Department of Occupational Safety and Health
Ministry of Human Resources
Malaysia

MANUAL ON SIMPLE RISK ASSESSMENT AND CONTROL FOR CHEMICALS (SiRAC) 2019

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PREFACE

This manual may be cited as the Manual on Simple Risk Assessment and Control for Chemicals (SiRAC).

The manual provides practical guidance and advice for compliance to:

(a) Section 15(1) & (2) of Occupational Safety and Health Act 1994 or as amended with respect to the duties of employers and self-employed persons to their workers; and

(b) Regulation 9 of the Occupational Safety and Health (Use and Standard of Exposure of Chemicals Hazardous to Health) Regulations 2000 or as amended hereinafter referred to as USECHH Regulations with respect to the duty of employer to conduct an assessment of risk to health for any work activities which may exposed or likely to exposed any workers to chemicals hazardous to health.

This manual has been developed to provide guidance to carry out an assessment of risk to health due to exposure to chemicals hazardous to health using the Simple Risk Assessment and Control for Chemicals (SiRAC) method.This manual has also been designed to assist employers to understand the scope of the assessment which shall contain the nature of the hazard to health, the exposure potential arising from the use of chemicals hazardous to health and the measures and procedures required to control the exposure of a worker to chemicals hazardous to health.

This manual will be reviewed from time to time. Written comments from any interested persons or parties are welcomed. These should be sent to the Department of Occupational Safety and Health (DOSH) for further consideration in improving the manual.

Director General
Department of Occupational Safety and Health
Malaysia
2019

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We also wish to thank individuals who directly or indirectly contributed in the preparation of this manual.

ABBREVIATION

SiRAC	Simple Risk Assessment and Control for Chemicals
USECHH Regulations	Occupational Safety and Health (Use and Standard of Exposure of Chemicals Hazardous to Health) Regulations 2000 or as amended
DOSH	Department of Occupational Safety and Health
CGS	Control Guidance Sheet
CA	Control Approach
OSHA	Occupational Safety and Health Act 1994 or as amended
CLASS Regulations	Occupational Safety and Health (Classification, Labelling and Safety Data Sheet of Hazardous Chemicals) Regulations 2013 or as amended
CHRA	Chemical Health Risk Assessment
SDS	Safety Data Sheet
CPL Regulations	Occupational Safety and Health (Classification, Packaging and Labelling of Hazardous Chemicals) Regulations 1997
PPE	Personal Protective Equipment
IBC	Intermediate Bulk Container
RPE	Respiratory Protective Equipment
LEV	Local Exhaust Ventilation
EU Directive 67/548/EEC	European Union Directive on Dangerous Substances

CONTENTS

PART 1: INTRODUCTION

1.1 Legal Requirements

One of the primary duties of an employer as stipulated under the Occupational Safety and Health Act 1994 (OSHA) is the making of arrangements for ensuring, so far as is practicable, safety and absence of risks to health in connection with the use or operation, handling, storage and transport of plant and substances. This duty includes the protection of workers from the adverse effects of chemicals. To fulfil this duty, an assessment of all chemicals used in the workplace must be carried out in order to identify, evaluate and control any health risk associated with work activities involving the use of chemicals.

Under the Occupational Safety and Health (Use and Standard of Exposure of Chemicals Hazardous to Health) Regulations 2000 or as amended (USECHH Regulations), the duty to perform an assessment of health risks arising from the use of chemicals hazardous to health at the workplace is mandatory whereby employers are not permitted to use any chemicals hazardous to health unless an assessment has been conducted.

1.2 Chemicals Hazardous to Health

Chemicals hazardous to health is defined under the USECHH Regulations as chemicals which are:

(a) listed in Schedule I or II of the USECHH Regulations;
(b) classified in any hazard classes under Health Hazard of the First Schedule of the Occupational Safety and Health (Classification, Labelling and Safety Data Sheet of Hazardous Chemicals) Regulations 2013 or as amended (CLASS Regulations);
(c) pesticides as defined under the Pesticides Act 1974 or as amended; or
(d) scheduled wastes listed in the First Schedule of the Environmental Quality (Scheduled Wastes) Regulations 2005 or as amended.

The chemicals that have been classified under health hazard of the CLASS Regulations are those chemical posing hazard to health. These chemicals are classified into various health hazard classes with hazard statement or H-code in the H300 series.

1.3 Full Assessment versus Simple Assessment

There are basically two approaches to conduct an assessment of risk to health arising from the use of chemicals hazardous to health, any one of which may be applied depending on the hazard class of the chemical, chemical use situation and the complexity of the work process. These approaches are:

(a) Full assessment which is conducted using method of “Chemical Health Risk Assessment” (CHRA); and

(b) Simple assessment which is conducted using method of “Simple Risk Assessment and Control for Chemicals” (SiRAC).

The flow chart for selection of assessment approach is shown in Figure 1.

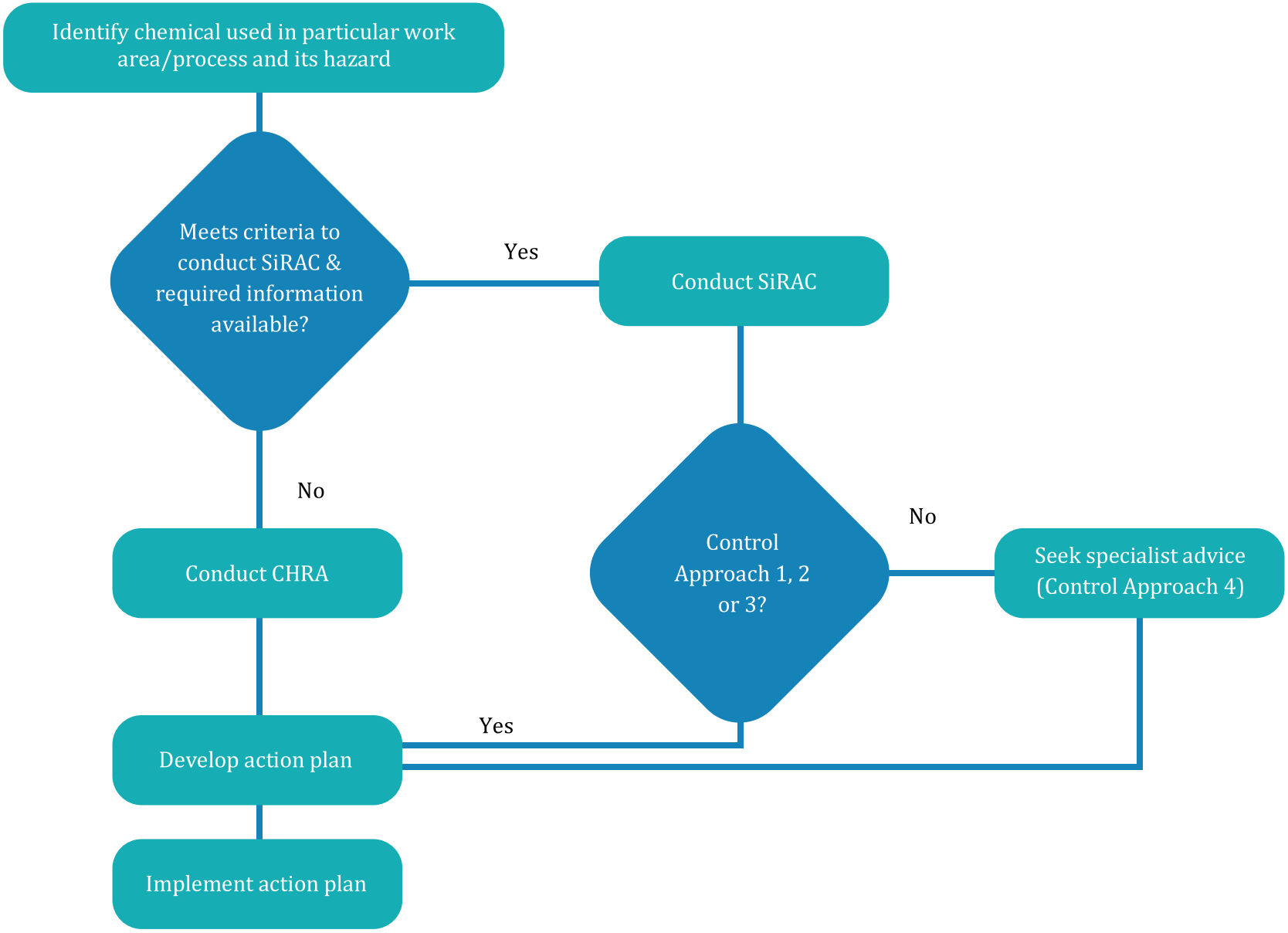


Figure 1: Selection of Assessment Approach

1.3.1 Full assessment

Full assessment should be conducted for each and every workplace where chemicals hazardous to health are used. It should be conducted by a registered chemical risk assessor appointed by the employer for each and every workplace where chemicals hazardous to health are used.

Generic assessment is a full assessment conducted at representative locations which may be applied to all other locations in which the work activities are similar, with comparable levels of risk, and similar control measures.

1.3.2 Simple assessment

A simple assessment involves a process of grouping workplace risks into control bands based on combination of hazard and exposure information. A simple assessment may be conducted, instead of the full assessment, if the chemicals hazardous to health used in a particular work unit meets the criteria specified in paragraph 2.1 of this manual. In order to conduct simple assessment, the required information are:

(a) hazard classification and hazard statement (H-code);
(b) physical form;
(c) boiling point or vapour pressure;
(d) operating temperature of chemicals (where applicable);
(e) quantity used; and
(f) total duration of exposure to the chemicals.

1.4 Benefits of Controlling Exposure to Chemicals Hazardous to Health

Chemicals hazardous to health used in the workplace can harm workers' health if exposures are not properly controlled. If an employer fails to prevent exposure or to properly control any exposure that does occur:

(a) It adds to the unnecessary and preventable burden of ill health;
(b) Business performance can be affected through lost time for sick leave;
(c) There can be civil claims for damages; and
(d) It is an offence under OSHA and specifically USECHH Regulations.

Simple assessment can help an employer to control exposure and meet his legal duties. It addresses some of basic requirements of USECHH Regulations for some chemicals hazardous to health in a simple and practical way. It also flags up other things that an employer need to tackle. It may be helpful to occupational safety and health practitioners, safety and health officers, safety and health committee members, chemical suppliers or trade associations.

1.5 Person to Conduct SiRAC

A person who conduct SiRAC should:

(a) have adequate knowledge, training and expertise in understanding hazard and risk;
(b) know how the work activity uses chemicals hazardous to health;
(c) have the ability and the authority to collate all the necessary, relevant information;
(d) have the knowledge, skills and experience to make the right decisions about the risks and the precautions that are needed;
(e) know how to interpret Safety Data Sheets (SDS);
(f) have knowledge on chemical control measures;
(g) know basic requirement of OSHA, USECHH Regulations and relevant guidelines;
(h) have knowledge on the SiRAC manual; and
(i) undergone SiRAC training programme by approved training providers.

PART 2: SCOPE AND APPLICATION

2.1 Scope and Application

USECHH Regulations applies to a wide range of chemicals hazardous to health. SiRAC method applies only to chemicals hazardous to health in solid and liquid forms that are supplied for use at the workplace. Typical examples include powder coatings; degreasing solvents and cleaning products; varnishes; ink and paints; and chemicals for making into other products. Chemicals hazardous to health are referred to hereinafter as "chemicals". These chemicals will generally be covered by the CLASS Regulations, and should have label and SDS.

SiRAC **does not** generally apply to the following types of chemicals:

(a) Chemical classified as carcinogenicity category 1, mutagenicity category 1 or respiratory sensitization category 1 under CLASS Regulations;
(b) Process generated dusts and fumes (e.g. wood dusts, fume released from molten metal);
(c) Organic dust, e.g. grain dust, cotton dust and paddy husk dust;
(d) Gases, e.g. hydrogen sulphide, ammonia, etc.; and
(e) Scheduled waste as listed in the First Schedule under the Environmental Quality (Scheduled Wastes) Regulations 2005 or as amended.

2.2 Routes of Exposure

Two most significant routes of exposure of chemicals into the human body are inhalation and dermal which will be covered in this manual. Entry of chemicals through ingestion or through injection will not be covered by this manual.

2.2.1 Inhalation

In industrial workplace, inhalation is the most significant route of exposure. Inhalation involves breathing in of airborne dusts and fibres, gases, vapours, mists or fumes. As we breathe in, the airborne chemicals will enter the upper respiratory tract (nose, mouth and throat), the air passage ways (trachea, bronchi, bronchioles and respiratory bronchioles) and some of the chemicals will penetrate into the gas exchange area (alveoli). Very soluble chemicals pass through the lungs in minutes. Less soluble chemicals are trapped in the alveolar region, exhaled out, swallowed or expectorated. Very fine dusts that are trapped in the alveolar region can cause lung disease such as silicosis, asbestosis and lung cancer.

2.2.2 Dermal contact and absorption

Some chemicals can cause damage to skin or skin disease (e.g. dermatitis, acne and eczema). Dermal contact with a chemical may result in local reaction such as a burn or rash, or absorption which causes systemic effect.

The absorption of a chemical through intact skin is influenced by the condition of the skin and the properties of the chemicals. Different parts of the body have different skin structure and thickness and hence different resistance to chemical penetration. These chemicals may enter the body through cuts or damaged skin. These chemicals pass through the blood stream and distributed and deposited in various organs or system causing various illnesses and diseases such as leukaemia, hepatitis and kidney failure.

PART 3: CONCEPTS

There are two main factors that affect whether workers' health is likely to be harmed, and these can help to identify adequate controls. The factors are:

(a) the type of damage the chemical causes and the amount needed to cause it; and
(b) how much of the chemical is likely to get into the air around workers and be breathed in, or come into contact with their skin or eyes. This in turn depends on the amount being used, its dustiness or volatility and total duration of exposure.

3.1 Hazard Classes and Groups

Different chemicals can harm workers in different ways, and some are more hazardous or can cause more harm than others. For example, some chemicals will only cause minor irritation to the eyes or throat, whilst other chemicals can make it more difficult to breathe or can kill. Some effects will be obvious straight away, whilst other effects will take many years to appear. It is important that all these effects are controlled, but chemicals which can cause the more serious effects will need a greater degree of control than less hazardous chemicals. One important way to reduce risk is by using a less hazardous chemical.

Chemicals are placed into four different groups, A to D, to indicate the degree of hazard. Group A is the least hazardous and group D is the most hazardous. An additional group, group S, indicates if it is hazardous to get the chemicals on the skin or in the eyes. Grouping of chemicals in the hazard group are based on its health effect and hazard classification. Table 3.1 and 3.2 present the hazard groups A to D and hazard group S, respectively, based on hazard classification and hazard statements (H-code) under the CLASS Regulations. Refer to Appendix 1 for the list of H-code and hazard statements.

In cases where the available information on hazard classification are given under the previous Occupational Safety and Health (Classification, Packaging and Labelling of Hazardous Chemicals) Regulations 1997 (CPL Regulations) or EU Directive 67/548/EEC (Directive on Dangerous Substances) then the classification has to be converted to classification under CLASS Regulations. Appendix 2 provides the conversion from risk phrases to hazard classifications and hazard statements.

Table 3.1: Hazard Groups A to D (chemicals causing harm when airborne)

Hazard Group	Hazard Class	H- code
Group A	Specific target organ – single exposure category 3 (narcotic effect)	H336
	Hazard classes not listed under Groups B, C or D (**EXCLUDE** respiratory sensitization category 1, germ cell mutagenicity category 1, carcinogenicity category 1)	all H-numbers not listed under Groups B, C and D (**EXCLUDE** H334, H340, H350, H350i)
Group B	Acute toxicity (inhalation) category 4	H332
	Acute toxicity (oral) category 4 and Acute toxicity (inhalation) category 4	H302+H332
	Acute toxicity (dermal) category 4 and Acute toxicity (inhalation) category 4	H312+H332
	Acute toxicity (oral) category 4; Acute toxicity (dermal) category 4 and Acute toxicity (inhalation) category 4	H302+H312+H332
Group C	Acute toxicity (inhalation) category 2	H330
	Acute toxicity (inhalation) category3	H331
	Specific target organ toxicity – single exposure category 2	H371
	Specific target organ toxicity – repeated exposure category 1	H372
	Acute toxicity (oral) category 3 and Acute toxicity (inhalation) category 3	H301+H331
	Acute toxicity (dermal) category 3 and Acute toxicity (inhalation) category 3	H311+H331
	Acute toxicity (oral) category 3; Acute toxicity (dermal) category 3 and Acute toxicity (inhalation) category 3	H301+H311+H331
	Reproductive toxicity category 2	H361/H361f/H361d/H361fd
	Specific target organ toxicity – repeated exposure category 2	H373
	Specific target organ toxicity – single exposure category 3 (respiratory irritation)	H335
Group D	Acute toxicity (inhalation) category 1	H330
	Carcinogenicity category 2	H351
	Reproductive toxicity category 1/1A/1B	H360/H360F/H360D/ H360FD/H360Fd/H360Df
	Effect on or via lactation	H362
	Specific target organ toxicity – single exposure category 1	H370
	Acute toxicity (oral) category 1 and Acute toxicity (inhalation) category 1	H300+H330
	Acute toxicity (dermal) category 1 and Acute toxicity (inhalation) category 1	H310+H330
	Acute toxicity (oral) category 1; Acute toxicity (dermal) category 1 and Acute toxicity (inhalation) category 1	H300+H310+H330
	Germ cell mutagenicity category 2	H341

Table 3.2: Hazard Group S (chemicals causing harm in contact with skin and eyes)

Hazard class	H- code
Acute toxicity (dermal) category 1 / category 2	H310
Acute toxicity (dermal) category 3	H311
Acute toxicity (dermal) category 4	H312
Skin corrosion or irritation category 2	H315
Skin corrosion or irritation category 1	H314
Skin sensitization category 1	H317
Serious eye damage category 1	H318
Serious eye damage category 2	H319
Acute toxicity (oral) category 1 / category 2 and Acute toxicity (dermal) category 1 / category 2	H300+H310
Acute toxicity (dermal) category 1 / category 2 and Acute toxicity (inhalation) category 1 / category 2	H310+H330
Acute toxicity (oral) category 1 / category 2; Acute toxicity (dermal) category 1 / category 2 and Acute toxicity (inhalation) category 1 / category 2	H300+H310+H330
Acute toxicity (oral) category 3 and Acute toxicity (dermal) category 3	H301+H311
Acute toxicity (dermal) category 3 and Acute toxicity (inhalation) category 3	H311+H331
Acute toxicity (oral) category 3; Acute toxicity (dermal) category 3 and Acute toxicity (inhalation) category 3	H301+H311+H331
Acute toxicity (oral) category 4 and Acute toxicity (dermal) category 4	H302+H312
Acute toxicity (dermal) category 4 and Acute toxicity (inhalation) category 4	H312+H332
Acute toxicity (oral) category 4; Acute toxicity (dermal) category 4 and Acute toxicity (inhalation) category 4	H302+H312+H332
any chemicals with “skin” notation as prescribed in Schedule I of USECHH Regulations	

3.1.1 Hazard group consideration for mixture made in the workplace

If the task involved mixing of chemicals in the workplace, the hazard group of the mixture can be determined based on the following considerations:

(a) If any component is in Hazard Group ‘S’, then the mixture is Hazard Group S; and
(b) If any component is in Hazard Group ‘D’ ≥ 0.3% then the mixture is Hazard Group D;or
(c) If any component is in Hazard Group ‘C’ ≥ 1.0% then the mixture is Hazard Group C;or
(d) If any component is in Hazard Group ‘B’ ≥ 10% then the mixture is Hazard Group B; or
(e) Otherwise the mixture is Hazard Group A.

3.2 Factors Which Affect Exposure

3.2.1 Scale of use

The amount of chemicals used will determine the way chemicals is handled and how much the workers are exposed to the chemicals. The amount of chemicals use per operation or batch (or a day for a continuous process) can be described as small, medium or large. Use the information in the Table 3.3 to see if the use is small, medium or large.

Table 3.3: Scale of Chemical in Use

Quantity	Solid		Liquid	
	Weight	Typically received in	Volume	Typically received in
Small	Grams	Packets or bottles	Millilitres	Bottles
Medium	Kilograms	Kegs or drums	Litres	Drums
Large	Tonnes	Bulk	Cubic metres	Bulk

Example:
Cleaning parts activity conducted three times per day using 500ml of solvent per operation. Therefore, the amount of chemicals used is 500ml and the scale of chemical in use is small.

3.2.2 Ability to become airborne

The physical form of a chemical affects how likely it is to get into the air. For solids, the physical property is its dustiness, and for liquids, it is volatility. The dustier or more volatile the chemicals, the more it is likely to become airborne. It may be possible to reduce the amount of chemical getting into the air by buying and using the chemical in a different form, for example, by:

(a) replacing fine powders with pellets or less dusty granules; or
(b) using liquids at a lower temperature.

3.2.2.1 Solids

The dustiness of a solid is classified as low, medium or high. Table 3.4 describes the level of dustiness of chemicals being used.

Table 3.4: Level of Dustiness

Level	Descriptions	Example
Low	Pellet like solids that do not break up. Little dust is seen during use.	Polyvinyl chloride (PVC) pellets,waxed flakes
Medium	Crystalline, granular solids. When used, dust is seen, but settles out quickly. Dust is left on surfaces after use.	Soap powder
High	Fine, light powders. When used, dust clouds can be seen to form and remain in the air for several minutes.	Cement, carbon black

3.2.2.2 Liquids

Volatility describes a liquid's ability to turn into a vapour, and therefore become airborne.Some liquids, highly volatile ones, do this more readily than others, and thus create the potential for greater exposures than chemicals with lower volatility.

The degree of liquid volatility can be determined based on either the vapour pressure or the boiling point and operating temperature. The information on vapour pressure and boiling point is normally found in the SDS for that chemical.

To determine the degree of volatility based on vapour pressure and boiling point, refer to Table 3.5a and Table 3.5b respectively.

Table 3.5a: Degree of Volatility Based on Vapour Pressure

Volatility band	Vapour pressure
Low	Less than 500 Pa
Medium	500 to 25 000 Pa
High	More than 25 000 Pa

Note:
1 atmosphere = 760 mm Hg = 0.98 Bar = 101325 Pa

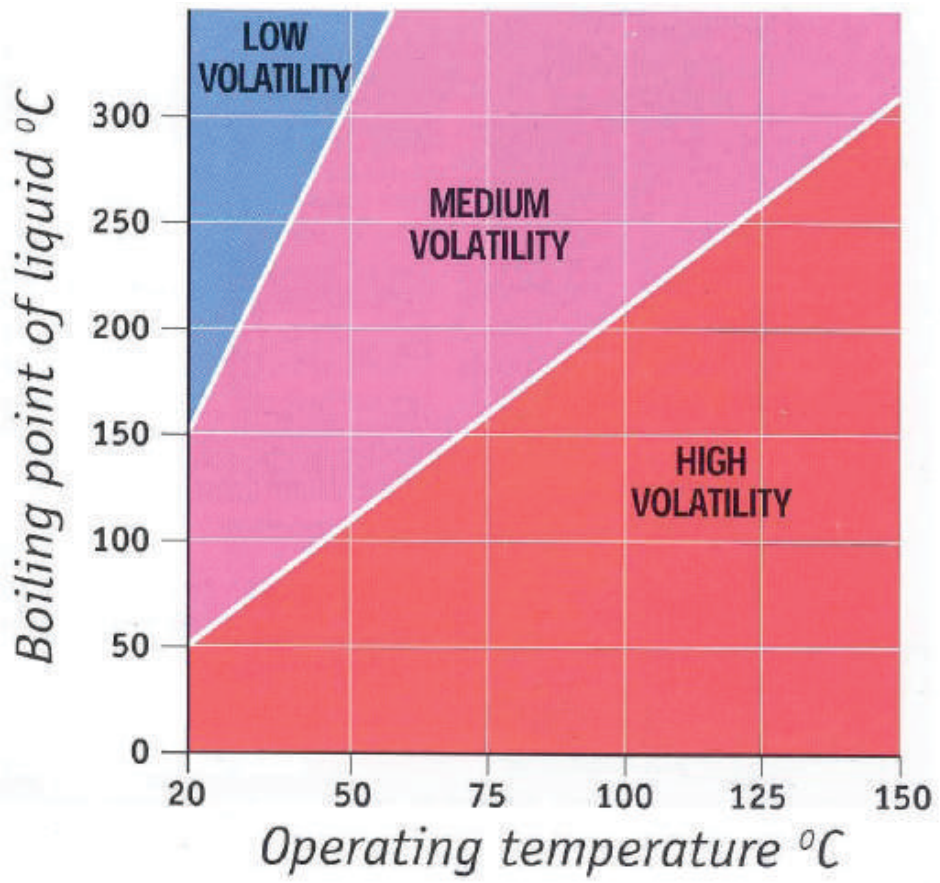
For tasks carried out at room temperature 25℃, the volatility of a liquid is classified as low, medium or high as specified in Table 3.5b.

Table 3.5b: Degree of Volatility Based on Boiling Point at 25℃

Degree	Descriptions	Example
High	Boiling point below 50℃	Butadiene
Medium	Boiling point between 50℃ and 150℃	Acetaldehyde, acetone, chloroform, diethylamine
Low	Boiling point above 150℃	Ethylene glycol, carbon tetrachloride, n-butyl acetate

Source : The Technical Basis for COSHH Essential: Easy Step to Control Chemical, 2016

For task carried out above room temperature, the chemical's boiling point and operating temperature can be used to decide volatility from graph in Figure 2. Read across from the boiling point, and up from the operating temperature. The section in which two lines meet on the graph will tell the volatility. If it falls on a dividing line, the higher volatility is selected. If the task involves a range of operating temperature, use the highest value.



Source : The Technical Basis for COSHH Essential: Easy Step to Control Chemical, 2016

Figure 2: Graph to select volatility of liquid

Note:
Conversion from Fahrenheit to Celsius, °C = 5/9 x (°F – 32).

Alternatively, the degree of volatility is determined in Table 3.5c :

Table 3.5c: Formula to determine the degree of volatility

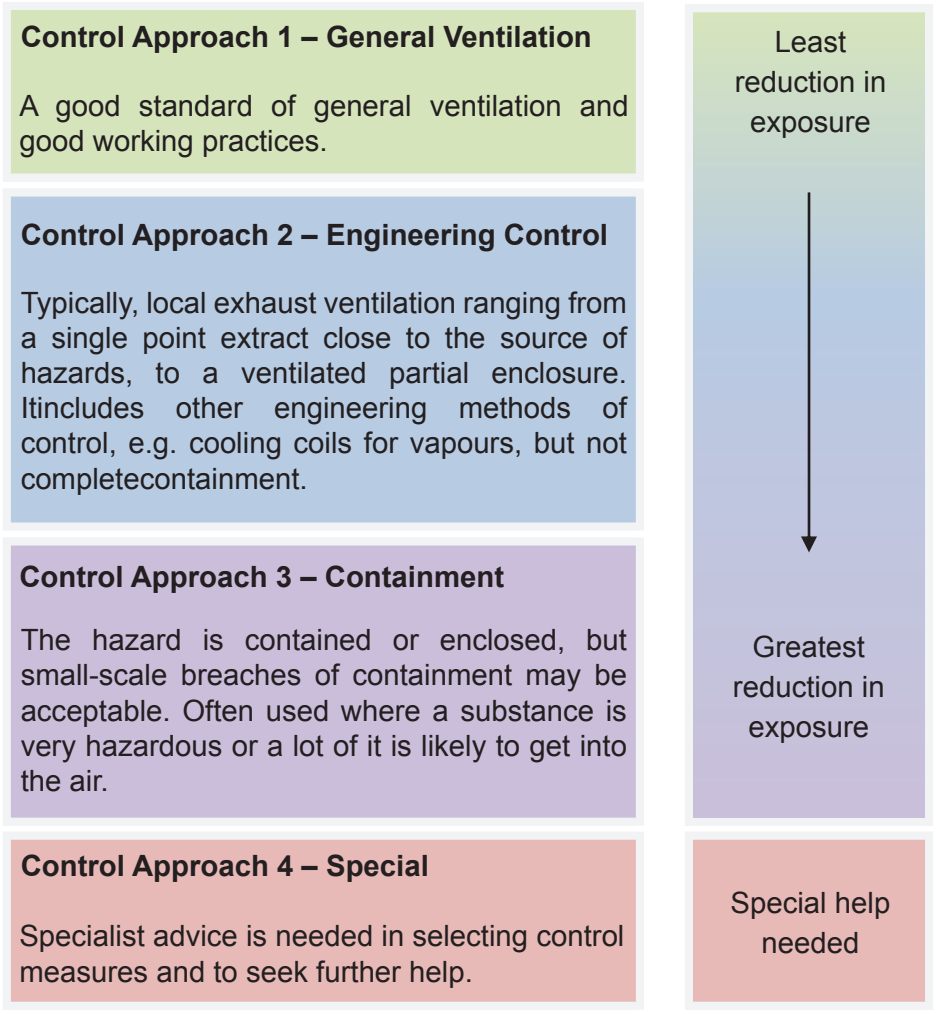
Boiling Point	Volatility
Boiling point ≤ (2 x OT) + 10 °C	High
(2 x OT) + 10 °C < boiling point < (5 x OT) + 50 °C	Medium
Boiling point ≥ (5 x OT) + 50 °C	Low

Note:
OT means Operating Temperature in Celsius, °C

3.3 Control Approaches to Reduce Exposure

3.3.1 Group of Control Approach

SiRAC recommends four groups of controls, called Control Approaches. The four approaches are:



Source : The Technical Basis for COSHH Essential: Easy Step to Control Chemical, 2016

Notes:

- Please refer to Appendix 3 for details on general ventilation, engineering control and containment.
- Control Approaches 4 is the highest control approach. Refer to Control Guidance Sheet (CGS) G400.

Each Control Approach covers a range of actions that work together to reduce exposure:

(a) Good plant and equipment design;
(b) Regular housekeeping and cleaning;
(c) Regular maintenance, examination and testing of equipment;
(d) Worker training and supervision; and
(e) In some cases, using PPE.

Table 3.6 can be used to identify the control approaches using the information on the hazard group, scale of use and ability to become airborne.

Table 3.6: Control Approach Selection

Scale of used	Low dustiness or volatility	Medium volatility	Medium dustiness	High dustiness or volatility
Hazard group A				
Small	1	1	1	1
Medium	1	1	1	2
Large	1	1	2	2
Hazard group B				
Small	1	1	1	1
Medium	1	2	2	2
Large	1	2	3	3
Hazard group C				
Small	1	2	1	2
Medium	2	3	3	3
Large	2	4	4	4
Hazard group D				
Small	2	3	2	3
Medium	3	4	4	4
Large	3	4	4	4

Source : The Technical Basis for COSHH Essential: Easy Step to Control Chemical, 2016

3.3.2 Adjustment for frequency and duration of use (time-weighting)

A threshold of 15 minutes use per day is applied to adjust the Control Approach. A total duration of use of less than 15 minutes will result in a drop of one level in the Control Approach. Example from Control Approach 3 (containment) drops to 2 (engineering control), or from 2 to 1 (general ventilation). The superficial reason for this assessment is task-based and precautionary. This adjustment does not apply for Control Approach 4.

3.4 Control Guidance Sheet (CGS)

CGS is a fact sheet providing guidance to employer on how to control exposure to chemical for each control approach. CGS can be divided into two groups which are Specific CGS and Generic CGS.

3.4.1 Specific CGS

Specific CGS is a straight forward advice in the form of fact sheet for the following activities:

(a) Pest control
(b) Cleaning services
(c) Lithography printing

The Specific CGS will be based on task performed and can be selected from Table 3.7 to Table 3.9 without going through the processes of determining the hazard group, ability to become airborne and scale of use.

The Specific CGS may be reviewed and added if necessary by the DOSH from time to time.

Table 3.7: List of Control Guidance Sheet for Pest Control

Task Description	P
General principle – handling concentrated pesticides for protection of plants	P001
Diluting chemical concentrates	P002
Ready-for-use insecticide sprays and powder	P003
Eradicating vermin (rats, etc.)	P004
Fogging and misting using space sprayers	P005
Storing pesticides products	P006
Disposal of pesticides wastes	P007

Table 3.8: List of Control Guidance Sheet for Cleaning Services

Task Description	C
Cleaning and disinfection using a low-pressure washer	C001
Dry cleaning using chlorinated solvent	C002
Dry cleaning – spot cleaning	C003
Diluting chemical concentrates	C004
Manual cleaning and disinfecting surfaces	C005
Storing chemical products (small scale)	C006

Table 3.9: List of Control Guidance Sheet for Lithography Printing

Task Description	LP
Ink mixing and cleaning up	LP001
Manual film and plate development	LP002
Automated film and plate development	LP003
Printing with conventional ink	LP004
Manual cleaning of presses	LP005
Automated cleaning of presses (conventional ink)	LP006

3.4.2 Generic CGS

Generic CGS is applicable to chemicals used in activities which are not covered under Specific CGS (refer to paragraph 3.4.1). The CGS are arranged according to the control approaches they covered, consisting of:

(a) general sheets for each control approach (G100, G200, G300, G400);
(b) sheets that give recommendations on good practice controls for task-specific such as mixing, weighing and sieving; and
(c) supplementary sheets on avoiding skin and eye contact with chemicals, and on selecting and using PPE.

The CGS is selected based on unit operation or tasks description. If the task does not match with the task description in Table 3.10, the appropriate general task CGS is selected for the relevant control approach.

Table 3.10: List of Generic CGS

Control Approach 1: General ventilation

Unit Operation	Sheet title	Solids			Liquids		
		Small	Medium	Large	Small	Medium	Large
General tasks	General ventilation	G100	G100	G100	G100	G100	G100
Storage	General storage	G101	G101	G101	G101	G101	G101
	Open bulk storage			G102			
Dust extraction	Removing waste from dust extraction unit	G103	G103	G103			

Control Approach 2: Engineering control

Unit Operation	Sheet title	Solids			Liquids		
		Small	Medium	Large	Small	Medium	Large
General tasks	Local exhaust ventilation	G200	G200	G200	G200	G200	G200
	Fume cupboard	G201			G201		
	Laminar flow booth		G202			G202	
	Ventilated benchwork (downdraught bench)	G203			G203		
Dust extraction	Removing waste from dust extraction unit	G204	G204	G204			
Transfer	Conveyor transfer		G205	G205			
	Sack filling		G206	G207			
	Sack emptying		G208				
	Filling kegs		G209				
	Charging reactors and mixers from a sack or keg	G210	G210				
	IBC filling and emptying			G211			
	Drum filling					G212	
	Drum emptying using a drum pump					G213	
Weighing	Weighing	G201	G214		G201		
Mixing	Mixing	G201	G215	G216	G201	G217	G217
Sieving	Sieving	G218	G218				
Screening	Screening			G219			
Surface coating	Spray painting				G220	G221	
	Powder coating		G222	G222			
Lamination	Batch lamination					G223	G223
	Continuous lamination					G224	G224
Dipping	Pickling bath					G225	G226
	Vapour degreasing bath					G227	G227
Drying	Tray drying oven		G228			G228	
	Continuous drying labyrinth oven					G229	G229
Pelletising	Pelletising		G230	G230			
	Tablet press		G231				

Control Approach 3: Containment

Unit Operation	Sheet title	Solids			Liquids		
		Small	Medium	Large	Small	Medium	Large
General tasks	Containment	G300	G300	G300	G300	G300	G300
	Glove box	G301			G301		
Dust extraction	Removing waste from dust extraction unit			G302			
Transfer	Transferring solids		G303	G303			
	Sack emptying		G304				
	Drum filling					G305	G305
	Drum emptying					G306	
	IBC filling and emptying			G307			G308
	Tanker filling and emptying			G309			G310
	Filling kegs		G311				
	Transferring liquid by pump					G312	G312
	Packet filling	G301	G313	G313			
	Bottle filling				G301	G314	G314
Weighing	Weighing	G301	G315	G315	G301	G316	G316
Mixing	Mixing	G301	G317	G317	G301	G318	G318
Surface coating	Robotised spray booth					G319	G319
	Automated powder coating		G320	G320			
Dipping	Vapour degreasing bath				G321	G321	G321
Drying	Spray drying		G322	G322		G322	G322

Control Approach 4: Special

Sheet No	Title
G400	General principles

Supplementary Advice

Control Guidance Sheet for chemicals causing harm by skin contact

Sheet No	Title
S100	Chemical causing harm via skin or eye contact
S101	Selecting protective gloves
S102	Selecting personal protective equipment (PPE) except gloves

Control Guidance Sheet for respiratory protection

Sheet No	Title
R001	Respiratory protective equipment (RPE)

The CGS for all Control Approach are available in Appendix 6.

3.5 Workers Involvement

Involvement of workers or safety and health committee member in the risk assessment is important. They are in a good position to know what happens in practice, and they are the one who will need to use any controls introduced. Workers involvement could be part of the training and information the employer must provide under USECHH Regulations.

PART 4: STEPS IN CONDUCTING SiRAC

The steps to conduct SiRAC are as shown in Figure 3.

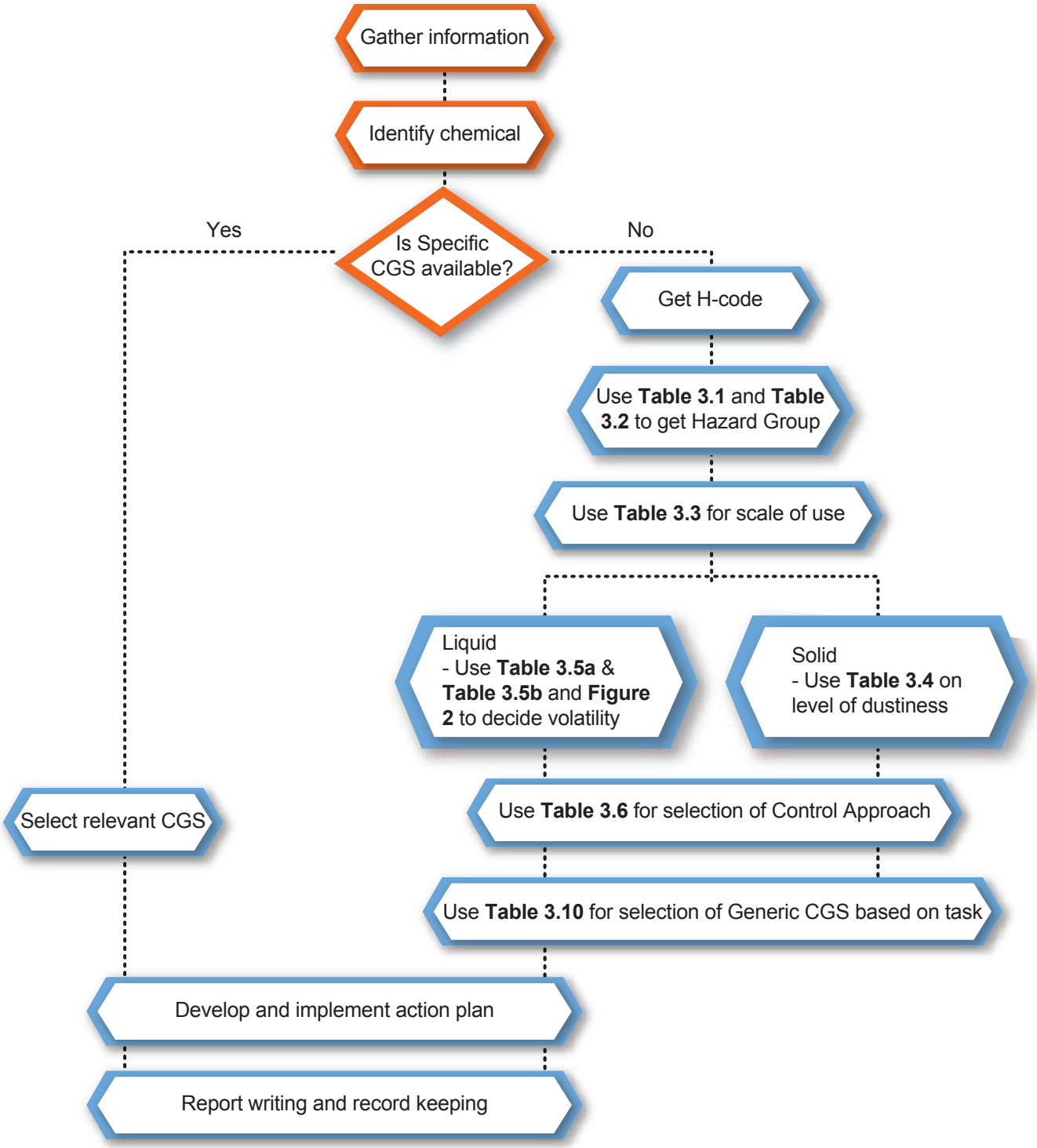


Figure 3: Flow chart to conduct simple assessment

4.1 Step 1- Gather Information

4.1.1 The assessment begins with gathering of the following:

(a) Chemical register;
(b) SDS;
(c) Label;
(d) Information about the task where chemical is used and total duration of use;
(e) Existing control measures such as general ventilation, local exhaust ventilation; and
(f) Other information such as layout plan, process flow, operating temperature of process and number of workers exposed to chemical.

Notes:

1. The SDS should contain the following information:

(a) *Hazard classification and relevant hazard statements (given under Section 2: Hazard Identification);*
(b) *The boiling point or vapour pressures for liquid (Section 9: Physical and Chemical Properties).*

If the above information is not available, contact the supplier.

2. If the SDS is not available or outdated, get the current SDS from the supplier.

4.1.2 Identify a work area/process using chemicals.

4.1.3 Select a task to assess within the work area/process.

Note:

It may be helpful to categorise the task as described by the task-specific CGS such as mixing, weighing, transfer, storage, separation, surface coating, lamination, dipping, drying and palletising.

4.1.4 Identify the chemical used.

4.1.5 Record the following in the Gathering Information form (SA 2a) provided in the manual:

(a) work area/process;
(b) task involved;
(c) name of the chemical assessed; and
(d) date of assessment.

4.1.6 If Specific CGS is available go to Step 6.

4.2 Step 2 – Determining Hazard Group

4.2.1 Check the hazard classification and relevant hazard statements from SDS of the chemicals. Obtain H-codes for each of the hazard statements. Information on hazard classification and hazard statements are normally found in Section 2 of the SDS (Hazard Identification).

4.2.2 Determine the hazard group(s) for the chemicals using Table 3.1. Decide on the group from hazard group A to D, and be careful to match the H-code exactly. Some H-code can be single or in combination with others*. In addition, check group S (refer Table 3.2), to see if contact with skin and eyes is also a hazard. If the SDS contain H-code that is not listed in Table 3.1, then the chemical belongs to group A.

Note:
*This is indicated by a '+' for H-code between the numbers, e.g. *Harmful if swallowed and in contact with skin (H302+H312) means that both harmful if swallowed (H302) and harmful in contact with skin (H312) apply to the chemical.*

4.2.3 If there are several H-code on the SDS which appear in different hazard groups from A to D, always select the higher group. For example, for a chemical with H332 (group B) and H330 (category 2) (group C), select group C.

4.2.4 If the H-code on the SDS and label could not be found, or the appropriate hazard group could not be determined, contact the chemical supplier for information.

4.2.5 Fill in the appropriate hazard group for each chemical on the Simple Assessment Worksheet (SA 2b).

4.3 Step 3 – Deciding the Scale of Use

4.3.1 Decide the amount of chemical used per operation or batch or a day (for a continuous process) by using Table 3.3 and record on the form. If in doubt about the amount, choose the larger quantity.

4.3.2 Fill in the appropriate scale of use for each chemical on the SA 2b.

4.4 Step 4 – Determining Dustiness and Volatility

4.4.1 Solid form

For solid, use Table 3.4 to decide on the level of dustiness. If in doubt about the level of dustiness, choose the dustier description (refer to paragraph 3.2.2.1).

4.4.2 Liquid form

To work out the volatility of a liquid, its vapour pressure or boiling point needs to be found on the SDS. This can normally be found in section 9 of the SDS (Physical and Chemicals Properties). Where information on the substance's vapour pressure or boiling point is given in a range of values, use the lowest value. If a preparation is made up of two or more substances with different boiling points, use the lowest value. For tasks carried out at room temperature, compare the boiling point against the ranges in Table 3.5 to decide on the degree of volatility and record in SA 2b (refer to paragraph 3.2.2.2).

4.4.3 Other physical form

For paste, gel, slurry and etc. their volatility should be considered if data on boiling point or vapour pressure is available.

4.4.4 Fill in the appropriate volatility or dustiness for each chemical on the SA 2b.

4.5 Step 5 – Selection of Control Approach

4.5.1 Table 3.6 can be used to identify the control approaches based on the outcome from the previous steps. The Control Approach is found by first going to the hazard group to which the chemical has been allocated as in Step 2. Read across from the scale of use (Step 3) to the appropriate volatility/dustiness column as in Step 3. The number in the box identifies the Control Approach. Fill in the appropriate Control Approach on the SA 2b.

4.5.2 If duration of use is less than 15 minutes, adjust the Control Approach to one level below the selected Control Approach. For example, if the selected Control Approach is 3 the adjusted Control Approach will be Control Approach 2. This adjustment does not apply for Control Approach 1 and 4. Fill in the adjusted Control Approach in the SA 2b.

4.5.3 For task using more than one chemical, select the highest Control Approach taking into consideration its suitability and practicality.
Example:

Task	Chemicals	Hazard Group	Amount Used	Volatility/ Dustiness	Control Approach
Mixing	Aromatic solvent	B	Large	Medium (volatility)	2
	Zirconium octoate	C	Small	Low (dustiness)	1

Hence, the Control Approach selected is 2 (Engineering Control)

4.6 Step 6 – Finding The Task – Specific Control Guidance Sheet(s)

4.6.1 From the Control Approaches decided in Step 5, use Table 3.10 to select task-specific CGS that best describe the task(s) carried out. To select the task-specific CGS find the number(s) of the guidance sheets using the following information from assessment form:

(a) The task;
(b) Whether the substance is a solid or a liquid; and
(c) How much is being used in the task or batch.

4.6.2 Write the CGS number(s) on SA 2b and find the relevant sheet(s).

4.6.3 If task carried out do not meet the task description, select general CGS for the Control Approach selected.

4.6.4 If the chemicals fall under hazard group S, extra action is needed to protect workers' skin and eyes. This means that CGS S100, S101 and S102 should be selected, which give advice on protecting skin and eyes, and on selecting and using PPE. Insert S100, S101 and S102 in the CGS column on the SA 2b, in addition to the existing CGS. To determine the appropriate PPE, refer to section 8 of the SDS (Exposure Control and Personal Protection).

4.6.5 For direct advice, use Table 3.7 (Pest Control) , Table 3.8 (Cleaning Services) and Table 3.9 (Lithography Printing) to select appropriate CGS according to task description and record the CGS on the SA 2b.

4.6.6 If respiratory protective equipment (RPE) is necessary, refer to CGS R001.

Work example of Step 1 to 6

Worked example

Question

Determine the CGS for the following activity:

Name of chemical : Resin solution X50
Task : Drum filling
Physical State : Liquid
Operating temperature : 25°C
Boiling point : 77°C
Amount of use : 200 litres
R-Phrases : R48/20, R63, R36/38, R43, R51/53, R67

Answer

Convert R-phrase to H-code using Appendix 2. Then assign the appropriate hazard group based on H-code (Table 3.1)

R-phrase	H-code	Hazard Group
R48/20	H373	C
R63	H361d	C
R36/38	H319, H315	A, S
R43	H317	A, S
R51/53	Not applicable (environmental hazard)	_
R67	H336	A

Hazard Group : C, S
Scale of use : Medium (refer Table 3.3)
Volatility of the mixture : Medium (refer Table 3.5b)

Thus, from **Table 3.6, Control Approach 3** is selected based on matrix in the table.
Therefore, from **Table 3.10, CGS G305** is selected based on task.
CGS S100, S101 and or S102 also need to be considered based on work activities involved.

4.7 Step 7- Develop and Implement Action Plan

4.7.1 In developing the action plan, compare advice given in the CGS (refer Appendix 6) with the current practices including existing control measures in place, procedures and work practices.

4.7.2 Look at the range of chemicals used and tasks performed, and decide how best to implement action across the board by taking into consideration **suitability** and **practicality** of the Control Approach selected. If in doubt, seek specialist advice. The advice may come from an expert such as an industrial hygienist, chemical health risk assessor, professional engineer and hygiene technician involved in the design and installation of engineering control.

Notes:
"Suitability" means it is suitable for protecting the workers, taking into consideration the physical form and toxicity of the chemical, the nature of work, the routes of exposure of the chemical and not prejudice to the health of the workers.

"Practicality" means practicable having regard to:

(a) the severity of the hazard or risk in question;
(b) the state of knowledge about the hazard or risk and any way of removing or mitigating the hazard or risk;
(c) the availability and suitability of ways to remove or mitigate the hazard or risk; and
(d) the cost of removing or mitigating the hazard or risk.

4.7.3 Consider all aspects of the advice on the CGS as all the aspects work together to provide adequate control. For example, local exhaust ventilation may not provide adequate control if it is not used properly, maintained, inspected, examined and tested periodically.

4.7.4 If Control Approach 4 has been selected, seek further guidance or specialist advice on what to do. This is critical because there could be very serious health effects if exposure is not properly controlled.

4.7.5 If the S100, S101 and S102 guidance sheets on protecting skin and eyes, and on selecting PPE have been chosen, link the advice to the CGS selected. These are not a replacement for but in addition to Control Approaches 1 to 4.

4.7.6 Take account of any safety hazards (refer to hazard statement and advice on the SDS), which may affect the required controls and their implementation.

4.7.7 Consider other actions required to fully comply with USECHH Regulations. For example:

(a) For other chemicals hazardous to health in the workplace covered by USECHH Regulations, but not covered by SiRAC, which need assessing and control measures (see Part 2.1) appoint chemical risk assessor to conduct full assessment.

(b) Consideration on the necessity to conduct exposure monitoring:

i. The route of exposure is through inhalation;
ii. Possibility of permissible exposure limits (PEL) as specified in Schedule 1 of USECHH Regulations being exceeded**; or
iii. To check the existing control equipment are maintained to ensure that the exposure level of chemicals hazardous to health are below the PEL;

and there is a validated method of sampling and analysis.

Note:
**Conditions where PEL may be exceeded:

- moderate to high volatility or dustiness; and
- there is an evidence of inadequate control measures.

Once the necessity to conduct exposure monitoring has been determined, the chemical identity or the specific chemical name needs to be specified in the Action Plan form (SA 3).

(c) The necessity to carry out health/medical surveillance if:

i. the results of exposure monitoring at or above half of 8 hours time weighted average or exceed ceiling limits;
ii. the chemical pose potential systemic effects through dermal absorption which is indicated as (skin) in Schedule I of USECHH regulations and the task is performed with a likelihood of dermal contact or absorption;
iii. the worker is exposed to chemicals listed in Schedule II of USECHH Regulations and there is a likelihood that an identifiable disease will result from that exposure; or
iv. cases of ill health or worker feedback related to exposure to chemicals hazardous to health at the workplace;

and there are valid techniques for detecting indications of identifiable disease.

4.7.8 Implement measures, procedures, and equipment necessary to control any accidental emission of chemicals hazardous to health as a result of leakage, spillage, or process or equipment failure.

4.7.9 Determine the appropriate control measures based on the overall assessment and the above considerations and develop an action plan (as per SA 3). Action plan should include action item, due date and person in charge.

4.7.10 Implement the control measures in consultation with workers, and check the effectiveness of the control measures. Take any other identified action in 4.7.7 to fully comply with USECHH Regulations.

4.8 Report Writing and Record Keeping

4.8.1 SiRAC report should contain the following:

(a) the nature of the hazard to health;
(b) the exposure potential arising from the use of chemicals hazardous to health; and
(c) the measures and procedures required to control the exposure of a worker to chemicals hazardous to health.

4.8.2 These items are incorporated in SA 1, SA2a, SA 2b and SA 3.

4.8.3 The SiRAC report should contain the following section at minimum:

(a) Report title page (refer to Appendix 5)
(b) Assessment summary (SA 1)
(c) Introduction
- Summary of workplace operation
- Objective and scope of assessment

(d) Process description
- Description of processes at workplace including process flow chart if applicable

(e) Assessment findings (SA2a, SA 2b and SA 3).
(f) Appendix
- SiRAC trained person's certificate of attendance
- CGS related

4.8.4 Records are important documents that show compliance to legislations requirements.They can either be in hard copies (for example bound reports) or electronic copies. In maintaining records, the employers must ensure that all records remain legible, identifiable and traceable to the work area involved in the assessment. All records should be stored and maintained in such a way that they are readily retrievable and protected against damage, deterioration or loss. The retention period and disposition of records should be in accordance to USECHH Regulations.

4.8.5 For the purpose of the assessment, SiRAC records should be maintained by the employers for at least 30 years.

4.9 Review Assessment

According to USECHH Regulations, the employer shall review the assessment if:

(a) there has been a significant change in the work that could affect the outcome of the assessment;
(b) new or improved control measures are implemented;
(c) more than five years have elapsed since the last assessment; or
(d) directed by the Director General, Deputy Director General or the Director of Occupational Safety and Health.

5.0 REFERENCES

1. Occupational Safety and Health Act 1994 (Act 514).
2. Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations 2000.
3. Occupational Safety and Health (Classification, Labelling and Safety Data Sheet of Hazardous Chemicals) Regulations 2013.
4. A Manual of Recommended Practice on Assessment of the Health Risk Arising From the Use of Chemicals Hazardous to Health at the Workplace 3rd Edition (First Reprint), DOSH 2018.
5. Guidelines on the Use of Personal Protective Equipment against Chemicals Hazards, DOSH 2005
6. Guidelines on Occupational Safety and Health for Design, Inspection, Testing and Examination of Local Exhaust Ventilation System, DOSH 2008.
7. Guidelines on the Control of Chemicals Hazardous to Health, DOSH 2001.
8. Guidelines on Medical Surveillance, DOSH 2001.
9. Guidelines on Monitoring of Airborne Contaminant for Chemicals Hazardous to Health, DOSH 2002.
10. Industry Code of Practice for Safe Working in a Confined Space DOSH, 2010.
11. The Technical Basis for COSHH Essentials: Easy Steps to Control Chemicals, Health and Safety Executive, United Kingdom 2016.
12. International Chemical Control Toolkit, International Labour Organization.

6.0 FORM

SUMMARY OF SIMPLE ASSESSMENT SA 1

General Information

Company :			
Address :			
Telephone :	Fax :	Email :	
Name of Assessor/Trained Person:	Position:	Contact No.:	
Type of industry: (refer to Appendix 4)			
Total no. of chemicals at the workplace :	No. of chemicals assessed (using simple assessment) :		

Summary of Simple Assessment							
Work Area /Process	Task Description	CGS*	Existing control**	Further Action			
				Control measure**	Training yes / no	EM* yes / no	MS* yes / no

*CGS: Control Guidance Sheet, EM: Exposure Monitoring, MS: Medical Surveillance
**Existing control (fill in the following code)

Control Measure	Code
General Ventilation	01
Local exhaust ventilation	02
Containment	03
Training	04
Safe work procedures	05
PPE (please specify)	06
Others (please specify)	07

Work Area :

Date of assessment :

Process	Number of workers	Task	Name of chemicals	H-code	Quantity use	Physical form	B.P &O.T (°C)	Total duration of use/day (minutes)	Existing control

Notes:
B.P : Boiling point
O.T : Operating temperature

Work Area :

Date of assessment :

No.	Task	Name of chemicals	Hazard group (A, B, C, D, S)	Scale of use (S/M/L)	Dustiness/ Volatility (L/M/H)	Total duration of use <15min? yes / no	Control Approach (CA)	Control Guidance Sheet (CGS)

Work Area :

No.	Task	Name of chemical	Existing control	Adequacy of control yes / no	Action to be taken	Due Date	PIC

I ..... NIRC No. ..... will be responsible for the improvements as specified in the action plan. I also promise to keep good records of the assessment and hand it over to my successor if my company ceases business or hand it over to the Director General of Occupational Safety and Health if there is no successor.

Signature of employer :	Position :	Date:

Table 6.1: Guidance Notes on filling Form SA 2b

Field Name	Instructions
Hazard group (A, B, C, D, S)	Fill in the appropriate hazard group A,B,C,D and/or S. Refer Table 3.1, Table 3.2 and paragraph 3.1.1.
Scale of use (S, M, L)	Fill in the scale of use either small (S), medium (M) or large (L). Refer Table 3.3.
Dustiness/Volatility (L, M, H)	Fill in the appropriate level of dustiness or degree of volatility either low (L), medium (M) or high (H). Refer Table 3.4, Table 3.5a or Table 3.5b.
Total duration of use <15min	Fill in 'yes' if total duration of use less than 15 minutes. (Adjustment for control approach is required) Refer paragraph 3.3.2. Otherwise fill in 'no'. (No adjustment for control approach is required).
Control Approach (CA)	Fill in the relevant Control Approach either 1, 2, 3 or 4. Refer Table 3.6.
Control Guidance Sheet (CGS)	Fill in the appropriate CGS. Refer Table 3.7.

Table 6.2: Guidance Notes on filling Form SA 3

Field Name	Instructions
Adequacy of control	Fill in 'yes' if ALL of the following criteria are met: (a) Suitability*; (b) Use and Effectiveness**; and (c) Maintenance***. Otherwise, fill in 'no'. **Notes:** *Refer paragraph 4.7.2 **The control measures are used according to the manufacturers' instructions and recommendations, and effective in preventing or minimising exposure. ***refer to maintenance and/or PPE records.
Action to be taken	Recommend further controls if existing controls are not adequate. Recommend action to be taken to comply with the requirement of the USECHH Regulations (refer paragraph 4.7.7 and 4.7.8).
Due date	Target date when the action has to be accomplished (to be completed by employer).
PIC	Name of person in charge responsible to execute the action to be taken (to be completed by employer).
Signature of employer	Signed by a person who has control over the workplace and responsible for the improvements. For example plant manager, factory manager, managing director and etc.

7.0 LIST OF TABLES

8.0 LIST OF FIGURES

9.0 APPENDICES

APPENDIX 1

List of Hazard Statements

H-code	Hazard statement
H300	Fatal if swallowed
H301	Toxic if swallowed
H302	Harmful if swallowed
H304	May be fatal if swallowed and enters airways
H310	Fatal if in contact with skin
H311	Toxic if in contact with skin
H312	Harmful if in contact with skin
H314	Causes severe skin burns and eye damage
H315	Causes skin irritation
H317	May cause allergic skin reaction
H318	Causes serious eye damage
H319	Causes serious eye irritation
H330	Fatal if inhaled
H331	Toxic if inhaled
H332	Harmful if inhaled
H334	May cause allergic or asthma symptoms or breathing difficulties if inhaled
H335	May cause respiratory irritation
H336	May cause drowsiness or dizziness
H340	May cause genetic defects *(state route of exposure, if it is conclusively proven that no other routes of exposure cause the hazard)*
H341	Suspected of causing genetic defects *(state route of exposure, if it is conclusively proven that no other routes of exposure cause the hazard)*
H350	May cause cancer *(state route of exposure, if it is conclusively proven that no other routes of exposure cause the hazard)*
H350i	May cause cancer by inhalation
H351	Suspected of causing cancer *(state route of exposure, if it is conclusively proven that no other routes of exposure cause the hazard)*
H360	May damage fertility or the unborn child *(state specific effect, if known) (state route of exposure, if it is conclusively proven that no other routes of exposure cause the hazard)*
H360D	May damage the unborn child
H360F	May damage fertility
H360FD	May damage fertility. May damage the unborn child.

H-code	Hazard statement
H360Fd	May damage fertility. Suspected of damaging the unborn child.
H360Df	May damage the unborn child. Suspected of damaging fertility.
H361	Suspected of damaging fertility or the unborn child *(state specific effect, if known) (state route of exposure, if it is conclusively proven that no other routes of exposure cause the hazard)*
H361f	Suspected of damaging fertility
H361d	Suspected of damaging the unborn child
H361fd	Suspected of damaging fertility. Suspected of damaging the unborn child.
H362	May cause harm to breast-fed children
H370	Causes damage to organs *(state all organs effected, if known) (state route of exposure, if it is conclusively proven that no other routes of exposure cause the hazard)*
H371	May cause damage to organs *(state all organs effected, if known) (state route of exposure, if it is conclusively proven that no other routes of exposure cause the hazard)*
H372	Causes damage to organs *(state all organs effected, if known)* through prolonged or repeated exposure *(state route of exposure, if it is conclusively proven that no other routes of exposure cause the hazard)*
H373	May cause damage to organs *(state all organs effected, if known)* through prolonged or repeated exposure *(state route of exposure, if it is conclusively proven that no other routes of exposure cause the hazard)*
H300+H310	Fatal if swallowed or in contact with skin
H300+H330	Fatal if swallowed or inhaled
H310+H330	Fatal if in contact with skin or inhaled
H300+H310+H330	Fatal if swallowed, in contact with skin or inhaled
H301+H311	Toxic if swallowed or in contact with skin
H301+H331	Toxic if swallowed or inhaled
H311+H331	Toxic if in contact with skin or inhaled
H301+H311+H331	Toxic if swallowed, in contact with skin or inhaled
H302+H312	Harmful if swallowed or in contact with skin
H302+H332	Harmful if swallowed or inhaled
H312+H332	Harmful if in contact with skin or inhaled
H302+H312+H332	Harmful if swallowed, in contact with skin or inhaled

APPENDIX 2

Conversion Table from R-phrase to H-code

Classification under CPL 1997 or EU Directive 67/ 548/EEC	Classification under CLASS Regulations 2013	
	Hazard Classification	**H-code: Hazard Statement**
Xn; R20	Acute toxicity category 4	H332: Harmful if inhaled
Xn; R21	Acute toxicity category 4	H312: Harmful if in contact with skin
Xn; R22	Acute toxicity category 4	H302: Harmful if swallowed
T; R23 (gas)	Acute toxicity category 3	H331: Toxic if inhaled
T; R23 (vapour)	Acute toxicity category 2	H330: Fatal if inhaled
T; R23 (dust/mist)	Acute toxicity category 3	H331: Toxic if inhaled
T; R24	Acute toxicity category 3	H311: Toxic if in contact with skin
T; R25	Acute toxicity category 3	H301: Toxic if swallowed
T+; R26 (gas)	Acute toxicity category 2	H330: Fatal if inhaled
T+; R26 (vapour)	Acute toxicity category 1	H330: Fatal if inhaled
T+; R26 (dust/mist)	Acute toxicity category 2	H330: Fatal if inhaled
T+; R27	Acute toxicity category 1	H310: Fatal if in contact with skin
T+; R28	Acute toxicity category 2	H300: Fatal if swallowed
R33	Specific target organ toxicity – repeated exposure category 2	H373: May cause damage to organs *(or state all organs effected, if known)* through prolonged or repeated exposure *(state route of exposure, if it is conclusively proven that no other routes of exposure cause the hazard)*
C; R34	Skin corrosion or irritation category 1B	H314: Causes severe skin burns and eye damage
C; R35	Skin corrosion or irritation category 1A	H314: Causes severe skin burns and eye damage
Xi; R36	Serious eye damage or eye irritation category 2	H319: Causes serious eye irritation
Xi; R37	Specific target organ toxicity – single exposure category 3	H335: May cause respiratory irritation
Xi; R38	Skin corrosion or irritation category 2	H315: Causes skin irritation
T; R39/23	Specific target organ toxicity – single exposure category 1	H370: Causes damage to organs *(or state all organs effected, if known) (state route of exposure, if it is conclusively proven that no other routes of exposure cause the hazard)*
T; R39/24	Specific target organ toxicity – single exposure category 1	H370: Causes damage to organs *(or state all organs effected, if known) (state route of exposure, if it is conclusively proven that no other routes of exposure cause the hazard)*
T; R39/25	Specific target organ toxicity – single exposure category 1	H370: Causes damage to organs *(or state all organs effected, if known) (state route of exposure, if it is conclusively proven that no other routes of exposure cause the hazard)*
T+; R39/26	Specific target organ toxicity – single exposure category 1	H370: Causes damage to organs *(or state all organs effected, if known) (state route*

Classification under CPL 1997 or EU Directive 67/ 548/EEC	Classification under CLASS Regulations 2013	
	Hazard Classification	**H-code: Hazard Statement**
		of exposure, if it is conclusively proven that no other routes of exposure cause the hazard)
T+; R39/27	Specific target organ toxicity – single exposure category 1	H370: Causes damage to organs *(or state all organs effected, if known) (state route of exposure, if it is conclusively proven that no other routes of exposure cause the hazard)*
T+; R39/28	Specific target organ toxicity – single exposure category 1	H370: Causes damage to organs *(or state all organs effected, if known) (state route of exposure, if it is conclusively proven that no other routes of exposure cause the hazard)*
Xi; R41	Serious eye damage or eye irritation category 1	H318: Causes serious eye damage
R42	Respiratory sensitization category 1	H334: May cause allergic or asthma symptoms or breathing difficulties if inhaled
R43	Skin sensitization category 1	H317: May cause allergic skin reaction
Xn; R48/20	Specific target organ toxicity – repeated exposure category 2	H373: May cause damage to organs *(or state all organs effected, if known)* through prolonged or repeated exposure *(state route of exposure, if it is conclusively proven that no other routes of exposure cause the hazard)*
Xn; R48/21	Specific target organ toxicity – repeated exposure category 2	H373: May cause damage to organs *(or state all organs effected, if known)* through prolonged or repeated exposure *(state route of exposure, if it is conclusively proven that no other routes of exposure cause the hazard)*
Xn; R48/22	Specific target organ toxicity – repeated exposure category 2	H373: May cause damage to organs *(or state all organs effected, if known)* through prolonged or repeated exposure *(state route of exposure, if it is conclusively proven that no other routes of exposure cause the hazard)*
T; R48/23	Specific target organ toxicity – repeated exposure category 1	H372: Causes damage to organs *(or state all organs effected, if known)* through prolonged or repeated exposure *(state route of exposure, if it is conclusively proven that no other routes of exposure cause the hazard)*
T; R48/24	Specific target organ toxicity – repeated exposure category 1	H372: Causes damage to organs *(or state all organs effected, if known)* through prolonged or repeated exposure *(state route of exposure, if it is conclusively proven that no other routes of exposure cause the hazard)*

Classification under CPL 1997 or EU Directive 67/ 548/EEC	Classification under CLASS Regulations 2013	
	Hazard Classification	**H-code: Hazard Statement**
T; R48/25	Specific target organ toxicity – repeated exposure category 1	H372: Causes damage to organs *(or state all organs effected, if known)* through prolonged or repeated exposure *(state route of exposure, if it is conclusively proven that no other routes of exposure cause the hazard)*
R64	Effect on or via lactation	H362: May cause harm to breast-fed children
Xn; R65	Aspiration hazard category 1	H304: May be fatal if swallowed and enters airways
R67	Specific target organ toxicity-single exposure category 3	H336: May cause drowsiness or dizziness
Xn; R68/20	Specific target organ toxicity – single exposure category 2	H371: May cause damage to organs *(or state all organs effected, if known) (state route of exposure, if it is conclusively proven that no other routes of exposure cause the hazard)*
Xn; R68/21	Specific target organ toxicity – single exposure category 2	H371: May cause damage to organs *(or state all organs effected, if known) (state route of exposure, if it is conclusively proven that no other routes of exposure cause the hazard)*
Xn; R68/22	Specific target organ toxicity – single exposure category 2	H371: May cause damage to organs *(or state all organs effected, if known) (state route of exposure, if it is conclusively proven that no other routes of exposure cause the hazard)*
Carc. cat. 1; R45	Carcinogenicity category 1A	H350: May cause cancer *(state route of exposure, if it is conclusively proven that no other routes of exposure cause the hazard)*
Carc. cat. 2; R45	Carcinogenicity category 1B	H350: May cause cancer *(state route of exposure, if it is conclusively proven that no other routes of exposure cause the hazard)*
Carc. cat. 1; R49	Carcinogenicity category 1A	H350i: May cause cancer by inhalation
Carc. cat. 2; R49	Carcinogenicity category 1B	H350i: May cause cancer by inhalation
Carc. cat. 3; R40	Carcinogenicity category 2	H351: Suspected of causing cancer *(state route of exposure, if it is conclusively proven that no other routes of exposure cause the hazard)*
Muta. cat. 2; R46	Germ cell mutagenicity category 1B	H340: May cause genetic defects *(state route of exposure, if it is conclusively proven that no other routes of exposure cause the hazard)*
Muta. cat. 3; R68	Germ cell mutagenicity category 2	H341: Suspected of causing genetic defects *(state route of exposure, if it is conclusively proven that no other routes of exposure cause the hazard)*

Classification under CPL 1997 or EU Directive 67/ 548/EEC	Classification under CLASS Regulations 2013	
	Hazard Classification	H-code: Hazard Statement
Repr. cat. 1; R60	Reproductive toxicity category 1A	H360F: May damage fertility
Repr. cat. 2; R60	Reproductive toxicity category 1B	H360F: May damage fertility
Repr. cat. 1; R61	Reproductive toxicity category 1A	H360D: May damage the unborn child
Repr. cat. 2; R61	Reproductive toxicity category 1B	H360D: May damage the unborn child
Repr. cat. 3; R62	Reproductive toxicity category 2	H361f: Suspected of damaging fertility
Repr. cat. 3; R63	Reproductive toxicity category 2	H361d: Suspected of damaging the unborn child
Repr. cat. 1; R60-61	Reproductive toxicity category 1A	H360FD: May damage fertility. May damage the unborn child.
Repr. cat. 1; R60 Repr. cat. 2; R61	Reproductive toxicity category 1A	H360FD: May damage fertility. May damage the unborn child.
Repr. cat. 2; R60 Repr. cat. 1; R61	Reproductive toxicity category 1A	H360FD: May damage fertility. May damage the unborn child.
Repr. cat. 2; R60-61	Reproductive toxicity category 1B	H360FD: May damage fertility. May damage the unborn child.
Repr. cat. 3; R62-63	Reproductive toxicity category 2	H361fd: Suspected of damaging fertility. Suspected of damaging the unborn child.
Repr. cat. 1; R60 Repr. cat. 3; R63	Reproductive toxicity category 1A	H360Fd: May damage fertility. Suspected of damaging the unborn child
Repr. cat. 2; R60 Repr. cat. 3; R63	Reproductive toxicity category 1B	H360Fd: May damage fertility. Suspected of damaging the unborn child
Repr. cat. 1; R61 Repr. cat. 3; R62	Reproductive toxicity category 1A	H360Df: May damage the unborn child. Suspected of damaging fertility.
Repr. cat. 2; R61 Repr. cat. 3; R62	Reproductive toxicity category 1B	H360Df: May damage the unborn child. Suspected of damaging fertility.

Source: EU CLP, 2009

Notes:

T+	: Very toxic
T	: Toxic
Xn	: Harmful
C	: Corrosive
Xi	: Irritant
R42 and/or R43	: Sensitizing
Carc. cat.	: Carcinogenic
Muta. cat.	: Mutagenic
Repr. cat.	: Toxic for reproduction
D	: Damaging the unborn child (known)
F	: Damaging the fertility (known)
d	: Damaging the unborn child (suspected)
f	: Damaging the fertility (suspected)
i	: Exposure through inhalation

APPENDIX 3

Description of Control Approach 1 to 3

1. Control Approach 1- General ventilation

It is a control of the chemicals generated in a space by diluting it with uncontaminated outside air flowing into the room in large quantities so as to reduce the concentration of airborne chemicals to acceptable levels. There are two types of general ventilations, i.e. natural ventilation and forced ventilation.

Natural ventilation

- Produced by movement of air entering and leaving through the openings such as by opening of windows or doors to allow air to exchange naturally.
- Should not be used as control measures to reduce worker's exposure in a workroom.

Forced ventilation

- There are three types of mechanically induced air movement used to dilute chemical
  i) supply system
  ii) exhaust system
  iii) supply-exhaust system

- Use of mechanical fan e.g. axial fan to move air out of space for the purpose of diluting the chemicals in the space.

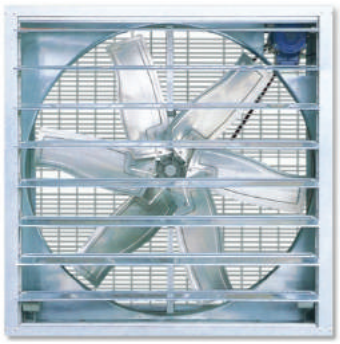


Figure 4: Industrial axial fan

Applicability

Factors to consider

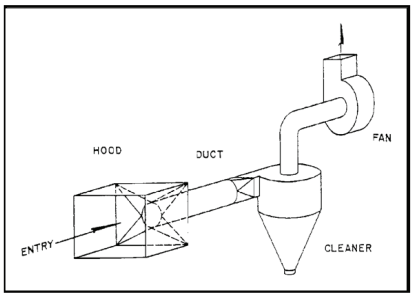
- Quantity of chemical generated must be low
- Low concentration
- Non-toxic or low toxicity chemical
- Evolution of chemical reasonably uniform

2. Control Approach 2- Engineering control

- Methods of control that apply engineering principles such as local exhaust ventilation, cooling coil for vapours, water spray, etc.

Local Exhaust Ventilation (LEV)

A system that consists of hood, duct, air cleaner/filter, exhaust fan e.g. centrifugal fan and exhaust stack to capture or remove chemical at/near source or point of release. Example fume cupboard, spray booth, etc.



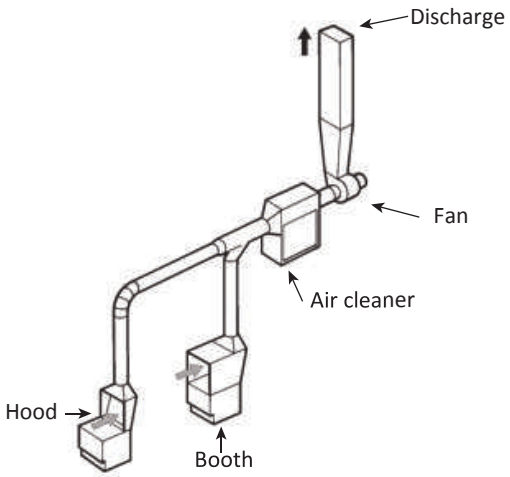


Figure 5: Local exhaust ventilation (LEV)

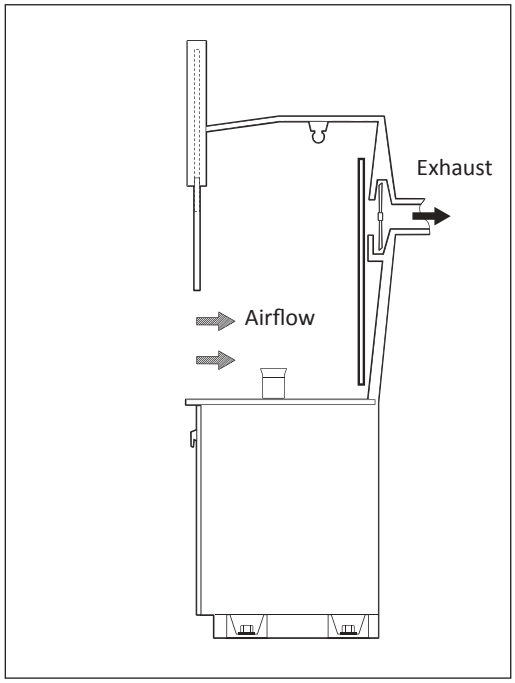


Figure 6: Fume cupboard

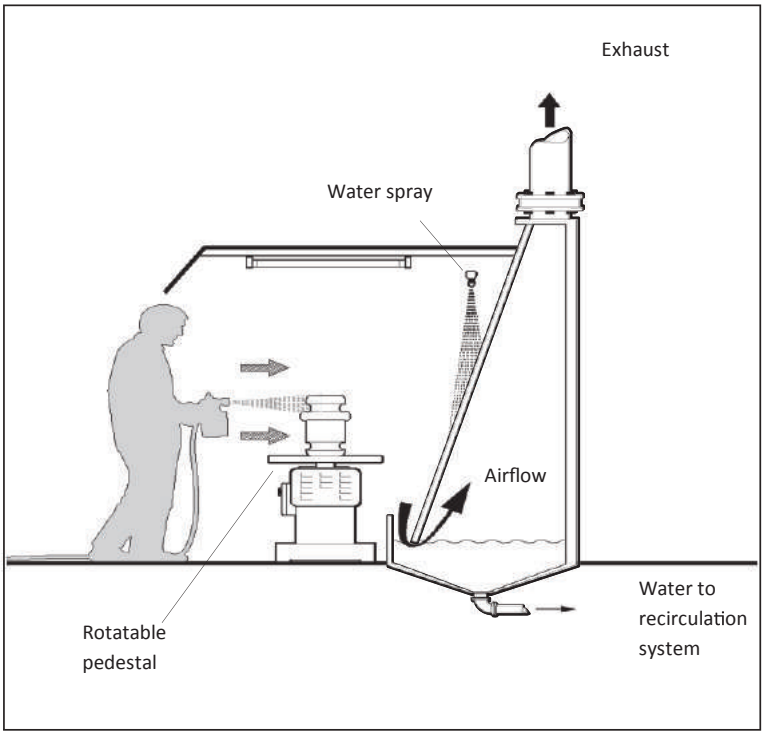


Figure 7: Spray booth

3. Control Approach 3- Containment

The hazard is contained or enclosed due to the very hazardous nature of the chemical. It is a closed system with limited breach of containment e.g. during sampling.

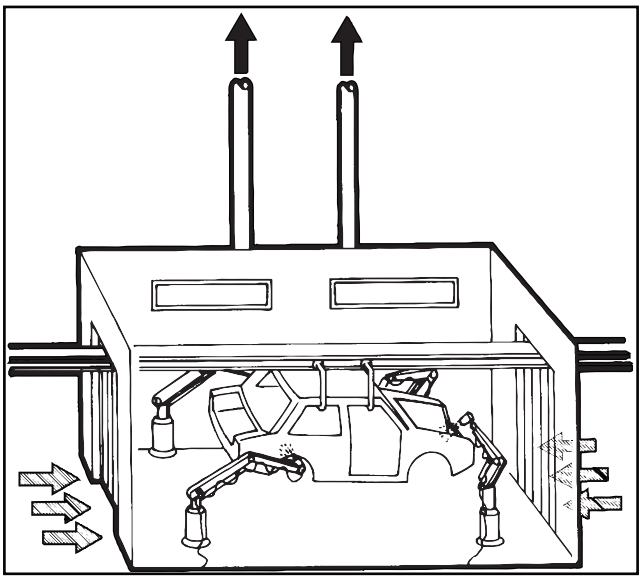


Figure 8: Robotized spray booth

APPENDIX 4

TYPE OF INDUSTRY

Industrial sector

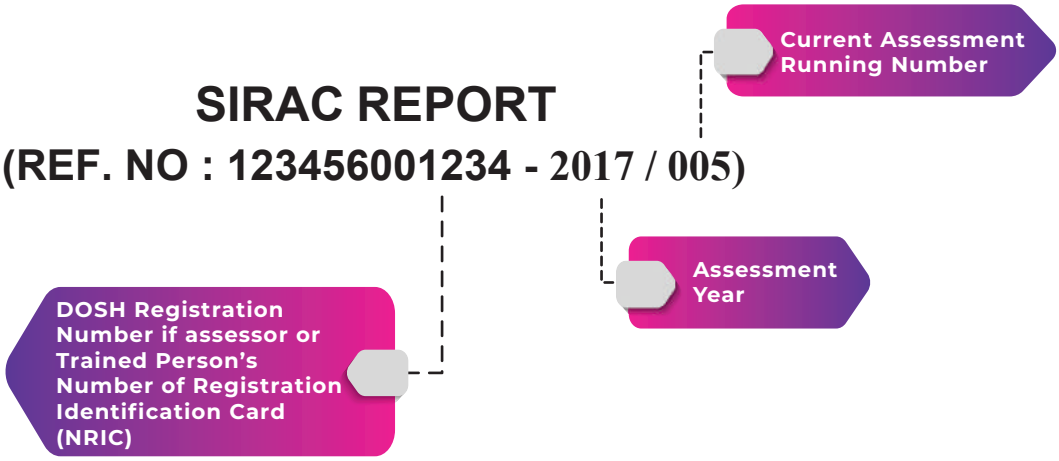
1. Agriculture
2. Business Trade
3. Civil Service
4. Communication
5. Construction
6. Facility (electric, gas, sanitary, water)
7. Finance
8. Fishing
9. Forestry
10. Hotel
11. Insurance
12. Local Authority
13. Logging
14. Manufacturing
15. Mining and Quarrying
16. Property
17. Restaurant
18. Retail Trade
19. Storage
20. Transport
21. Wholesale Trade

APPENDIX 5

Format of Report Title Page

COMPANY NAME & ADDRESS

DOSH REGISTRATION NO.:



ASSESSOR / TRAINED PERSON'S NAME :
ASSESSOR REGISTRATION NO. (IF APPLICABLE) :
DATE OF ASSESSMENT :

Assessor's Company and Address
(If Applicable)

APPENDIX 6

LIST OF CONTROL GUIDANCE SHEETS

No.	CGS	Types of CGS	CA	Title	Pages
1	C001	Specific CGS (Cleaning Services)		Cleaning and Disinfection using a Low-Pressure Washer	54
2	C002			Dry Cleaning Using Chlorinated Solvent	56
3	C003			Dry Cleaning – Spot Cleaning	58
4	C004			Diluting Chemical Concentrates	60
5	C005			Manual Cleaning and Disinfecting Surfaces	62
6	C006			Storing Chemical Products (Small Scale)	64
7	LP001	Specific CGS (Lithography Printing)		Ink Mixing and Cleaning Up	66
8	LP002			Manual Film and Plate Development	68
9	LP003			Automated Film and Plate Development	70
10	LP004			Printing with Conventional Ink	72
11	LP005			Manual Cleaning of Presses	74
12	LP006			Automated Cleaning of Presses (Conventional Inks)	76
13	P001	Specific CGS (Pest Control)		General Principle-Handling Concentrated Pesticides for Protection of Plants	78
14	P002			Diluting Chemical Concentrates Harm via Skin or Eye Contact	80
15	P003			Ready-For-Use Insecticide Sprays and Powder	82
16	P004			Eradicating Vermin (Rats, Etc)	84
17	P005			Fogging And Misting Using Space Sprayers	86
18	P006			Storing Pesticides Products	89
19	P007			Disposing of Pesticide Wastes	91
20	R001	Generic CGS (Supplementary Advice)		Respiratory Protective Equipment (RPE)	93
21	S100	Generic CGS (Supplementary Advice)		General Advice Chemicals Causing Harm Via Skin or Eye Contact	95
22	S101			Selecting Protective Gloves	97
23	S102			Selecting Personal Protective Equipment (PPE)	99
24	G100	Generic CGS (General ventilation)	1	General Ventilation	101
25	G101			General Storage	103
26	G102			Open Bulk Storage	105
27	G103			Removing Waste From a Dust Extraction Unit	107

CONTROL GUIDANCE SHEETS

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Cleaning Services

Cleaning and Disinfection Using a Low-Pressure Washer

C001

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

This sheet provides control measure and good practice recommendation on using personal protective equipment (PPE). It describes the key points that need to be followed to help reduce exposure to an acceptable level. It is important that all the points are followed. Disinfectants are biocidal products. These products are safe for use so long as the instructions on the label are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to Safety Data Sheet (SDS) for more information.

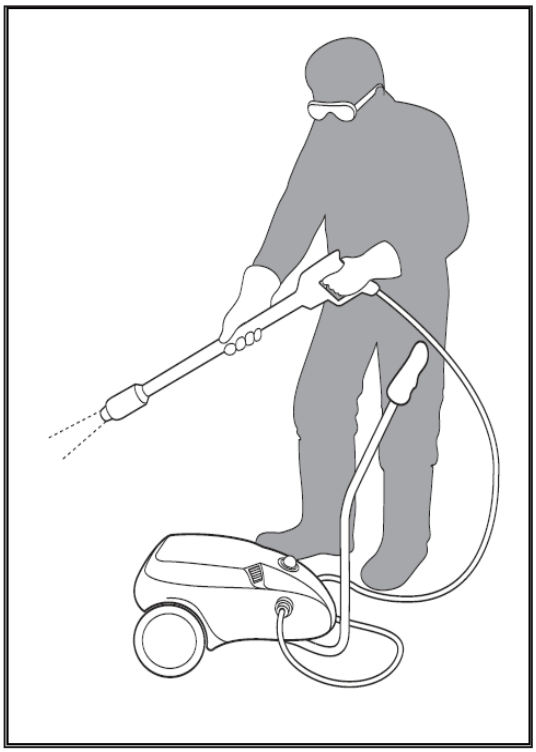
Workplace and access

- ✓ Set up barriers and post warning signs.
- ✓ Keep people away while using a pressure washer.
- ✓ Provide good washing facilities.

Equipment

- ✓ Designate a segregated area for pressure washing, or do the job outdoors.
- ✓ Provide suitable PPE.
- ✓ Remove heavy dirt deposits first.
- ✓ Ensure that nearby electrical fittings are suitably waterproofed.

Caution: Do not store more than 50 liters of flammable liquid indoors. Use a flammables store.



Cleaning using low pressure washer

Personal protective equipment (PPE)

- ✓ Ask PPE supplier for advice on selection of suitable protective equipment.
- ✓ Respiratory protection equipment (RPE) may be needed. Seek advice from RPE supplier on the selection of correct cartridge. Refer to R001.
- ✓ Provide protective gloves, disposable nitrile gloves are acceptable. If latex gloves are used, use only 'low-protein','powder-free' gloves.
- ✓ Throw away disposable gloves every time they are taken off.
- ✓ Provide waterproof, slip-resistant boots and protective goggles.
- ✓ For pressure washing overhead, a waterproof suit with head and face protection may be needed.

Procedures

- ✓ Store products containing chemicals securely in a cool, dry, dark place, capable of keeping in spills. Do not store far more than needed.
- ✓ Ensure that workers follow work instructions, and make up solutions for immediate use only.
- ✓ Keep chemicals off skin. Workers should wash off splashes and avoid contact with surfaces until they are dry.
- ✓ Reduce cross contamination by washing out equipment after use.

Caution: Warn workers never to direct the water jet at their skin or another person.

Special Care

- ✓ Contact with many chemicals and wet-work can lead to dermatitis, eye damage and asthma. Refer to the SDS (Section 11: Toxicological Information) for specific health effect.
- ✗ Avoid products that contain hydrofluoric acid.
- ✗ Try to avoid disinfectants that contain formaldehyde or glutaraldehyde.
- ✓ RPE may need to be provided.
- ✓ Seek advice from the chemical supplier if products contain enzymes.
- ✓ Ask workers to check their skin for dryness or soreness every six months. If these effects appear, check the proper use of PPE.
- ✓ If you use a product labelled 'may cause sensitisation by skin contact' or 'may cause sensitisation by inhalation', seek specialist advice for appropriate control.

Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer.
- ✓ Keep the equipment in effective and efficient working order and good repair.

Cleaning and housekeeping

- ✓ Clean up spills promptly. Follow spillage procedures.

Training and supervision

- ✓ Give workers information on the risk of using the chemicals.
- ✓ Provide workers with training on:
  - handling chemical safely;
  - how to use control equipment properly and ensure the control is working;
  - when and how to use any PPE provided; and
  - what to do if something goes wrong.
- ✓ Training programme should be reviewed and conducted at least once in two years.

Worker's Checklist

- ☐ Never direct the water jet at yourself or other people.
- ☐ Look for signs of leaks, wear and damage.
- ☐ If worker finds any problems, tell the supervisor. Do not just carry on working.
- ☐ Use and store PPE according to instructions.
- ☐ Throw away single-use gloves every time take them off.
- ☐ Wash hands after use, and before and after eating, drinking, smoking and using the washroom.
- ☐ Never clean hands with concentrated cleaning products or solvents.
- ☐ Check skin regularly for dryness or soreness, inform the supervisor if these symptoms appear.

Further information

- Safety Data Sheets.
- Guidelines on the Use of Personal Protective Equipment against Chemicals Hazards, DOSH 2005
- Control Guidance Sheets S100, S101, S102 and R001.

Useful links

- DOSH portal: https://www.dosh.gov.my
- SiRAC Online: sirac.dosh.gov.my
- HSE COSHH essentials website: https://www.hse.gov.uk/coshh/essentials/index.htm
- ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Cleaning Services

Dry Cleaning Using Chlorinated Solvent

C002

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

It describes the key points that need to be followed to help reduce exposure to an acceptable level. It is important that all the points are followed. This sheet applies to chlorinated solvents other than perchloroethylene or chemicals classified as carcinogenicity category 1, mutagenicity category 1 and respiratory sensitisation category 1. It does not apply to hydrocarbon solvents.

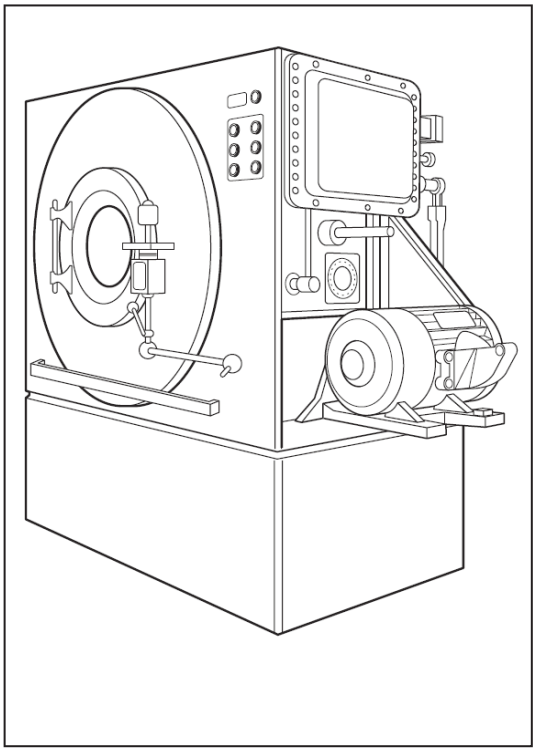
Dry cleaning can lead to exposure by breathing in vapour. Solvent vapours can cause headaches, dizziness and nausea. Containment is the recommended approach. Other health risks are associated with dry cleaning, especially when workers spend long periods doing one job (e.g. steam pressing, lifting clothes onto hangers). These jobs can lead to upper limb disorders. Rotate such jobs, if possible.

Workplace and access

✓ Keep customers away from dry cleaning machines.
✓ Keep the workplace well organised, with clear exit routes.

Design and equipment

✓ Use well-maintained closed circuit machines.
✓ Keep the work area well ventilated (10 to 15 air changes per hour) with a through draught.
✓ Workers can breathe in most solvent vapour when loading the machine. Use machines that draw air in when the door is opened. Otherwise, use a room fan to help disperse vapour.
✓ Make sure that the extraction discharges to a safe place. Vapours must not get into other premises.



Dry cleaning equipment

✓ Follow the specified procedures for adding solvent to the machine.
✓ Washing facilities are needed for decontamination after handling products.

Procedures

✓ Store products containing chemicals securely in a cool, dry, dark place, capable of keeping in spills. Do not store far more than needed.
✓ Put the cap back on the container immediately.
✓ Plan procedure in case of a spill and communicate with workers and execute the procedure.
✓ Check that authorised workers understand how to empty button traps, clean lint filters and clean the still safely.
✗ Do not remove solvent-damp material from the machine. If fabric is not dry at the end of the cycle, return it to the cage and continue drying. Then rectify the fault before reloading.
✓ Ask customers to separate contaminated work clothing, if any.
✗ Never pour waste or still residues down the drain. Collect it for recycling.

Special care

- ✓ Get label that complies with CLASS Regulations from solvent supplier and communicate it to workers.
- ✓ Evacuate the workplace and call Fire and Rescue Department if there is a large spill of solvent or a leak of hot solvent.
- ✓ Ask workers to check their skin for dryness or soreness every six months. If these effects appear, check the proper use of PPE.

Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer.
- ✓ Keep the engineering control equipment in effective and efficient working order and good repair.
- ✓ If the equipment is equipped with the local exhaust ventilation (LEV), ensure that the LEV is examined and tested against its performance specification by hygiene technician at least every 12 months.
- ✓ Keep records of all examinations and tests for at least five years.
- ✓ If the equipment is faulty, stop work until it is repaired.
- ✓ Check for leaks regularly.

Cleaning and housekeeping

- ✓ Deal with smaller spills of cold solvent immediately. Use a spillage blanket and recover the solvent as soon as possible.
- ✓ Keep a solvent-soaked spillage blanket in a strong polythene bag until you can recover the solvent in the machine.
- ✓ For larger spills and hot solvent, see Special care.
- ✓ Dispose off waste through an authorised contractor by Department of Environment (DOE).

Personal Protective Equipment (PPE)

- ✓ Evacuate the workplace in case of a larger or hot solvent spill. Use Respiratory Protective Equipment (RPE) only if you have been trained to do so. Seek advice from RPE supplier.

Training

- ✓ Give workers information on the risk of using the chemicals.
- ✓ Provide workers with training on:
  - handling chemical safely;
  - how to use control equipment properly and ensure the control is working;
  - when and how to use any PPE provided; and
  - what to do if something goes wrong.
- ✓ Training programme should be reviewed and conducted at least once in two years.

Worker's Checklist

- ☐ Look for signs of leaks, wear and damage.
- ☐ Check that RPE works properly every time before put it on.
- ☐ If worker finds any problems, inform the supervisor. Do not just carry on working.
- ☐ Wash hands after use, and before and after eating, drinking, smoking and using the washroom.
- ☐ Never clean hands with concentrated cleaning products or solvents.
- ☐ Make sure worker know what to do if there is a spill of solvent.
- ☐ Check skin regularly for dryness or soreness, inform the supervisor if these symptoms appear.

Further information

- Safety Data Sheets.
- Guidelines on the Use of Personal Protective Equipment against Chemicals Hazards, DOSH 2005
- Control Guidance Sheets S100, S101, S102 and R001.

Useful links

- DOSH portal: https://www.dosh.gov.my
- SiRAC Online: sirac.dosh.gov.my
- HSE COSHH essentials website: https://www.hse.gov.uk/coshh/essentials/index.htm
- ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Cleaning Services

Dry Cleaning – Spot Cleaning
C003

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

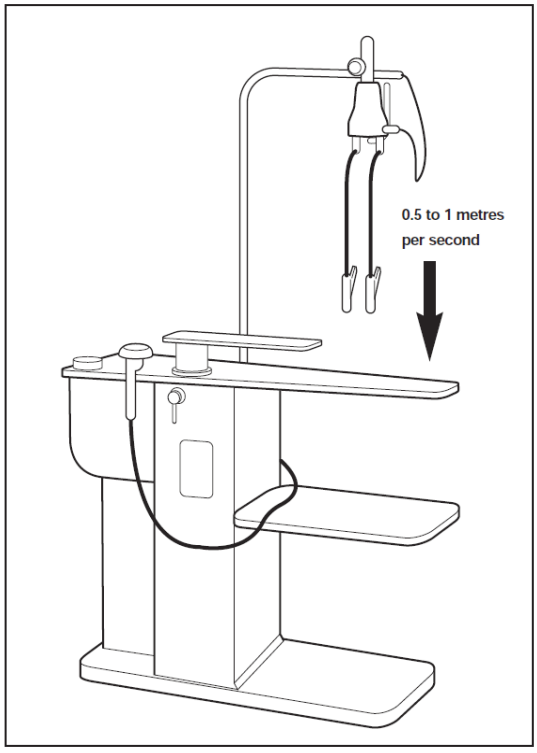
It describes the key points that need to be followed to help reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to the Safety Data Sheet (SDS) for more information. Use these to identify the more hazardous chemicals, and less hazardous substitutes. Also check for flammability. Many spotting fluids are irritating to the skin and eyes, and some can cause skin damage. Engineering control (extraction unit) is the recommended approach.

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ Make sure there is enough room to do the job safely.
- ✓ Keep the workplace well organised, with clear exit routes.

Design and equipment

- ✓ Keep the workplace well ventilated (10 to 15 air changes per hour) with a through draught.
- ✓ Use a spotting table provided with extraction unit.
- ✓ An air velocity between 0.5 and 1 meter per second at the extraction point is needed.
- ✓ Use spotting bottles with the smallest practical hole size in the nozzle.
- ✓ Washing facilities are needed for decontamination after handling products.



Spotting table with extraction unit

Procedures

- ✓ Obtain chemical in a ready for use solution.
- ✓ Spotting bottles should never be more than two thirds full, to avoid squirting fluid into eyes.
- ✓ Store products containing chemicals securely in a cool, dry, dark place, capable of keeping in spills. Do not store far more than needed.
- ✓ Read the instructions on labels carefully - follow the instructions for use.
- ✓ Keep chemicals off your skin, wash off any splashes immediately.
- ✓ Put the cap back on the container immediately.
- ✓ Plan procedure in case of a spill and communicate with workers and execute the procedure.

Special care

- ✓ Contact with many chemicals can lead to skin soreness, itching, rashes, blistering (dermatitis), eye damage and asthma. Refer to the SDS (Section 11: Toxicological Information) for specific health effect.
- ✓ Try to avoid products that contain hydrofluoric acid. This is very dangerous by skin contact and by breathing in. Get expert advice on first aid.
- ✓ Ask workers to check their skin for dryness or soreness every six months. If these effects appear, check the proper use of PPE.

Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer.
- ✓ Keep the equipment in effective and efficient working order and good repair.
- ✓ Ensure any engineering control equipment used is examined and tested against its performance specification by hygiene technician at least every 12 months.
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Clear up spills promptly. Follow spillage procedures.

Personal Protective Equipment (PPE)

- ✓ Ask PPE supplier for advice on selection of suitable protective equipment.
- ✓ Use protective gloves and eye protection for topping up bottles. Disposable nitrile gloves are acceptable. If latex gloves must be used, use only 'low protein, powder free' gloves.
- ✓ Throw away disposable gloves every time take them off.

Training

- ✓ Give workers information on the risk of using the chemicals.
- ✓ Provide workers with training on:
  - handling chemical safely;
  - how to use control equipment properly and ensure the control is working;
  - when and how to use any PPE provided; and
  - what to do if something goes wrong.
- ✓ Training programme should be reviewed and conducted at least once in two years.

Worker's Checklist

- ☐ Look for signs of leaks, wear and damage.
- ☐ If worker finds any problems, inform the supervisor. Do not just carry on working.
- ☐ Wash hands after use, before and after eating, drinking, smoking and using the washroom.
- ☐ Never clean hands with concentrated cleaning products or solvents.
- ☐ If worker get hydrofluoric acid on his skin, wash it off immediately, apply calcium gluconate gel and go to hospital for further treatment. Bring the SDS.
- ☐ Clear up chemical spills promptly. Follow spillage procedures.
- ☐ Throw away single-use gloves every time take them off.
- ☐ Check skin regularly for dryness or soreness, tell the supervisor if these symptoms appear.

Further information

- Safety Data Sheets.
- Guidelines on the Use of Personal Protective Equipment against Chemicals Hazards, DOSH 2005
- Control Guidance Sheets S100, S101, S102 and R001.

Useful links

- DOSH portal: https://www.dosh.gov.my
- SiRAC Online: sirac.dosh.gov.my
- HSE COSHH essentials website: https://www.hse.gov.uk/coshh/essentials/index.htm
- ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Cleaning Services

Diluting Chemical Concentrates
C004

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

This sheet describes good practice using personal protective equipment (PPE). It describes the key points that need to be followed to help reduce exposure to an acceptable level. It is important that all the points are followed. Some concentrates are biocidal products. Therefore, the controls must be suitable for those hazards too. Refer to the Safety Data Sheet (SDS) for more information.

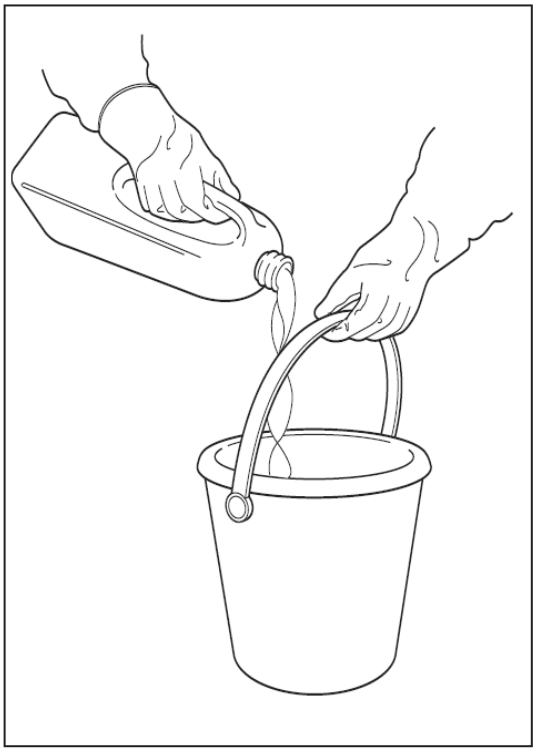
Workplace and access

✓ Make sure there is enough room to do the job safely.
✓ Provide good washing facilities.

Equipment

✓ Ensure the equipment used with the product works properly, without leaks.
✓ Provide protective gloves.
✓ If diluting with a solvent, make sure the room is well ventilated; five to ten air changes per hour, with a through draught.
✓ Buy liquid chemicals in containers that are easy to pour from, do not dribble, and do not trap liquid in a rim.
✓ Try to buy solid chemicals in tablet or granule form, or in wide-necked containers so it is easy to scoop out.

Caution: Never decant concentrate into an unlabelled container. Never re-use a concentrate container, dispose off it safely or return it to supplier. Do not store more than 50 litres of flammable liquid indoors- use a flammables store.



Diluting process

Procedures

✓ Store products containing chemicals securely in a cool, dry, dark place, capable of retaining spills. Do not store far more than needed.
✓ Reduce skin contact - workers should wash off splashes immediately.
✓ Ensure that workers follow work instructions, and make up solutions for immediate use only.
✓ Plan procedure in case of a spill and communicate with workers and execute the procedure.
✓ Make sure they are aware of the following general guidelines:
  • Add liquid concentrate to diluting liquid - never the other way round, unless the instructions say so.
  • Make a thin paste of powders with a small amount of diluting liquid, then dilute as for liquids.
  • Put the cap back on the container immediately and wipe the outside clean.

Special care

- ✓ Contact with many chemicals can lead to dermatitis, eye damage or asthma. Refer to the SDS (Section 11: Toxicological Information) for specific health effect.
- ✓ Avoid products that contain hydrofluoric acid.
- ✓ Take special care using caustic soda (sodium hydroxide). This can erupt when mixed with water. Splashes in the eye can cause blindness.
- ✓ Never add any other chemical to concentrates that contain bleach (sodium hypochlorite solution). This can cause a hazardous gas (chlorine) to be given off.
- ✓ Ask workers to check their skin for dryness or soreness every six months. If these effects appear, check the proper use of PPE.
- ✓ If a product labelled 'may cause sensitisation by skin contact' or 'may cause sensitisation by inhalation' is used, seek specialist advice for appropriate control.

Personal Protective Equipment (PPE)

- ✓ Ask PPE supplier for advice on selection of suitable protective equipment.
- ✓ Provide protective gloves, disposable nitrile gloves are acceptable. If latex gloves must be used, use only 'low protein, powder free' gloves.
- ✓ Throw away disposable gloves every time they are taken off.
- ✓ Provide protective goggles to protect eyes when using products that can cause burns (e.g. acids, caustics).

Cleaning and housekeeping

- ✓ Wash out mixing equipment after use.
- ✓ Dispose off waste liquid safely.
- ✓ Clean up spills promptly. Follow spillage procedures.

Training

- ✓ Give workers information on the risk of using the chemicals.
- ✓ Provide workers with training on:
  - handling chemical safely;
  - how to use control equipment properly and ensure the control is working;
  - when and how to use any PPE provided; and
  - what to do if something goes wrong.
- ✓ Training programme should be reviewed and conducted at least once in two years.

Worker's Checklist

- ☐ If worker finds any problems, inform the supervisor. Do not just carry on working.
- ☐ Use and store PPE according to instructions.
- ☐ Throw away disposable gloves every time take them off.
- ☐ Wash hands after use, before and after eating, drinking, smoking and using the washroom.
- ☐ Never clean hands with concentrated cleaning products or solvents.
- ☐ Check skin regularly for dryness or soreness, inform supervisor if these symptoms appear.

Further information

- Safety Data Sheets.
- Guidelines on the Use of Personal Protective Equipment against Chemicals Hazards,DOSH 2005
- Control Guidance Sheets S100, S101, S102 and R001.

Useful links

- DOSH portal: https://www.dosh.gov.my
- SiRAC Online: sirac.dosh.gov.my
- HSE COSHH essentials website: https://www.hse.gov.uk/coshh/essentials/index.htm
- ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Cleaning Services

Manual Cleaning and Disinfecting Surfaces

C005

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

This sheet describes good practice using personal protective equipment (PPE). It describes the key points that need to be followed to help reduce exposure to an acceptable level. It is important that all the points are followed. Disinfectants are biocidal products. Therefore, the controls must be suitable for those hazards too. Refer to the Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Mark any pedestrian routes that can become slippery when wet.
- ✓ Provide good washing facilities.

Equipment

- ✓ Use colour-coded cloths, mops and buckets to minimise cross-contamination if possible.
- ✓ Provide protective gloves.
- ✓ Remove heavy dirt deposits first.

Caution: Never decant concentrate into an unlabelled container. Never re-use a concentrate container - dispose off it safely or return it to supplier. Do not store more than 50 litres of flammable liquid indoors - use a flammable store.

Personal Protective Equipment (PPE)

- ✓ Ask PPE supplier for advice on selection of suitable protective equipment.
- ✓ Provide protective gloves - disposable gloves are acceptable. If latex gloves must be used, use only 'low-protein, powder-free' gloves.
- ✓ Throw away disposable gloves every time they are taken off.
- ✓ Provide waterproof, slip-resistant footwear.

Procedures

- ✓ Store products securely in a cool, dry, dark place, capable of keeping in spills. Do not store far more than needed.
- ✓ Ensure that workers follow work instructions, and make up solutions for immediate use only.
- ✓ Put the cap back on the container immediately.
- ✓ Plan procedure in case of a spill and communicate with workers and execute the procedure. Keep products off your skin. Workers should wash off any splashes and avoid contact with surfaces until they are dry.

Special care

- ✓ Contact with many products can lead to dermatitis, eye damage and asthma. Refer to the SDS (Section 11: Toxicological Information) for specific health effect.
- ✓ Take special care using caustic soda (sodium hydroxide). Splashes in the eye can cause blindness.
- ✗ Never add any other chemical to concentrates that contain bleach (sodium hypochlorite solution). This can cause a hazardous gas (chlorine) to be given off.
- ✓ Ask workers to check their skin for dryness or soreness every month. If these effects appear, check the proper use of PPE.
- ✓ If a product labelled 'may cause sensitisation by skin contact' or 'may cause sensitisation by inhalation' is used, seek specialist advice for appropriate control.

Cleaning and housekeeping

- ✓ Wash out the equipment after use.
- ✓ Dispose off this waste liquid safely.
- ✓ Clean up spills promptly. Follow spillage procedures.

Training and supervision

- ✓ Give workers information on the risk of using the chemicals.
- ✓ Provide workers with training on:
  - handling chemical safely;
  - how to use control equipment properly and ensure the control is working;
  - when and how to use any PPE provided; and
  - what to do if something goes wrong.
- ✓ Training programme should be reviewed and conducted at least once in two years.

Worker's Checklist

- ☐ If worker finds any problems, inform the supervisor. Do not just carry on working.
- ☐ Use and store PPE according to instructions.
- ☐ Throw away disposable gloves every time take them off.
- ☐ Wash hands after use, before and after eating, drinking, smoking and using the washroom.
- ☐ Never clean hands with concentrated cleaning products or solvents.
- ☐ Check skin regularly for dryness or soreness, inform supervisor if these symptoms appear.

Further information

- Safety Data Sheets.
- Guidelines on the Use of Personal Protective Equipment against Chemicals Hazards, DOSH 2005
- Control Guidance Sheets S100, S101, S102 and R001.

Useful links

DOSH portal: https://www.dosh.gov.my

- SiRAC Online: sirac.dosh.gov.my
- HSE COSHH essentials website: https://www.hse.gov.uk/coshh/essentials/index.htm
- ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Cleaning Services

Storing Chemical Products (Small Scale)

C006

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

This sheet describes good practice using general ventilation. It describes the key points that need to be followed to help reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to the Safety Data Sheet (SDS) for more information.

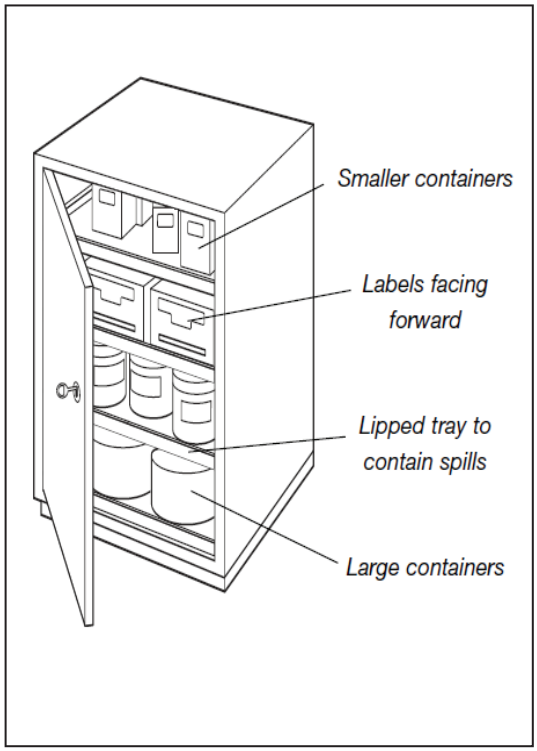
Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ Keep the storage container locked.
- ✓ Provide good washing facilities.

Equipment

- ✓ Keep the store area well ventilated; five to ten air changes per hour with a through draught.
- ✓ Keep a spill cleanup kit nearby. Ask supplier for advice.

Caution: Never decant concentrate into an unlabelled container. Never re-use a concentrate container. Dispose off it safely or return it to the supplier. Do not store more than 50 litres of flammable liquid indoors. Use a flammables store.



Chemicals cabinet

Personal protective equipment (PPE)

- ✓ Ask PPE supplier for advice on selection of suitable protective equipment.
- ✓ Respiratory protective equipment (RPE) may be needed in case of a spill.
- ✓ Seek advice from RPE supplier.
- ✓ Provide protective gloves - disposable nitrile gloves are acceptable. If latex gloves must be used, use only 'low-protein, powder-free' gloves.
- ✓ Throw away disposable gloves every time they are taken off.

Procedures

- ✓ Keep apart:
  - solid and liquid products;
  - flammable and non-flammable liquids;
  - acids and alkalis; and
  - wastes.
- ✓ Check compatibility of each chemical stored. Refer SDS.
- ✓ Store products containing chemicals securely in a cool, dry, dark place, capable of keeping in spills. Do not store far more than needed.
- ✓ Store containers so their labels face forwards.
- ✓ Store heavier items and corrosive chemicals on lower shelves.

- ✓ Ensure that containers are easy to pour from, do not dribble, and do not trap liquid in a rim.
- ✓ Plan procedure in case of a spill and communicate with workers and execute the procedure.
- ✓ Try to buy solid chemicals in tablet form, or in a wide-necked container such that it is easy to scoop out granules.

Caution: Never store chemicals in open containers.

Special care

- ✓ Contact with many chemicals can lead to skin soreness and itching, rashes, blistering (dermatitis). Some can also damage the eyes. Refer to the SDS (Section 11: Toxicological Information) for specific health effect.

Cleaning and housekeeping

- ✓ Keep the storage area clean and well organised.
- ✓ Clear up spills immediately. Follow spillage procedures.
- ✓ Dispose off waste through an authorised contractor by Department of Environment (DOE).

Training and supervision

- ✓ Give workers information on the risk of using the chemicals.
- ✓ Provide workers with training on:
  - handling chemical safely;
  - how to use control equipment properly and ensure the control is working;
  - when and how to use any PPE provided; and
  - what to do if something goes wrong.
- ✓ Training programme should be reviewed and conducted at least once in two years.

Worker's Checklist

- ☐ If worker finds any problems, inform the supervisor. Do not just carry on working.
- ☐ Clear up spills straight away. Follow spillage procedures.
- ☐ Wash hands after use, before and after eating, drinking, smoking and using the washroom.
- ☐ Never clean hands with concentrated cleaning products or solvents.

Further information

- Safety Data Sheets
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Control Guidance Sheets S100, S101, S102 and R001

Useful links

- DOSH portal: https://www.dosh.gov.my
- SiRAC Online: sirac.dosh.gov.my
- HSE COSHH essentials website: https://www.hse.gov.uk/coshh/essentials/index.htm
- ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Lithography Printing

Ink Mixing and Cleaning Up
LP001

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

It can be used as suitable approach for controlling exposure to chemicals hazardous to health used in printing industry for specified task or process. This sheet provide good practice for the mixing of conventional inks (vegetable/mineral oil-based), ultra violet (UV)-curable inks and cold-set inks and heat-set inks and cleaning the mixing equipment. It describes the key points that need to be followed to reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to the Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Control worker entry to the work area. Limit entrance to an authorised worker only.
- ✓ Put up warning sign at the entrance of work area where chemicals hazardous to health are used.

Equipment

- ✓ Provide a good standard of general ventilation. Use powered wall or window-mounted fans to supply fresh air, minimum of ten air changes per hour, with a through draught.
- ✓ Provide splash-resistant gloves.
- ✓ Provide easy-to-clean work surfaces with lipped edges for liquid handling.
- ✓ Provide pumped transfer systems or dispensing aids. Avoid hand-pouring inks and reducers.

Special care

- ✓ Avoid skin contact with UV-curable inks. Skin contact with UV-curable inks can cause dermatitis.
- ✓ Minimize skin contact with inks, reducers and cleaning chemicals.

Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer.
- ✓ Keep the equipment in effective and efficient working order and good repair.
- ✓ Noisy or vibrating fans indicate a problem. Do repairs as necessary.
- ✓ Check transfer hoses and connectors regularly for leaks.

Personal Protective Equipment (PPE)

- ✓ Provide storage for PPE to prevent damage or contamination when not in use.
- ✓ Use splash-resistant gloves. Disposable nitrile gloves, 0.2 mm thick are acceptable.
- ✓ Ensure that workers dispose disposable gloves every time they take them off.
- ✓ Use eye protection and impervious apron. Cotton overalls can minimise clothing contamination. Change contaminated overalls immediately and ensure they are laundered before reuse.

Skin management

- ✓ Keep hands clean and in good condition.
- ✓ Using pre-work creams (barrier cream) help make removing chemicals easier. However, pre-work creams should not be seen as a substitute for gloves.
- ✓ If need to use hand cleansers to remove ink, ensure that the cleanser is rinsed off afterwards.
- ✓ Never allow solvents to be used for cleaning skin.
- ✓ Provide after-work creams (moisturisers) to replace skin oils.
- ✓ Consider seeking advice from an occupational health doctor.
- ✓ Appoint a responsible person to carry out periodic skin inspections and record the findings.

Cleaning and housekeeping

- ✓ Keep the work area tidy, clean and free of ink contamination.
- ✓ Clean up spills immediately. Use new nitrile gloves 0.4 mm thick or refer to SDS (Section 8: Exposure Control and Personal Protection) for appropriate PPE. Throw away gloves once used.
- ✓ Dispose off contaminated cloths, wipes, gloves, solvent, ink and empty containers as hazardous waste through an authorised contractor by Department of Environment.
- ✓ Store containers in a safe place, securely closed.
- ✓ Handle containers with care and replace caps.
- ✓ Replace covers on ink ducts immediately.
- ✓ Plan procedure in case of a spill and communicate with workers and execute the procedure.

Training

- ✓ Give workers information on the risk of using the chemicals.
- ✓ Provide workers with training on:
  - safe operating procedures or work instructions;
  - control measures used; and
  - when and how to use any PPE provided.
- ✓ Training programme should be reviewed and conducted at least once in 2 years.

Supervision

- ✓ Provide supervision to ensure that safe work procedures are followed.
- ✓ Establish a system to monitor that all control measures are in place and being followed.

Worker's Checklist

- ☐ Make sure any ventilation system is switched on and is working.
- ☐ Look for signs of leaks, wear or damage of any equipment used. If worker finds any problems, inform the supervisor. Do not carry on working if there is a problem.
- ☐ Wash hands before and after eating, drinking or using the washroom.
- ☐ Do not smoke in the work area.
- ☐ Do not use solvents to clean skin.
- ☐ Clear up spills immediately. Follow spillage procedure.
- ☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

- Safety Data Sheets.
- Guidelines on the Use of Personal Protective Equipment against Chemicals Hazards, DOSH 2005
- Control Guidance Sheets S100, S101, S102 and R001.

Useful links

- DOSH portal: https://www.dosh.gov.my
- SiRAC Online: sirac.dosh.gov.my
- HSE COSHH essentials website: https://www.hse.gov.uk/coshh/essentials/index.htm
- ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Lithography Printing

Manual Film and Plate Development
LP002

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

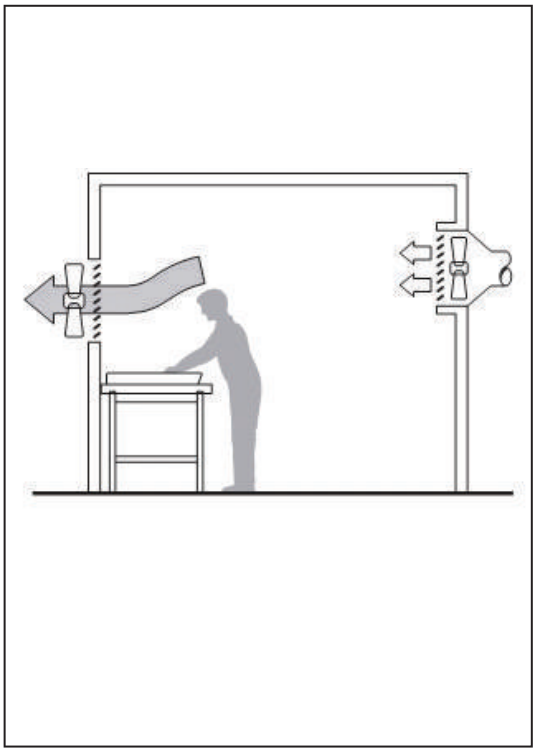
It can be used as suitable approach for controlling exposure to chemicals hazardous to health used in printing industry for specified task or process. The sheet gives good practice advice for manual film development and plate making. It describes the key points that need to be followed to reduce exposure to an acceptable level. Consider to using automatic processes to reduce risk of skin exposure. It is important that all the points are followed or use equally effective measures.

Workplace and access

- ✓ Control worker entry to the work area. Limit entrance to authorised worker only.
- ✓ Put up warning sign at the entrance of work area where chemicals hazardous to health are used.

Equipment

- ✓ Provide a good standard of general ventilation. Use powered wall or window-mounted fans to supply fresh air, minimum of ten air changes per hour, with a through draught.
- ✓ Provide splash-resistant gloves.
- ✓ Provide easy-to-clean work surfaces with lipped edges for liquid handling.
- ✓ Keep developing solutions in shallow trays to contain spillage.
- ✓ Provide pumps or squeezy bottles in place of hand pouring.
- ✓ Screen ultra violet exposure units with shutters, blinds or wrap around curtains.
- ✓ Scoop the concentrate into the dilution jug.



General ventilation for manual film development

Special care

- ✓ Deletion fluids contain hydrofluoric acid. This is very toxic and causes serious burns. Damage to skin and eyes can be permanent.
- ✓ Provide deletion pens in place of jars of fluid.
- ✓ Ensure first-aid procedures are adequate. Stock calcium gluconate gel and keep it handy.

Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer.
- ✓ Keep the equipment in effective and efficient working order and good repair.
- ✓ Noisy or vibrating fans indicate a problem. Do repair as necessary.

Personal Protective Equipment (PPE)

- ✓ Provide storage for PPE to prevent damage or contamination when not in use.
- ✓ Use splash-resistant gloves - disposable nitrile gloves, 0.2 mm thick are acceptable. Ensure that workers dispose disposable gloves every time they take them off.
- ✓ Cotton overalls to minimise clothing contamination. Change contaminated overalls immediately and ensure they are laundered before reuse.

Skin management

- ✓ Skin contact with the chemicals may cause dermatitis.
- ✓ Keep hands clean and in good condition.
- ✓ If need to use hand cleansers to remove ink, ensure that the cleanser is rinsed off afterwards.
- ✓ Provide after-work creams (moisturisers) to replace skin oils. Never allow solvents to be used for cleaning skin.
- ✓ Consider seeking advice from an occupational health doctor.
- ✓ Appoint a responsible person to carry out periodic skin inspections and record the findings.

Cleaning and housekeeping

- ✓ Keep the work area tidy, clean and free of combustible materials.
- ✓ Clean up spills immediately. Use an impervious apron and new nitrile gloves 0.4 mm thick or refer to SDS for appropriate PPE. Throw away gloves properly once used.
- ✓ Plan procedure in case of a spill and communicate with workers and execute the procedure.
- ✓ Clean the workroom at least once a week.
- ✓ Store containers in a safe place, securely closed.
- ✓ Handle containers with care and replace caps.
- ✓ Dispose off contaminated cloths, wipes, gloves, solvent, ink and empty containers as hazardous waste through an authorised contractor by Department of Environment.

Training

- ✓ Give workers information on the risk of using the chemicals.
- ✓ Provide workers with training on:
  - safe operating procedures or work instructions;
  - control measure; and
  - when and how to use any PPE provided.
- ✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

- ✓ Provide supervision to ensure that a safe work procedures are followed
- ✓ Establish a system to monitor that all control measures are in place and being followed.

Worker's Checklist

- ☐ Make sure any ventilation system is switched on and is working.
- ☐ Look for signs of leaks, wear or damage of any equipment used. If worker finds any problems, inform the supervisor. Do not carry on working if there is a problem.
- ☐ Wash hands before and after eating, drinking or using the washroom.
- ☐ Do not smoke in the work area.
- ☐ Do not use solvents to clean skin.
- ☐ Clear up spills immediately. Follow spillage procedure.
- ☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

- Safety Data Sheets.
- Guidelines on the Use of Personal Protective Equipment against Chemicals Hazards, DOSH 2005
- Control Guidance Sheets S100, S101, S102 and R001.

Useful links

- DOSH portal: https://www.dosh.gov.my
- SiRAC Online: sirac.dosh.gov.my
- HSE COSHH essentials website: https://www.hse.gov.uk/coshh/essentials/index.htm
- ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Lithography Printing

Automated Film and Plate Development
LP003

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

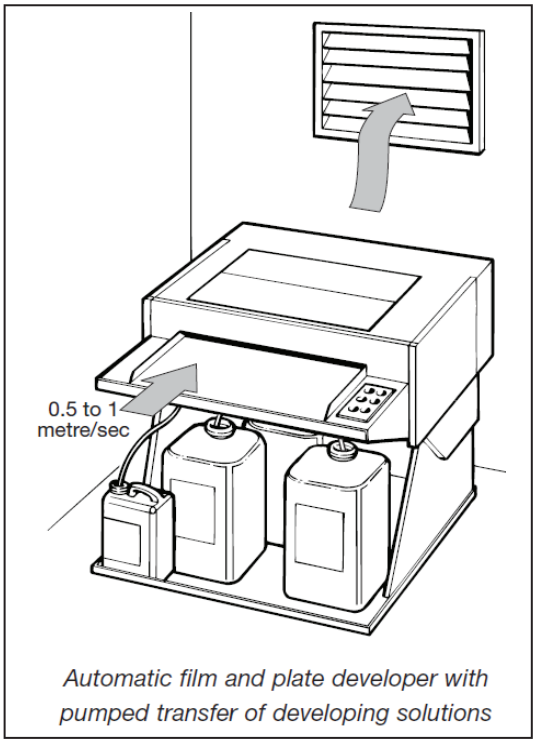
It can be used as suitable approach for controlling exposure to chemicals hazardous to health used in printing industry for specified task or process. The sheet gives good practice advice for automatic film and litho-plate development. It describes the key points that need to be followed to reduce exposure to an acceptable level. Automatic processors help avoid skin contact. Use extraction unit for developer vapours. It is important that all the points are followed or use equally effective measures. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to the Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Control worker entry to the work area. Limit entrance to authorised worker only.
- ✓ Put up warning sign at the entrance of work area where chemicals hazardous to health are used.

Equipment

- ✓ Provide a good standard of general ventilation. Use powered wall or window-mounted fans to supply fresh air; minimum of ten air changes per hour, with a through draught.
- ✓ Use automatic processors with closed panels and closed liquid transfers (solutions pumped from reservoirs and to waste containers).
- ✓ Interlock ultra violet (UV) lamps with the unit's fixed covers.
- ✓ Extract vapours from the machine when making larger plates and for longer periods of plate-making.
- ✓ Wire in the extraction unit to the processor unit. You need an inward air flow between 0.5 and 1 metre per second at openings.



Automatic film and plate developer with pumped transfer of developing solutions

Automated film and plate development

- ✓ Fit an airflow indicator or equivalent to show that extraction unit is working.

Special care

- ✓ Deletion fluids contain hydrofluoric acid. This acid is hazardous and causes serious burns. Damage to skin and eyes can be permanent.
- ✓ Provide deletion pens in place of jars of fluid.
- ✓ Ensure first-aid procedures are adequate. Stock calcium gluconate gel and keep it handy.

Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer
- ✓ Keep the equipment in effective and efficient working order and good repair.
- ✓ If the extraction unit stops, or is faulty, get it repaired straight away.
- ✗ Do not alter, add or remove extraction without specialist advice.
- ✓ Check transfer hoses and connectors regularly for leaks.
- ✓ Ensure that screens on the UV units are secure and any interlocks are in working order.
- ✓ Noisy or vibrating fans indicate a problem. Do repairs as necessary.

Inspection, examination and testing

- ✓ Check the extraction unit and gauges is working properly regularly, recommended at least once a week. Compare with manufacturer's performance specifications to check if extraction unit is working properly.
- ✓ Ensure any engineering control equipment used is examined and tested against its performance specification by hygiene technician at least every 12 months.
- ✓ Keep records of all inspections, examinations and testing for at least five years.

Personal Protective Equipment (PPE)

- ✓ Refer to the product label or SDS or ask PPE supplier for advice on selection of suitable PPE.
- ✓ PPE may be needed for some cleaning and maintenance activities, e.g. dealing with spills.
- ✓ Keep any PPE clean and replace at recommended intervals.
- ✓ Store PPE in appropriate places to avoid contamination.

Skin management

- ✓ Skin contact with the chemicals may cause dermatitis.
- ✓ Keep hands clean and in good condition.
- ✓ If need to use hand cleansers to remove ink, ensure that the cleanser is rinsed off afterwards.
- ✓ Provide after-work creams (moisturisers) to replace skin oils. Never allow solvents to be used for cleaning skin.
- ✓ Consider seeking advice from an occupational health doctor.
- ✓ Appoint a responsible person to carry out periodic skin inspections and record the findings.

Cleaning and housekeeping

- ✓ Keep the work area tidy, clean and free of combustible materials.
- ✓ Clean up spills immediately. Use an impervious apron and new nitrile gloves 0.4 mm thick or refer to SDS for appropriate PPE. Throw away gloves properly once used.
- ✓ Plan procedure in case of a spill and communicate with workers and execute the procedure. Clean the workroom at least once a week.
- ✓ Dispose off waste solvent, ink and empty container as hazardous waste through an authorised contractor by Department of Environment Training.

Training

- ✓ Give workers information on the risk of using the chemicals.
- ✓ Provide workers with training on:
  - safe operating procedures or work instructions;
  - control measure; and
  - when and how to use any PPE provided.
- ✓ Training programme should be reviewed and conducted at least once in two

Supervision

- ✓ Provide supervision to ensure that a safe work procedures are followed.
- ✓ Establish a system to monitor that all control measures are in place and being followed.

Worker's Checklist

- ☐ Make sure any ventilation system is switched on and is working.
- ☐ Look for signs of leaks, wear or damage of any equipment used. If worker finds any problems, inform the supervisor. Do not carry on working if there is a problem.
- ☐ Do not inspect printed sheets under a UV lamp. The reflected light can be dangerous.
- ☐ Wash hands before and after eating, drinking or using the washroom.
- ☐ Do not smoke in the work area.
- ☐ Do not use solvents to clean skin.
- ☐ Clear up spills immediately. Follow spillage procedure.
- ☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

- Safety Data Sheets
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Guidelines on Occupational Safety and Health for Design, Inspection, Testing and Examination of Local Exhaust Ventilation System, DOSH 2008
- Guidelines on the Control of Chemicals Hazardous to Health, DOSH 2001
- Control Guidance Sheets S100, S101 and S102

Useful links

- DOSH portal: https://www.dosh.gov.my
- SiRAC Online: sirac.dosh.gov.my
- HSE COSHH essentials website: https://www.hse.gov.uk/coshh/essentials/index.htm
- ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Lithography Printing

Printing with Conventional Inks
LP004

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

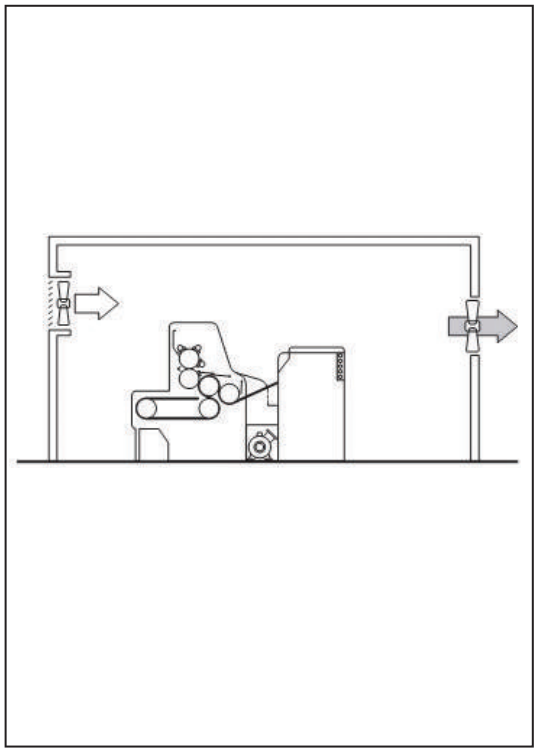
It can be used as suitable approach for controlling exposure to chemicals hazardous to health used in Printing Industry for specified task or process. This sheet provides good practice for lithography printing processes using conventional inks with or without isopropanol (IPA) damping. It describes the key points that need to be followed to reduce exposure to acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to the Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Control worker entry to the work area. Limit entrance to an authorised worker only.
- ✓ Put up warning sign at the entrance of work area where chemicals hazardous to health are used.

Equipment

- ✓ Provide a good standard of general ventilation. Use powered wall or window-mounted fans to supply fresh air; minimum of ten air changes per hour, with a through draught.
- ✓ Transfer ink via fixed pipework. Otherwise consider using proprietary mixing systems and automatic cartridges to dispense inks to ducts.



General ventilation in a lithographic press room

Special care

- ✓ Dermatitis is common in printing. This is caused by frequent contact with chemicals used in printing processes. Minimize skin contact with inks, reducers and cleaning chemicals.
- ✓ Deletion fluids contain hydrofluoric acid. This acid is hazardous and causes serious burns. Damage to skin and eyes can be permanent.
- ✓ Provide deletion pens in place of jars of fluid.
- ✓ Ensure first-aid procedures are adequate. Stock calcium gluconate gel and keep it handy.
- ✓ Ensure IPA concentration as low as possible and in any case below 10%.

Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer.
- ✓ Keep the equipment in effective and efficient working order and good repair.
- ✓ Noisy or vibrating fans indicate a problem. Do repair as necessary.

Personal Protective Equipment (PPE)

- ✓ Refer to the product label or SDS or ask PPE supplier for advice on selection of suitable PPE.
- ✓ PPE may be needed for some cleaning and maintenance activities, e.g. dealing with spills.
- ✓ Keep any PPE clean and replace at recommended intervals.
- ✓ Store PPE in appropriate places to avoid contamination.

Skin management

- ✓ Keep hands clean and in good condition.
- ✓ If need to use hand cleansers to remove ink, ensure that the cleanser is rinsed off afterwards.
- ✓ Provide after-work creams (moisturisers) to replace skin oils. Never allow solvents to be used for cleaning skin.
- ✓ Consider seeking advice from an occupational health doctor.
- ✓ Appoint a responsible person to carry out periodic skin inspections and record the findings.

Cleaning and housekeeping

- ✓ Keep the work area tidy, clean and free of ink contamination.
- ✓ Dispose off contaminated cloths, wipes, gloves, solvent, ink and empty containers as hazardous waste through an authorised contractor by Department of Environment.
- ✓ Store containers in a safe place, securely closed.
- ✓ Handle containers with care and replace caps.
- ✓ Clean up spills immediately. Use an impervious apron and new nitrile gloves 0.4 mm thick or refer to SDS for appropriate PPE. Throw away gloves properly once used.
- ✓ Plan procedure in case of a spill and communicate with workers and execute the procedure.

Training

- ✓ Give workers information on the risk of using the chemicals.
- ✓ Provide workers with training on:
  - safe operating procedures or work instructions;
  - control measures; and
  - when and how to use any PPE provided.
- ✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

- ✓ Provide supervision to ensure that a safe work procedures are followed.
- ✓ Establish a system to monitor that all control measures are in place and being followed.

Worker's Checklist

- ☐ Make sure any ventilation system is switched on and is working.
- ☐ Look for signs of leaks, wear or damage of any equipment used. If worker finds any problems, inform the supervisor. Do not carry on working if there is a problem.
- ☐ Do not inspect printed sheets under a UV lamp. The reflected light can be dangerous.
- ☐ Wash hands before and after eating, drinking or using the washroom.
- ☐ Do not smoke in the work area.
- ☐ Do not use solvents to clean skin.
- ☐ Clear up spills immediately. Follow spillage procedure.
- ☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

- Safety Data Sheets
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Guidelines on Occupational Safety and Health for Design, Inspection, Testing and Examination of Local Exhaust Ventilation System, DOSH 2008
- Guidelines on the Control of Chemicals Hazardous to Health, DOSH 2001
- Control Guidance Sheets S100, S101 and S102

Useful links

- DOSH portal: https://www.dosh.gov.my
- SiRAC Online: sirac.dosh.gov.my
- HSE COSHH essentials website: https://www.hse.gov.uk/coshh/essentials/index.htm
- ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Lithography Printing

Manual Cleaning of Presses
LP005

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

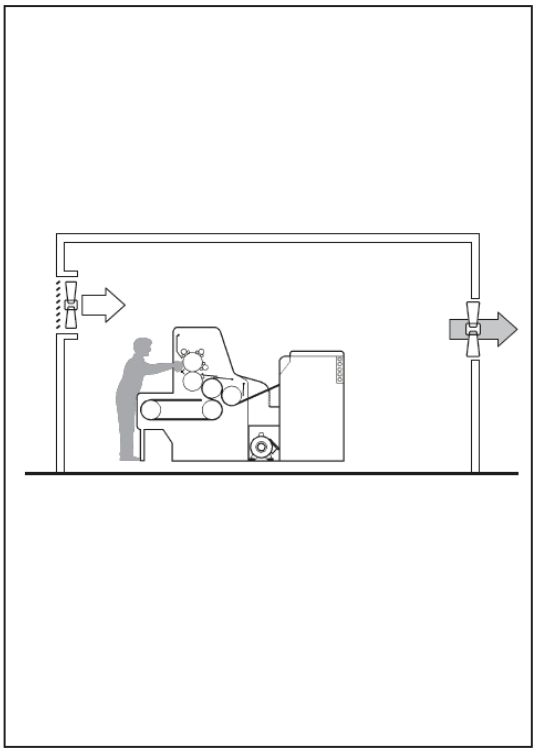
It can be used as suitable approach for controlling exposure to chemicals hazardous to health used in printing industry for specified task or process. This sheet provides good practice for manual cleaning of presses, rollers and blanket of printing machine using cleaning chemicals such as solvent naphta. It describes the key points that need to be followed to reduce exposure to acceptable level. It is important that all the points are followed or use equally effective measure. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to the Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Control worker entry to the work area. Limit entrance to an authorised worker only.
- ✓ Put up warning sign at the entrance of work area where chemicals hazardous to health are used.

Equipment

- ✓ Manual cleaning increases the risks of skin exposure. Consider introducing automatic systems.
- ✓ Provide a good standard of general ventilation. Use powered wall or window-mounted fans to supply fresh air, minimum of ten air changes per hour, with a through draught.
- ✓ Provide a good through draught with a fan or air mover for work in restricted areas, e.g. removing ink from cylinders, work in dead spaces between machines.
- ✓ Use cleaning chemical with lower volatility or higher flash point.
- ✓ Use a wiping tool in place of rags or cloths to minimise hand wiping.
- ✓ If extraction unit is fitted to the press, turn it on for cleaning. The press should be stationary.



General ventilation for cleaning printing press

- ✓ Provide fire-resisting, metal cabinets for flammable liquid storage in the press area.

Special care

- ✓ Dermatitis is common in printing. This is caused by frequent contact with chemicals used in printing processes. Minimise skin contact with inks, reducers and cleaning chemicals.
- ✓ Solvent-based cleaners (e.g. solvent naphtha) can be absorbed through the skin.
- ✓ Avoid chemical cleaning using products based dichloromethane (methylene chloride) which is extremely volatile.

Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer.
- ✓ Keep the equipment in effective and efficient working order and good repair.
- ✓ Noisy or vibrating fans indicate a problem. Do repair as necessary.

Personal Protective Equipment (PPE)

- ✓ Use chemical resistant gloves or refer to SDS for appropriate PPE. Typically, nitrile gloves 0.4 mm thick for use with lower volatility solvents, for no more than eight hours are acceptable.
- ✓ Ensure workers remove and discard damaged gloves.
- ✓ Provide storage for PPE to prevent damage or contamination when not in use.
- ✓ Provide eye protection, impervious apron and anti-static foot wear.
- ✓ Respiratory protective equipment may be needed for some cleaning and maintenance activities, e.g. dealing with spills.

Skin management

- ✓ Keep hands clean and in good condition.
- ✓ If need to use hand cleansers to remove ink, ensure that the cleanser is rinsed off afterwards.
- ✓ Provide after-work creams (moisturisers) to replace skin oils. Never allow solvents to be used for cleaning skin.
- ✓ Consider seeking advice from an occupational health doctor.
- ✓ Appoint a responsible person to carry out periodic skin inspections and record the findings.

Cleaning and housekeeping

- ✓ Keep the work area tidy, clean and free of ink contamination.
- ✓ Dispose off contaminated cloths, wipes, gloves, solvent, ink and empty containers as hazardous waste through an authorised contractor by Department of Environment.
- ✓ Store containers in a safe place, securely closed.
- ✓ Handle containers with care and replace caps.
- ✓ Clean up spills immediately. Use an impervious apron and new nitrile gloves 0.4 mm thick or refer to SDS for appropriate PPE. Throw away gloves properly once used.
- ✓ Plan procedure in case of a spill and communicate with workers and execute the procedure.

Training

- ✓ Give workers information on the risk of using the chemicals.
- ✓ Provide workers with training on:
  - safe operating procedures or work instructions;
  - control measures; and
  - when and how to use any PPE provided.
- ✓ Training programme should be reviewed and conducted at least once in 2 years.

Supervision

- ✓ Provide supervision to ensure that a safe work procedures are followed.
- ✓ Establish a system to monitor that all control measures are in place and being followed.

Worker's Checklist

- ☐ Make sure any ventilation system is switched on and is working.
- ☐ Look for signs of leaks, wear or damage of any equipment used. If worker finds any problems, inform the supervisor. Do not carry on working if there is a problem.
- ☐ Wash hands before and after eating, drinking or using the washroom.
- ☐ Do not smoke in the work area.
- ☐ Do not use solvents to clean skin.
- ☐ Clear up spills immediately. Follow spillage procedure.
- ☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

- Safety Data Sheets
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Guidelines on Occupational Safety and Health for Design, Inspection, Testing and Examination of Local Exhaust Ventilation System, DOSH 2008
- Guidelines on the Control of Chemicals Hazardous to Health, DOSH 2001
- Control Guidance Sheets S100, S101 and S102

Useful links

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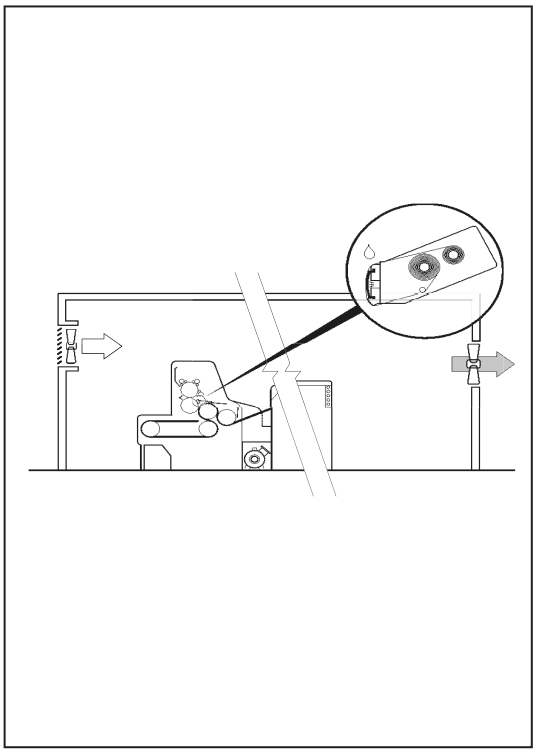
Lithography Printing

Automated Cleaning of Presses (Conventional Inks)

LP006

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

It can be used as suitable approach for controlling exposure to chemicals hazardous to health used in printing industry for specified task or process. This sheet provides good practice for automatic cleaning of presses using cleaning chemicals such as solvent naphtha. It describes the key points that need to be followed to reduce exposure to acceptable level. It is important that all the points are followed or use equally effective measure. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to the Safety Data Sheet (SDS) for more information.



Automatic cleaning for lithography printing

Workplace and access

- ✓ Control worker entry to the work area. Limit entrance to an authorised worker only.
- ✓ Put up warning sign at the entrance of work area where chemicals hazardous to health are used.

Equipment

- ✓ Provide a good standard of general ventilation. Use powered wall or window-mounted fans to supply fresh air; minimum of ten air changes per hour, with a through draught.
- ✓ Ensure the quantity of cleaning chemicals applied by the automatic blanket wash system is metered to the minimum necessary and is altered only as authorised.
- ✓ Use cleaning chemical with lower volatility or higher flash point.
- ✓ If extraction unit is fitted to the press, turn it on for cleaning. The press should be stationary.
- ✓ Provide fire-resisting, metal cabinets for flammable liquid storage in the press area.

Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer.
- ✓ Keep the equipment in effective and efficient working order and good repair.
- ✓ Check transfer hoses and connectors regularly for leaks.
- ✓ Noisy or vibrating fans indicate a problem. Do repair as necessary.

Personal Protective Equipment (PPE)

- ✓ Use chemical resistant gloves or refer to SDS for appropriate PPE where there is a risk of skin contact. Disposable nitrile gloves 0.2 mm thick are acceptable. Dispose disposable gloves once used.
- ✓ Ensure workers remove and discard damaged gloves.
- ✓ Provide storage for PPE to prevent damage or contamination when not in use.
- ✓ Respiratory protective equipment may be needed for some cleaning and maintenance activities, e.g. dealing with spills.

Skin management

✓ Keep hands clean and in good condition.
✓ If need to use hand cleansers to remove ink, ensure that the cleanser is rinsed off afterwards.
✓ Provide after-work creams (moisturisers) to replace skin oils. Never allow solvents to be used for cleaning skin.
✓ Consider seeking advice from an occupational health doctor.
✓ Appoint a responsible person to carry out periodic skin inspections and record the findings.

Cleaning and housekeeping

✓ Keep the work area tidy, clean and free of ink contamination and combustible materials.
✓ Dispose off contaminated cloths, wipes, gloves, solvent, ink and empty containers as hazardous waste through an authorised contractor by Department of Environment.
✓ Minimise the amount of flammable liquid in use. Use a self-sealing container or proprietary dispenser.
✓ Store containers in a safe place, securely closed.
✓ Handle containers with care and replace caps.
✓ Clean up spills immediately. Use an impervious apron and new nitrile gloves 0.4 mm thick or refer to SDS for appropriate PPE. Throw away gloves properly once used.
✓ Plan procedure in case of a spill and communicate with workers and execute the procedure.

Training

✓ Give workers information on the risk of using the chemicals.
✓ Provide workers with training on:
  • safe operating procedures or work instructions;
  • control measures; and
  • when and how to use any PPE provided.
✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

✓ Provide supervision to ensure that a safe work procedures are followed.
✓ Establish a system to monitor that all control measures are in place and being followed.

Worker's Checklist

☐ Make sure any ventilation system is switched on and is working.
☐ Look for signs of leaks, wear or damage of any equipment used. If worker finds any problems, inform the supervisor. Do not carry on working if there is a problem.
☐ Wash hands before and after eating, drinking or using the washroom.
☐ Do not smoke in the work area.
☐ Do not use solvents to clean skin.
☐ Clear up spills immediately. Follow spillage procedure.
☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

• Safety Data Sheets
• Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
• Guidelines on Occupational Safety and Health for Design, Inspection, Testing and Examination of Local Exhaust Ventilation System, DOSH 2008
• Guidelines on the Control of Chemicals Hazardous to Health, DOSH 2001
• Control Guidance Sheets S100, S101 and S102

Useful links

• DOSH portal: https://www.dosh.gov.my
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• ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Pest Control

General Principle-Handling Concentrated Pesticides for Protection of Plants

P001

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

It can be used as the suitable approach for handling pesticides. The sheet gives control measure and good practice recommendation on exposure control. It can be applied to all tasks in handling concentrated pesticides for protection of plants. It describes the key points that need to be followed to reduce exposure to an acceptable level. It is important that all the points are followed. This sheet identifies the minimum standards to protect workers' health. It should not be used to justify a lower standard of control than that which may be required by the pesticide label. That label often has detailed information, which should always be followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to the Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design - environment

- ✓ Keep pesticides stored securely in a dry place that is capable of retaining spills.
- ✓ Post warning signs.
- ✓ Keep other people away while handling pesticide concentrates. The working space should be wide enough to comfortably contain the equipment and materials needed.
- ✓ Handle concentrates where any spillages will be caught. Do not allow concentrate to enter the soil or drains.

Design - product

- ✓ Only buy liquid pesticide concentrates in containers that are easy to pour from, that do not dribble and do not trap pesticide concentrate spills in any rim.
- ✓ Only buy wettable powders in a wide-necked waterproof container from which can scoop the concentrate into the dilution jug.

Mixing and loading the application equipment

Portable equipment (e.g. knapsack or compression sprayer, fogger)

- ✓ Ensure the application equipment is working without leaks before handling pesticide.
- ✓ Make sure the equipment is working properly.
- ✓ Check carefully the calculations on the quantities to mix. Make up only the required amount.
- ✓ Close the pesticide concentrate container. Do not leave it unattended.
- ✓ Wipe the gloves free of concentrate before handling the application equipment including the cap and the spray lance. Burn used wipes at the end of the day.
- ✓ Make up liquids by adding concentrate to some water or solvent in the application equipment. Take care not to spill pesticide concentrate on the outside of the application equipment. Wash out the measuring jug and put the washings into the application equipment and mix. Then fill with fresh water or solvent to make the quantity of mix required.
- ✓ Make up powders by preparing a thin paste with water or solvent in the measuring jug, and proceed as for liquids. If not well dispersed, powders will block a spray nozzle.

Tractor-trailed sprayer

- ✓ For spraying with a tractor-trailed sprayer, the same guidance applies.
- ✓ The best practice is to fit an induction bowl for mixing and loading.

Personal protective equipment (PPE)

- ✓ Check the product label or SDS or ask PPE supplier to help on selection of suitable PPE. If the product is volatile or dusty, use a respirator (refer to R001).
- ✓ Avoid contact with pesticide concentrate. Wipe off any splashes immediately, and wash down before taking off protective equipment. Burn used wipes at the end of the day.

- ✓ If using disposable protective gloves, discard after finished making up the diluted solution.Throw disposable gloves away every time after using them.
- ✓ If using non-disposable gloves, wash them well in soapy water before taking them off, then wash them inside and outside, and hang them up to dry. Throw the gloves away after using them for a week even if they are not worn out.
- ✓ Manage hazardous waste according to requirements by the Department of Environment.
- ✓ Wash coveralls at the end of the day.
- ✓ When PPE is not in use, keep it clean and store it in a clean, safe place, separate from normal clothing. Change the PPE when it is damaged.

Training

- ✓ Give workers information on the risk of using the chemicals.
- ✓ Provide workers with training on:
  - handling chemicals safely;
  - how to use control equipment properly and ensure the controls is working;
  - when and how to use any PPE provided;
  - any safe work procedure; and
  - what to do if something goes wrong.
- ✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

- ✓ Provide supervision to ensure safe work procedure are followed.
- ✓ Establish a system to check that control measures are in place and being followed.

Worker's Checklist

- ☐ If worker finds any problems, inform the supervisor. Do not just carry on working.
- ☐ Use and store protective equipment according to instructions.
- ☐ Throw away disposable gloves every time worker takes them off.
- ☐ Wash hands after use, and before and after eating, drinking, smoking and using the washroom.
- ☐ Never clean hands with concentrated cleaning products or solvents.
- ☐ Check skin regularly for dryness or soreness, inform supervisor if these symptoms appear.
- ☐ Wash coveralls at the end of the day.

Further information

- Safety Data Sheets
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Guidelines on Occupational Safety and Health for Design, Inspection, Testing and Examination of Local Exhaust Ventilation System, DOSH 2008
- Guidelines on the Control of Chemicals Hazardous to Health, DOSH 2001
- Control Guidance Sheets S100, S101 and S102

Useful links

- DOSH portal: https://www.dosh.gov.my
- SiRAC Online: sirac.dosh.gov.my
- HSE COSHH essentials website: https://www.hse.gov.uk/coshh/essentials/index.htm
- ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Pest Control

Diluting Chemical Concentrates Harm Via Skin or Eye Contact

P002

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

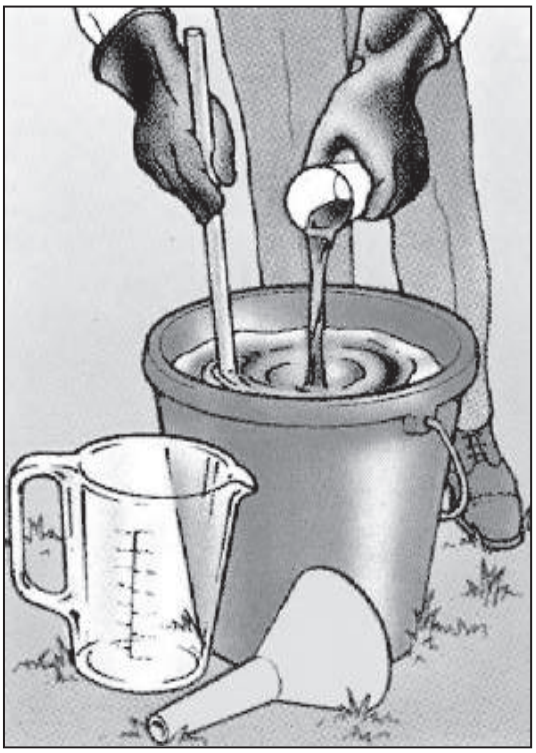
It can be used as the suitable approach for handling pesticides. The sheet gives control measure and good practice recommendation on exposure control. It can be applied to all tasks in diluting chemical concentrates. It describes the key points that need to be followed to reduce exposure to an acceptable level. It is important that all the points are followed. This sheet identifies the minimum standards to protect workers' health. It should not be used to justify a lower standard of control than that which may be required by the pesticide label. That label often has detailed information, which should always be followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to the Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Make sure there is enough room to do the job safely.
- ✓ Provide good washing facilities.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Equipment

- ✓ Ensure the equipment used with the product works properly, without leaks.
- ✓ Provide protective gloves.
- ✓ If diluting with a solvent, make sure the room is well ventilated; five to ten air changes per hour, with a through draught.
- ✓ Buy liquid chemicals in containers that are easy to pour from, do not dribble, and do not trap liquid in a rim.
- ✓ Try to buy solid chemicals in tablet or granule form, or in wide-necked containers so it is easy to scoop out.



Diluting chemical concentrates

Caution:

- ✗ Never decant concentrate into an unlabelled container.
- ✗ Never re-use a concentrate container - dispose of it safely or return it to your supplier.
- ✗ Do not store more than 50 litres of flammable liquid indoors - use a flammable store.

Procedures

- ✓ Store products containing chemicals securely in a cool, dry, dark place, capable of retaining spills. Do not store far more than you need.
- ✓ Reduce skin contact - workers should wash off splashes immediately.
- ✓ Ensure that workers follow instructions for use by reading the label, and make up solutions for immediate use only.
- ✓ Plan procedure in case of a spill and communicate with workers and execute the procedure.
- ✓ Make sure they are aware of the following general guidelines:
  - Add liquid concentrate to diluting liquid - never the other way round, unless the instructions say so.
  - Make a thin paste of powders with a small amount of diluting liquid, then dilute as for liquids.

✓ Put the cap back on the container immediately and wipe the outside clean.

Special care

✓ Contact with many chemicals can lead to dermatitis, eye damage or asthma. Refer to the SDS (Section 11: Toxicological Information) for specific health effect.
✓ Avoid products that contain hydrofluoric acid.
✓ Take special care using caustic soda (sodium hydroxide). This can erupt when mixed with water. Splashes in the eye can cause blindness.
✓ Never add any other chemical to concentrates that contain bleach (sodium hypochlorite solution). This can cause a hazardous gas (chlorine) to be given off.
✓ Ask workers to check their skin for dryness or soreness every six months. If these effects appear, refer to medical practitioner.
✓ If you use a product labelled 'may cause sensitisation by skin contact' or 'may cause sensitisation by inhalation', seek specialist advice for appropriate control.

Maintenance

✓ Wash out mixing equipment after use. Dispose off waste liquid as hazardous waste through an authorised contractor by the Department of Environment (DOE).

Personal protective equipment (PPE)

✓ Refer to the product label or SDS or ask PPE supplier to help on selection of suitable PPE.
✓ Provide protective gloves - disposable nitrile gloves are acceptable. If you must use latex gloves, use only 'low protein, powder free' gloves.
✓ Throw away disposable gloves every time they are taken off. Manage hazardous waste according to requirements by the DOE. Provide protective goggles to protect eyes when using products that can cause burns (e.g. acids, caustics).

Cleaning and housekeeping

✓ Clean up spills promptly. Follow spillage procedures.

Training

✓ Give workers information on the risk of using the chemicals.
✓ Provide workers with training on:
- handling chemical safely;
- how to use control equipment properly and ensure the control is working;
- when and how to use any PPE provided; and
- what to do if something goes wrong.

✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

✓ Provide supervision to ensure that a safe work procedures are followed
✓ Establish a system to monitor that all control measures are in place and being followed.

Worker's Checklist

☐ If worker finds any problems, inform the supervisor. Do not just carry on working.
☐ Use and store protective equipment according to instructions.
☐ Throw away disposable gloves every time worker take them off.
☐ Wash hands after use, and before and after eating, drinking, smoking and using the washroom.
☐ Never clean hands with concentrated cleaning products or solvents.
☐ Check skin regularly for dryness or soreness, inform supervisor if these symptoms appear.
☐ Wash coveralls at the end of the day.

Further information
- Safety Data Sheets
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Guidelines on the Control of Chemicals Hazardous to Health, DOSH 2001
- Control Guidance Sheets S100, S101 and S102

Useful links
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- ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Pest Control

Ready-for-Use Insecticide Sprays and Powder

P003

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

It can be used as the suitable approach for handling pesticides. The sheet gives good practice advice on exposure control. It can be applied to all tasks in ready-for-use insecticide sprays and powder. It describes the key points that need to be followed to reduce exposure to an acceptable level. It is important that all the points are followed. This sheet identifies the minimum standards to protect worker's health. It should not be used to justify a lower standard of control than that which may be required by the pesticide label. That label often has detailed information, which should always be followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to the Safety Data Sheet (SDS) for more information.

Caution : Aerosol propellants are often flammable.

Design and equipment

✗ Never re-use empty insecticide containers. Dispose of them safely according to Department of Environment or local authority requirements.
✓ Washing facilities are needed for decontamination after handling products.

Procedures

✓ Store products containing chemicals securely in a cool, dry, dark place, capable of keeping in spills. Do not store far more than required.
✓ Read the instructions on labels carefully. Follow the instructions for use.
✓ Keep chemicals off your skin. Wash off any splashes immediately.
✗ Do not direct sprays or dusts as people or animals, or over food.

Ready-for-use insecticide sprays

✗ Never use aerosols or solvent-based trigger sprayers near a naked flame.

Personal protective equipment (PPE)

✓ Follow the instructions on product labels.
✓ Wear protective gloves. Disposable nitrile gloves are acceptable. If latex gloves have to be used, use only 'low-protein, powder-free' gloves.
✓ Throw away disposable gloves every time they are taken off.

Training

✓ Show workers this sheet and check that they understand it.
✓ Tell them about the risks of using the product. Refer product labels SDS from product supplier.

Supervision

✓ Provide supervision to ensure that safe work procedures are followed.
✓ Establish a system to monitor that all control measures are in place and being followed.

Worker's Checklist

- ☐ If worker finds any problems, inform the supervisor. Do not just carry on working.
- ☐ Use and store protective equipment according to instructions.
- ☐ Throw away disposable gloves every time worker takes them off.
- ☐ Wash hands after use, before and after eating, drinking, smoking and using the washroom.
- ☐ Never clean hands with concentrated cleaning products or solvents.
- ☐ Check skin regularly for dryness or soreness, inform supervisor if these symptoms appear.
- ☐ Wash coveralls at the end of the day.

Further information

- Safety Data Sheets
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Guidelines on the Control of Chemicals Hazardous to Health, DOSH 2001
- Control Guidance Sheets S100, S101 and S102

Useful links

- DOSH portal: https://www.dosh.gov.my
- SiRAC Online: sirac.dosh.gov.my
- HSE COSHH essentials website: https://www.hse.gov.uk/coshh/essentials/index.htm
- ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Pest Control

Eradicating Vermin (rats, etc)

P004

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

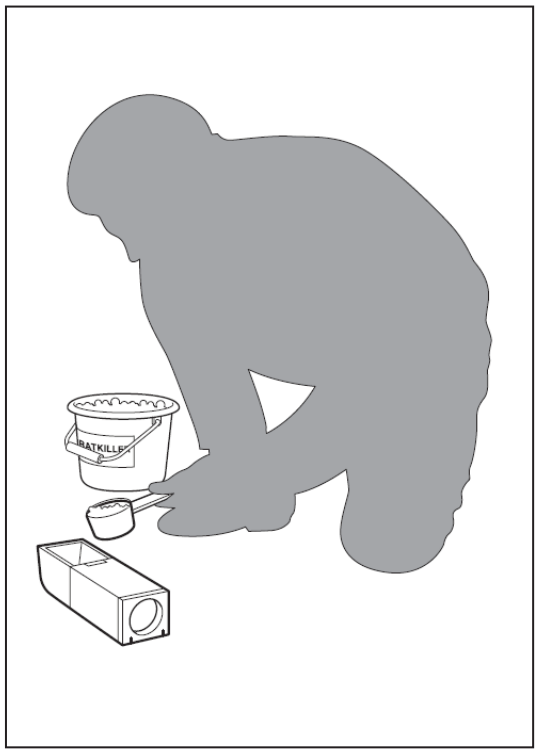
It can be used as the suitable approach for handling pesticides. The sheet gives control measure and good practice recommendation on exposure control. It can be applied to all tasks in eradicating vermin (rats, etc.). It describes the key points that need to be followed to reduce exposure to an acceptable level. It is important that all the points are followed. This sheet identifies the minimum standards to protect worker's health. It should not be used to justify a lower standard of control than that which may be required by the pesticide label. That label often has detailed information, which should always be followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to the Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Vermin control is commonly needed on farms, around docks and in cities.
- ✓ Keep people and pets away while applying rodenticides etc. and when retrieving bait or dead animals.
- ✓ Place bait to prevent access by children, pets and non-target animals.
- ✓ If treating by powder blowing, help in blocking burrows may be needed.
- ✓ Display warning signs.

Design and equipment

- ✓ Ensure the equipment using the product works properly, without leaks.
- ✗ Never re-use a rodenticide container. Dispose of it safely or return it to supplier.
- ✓ Washing facilities are needed for decontamination after handling products.



Eradicating vermin

Procedures

- ✓ Store products containing chemicals securely in a cool, dry, dark place, capable of keeping in spills. Do not store far more than required.
- ✓ Read instructions on labels carefully. Follow the instructions for use.
- ✓ Keep chemicals and mix bait on a lipped tray, to retain spills.
- ✓ Clear up spills immediately. Absorb liquids in granules. Scoop solids or absorbed liquids into a marked secure container.
- ✓ Avoid contact with chemicals. Wash off any splashes immediately.
- ✓ Put the cap back on the container immediately.
- ✓ Make a plan for the treatment. Do not over-bait.
- ✓ Make sure the air is fit to breathe before working in a confined space (e.g. in a conveyor boot or sewer).
- ✗ Do not carry out gassing treatments within ten metres of dwellings.
- ✓ Keep baits away from watercourses.
- ✓ Scoop residues and left-over baits into a marked secure container. Put dead animals into marked polythene bags and seal for disposal by burning.
- ✓ Consider what information you need to give to clients.

Special care

✓ Contact with rat urine can lead to leptospirosis (Weil's disease). Cover cuts and broken skin.

Personal protective equipment (PPE)

✓ Follow the instructions on product labels.
✓ Ask PPE supplier for advice on selection of suitable protective equipment.
✓ Respiratory protective equipment (RPE) is needed when using phosphine or cyanide powders or pellets. Seek advice from RPE supplier. Make sure the right cartridge is fitted before starting work.
✓ Make sure workers know how to check that RPE fits correctly. Seek advice from supplier.
✓ Make sure that workers examine their RPE thoroughly and test that it works properly every time it is used.
✓ If the label does not tell what PPE to use, wear cotton coveralls, protective footwear and gloves. Disposable gloves are acceptable. If latex gloves have to be used, use only 'low-protein, powder-free' gloves.
✓ Throw away disposable gloves properly every time take them off.
✓ For phosphine or cyanide treatments, wipe down the respirator, clothing and equipment with a damp cloth before taking RPE off.
✗ Workers must not take work clothing home for washing. Wash separately.

Health advice

✓ Instruct workers to check their skin for dryness or soreness every six months. If these effects appear, check the proper use of PPE.
✓ Workers must tell their doctor that they work with rats if they develop flu-like symptoms.

Training

✓ Give workers information on the risk of using the chemicals.
✓ Provide workers with training on:
- handling chemicals safely;
- how to use control equipment properly and ensure the controls is working;
- when and how to use any PPE provided;
- any safe work procedure;
- what to do if something goes wrong;
- how to clear up spills, bait and dead animals safely; and
- how to inform clients about the risks.

✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

✓ Provide supervision to ensure safe work procedure are followed.
✓ Establish a system to check that control measures are in place and being followed.

Worker's Checklist

☐ Look for signs of leaks, wear and damage.
☐ Check that RPE works properly every time worker put it on.
☐ If worker finds any problems, inform the supervisor. Do not just carry on working.
☐ Inform clients not to interfere with bait or dead animals. Inform them how to contact you.
☐ Wash hands after use, before and after eating, drinking, smoking and using the washroom.
☐ Clear up chemical spills promptly. Absorb liquid spills in granules and dispose of them safely.
☐ Use and store protective equipment according to instructions.
☐ Throw away single-use gloves every time worker takes them off.
☐ Check your skin regularly for dryness or soreness - inform supervisor if these symptoms appear.

Further information
- Safety Data Sheets
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Guidelines on the Control of Chemicals Hazardous to Health, DOSH 2001
- Control Guidance Sheets S100, S101 and S102

Useful links
- DOSH portal: https://www.dosh.gov.my
- SiRAC Online: sirac.dosh.gov.my
- HSE COSHH essentials website: https://www.hse.gov.uk/coshh/essentials/index.htm
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Pest Control

Fogging and Misting Using Space Sprayers
P005

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

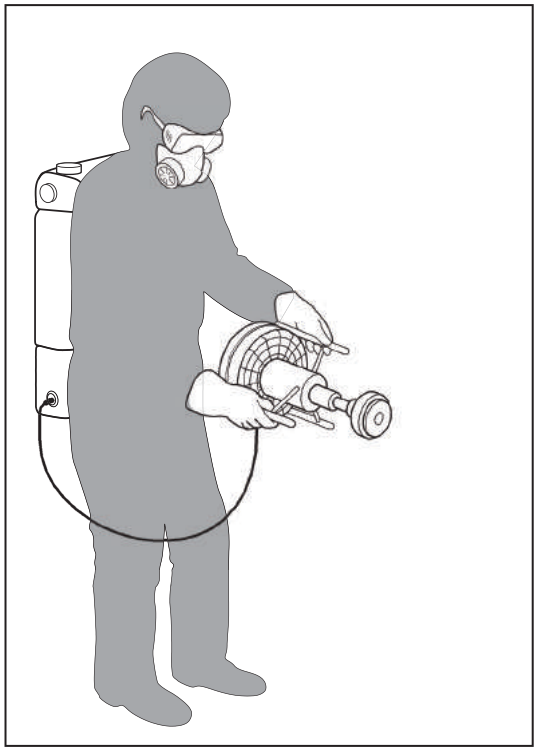
It can be used as the suitable approach for handling pesticides. The sheet gives control measure and good practice recommendation on exposure control. It can be applied to all tasks in fogging and misting using space sprayers. It describes the key points that need to be followed to reduce exposure to an acceptable level. It is important that all the points are followed. This sheet identifies the minimum standards to protect workers' health. It should not be used to justify a lower standard of control than that which may be required by the pesticide label. That label often has detailed information, which should always be followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to the Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Fogging and misting is common in food preparation areas, in warehouses, animal housing and garden centres.
- ✓ Clear the treatment area of people before starting work. Keep the area vacated for at least 30 minutes.
- ✓ Display warning signs.

Design and equipment

- ✓ Ensure the spraying works properly, without leaks.
- ✗ Do not decant treatment fluid into an unlabelled container.
- ✗ Do not re-use a treatment fluid container. Dispose of it safely, not by burning.
- ✗ Do not store more than 50 litres of flammable liquid indoors. Use a chemical store.
- ✓ Washing facilities are needed for decontamination after handling products.



Fogging and misting equipment

Procedures

- ✓ Pesticide spraying shall be carried out by licensed pest control operator as stipulated in the Pesticides Act.
- ✓ If possible, buy products in a ready-for-use solution.
- ✓ Store products containing chemicals securely in a cool, dry, dark place, capable of keeping in spills. Do not store far more than required.
- ✓ Read the instructions on labels carefully. Follow the instructions for use.
- ✓ Close doors and windows, and turn off ventilation systems before starting the treatment.
- ✓ Start work furthest from the exit and work towards the exit. Keep respiratory protective equipment (RPE) on until you have left the treatment area.
- ✓ Avoid contact with surfaces until they are dry.
- ✓ Clean up spills promptly. Plan procedure in case of a spill and communicate with workers and execute the procedure.
- ✓ Consider what information needs to give to clients.
- ✗ Check the wind, if too strong do not spray.
- ✓ Where possible spray down wind.
- ✗ Avoid walking through sprayed area.
- ✓ Ensure the correct coverage is sprayed on the target.

✘ Do not smoke while spraying.
✘ Avoid over spray.

Special care

✓ Contact with many chemicals can lead to skin soreness, itching, rashes, and blistering (dermatitis). Some can also damage the eyes.
✓ Some products may cause asthma. Refer to the SDS (Section 11: Toxicological Information).

Maintenance

✓ Ensure all equipment used in the task is maintained as advised by supplier/installer, in effective and efficient working order and good repair.
✓ Maintain system at least on monthly basis.
✓ Wash out the equipment after use. Dispose off this waste liquid safely.

Cleaning and housekeeping

✓ Keep the work area tidy and clean.
✓ Deal with spills immediately. This needs coveralls, RPE and disposable gloves.
✓ Plan procedure in case of a spill and communicate with workers and execute the procedure.
✓ Dispose of waste container and contaminated gloves as hazardous waste through an authorised contractor by Department of Environment.

Personal protective equipment (PPE)

✓ Follow the instructions on product labels.
✓ Ask PPE supplier for advice on selection of suitable protective equipment.
✓ RPE is needed. Seek advice from RPE supplier.
✓ Replace RPE filters as recommended by the supplier. Throw away disposable RPE after one use.
✓ Ensure RPE fits correctly. Seek advice from your supplier.
✓ Ensure that workers examine their RPE thoroughly and test that it works properly every time it is used.
✓ Keep RPE on until workers have left the work area.
✓ Wear protective gloves. Disposable nitrile gloves are acceptable. If workers must use latex gloves, use only 'low-protein, powder-free' gloves.
✓ Throw away single-use disposable gloves every time workers take them off.
✓ Use protective goggles to protect eyes.
✓ Wear a hooded coverall. Cotton or porous polypropylene is probably the best material.

Health advice

✓ Ask workers to check their skin for dryness or soreness every six months. If these effects appear, check the proper use of PPE.
✓ If the product is labelled as 'may cause sensitisation by skin contact' or 'may cause sensitisation by inhalation', seek medical practitioner advice.

Personal Hygiene

✓ Wash hands and face and remove protective equipment before eating, drinking or smoking.
✓ If get spray on skin, immediately wash the contaminated spot with plenty of soap and water. Contaminated equipment and clothes should also be removed and washed as soon as possible.
✓ On finishing spraying, take a bath and put on clean clothes. It is also necessary to make sure that the working clothes are washed.
✓ Wash hands before and after visiting the toilet.

Training

✓ Give workers information on the risk of using the chemicals.
✓ Provide workers with training on:
  • handling chemicals safely;
  • how to use control equipment properly and ensure the controls is working;
✓ • when and how to use any PPE provided;
  • any safe work procedure; and
  • what to do if something goes wrong;
✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

✓ Provide supervision to ensure safe work procedure are followed.
✓ Establish a system to check that control measures are in place and being followed.

Worker's Checklist

- ☐ Is the treatment area vacated?
- ☐ Check for signs of leaks, wear and damage.
- ☐ Check that your RPE works properly every time you put it on.
- ☐ If you finds any problems, tell your supervisor. Do not just carry on working.
- ☐ Wash your hands after use, and before and after eating, drinking, smoking and using the washroom.
- ☐ Clear up chemical spills promptly. Follow spillage procedure.
- ☐ Use and store your protective equipment according to instructions.
- ☐ Throw away single-use gloves every time you take them off.
- ☐ Check your skin regularly for dryness or soreness. Tell your supervisor if these symptoms appear.

Further information

- Safety Data Sheets
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Guidelines on the Control of Chemicals Hazardous to Health, DOSH 2001
- Control Guidance Sheets S100, S101 and S102

Useful links

- DOSH portal: https://www.dosh.gov.my
- SiRAC Online: sirac.dosh.gov.my
- HSE COSHH essentials website: https://www.hse.gov.uk/coshh/essentials/index.htm
- ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

P006

Pest Control

Storing Pesticides Products
P006

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

It can be used as the suitable approach for handling pesticides. The sheet gives control measure and good practice recommendation on exposure control. It can be applied to all tasks in storing pesticides products. It describes the key points that need to be followed to reduce exposure to an acceptable level. It is important that all the points are followed. This sheet identifies the minimum standards to protect worker's health. It should not be used to justify a lower standard of control than that which may be required by the pesticide label. That label often has detailed information, which should always be followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to the Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Ensure that only trained workers have access to stored chemical products. Keep the storage container locked.
- ✓ Provide good washing facilities.

Equipment

- ✓ Keep the storage area well ventilated; minimum of ten air changes per hour with a through draught.
- ✓ Keep a spill cleanup kit nearby. Ask supplier for advice.
- ✗ Do not decant concentrate into an unlabelled container.
- ✗ Do not re-use a concentrate container.
- ✓ Dispose of it safely or return it to the supplier.
- ✗ Do not store more than 50 litres of flammable liquid indoors. Use a flammable cabinet.

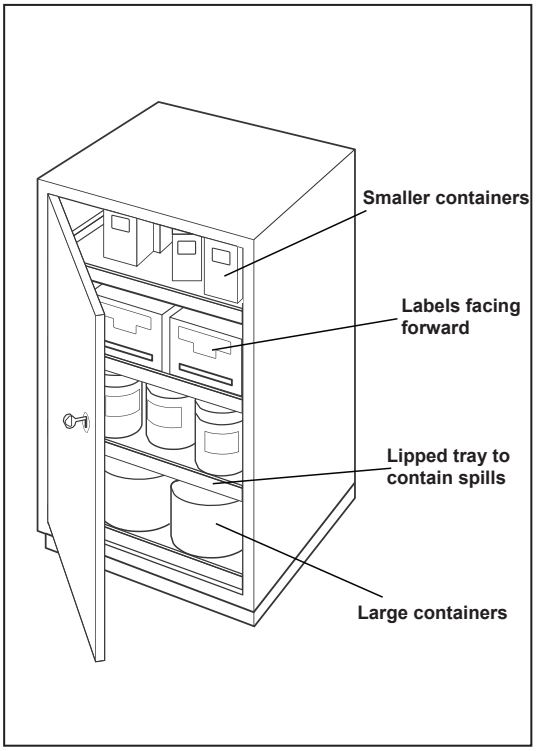


Illustration for small scale storage

Personal protective equipment (PPE)

- ✓ Follow the instructions on product labels.
- ✓ Ask PPE supplier for advice on selection of suitable protective equipment.
- ✓ In case of a spill, respiratory protective equipment (RPE) may be needed. Seek advice from RPE supplier.
- ✓ Provide protective gloves. Disposable nitrile gloves are acceptable. If latex gloves have to be used, use only 'low-protein, powder-free' gloves.
- ✓ Throw away disposable gloves properly every time they are taken off.

Procedures

- ✓ Keep apart:
  - solid and liquid products;
  - flammable and non-flammable liquids;
  - acids and alkalis; and
  - wastes.
- ✓ Store products containing chemicals securely in a cool, dry, dark place, capable of keeping in spills. Do not store far more than required.
- ✓ Store containers so their labels face forwards.
- ✓ Store heavier items and corrosive chemicals on lower shelves.

- ✓ Ensure that containers are easy to pour from, do not dribble and do not trap liquid in a rim.
- ✓ Try to buy solid chemicals in tablet form, or in a wide-necked container such that it is easy to scoop out granules.
- ✗ Do not store chemicals in open containers.

Special Care

- ✓ Contact with many chemicals can lead to skin soreness and itching, rashes, blistering (dermatitis). Some can also damage the eyes.

Cleaning and housekeeping

- ✓ Keep the storage area clean and well organised.
- ✓ Clear up spills immediately. Absorb liquids in granules. Scoop solids or absorbed liquids into a marked secure container.
- ✓ Plan procedure in case of a spill and communicate with workers and execute the procedure.
- ✓ Dispose of hazardous waste through an authorised contractor by Department of Environment (DOE).

Training

- ✓ Give workers information on the risk of using the chemicals.
- ✓ Provide workers with training on:
  - handling chemicals safely;
  - how to use control equipment properly and ensure the controls is working;
  - when and how to use any PPE provided;
  - any safe work procedure; and
  - what to do if something goes wrong.
- ✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

- ✓ Provide supervision to ensure safe work procedure are followed.
- ✓ Establish a system to check that control measures are in place and being followed.

Worker's Checklist

- ☐ If worker finds any problems, inform the supervisor. Do not just carry on working.
- ☐ Clear up spills straight away. Follow spillage procedure.
- ☐ Wash hands after use, before and after eating, drinking, smoking and using the washroom.
- ☐ Never clean hands with concentrated cleaning products or solvent.

Further information

- Safety Data Sheets
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Guidelines on the Control of Chemicals Hazardous to Health, DOSH 2001
- Control Guidance Sheets S100, S101 and S102.

Useful links

- DOSH portal: https://www.dosh.gov.my
- SiRAC Online: sirac.dosh.gov.my
- HSE COSHH essentials website: https://www.hse.gov.uk/coshh/essentials/index.htm
- ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

P007

Pest Control

Disposing of Pesticide Wastes
P007

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

It can be used as the suitable approach for handling pesticides. The sheet gives control measure and good practice recommendation on exposure control. It can be applied to all tasks in disposing of pesticide wastes, which includes pesticide containers. It describes the key points that need to be followed to reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to the Safety Data Sheet (SDS) for more information. This sheet identifies the minimum standards to protect workers' health. It should not be used to justify a lower standard of control than that which may be required by the pesticide label. That label often has detailed information, which should always be followed.

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.
- ✓ Keep wastes in secure storage. Lock them away in a place free from moisture and sunlight.
- ✓ Ensure that the store can hold back spillages.
- ✓ Ensure the waste container is labelled.
- ✓ Plans for what to do in case of waste spillage.

Concentrates pesticide wastes

- ✓ If possible, use up the concentrate pesticide. Otherwise it should be disposed waste according to Department of Environment (DOE) requirements through an authorised contractor.

Diluted pesticides wastes

- ✗ Do not dump unused diluted pesticide. Spray the crop or area again until the container is empty.
- ✓ Wash the container inside with clean water, and spray this also.

Pesticide waste containers

- ✓ Wash out containers with water and use the washings in making up diluted pesticide for application.

Metal containers

- ✗ Do not re-use metal pesticide containers.
- ✗ Do not cut metal containers.
- ✓ Dispose as hazardous waste through an authorised contractor by DOE.

Glass containers

- ✗ Do not re-use glass pesticide containers.
- ✓ Dispose as hazardous waste through an authorised contractor by DOE.

Plastic containers

- ✗ Do not re-use plastic pesticide containers.
- ✓ Dispose as hazardous waste through an authorised contractor by DOE.

Protective equipment

- ✓ Throw disposable gloves away every time you take them off.
- ✓ If you use non-disposable gloves, wash them well in soapy water before taking them off, then wash them inside and outside, and hang them up to dry. Throw these gloves away after using them for a week, even if they are not worn out.
- ✓ When PPE is not in use, keep it clean and store it in a clean, safe place, separate from normal clothing. Change the PPE when it is damaged.

Cleaning and housekeeping

- ✓ Seal waste into labelled containers. Do not mix different chemicals in the same container.
- ✗ Do not re-use a pesticide concentrate container.

- ✓ Collect water from washing the spray nozzles and spray boom and dispose off it safely.
- ✓ Park tractors and sprayers where rainwater run-off and tractor washings will not enter watercourses.

Training

- ✓ Give workers information on the risk of using the chemicals.
- ✓ Provide workers with training on:
  - safe operating procedures or work instructions;
  - when and how to use any PPE provided; and
  - how to detect and deal with leaks.
- ✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

- ✓ Provide supervision to ensure that safe work procedures are followed.
- ✓ Establish a system to monitor that control measures are in place and are being followed.

Further information

- Safety Data Sheets
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Control Guidance Sheets 101, 204, 302, S100, S101, S102 and R001

Useful links

- DOSH portal: https://www.dosh.gov.my
- SiRAC Online: sirac.dosh.gov.my
- HSE COSHH essentials website: https://www.hse.gov.uk/coshh/essentials/index.htm
- ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Control Approach R

Respiratory Protective Equipment (RPE)
R001

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

This sheet is used alongside Control Approaches 1-4 where the assessment allocates a chemical that can cause harm by inhalation. This sheet gives general advice on the selection and use of respiratory protective equipment that need to be considered for chemicals that can cause harm by inhalation. It describes the key points that need to be followed to help reduce exposure to an acceptable level. It is important that all the points are followed. Refer to the Safety Data Sheet (SDS) for more information.

Respiratory protective equipment (RPE)

- ✓ RPE is specially designed equipment that is worn over the mouth and nose (or sometimes a larger part of the body such as the head) to help protect against breathing in hazardous chemicals such as dusts, fumes and gases.
- ✓ There are two main types:
  - Respirator works by filtering the air as worker breathe it in. They should not be worn in oxygen deficient areas or areas where the filtered air may still be dangerous. The acceptable concentration of oxygen is 19.5 – 22%.
  - Breathing apparatus supplies breathable air from an independent source to the worker.

Selection of RPE

- ✓ RPE should be suitable for the chemicals being used, the task and the worker. Consult PPE supplier for assistance in choosing the correct RPE.
- ✓ Only use properly designed RPE. Look for compliance with a recognised standards.
- ✗ Scarf or handkerchief should not be used as RPE.

Suitability for chemicals

- ✓ Select RPE with a filter designed to protect against the exposure to chemicals. For example, a dust filter will not protect against the solvent vapour from paint. A solvent vapour filter will not protect against the acid gases from a plating bath.
- ✓ Careful when selecting filters to protect against gases and vapours as some of these only work for a small range of chemicals.

Suitability for task

- ✓ Ensure that the RPE is able to reduce the contamination in the breathing air to a safe level. The amount of work the filter has to do is called its protection factor. A filter with a protection factor of 10 is able to reduce the concentration of hazardous material in the breathing air to one tenth of the concentration outside of the RPE. Different types of RPE have different protection factors.
- ✓ Filters will only work for a limited time. Check with the supplier or in the instructions to find out how long the RPE could be worn before the filter needs changing.
- ✓ Only wear disposable RPE once.

Suitability for wearer

- ✓ Certain types of RPE will not be effective on a person who has a beard or not clean shaven. Choose another type of RPE such as one that covers the whole head.
- ✓ Ensure that the glasses, hearing protection or a hard hat do not interfere or get between the RPE and skin.
- ✓ Different sizes of RPE are available. Different people will need different sizes or shapes of masks to work efficiently for them. To check that an RPE mask fits, put it on, cover the filter and breathe in. The mask should suck down and stay there for ten seconds whilst worker holding his breath. If it does not, check it is fitted correctly and try again. If it still does not, try another size.
- ✓ If it is required need to wear RPE for a job, keep it on all the time. Taking it off for a few seconds to speak will seriously reduce the protection it provides.

Maintenance

- ✓ If the RPE has a replaceable filter, ensure that it is changed regularly before its workable life runs out.
- ✓ Reusable RPE requires cleaning with warm soapy water after each use.

- ✓ Check straps, face piece and seals for signs of deterioration. Replace if there are signs of damage or hardening.

Storage

- ✓ Store RPE in a safe place, away from contamination.
- ✓ Store the RPE in a clean location where it would not get damaged.
- ✓ Store rubber based RPE out of direct sunlight as it will shorten its usable life.

Training

- ✓ Make sure that workers know how to:
  - check the RPE is working properly before put it on;
  - check face fit;
  - replace worn or defective parts;
  - change filter;
  - maintain and store; and
  - check the RPE's limitations.
- ✓ Instruct workers to throw away disposable RPE after use.
- ✓ Tell workers to stop work and leave the area if they think their RPE is not working properly.
- ✓ The RPE supplier may be able to advice on training.

Further information

- Safety Data Sheets
- Guidelines on the Control of Chemicals Hazardous to Health, DOSH 2001
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005

Useful links

- DOSH portal: https://www.dosh.gov.my
- SiRAC Online: sirac.dosh.gov.my
- HSE COSHH essentials website: https://www.hse.gov.uk/coshh/essentials/index.htm

Control Approach S
Supplementary Advice

General Advice
S100
Chemicals causing harm via skin or eye contact

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

This sheet is used alongside Control Approaches 1 - 4 where the assessment allocates a chemical to hazard group S i.e. where chemicals can cause harm in contact with skin and eyes. This sheet provides general advice on the factors that need to be considered for a chemical allocated to hazard group S. It describes the key points that need to be followed to help reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to the Safety Data Sheet (SDS) for more information.

Contact with skin and eyes

✓ Group S covers chemicals that can damage the skin and/or eyes, or enter the body through the skin and cause harm. This may be in addition to causing harm by being breathed in. Contact with skin and eyes can be a particularly problematic type of exposure, and controls in addition to those in guidance sheets in the 100, 200 and 300 series may be needed.

✓ Consider how group S chemicals can come into contact with the skin and eyes. This can occur:
- when the skin comes into direct contact with a liquid or solid, e.g. by immersion;
- when dust or vapour/spray particles settle on the skin. The dust or vapour may be generated as part of the work activity or may be incidental to it;
- by touching dirty surfaces;
- by touching or removing dirty clothing or gloves; and
- by splashing or swallowing.

✓ Once contamination has got onto the hands, it may be spread to other parts of the body by rubbing or scratching.

Exposure control

✓ Consider substituting a safer chemical or product. If chemical substitution is not possible, reduce the chance of contact with skin or eyes.

✓ Reduce the chance of contact with skin or eyes:
- modify the process to minimise handling;
- change the physical form e.g. from dusty powders to granules, or from liquids to pastes;
- segregate clean and dirty areas to reduce the spread of contamination;
- provide smooth, impervious, easily cleaned surfaces;
- launder work clothing regularly;
- provide clean washrooms, with pre-work creams and after-work creams for skin care;
- inform workers about the risk and good personal hygiene;
- check skin for dryness or soreness regularly;
- clean the workroom regularly;
- provide eye protection where there are splash risks; and
- plan how to deal with spillages swiftly and safely.

✓ Workers should wash their hands before and after eating, drinking, smoking, using the washroom or applying cosmetics.

✓ Refer Sheet S101 for advice on selecting protective gloves and S102 for other PPE.

Containment

✓ Prepare a written method statement and use a Permit to Work before breaching containment. If necessary, use PPE and RPE.

✓ Seek advice from a health and safety professional if there are uncertainties.

Personal protective equipment (PPE)

✓ In situations where contact with chemicals in hazard group S is unavoidable, the use of PPE may be appropriate. However, PPE has a number of

✓ limitations:
- it has to be selected carefully (further information on the selection of PPE is given in S100, S101, and S102);
- it may limit mobility or communication;
- its continued effectiveness depends on proper maintenance, training and adherence to good working practices;
- It should only be considered if other measures are impracticable.

- ✓ Wear two layers of clothing to reduce the amount of chemicals reaching the skin.
- ✓ If using external laundry service, warn them what chemicals are on the clothing.
- ✓ Throw away disposable protective gloves the end of the workday, or the end of the job, whichever is shorter. Disposal of hazardous waste according to requirements by the Department of Environment (DOE).
- ✓ Use eye protection if dust or splashes of liquid could reach the eye.

Monitoring

- ✓ Biological monitoring may be needed if workers are taking up chemicals through the skin. Specialist advice is needed to decide if biological monitoring could apply. Refer 'Further Information'.

Worker's Checklist

- ☐ Check equipment for damage both before and after use.
- ☐ Inform supervisor if anything wrong.
- ☐ Keep all chemicals off the skin. Wash hands after touching surfaces that may be contaminated.This includes PPE.
- ☐ Cooperate with employer's procedures for personal hygiene.
- ☐ Do not take home work clothing (coveralls, gloves, footwear).
- ☐ Avoid skin contact with chemicals.
- ☐ Cooperate with biological monitoring.

Further information

- Safety Data Sheets
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Guidance on Medical Surveillance, DOSH 2001

Useful links

- DOSH portal: https://www.dosh.gov.my
- SiRAC Online: sirac.dosh.gov.my
- HSE COSHH essentials website: https://www.hse.gov.uk/coshh/essentials/index.htm

Control Approach S
Supplementary Advice

Selecting Protective Gloves
S101

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

This sheet is used alongside Control Approaches 1 - 4 where the assessment allocates a chemical to hazard group S i.e. where chemicals can cause harm in contact with skin. This sheet provides general advice on the factors that need to be considered for a chemical allocated to hazard group S. It describes the key points that need to be followed to help reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to the Safety Data Sheet (SDS) for more information.

It is important to follow all the points, or use equally effective measures.

- ✓ Selection of chemical protective gloves.
- ✓ Expert advice from the PPE supplier or manufacturer or from a health and safety professional may be needed.
- ✓ Incorrect selection or misuse of protective gloves can lead to skin disease including dermatitis, burns or serious ill health, and waste money.
- ✓ Involve workers in selecting protective gloves.
- ✓ Refer to the Safety Data Sheets (SDS) for all chemical products.
- ✓ Fill in Form Selection of Protective Gloves and show it, with SDS to PPE supplier.
- ✓ Check if the wearer has any skin condition that would affect their wearing of protective gloves. If so, consult an occupational health doctor.
- ✓ Chemicals can absorb through coated gloves with a knitted liner and cuffs onto exposed skin within seconds.
- ✓ If latex gloves have to be used, then use only 'low protein, powder free' gloves.
- ✓ Wet-work (hand immersion, particularly multiple short-term immersions using soap or detergent) is also associated with dermatitis.

Maintenance

- ✓ Gloves cannot be 'maintained'. They nearly always become contaminated inside the second time they are put on. Contamination works through the glove even while it is not being worn. Disposable gloves might offer better protection.
- ✓ No glove is tested to give more than 8 hours' protection against chemical permeation. Wear and tear, stretching and abrasion are not included in any testing.
- ✓ Throw away 'disposable' gloves when they are taken off.
- ✓ Throw away chemical-protective gloves if damaged.

Training and supervision

- ✓ Most workers do not know how to take off or put on contaminated gloves safely. Ask the glove supplier for training.
- ✓ Consider having a designated area for putting on and taking off gloves.
- ✓ Clean this area regularly.
- ✓ Inform workers:
  - where possible, to wipe gloves clean before taking them off;
  - to only use 'disposable' gloves once;
  - to store clean gloves in a place free from contamination;
  - to wash their hands after taking off protective gloves; and
  - to dispose off contaminated gloves safely as hazardous waste.

Further information
- Safety Data Sheets.
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005

Useful links
- DOSH portal: https://www.dosh.gov.my
- SiRAC Online: sirac.dosh.gov.my
- HSE COSHH essentials website: https://www.hse.gov.uk/coshh/essentials/index.htm
- ILO International Chemical Control Toolkit website: http://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Form Selection of Protective Gloves
Fill in the selection table below and show it, with Safety Data Sheets, to PPE supplier.

Information to help PPE supplier	
Task / Job name (one activity only – e.g. clearing spill)	
Name of chemicals/hazardous ingredients	
Physical form of product	☐ Gas ☐ Liquid ☐ Solid ☐ Paste ☐ Other _____
If a solid, dustiness	☐ High ☐ Medium ☐ Low
If a liquid, boiling point	____°C ☐ Water-based
Temperature the product is used at?	☐ Room temperature ☐ ____°C
How long does the task take?	___ hours / ___ minutes
How many times a day?	___ times
What hand contact (worst case)?	☐ Dipped ☐ Splashed ☐ Touch contact
How far does the contamination get?	☐ Hands ☐ Forearms ☐ Above elbow
Are there other hazards?	☐ Hot ☐ Cold ☐ Sharp ☐ Abrasive ☐ Electric shock ☐ Other_____
Important! What range of glove sizes needed?	
Is special sensitivity or dexterity needed for the job?	☐ Yes ☐ No

Control Approach S
Supplementary Advice

Selecting Personal Protective Equipment (PPE)
S102

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

This sheet covers protective clothing except gloves (refer sheet S101). It is important to follow all the points, or use equally effective measures.

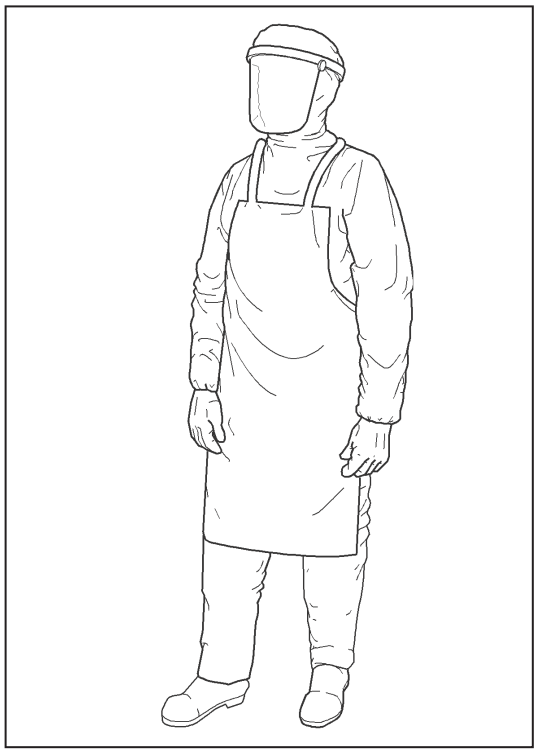
Selection of protective clothing and other PPE

- ✓ Expert advice from PPE supplier or manufacturer or from a health and safety professional may be needed. No materials offer protection against all chemicals. Any chemical will break through protective materials over a period of time. The buildup of contamination on PPE makes skin contact more likely.
- ✓ Incorrect selection or misuse can lead to skin disease including dermatitis, burns or serious ill health, and waste money.
- ✓ To determine the appropriate personal protective equipment, refer to Safety Data Sheet (Section 8 : Exposure Control and Personal Protection).

Planning and preparation

- ✓ The PPE chosen must be compatible with all other PPE that is needed, such as respiratory protective equipment (RPE), hard hat or ear muffs.
- ✓ Continued effectiveness depends on proper training in use, cleaning and maintenance, and having good working practices.
- ✓ Ask the PPE supplier/manufacturer or a safety and health professional how often the PPE needs to be changed. Make sure that the equipment is changed when necessary.

Caution: PPE may reduce mobility, limit communication and increase heat stress.



Selecting of PPE

What needs protecting - what skin is likely to be exposed?

- ✓ The four most common forms of protective clothing are:
  - hands and forearms - chemical protective gloves (refer sheet S101);
  - head and body - hooded coveralls or overalls, aprons;
  - face and eyes - face visors, goggles; and
  - feet, lower legs - protective footwear.

Coveralls

- ✓ Instruct workers to wear clothing under coveralls. Two layers of clothing reduce the amount that gets through to the skin. Air impermeable coveralls can give high levels of chemical protection, but can draw dusts and mists inside the clothing at neck, arm and ankle.
- ✓ Use, clean and maintain coveralls in accordance with the manufacturer's instruction. Throw away disposable coveralls, as hazardous waste, at the end of the shift or particular job.
- ✓ Manage hazardous waste according to requirements by the Department of Environment.

Eye and face protection

- ✓ Eye and face protection may be needed for protection against impact, dusts, mist, gases and vapours as well as chemical splashes. Seek expert advice from the PPE supplier or manufacturer, or a safety and health professional.
- ✓ If workers wear a full-face respirator that also provides eye and face protection, ensure that this is included in the manufacturing standard.

Protective footwear

- ✓ Need to provide protective footwear against safety hazards, e.g. static, crushing, heat, and spike-penetration.
- ✓ Some chemicals penetrate leather very easily. Inform supplier what chemicals are used. Wear wellington boots if chemicals or products could come into contact with the lower leg or drop into shoes.

Training and supervision

- ✓ Train workers how to keep exposures low, how to use the PPE, and what to do if something goes wrong.
- ✓ Provide facilities to keep clean clothing and dirty work clothing apart. Check that workers use, clean and store their PPE properly.

Worker's Checklist

- ☐ Check the equipment for damage both before and after use.
- ☐ Clean reusable PPE after every use in accordance with manufacturer's instructions.
- ☐ Never wash chemically contaminated PPE at home.
- ☐ Use disposable PPE once only. Throw it away after use.
- ☐ Change reusable overalls regularly, at least once a week.
- ☐ Store PPE in a clean cupboard or locker.
- ☐ Avoid contaminating the skin when taking off protective clothing and footwear.
- ☐ Try not to spread chemical contamination around.
- ☐ Never use compressed air to remove dust from PPE.

Further information

- Safety Data Sheets
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005

Useful links

- DOSH portal: https://www.dosh.gov.my
- SiRAC Online: sirac.dosh.gov.my
- HSE COSHH essentials website: https://www.hse.gov.uk/coshh/essentials/index.htm
- ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Control Approach 1

General Ventilation
G100
General Ventilation

G100

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

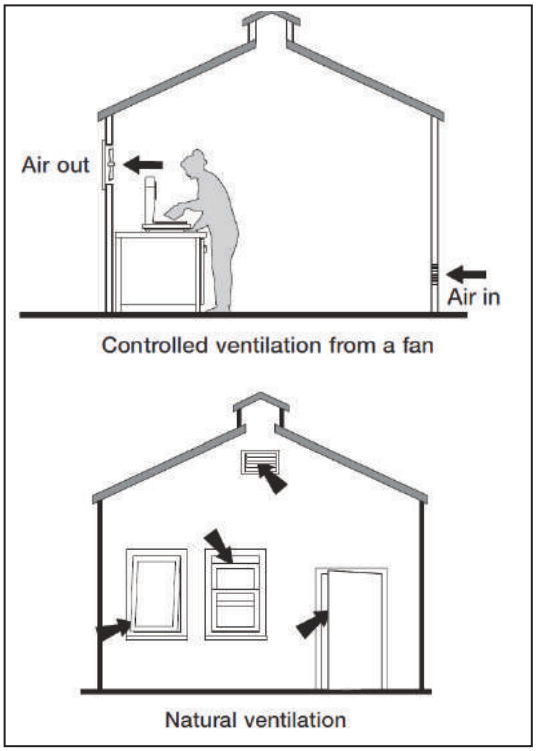
This sheet is used where the assessment recommends Control Approach 1 (General ventilation) as the suitable approach for chemical(s) and task(s). This sheet provides control measure and good practice recommendation on using general ventilation, and can be applied to a range of tasks involving small, medium or large scale use of solids and liquids. It describes the key points that need to be followed to help reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to the Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ Provide a good standard of general ventilation. This can be natural ventilation from doors, windows etc, or controlled, where air is supplied or removed by a powered fan.
- ✓ Ensure all powered fans are appropriate for the contaminants being controlled, i.e. suitable for explosive, corrosive and flammable substances.
- ✓ If work in a shop or office, natural ventilation will normally be enough to control dusts and vapours from cleaning materials etc.
- ✓ If work in a factory, controlled general ventilation normally will be needed to remove contaminated air and make it up with clean replacement air. This can be a wall-mounted fan to extract or supply air, with venting through airbricks, grills or louvres, or a more complex ducted air supply and removal system.
- ✓ Ensure that supplied or make-up air comes from an uncontaminated area.
- ✓ Ensure that enough fresh air is supplied to dilute and remove the dust or vapour produced. Range of 5 - 15 air changes per hour are recommended.
- ✓ Discharge air away from doors, windows and other air inlets.
- ✗ With vapours, re-circulation is not recommended.
- ✓ Ensure, where possible, that air comes from a fresh source, flows past the worker and then past the work activity to the extraction point.



Types of ventilation

Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer in effective and efficient working order.

Inspection, testing and examination (if a ventilation system is provided)

- ✓ Get information on the design performance of the ventilation equipment from the supplier. Keep this information to compare with future test results.
- ✓ Inspect the equipment at least once a month to ensure the equipment is functioning properly and effectively.
- ✓ Ensure the ventilation equipment is examined and tested against its performance specification by hygiene technician at least every 12 months.
- ✓ The effectiveness of the ventilation system can be checked by monitoring of airborne chemicals where appropriate.
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Clean work equipment and the work area daily. Clean other equipment and the workroom regularly, once a week is recommended.
- ✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
- ✗ Do not clean up with a dry brush or compressed air.
- ✓ Vacuum dry dust or use wet cleaning method.
- ✓ Store containers in a safe place and dispose off empty containers safely (refer CGS G101).
- ✓ Put lids on containers immediately after use.

Personal protective equipment (PPE)

- ✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101 and S102 for more specific advice.
- ✓ Refer to the product label or SDS or ask PPE supplier for advice on selection of suitable PPE. Keep any PPE clean, and replace at recommended intervals.
- ✓ Store PPE in appropriate places to avoid contamination.

Training

- ✓ Give workers information on the risk of using the chemicals.
- ✓ Provide workers with training on:
  - handling chemicals safely;
  - how to use control equipment properly and ensure the controls is working;
  - when and how to use any PPE provided;
  - any safe work procedure; and
  - what to do if something goes wrong.
- ✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

- ✓ Provide supervision to ensure safe work procedures are followed.
- ✓ Establish a system to monitor that control measures are in place and being followed.

Worker's Checklist

- ☐ Make sure the room is well ventilated, and any extraction or air supply is switched on and working.
- ☐ Look for signs of damage, wear or poor operation of any equipment used. If you finds any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- ☐ Wash your hands before and after eating, drinking or using the washroom.
- ☐ Do not use solvents to clean your skin.
- ☐ Clear up spills immediately. Follow spillage procedure

Further information

- Safety Data Sheets
- Guidelines on Monitoring of Airborne Contaminant for Chemicals Hazardous to Health, DOSH 2002
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Guidelines on the Control of Chemicals Hazardous to Health, DOSH 2001
- Control Guidance Sheets G101, G102, G103, S100, S101 and S102

Useful links

- DOSH portal: https://www.dosh.gov.my
- SiRAC Online: sirac.dosh.gov.my
- HSE COSHH essentials website: https://www.hse.gov.uk/coshh/essentials/index.htm
- ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Control Approach 1

General Storage
G101
General Ventilation

G 1 0 1

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

This sheet is used where the assessment recommends Control Approach 1 (General ventilation) as the suitable approach for chemical(s) and task(s). This sheet provides control measure and good practice recommendation on storing small, medium and large quantities of solids and liquids. It describes the key points that need to be followed to help reduce exposure to an adequate level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to the Safety Data Sheet (SDS) for more information.

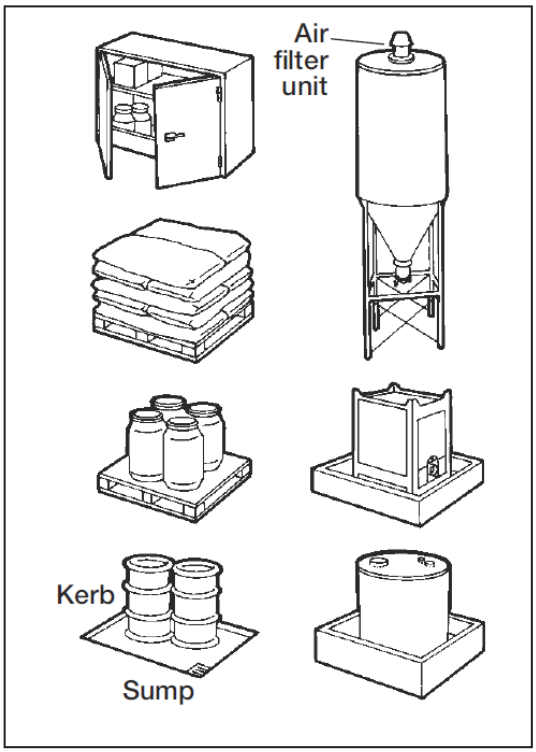
Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

General design aspects

- ✓ Define a specific area for storage and put up clear signs.
- ✓ Ensure the area is spacious, organised, well lit and ventilated.
- ✓ Provide enough space to easily deal with spills.
- ✓ Label all containers, including partly used ones.
- ✓ Floors should be impervious, resistant to liquids and easy to clean.
- ✓ Keep easily ignitable materials, such as empty packaging, in a separate store room and oxidising chemicals in dedicated buildings.
- ✓ Ask chemical supplier for specific advice on which chemicals to store separately from others.



Types of storage

Small packages

- ✓ Small packages should be stored in a suitable storage cabinet.
- ✓ Use removable trays within cabinets to contain leaks and spills, and to make cleaning easier.
- ✓ Store chemicals that react readily together in separate cabinets.
- ✓ Address flammability hazards if refrigerators for storage are used.

Sacks and drums

- ✓ Make sure spills can be contained, e.g. by using sump pallets or having kerbed areas.
- ✓ Store chemicals that react readily together at least three meters apart.

Silos

- ✓ Provide dust filtration for air displaced from the silo during filling.
- ✓ Put barriers around the silo to prevent damage, e.g. by fork-lift trucks.
- ✓ Individually label feed lines.
- ✓ Consider the need for explosion relief for combustible solids and ensure that equipment is appropriately earthed.
- ✓ Make sure spills can be contained, e.g. by bunding to hold 110% of the volume of the largest container.

Maintenance

✓ Ensure all equipment used in the task is maintained as advised by the supplier/ installer in effective and efficient working order.
✓ Adopt a 'permit to work' system for maintenance work on storage tanks and silos.
✓ Follow any special procedures that are needed before opening or entering storage tanks and silos, e.g. purging and washing.

Inspection, testing and examination

✓ Inspect the storage area at least once a week for signs of leaks or damage.
✓ Ensure the ventilation in the storage area is adequate.

Cleaning and housekeeping

✓ Clean work equipment and the storage area daily.
✓ Clean up spills promptly. Plan procedure in case of a spill and communicate with workers and execute the procedure.
✓ Repackage any damaged or leaking packages away from the main storage area, or dispose off them safely.
✗ Do not clean up with a dry brush or compressed air.
✓ Vacuum dry dust or use wet cleaning method.
✓ Dispose off empty containers safely according to the Department of Environment (DOE) regulations.
✓ Make sure ignition sources such as smoking, electrical power, vehicles and battery charging are tightly controlled.

Personal protective equipment (PPE)

✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101 and S102 for more specific advice.
✓ Refer to the product label or SDS or ask PPE supplier for advice on selection of suitable PPE.
✓ Respiratory protective equipment may be needed for some cleaning and maintenance activities, e.g. dealing with spills.
✓ Keep any PPE clean and replace it as recommended.
✓ Store PPE in appropriate places to avoid contamination.

Training

✓ Give workers information on the risk of using the chemicals.
✓ Provide workers with training on:
  • handling chemicals safely;
  • how to use control equipment properly and ensure the controls are working;
  • when and how to use any PPE provided;
  • any safe work procedure; and
  • what to do if something goes wrong.
✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

✓ Provide supervision to ensure safe work procedures are followed.
✓ Establish a system to monitor that control measures are in place and being followed.
✓ Oversee handling of leaks and spills, and disposal of any materials.

Worker's Checklist

☐ Make sure any ventilation system is switched on and is working.
☐ Do not stack materials against air vents, grills etc. Handle all packages and containers carefully to minimize spills.
☐ Look for signs of leaks, wear or damage in the storage area. If worker finds any problems, tell the supervisor. Stop working if there is a problem.
☐ Use handling aids to move sacks and drums.
☐ Clear up spills immediately. Follow spillage procedures.
☐ For solids, use vacuum cleaning or wet mopping. Dispose off spills safely.
☐ Wash hands before and after eating, drinking or using the washroom.
☐ Do not use solvents to clean skin.
☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

• Safety Data Sheets
• Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
• Industry Code of Practice for Safe Working in a Confined Space, DOSH 2010
• Guidelines on Storage of Hazardous Chemicals: A Guide for Safe Warehousing of Packaged Hazardous Chemicals, DOSH 2005
• Control Guidance Sheets G103, G204, G302, S100, S101, S102 and R001

Useful links

• DOSH portal: https://www.dosh.gov.my
• SiRAC Online: sirac.dosh.gov.my
• HSE COSHH essentials website: https://www.hse.gov.uk/coshh/essentials/index.htm
• ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

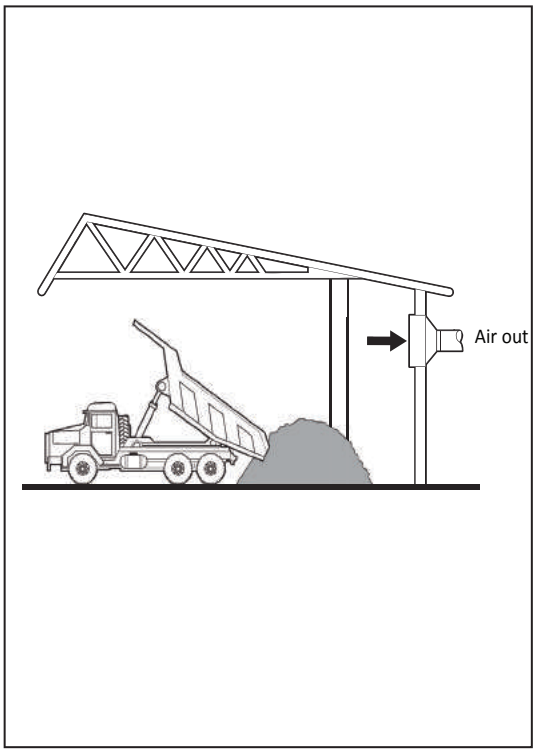
Control Approach 1

Open Bulk Storage
G102
General Ventilation

G 1 0 2

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

This sheet is use where the assessment recommends Control Approach 1 (General ventilation) as the suitable approach for chemical(s) and task(s). This sheet provides control measure and good practice recommendation on the open storage of large quantities of solids. It describes the key points that need to be followed to help reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to the Safety Data Sheet (SDS) for more information.



Open bulk storage

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✗ Do not have warehouse openings that face into the prevailing wind.
- ✓ Define a specific area for storage and put up clear signs.
- ✓ Position an air extraction system as close as possible to the source of the dust (refer figure).
- ✓ Clearly segregate different stockpiles.
- ✓ Keep easily ignitable materials, such as empty packaging, in a separate store room.
- ✓ Provide partitions to stop dust spreading through the building.
- ✓ Provide tarpaulins or plastic covers for stockpiles not in use.

Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer, in effective and efficient working order and good repair.

Cleaning and housekeeping

- ✓ Clean work equipment and the work area outside the defined storage area daily. Clean other equipment and the workroom regularly, once a week is recommended.
- ✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
- ✗ Do not clean up with a dry brush or compressed air.
- ✓ Vacuum dry dust or use wet cleaning method.

Personal protective equipment (PPE)

- ✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101 and S102 for more specific advice.
- ✓ Refer to the product label or SDS or ask PPE supplier for advice on selection of suitable PPE.

- ✓ Respiratory protective equipment may be needed for some cleaning and maintenance activities, e.g. cleaning up spills.
- ✓ Keep any PPE clean and replace at recommended intervals.
- ✓ Store PPE in appropriate places to avoid contamination.

Training

- ✓ Give workers information on the risk of using the chemicals.
- ✓ Provide workers with training on:
  - handling chemicals safely;
  - how to use control equipment properly and ensure the control is working;
  - when and how to use any PPE provided;
  - any safe work procedure; and
  - what to do if something goes wrong.
- ✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

- ✓ Provide supervision to ensure safe work procedure is followed.
- ✓ Establish a system to monitor that control measures are in place and being followed.

Worker's Checklist

- ☐ When moving materials make sure the storage area is well ventilated, and any extraction or air supply is switched on and is working.
- ☐ Re-cover stockpiles not in use with tarpaulins/plastic covers where provided.
- ☐ When stockpiles are not in use, keep doors and windows shut whenever possible to prevent draughts and the spread of contamination.
- ☐ Look for signs of damage, wear or poor operation of any equipment used. If worker finds any problems, inform the supervisor. Do not carry on working if there is a problem.
- ☐ Wash hands before and after eating, drinking or using the washroom.
- ☐ Clear up spills immediately. Follow spillage procedures.
- ☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

- Safety Data Sheets
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Control Guidance Sheets G101, G103, S100, S101, S102 and R001

Useful links

- DOSH portal: https://www.dosh.gov.my
- SiRAC Online: sirac.dosh.gov.my
- HSE COSHH essentials website: https://www.hse.gov.uk/coshh/essentials/index.htm
- ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

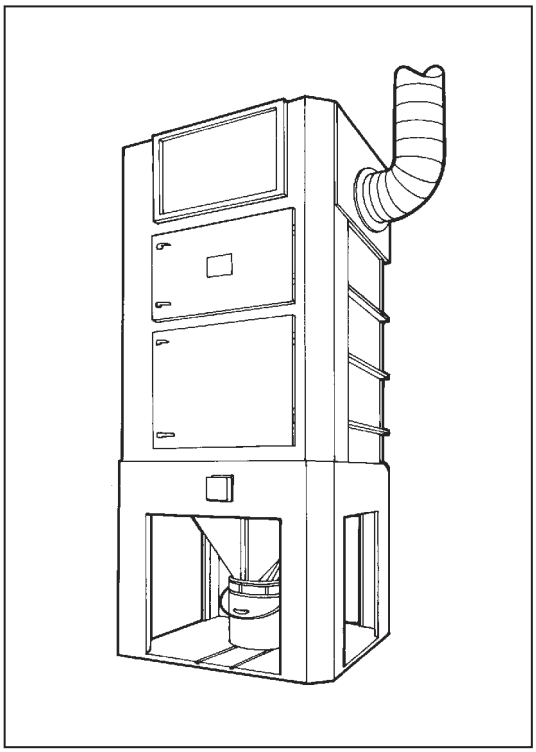
Control Approach 1

Removing Waste from a Dust Extraction Unit
G103
General Ventilation

G 1 0 3

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

This sheet is used where the assessment recommends Control Approach 1 (General ventilation) as the suitable approach for chemical(s) and task(s). This sheet provides advice on removing waste from a dust extraction or air cleaning unit. It describes the key points that need to be followed to help reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to the Safety Data Sheet (SDS) for more information.



Removing waste from a dust extraction unit

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ Where possible, locate the dust extraction unit outside of the main working area, but away from draughts and the prevailing wind.
- ✓ Consider the need for explosion relief for combustible solids and ensure that equipment is appropriately earthed.
- ✓ Determine how often the waste bin will require emptying.
- ✓ Consider how the bin will be moved for emptying and provide mechanical help if necessary.
- ✓ Manage hazardous waste according to requirements by the Department of Environment (DOE).

Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer in effective and efficient working order.

Inspection, testing and examination

- ✓ Get information on the design performance of the extraction unit from the supplier. Keep this information to compare with future test results.
- ✓ Inspect associated ventilation equipment is in working order, at least once a month.
- ✓ Ensure the ventilation equipment is examined and tested against its performance specification by hygiene technician at least every 12 months.
- ✓ The effectiveness of the ventilation system can be checked by monitoring of airborne chemicals where appropriate.
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

✓ Ensure the bin is emptied on a regular basis.
✗ Do not allow the waste bin to overfill.
✓ Provide a lid to put on the waste bin when it is moved.
✓ Clean work equipment and the work area outside the defined storage area daily. Clean other equipment regularly, once a week is recommended.
✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
✗ Do not clean up with a dry brush or compressed air.
✓ Vacuum dry dust or use wet mop.

Personal protective equipment (PPE)

✓ Materials allocated to hazard group S can harm the skin and eyes or enter the body through the skin and cause harm. Refer CGS S100, S101 and S102 for more specific advice.
✓ Refer to the product label or SDS or ask PPE supplier for advice on selection of suitable PPE.
✓ Respiratory protective equipment may be necessary for emptying the waste bin.
✓ Keep any PPE clean and replace at recommended intervals.
✓ Store PPE in appropriate places to avoid contamination.

Training

✓ Give workers information on the risk of using the chemicals.
✓ Provide workers with training on:
  • handling chemicals safely;
  • how to use control equipment properly and ensure the control is working;
  • when and how to use any PPE provided;
  • any safe work procedure; and
  • what to do if something goes wrong.
✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

✓ Provide supervision to ensure safe work procedure is followed.
✓ Establish a system to monitor that control measures are in place and being followed.

Worker's Checklist

☐ Empty the bin on a regular basis, as per instructions, and before it overfills.
☐ Stand upwind when removing the waste bin from the extraction unit.
☐ Put the lid on the bin before moving it.
☐ Empty the waste bin carefully and keep the tipping height as low as possible to avoid creating dust clouds.
☐ Look for signs of damage, wear or poor operation of any equipment used. If worker finds any problems, inform the supervisor. Do not carry on working if there is a problem.
☐ Wash hands before and after eating, drinking or using the washroom.
☐ Clear up spills immediately. Follow spillage procedures. Dispose of spills through an authorised contractor by the Department of Environment (DOE).
☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

- Safety Data Sheets.
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Guidelines on Occupational Safety and Health for Design, Inspection, Testing and Examination of Local Exhaust Ventilation System, DOSH 2008
- Control Guidance Sheets S100, S101, S102 and R001

Useful links

- DOSH portal: https://www.dosh.gov.my
- SiRAC Online: sirac.dosh.gov.my
- HSE COSHH essentials website: https://www.hse.gov.uk/coshh/essentials/index.htm
- ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Control Approach 2

Local Exhaust Ventilation
G200
Engineering Control

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

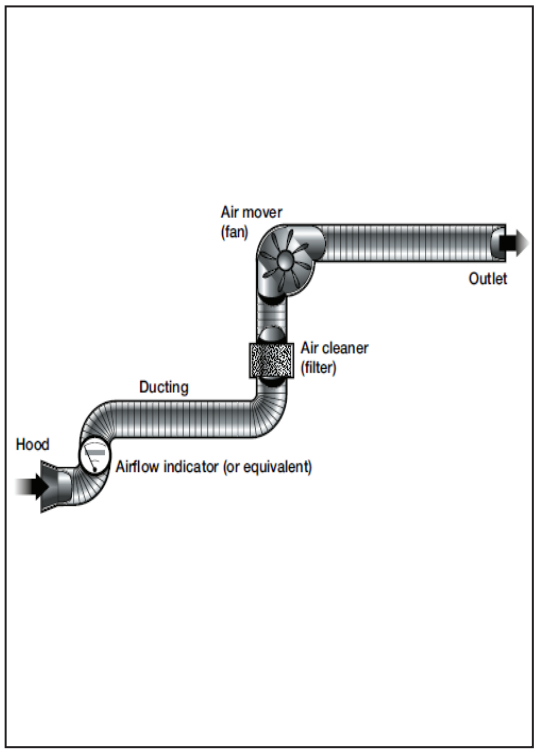
This sheet is used where the assessment recommends Control Approach 2 (Engineering control) as the suitable approach for chemical(s) and task(s). This sheet provides control measure and good practice recommendation on using local exhaust ventilation which is the commonest form of engineering control. It can be applied to a range of tasks involving small, medium and large scale use of solids or liquids. It describes the key points that need to be followed to help reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to Safety Data Sheet (SDS) for more information.

Workplace and access

✓ Restrict access to the working area to authorised workers only.
✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

✓ Apply local exhaust ventilation (LEV) at the source of exposure to capture the dust or vapour.
✓ Airflow must be sufficient to control airborne contaminants effectively. This will depend on the design, size of opening and the type of process and chemicals being controlled.
✓ Ensure LEV equipment complies with the requirement of USECHH Regulations.
✓ Enclose the source of dust or vapour as much as possible to help stop it spreading.
✗ Do not allow the worker to get between the source of exposure and the LEV, otherwise they'll be directly in the path of the contaminated airflow.



LEV design layout

✓ Where possible, site the work area away from doors, windows and walkways, to stop draughts interfering with the LEV and spreading the dust or vapour.
✓ Have an air supply coming into the workroom to replace extracted air.
✓ Keep ducts short and simple, and avoid long sections of flexible duct.
✓ Provide an easy way of checking the LEV is working, e.g. airflow indicator or equivalent.
✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
✗ With exposure to vapours, re-circulation is not recommended.

Maintenance

✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer, in effective and efficient working order and good repair.

Inspection, testing and examination

✓ Get information on the design performance of the LEV from the supplier. Keep this information to compare with future test results.
✓ Check the LEV and visible ducting at least once a month for signs of damage.

✓ Ensure the LEV is examined and tested against its performance specification by hygiene technician at least every 12 months.
✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

✓ Clean equipment and the work area daily. Clean other equipment and the workroom regularly, once a week is recommended.
✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
✓ Store containers in a safe place and dispose off empty containers safely (refer CGS G101).
✓ Put lids on containers immediately after use.
✗ Do not clean up with a dry brush or compressed air.
✓ Vacuum dry dust or use wet cleaning method.

Personal protective equipment (PPE)

✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101 and S102 for more specific advice.
✓ Refer to the product label or SDS or ask PPE supplier for advice on selection of suitable PPE.
✓ Respiratory protective equipment may be necessary for some cleaning and maintenance activities, e.g. cleaning up spills.
✓ Keep any PPE clean, and replace at recommended intervals.
✓ Store PPE in appropriate places to avoid contamination.

Training

✓ Give workers information on the risk of using the chemicals.
✓ Provide workers with training on:
  • handling chemicals safely;
  • how to use control equipment properly and ensure the control is working;
  • when and how to use any PPE provided;
  • any safe work procedure; and
  • what to do if something goes wrong.
✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

✓ Provide supervision to ensure safe work procedure are followed.
✓ Establish a system to monitor that control measures are in place and being followed.

Worker's Checklist

☐ Make sure the LEV is switched on and is working.
☐ Make sure it is working properly.
☐ Make sure the air movement is across or away from your face.
☐ Look for signs of damage, wear or poor operation of any equipment used. If worker finds any problems, inform the supervisor. Do not carry on working if there is a problem.
☐ Make sure that paper bags and other waste are not drawn into the LEV.
☐ Wash hands before and after eating, drinking or using the washroom.
☐ Do not use solvents to clean skin.
☐ Clear up spills immediately. Follow spillage procedure.
☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information
• Safety Data Sheets
• Guidelines on Occupational Safety and Health for Design, Inspection, Testing and Examination of Local Exhaust Ventilation System, DOSH 2008
• Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
• Control Guidance Sheets G101, G204, S100, S101, S102 and R001

Useful links
• DOSH portal: https://www.dosh.gov.my
• SiRAC Online: sirac.dosh.gov.my
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Control Approach 2

Fume Cupboard
G201
Engineering Control

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

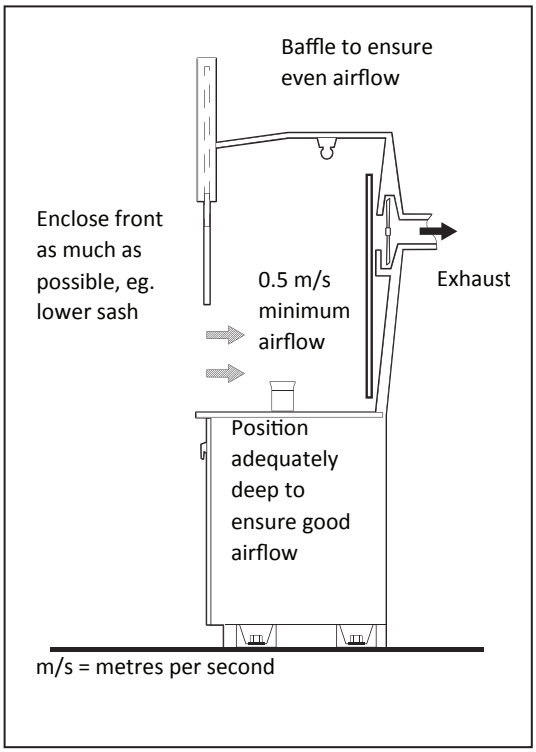
This sheet is used where the assessment recommends Control Approach 2 (Engineering control) as the suitable approach for chemical(s) and task(s). This sheet provides control measure and good practice recommendation on using a fume cupboard - a type of local exhaust ventilation (LEV). It can be applied to many small-scale tasks using solids or liquids, e.g. weighing or mixing. It describes the key points that need to be followed to help reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Restrict access to the working area to authorised workers only.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ Ensure fume cupboards are designed to recognised standards and comply to the requirement of USECHH Regulations.
- ✓ Airflow must be sufficient to control airborne contaminants effectively. This will depend on the design, size of opening and the type of process and chemical being controlled.
- ✓ Make the cupboard deep enough to comfortably contain equipment and materials.
- ✓ Keep the opening as small as possible, but allow enough room to work safely. Keep the sash down as far as possible.



Design of fume cupboard

- ✓ Provide good lighting. It should be suitable for the chemical(s) or task(s), e.g. dust tight or flameproof.
- ✓ Where possible, site the work area away from doors, windows and walkways to stop draughts interfering with the ventilation and spreading dust or vapour.
- ✓ Have an air supply coming into the workroom to replace air extracted by the fume cupboard.
- ✓ Keep ducts short and simple, and avoid long sections of flexible duct.
- ✓ Provide an easy way of checking the equipment is working, e.g. airflow indicator or equivalent.
- ✗ Do not store items inside the ventilated area, they will obstruct the airflow.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✗ With exposure to vapours, re-circulation is not recommended.

Maintenance

- ✓ Maintain the equipment as advised by the supplier/ installer, in effective and efficient working order.

Inspection, testing and examination

- ✓ Get information on the design performance of the fume cupboard from the supplier.
- ✓ Keep this information to compare with future test results.
- ✓ Inspect the fume cupboard at least once a month to ensure the equipment is functioning properly and effectively.
- ✓ Ensure the fume cupboard is examined and tested against its performance specification by hygiene technician at least every 12 months.
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Clean equipment and the work area daily. Clean other equipment and the workroom regularly, once a week is recommended.
- ✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
- ✓ Store containers in a safe place and dispose off empty containers safely (refer CGS 101).
- ✓ Put lids on containers immediately after use.
- ✗ Do not clean up with a dry brush or compressed air.
- ✓ Vacuum dry dust or use wet cleaning method.

Personal protective equipment (PPE)

- ✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101 and S102 for more specific advice.
- ✓ Refer to the product label or SDS or ask PPE supplier for advice on selection of suitable PPE.
- ✓ Respiratory protective equipment may be needed for some cleaning and maintenance activities, e.g. dealing with spills.
- ✓ Keep any PPE clean and replace at recommended intervals.

Training

- ✓ Give workers information on the risk of using the chemicals.
- ✓ Provide workers with training on:
  - handling chemicals safely;
  - how to use control equipment properly and ensure the control is working;
  - when and how to use any PPE provided;
  - any safe work procedure; and
  - what to do if something goes wrong.
- ✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

- ✓ Provide supervision to ensure safe work procedure is followed.
- ✓ Establish a system to monitor that control measures are in place and being followed.

Worker's Checklist

- ☐ Make sure the fume cupboard is switched on and is working.
- ☐ Make sure it is working properly.
- ☐ Look for signs of damage, wear or poor operation of any equipment used. If worker finds any problems, inform the supervisor. Do not carry on working if there is a problem.
- ☐ Make sure that paper bags and other waste are not drawn into the ventilation system.
- ☐ Make sure large items do not obstruct the opening to the cupboard.
- ☐ Wash hands before and after eating, drinking or using the washroom.
- ☐ Do not use solvents to clean skin.
- ☐ Clear up spills immediately. Follow spillage procedure.
- ☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

- Safety Data Sheets
- Guidelines on Occupational Safety and Health for Design, Inspection, Testing and Examination of Local Exhaust Ventilation System, DOSH 2008.
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Control Guidance Sheets G101, S100, S101,S102 and R001

Useful links

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Control Approach 2

Laminar Flow Booth
G202
Engineering Control

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

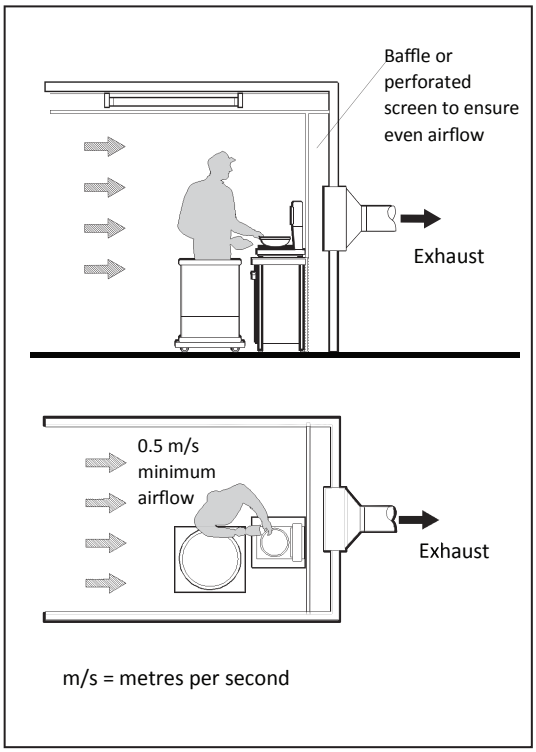
This sheet is used where the assessment recommends Control Approach 2 (Engineering control) as the suitable approach for chemical(s) and task(s). This sheet provides control measure and good practice recommendation on using a laminar flow booth – a type of local exhaust ventilation (LEV). It can be applied to many medium-scale tasks using solids or liquids, e.g. weighing or mixing. It describes the key points that need to be followed to help reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Restrict access to the working area to authorised workers only.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ The booth should be large enough to contain all equipment and materials needed for the task.
- ✓ Air should be exhausted from the booth across the full cross-sectional area (refer figure).
- ✓ Airflow must be sufficient to control airborne contaminants effectively. This will depend on the design, size of opening and the type of process and chemical being controlled.
- ✓ Air inlets, which may be powered and include filters, should be opposite the exhaust ventilation so air moves across the work area.
- ✓ Work 'side-on' to the airflow to reduce exposure.



Laminar Flow Booth

- ✓ Provide turntables in the booth, if this will make the task easier.
- ✓ Provide good lighting. It should be suitable for the chemical(s) and task(s), e.g. dust tight or flameproof.
- ✓ Where possible, site the work area away from doors, windows and walkways to stop draughts interfering with the ventilation and spreading the dust or vapour.
- ✓ Provide clean air supply coming into the workroom to replace extracted air.
- ✓ Keep extraction ducts short and simple - avoid long sections of flexible duct.
- ✓ Provide an easy way of checking the equipment is working, e.g. airflow indicator or equivalent.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✓ Ensure that extracted air is cleaned before discharge to the environment.
- ✗ With exposure to vapours, re-circulation is not recommended.

Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer, in effective and efficient working order and good repair.

Inspection, testing and examination

- ✓ Get information on the design performance of the laminar flow booth from the supplier. Keep this information to compare with future test results.
- ✓ Inspect the laminar flow booth at least once a month to ensure the equipment is functioning properly and effectively.
- ✓ Ensure the laminar flow booth is examined and tested against its performance specification by hygiene technician at least every 12 months.
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Clean equipment and the work area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
- ✓ Store containers in a safe place and dispose off empty containers safely (refer CGS G101).
- ✓ Put lids on containers immediately after use.
- ✗ Do not clean up with a dry brush or compressed air.
- ✓ Vacuum dry dust or use wet cleaning method.

Personal protective equipment (PPE)

- ✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101 and S102 for more specific advice.
- ✓ Refer to the product label or SDS or ask PPE supplier for advice on selection of suitable PPE.
- ✓ Respiratory protective equipment may be needed for some cleaning and maintenance activities, e.g. dealing with spills.
- ✓ Keep any PPE clean, and replace at recommended intervals.
- ✓ Store PPE in appropriate places to avoid contamination.

Training

- ✓ Give workers information on the risk of using the chemicals.
- ✓ Provide workers with training on:
  - handling chemicals safely;
  - how to use control equipment properly and ensure the control is working,
  - when and how to use any PPE you provided;
  - any safe work procedure; and
  - what to do if something goes wrong.
- ✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

- ✓ Provide supervision to ensure safe work procedure is followed.
- ✓ Establish a system to monitor that control measures are in place and being followed.

Worker's Checklist

- ☐ Make sure the laminar flow booth is switched on and is working.
- ☐ Make sure it is working properly.
- ☐ Make sure the air movement is across or away from your body and face.
- ☐ Look for signs of damage, wear or poor operation of any equipment used. If worker finds any problems, inform the supervisor. Do not carry on working if there is a problem.
- ☐ Make sure that paper bags and other waste are not drawn into the ventilation system.
- ☐ Make sure that large items do not obstruct the opening to the booth.
- ☐ Wash hands before and after eating, drinking or using the washroom.
- ☐ Do not use solvents to clean skin.
- ☐ Clear up spills immediately. Follow spillage procedure.
- ☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

- Safety Data Sheets
- Guidelines on Occupational Safety and Health for Design, Inspection, Testing and Examination of Local Exhaust Ventilation System, DOSH 2008.
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Control Guidance Sheets G101, G204, S100, S101, S102 and R001

Useful links

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- ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Control Approach 2

Ventilated Benchwork (Downdraught Bench)

G203

Engineering Control

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

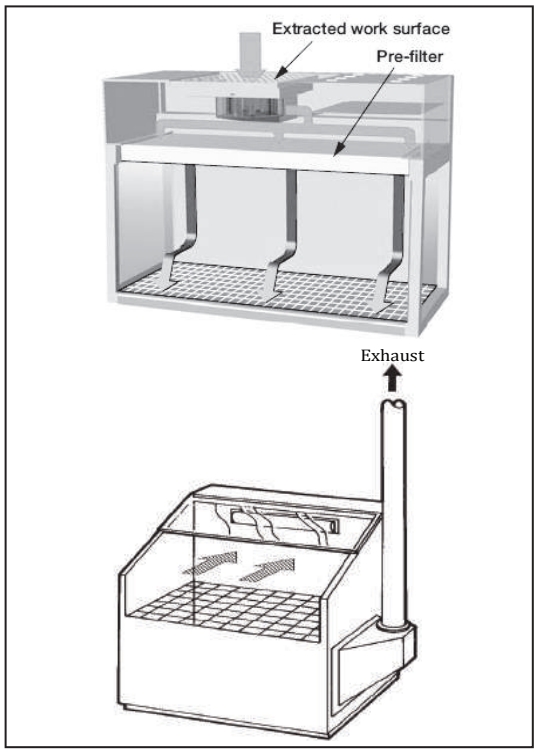
This sheet is used where the assessment recommends Control Approach 2 (Engineering control) as the suitable approach for chemical(s) and task(s). This sheet provides control measure and good practice recommendation on using a ventilated workbench with underbench extraction. It can be applied to a range of tasks involving small-scale use of solids or liquids, e.g. cleaning or applying adhesives. It describes the key points that need to be followed to help reduce exposure to an acceptable level. It is important that all the points are followed. Refer to the Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Restrict access to the working area to authorised workers only.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ Air is extracted downward, typically passing through holes or slots on the downdraught bench.
- ✓ The working zone is at, or very near to, the extracted perforated or gridded work surface or hood face.
- ✓ Airflow must be sufficient to control airborne contaminants effectively. This will depend on the design, size of opening and the type of process and chemical being controlled.
- ✓ The degree to which the extracted work surface is blocked off by, for instance, components and other materials on or near the bench, will influence its effectiveness.
- ✗ Do not store items on the ventilation grill.
- ✓ Keep the opening as small as possible, but allow enough room to work safely.



Ventilated benchwork

- ✓ Provide good lighting. It should be suitable for the chemical(s) and task(s), e.g. dust tight or flameproof.
- ✓ Where possible, site the work area away from doors, windows and walkways to stop draughts interfering with the ventilation and spreading the dust or vapour.
- ✓ Provide clean air supply coming into the workroom to replace extracted air.
- ✓ Keep ducts short and simple, and avoid long sections of flexible duct.
- ✓ Provide an easy way of checking the equipment is working, e.g. airflow indicator or equivalent.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✓ Ensure that extracted air is cleaned before discharge to the environment.
- ✗ With exposure to vapours, re-circulation is not recommended.
- ✓ Ensure all components are appropriate for the chemical being captured, i.e. suitable for explosive, corrosive and flammable chemicals.

Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer, in effective and efficient working order and good repair.

Inspection, testing and examination

- ✓ Get information on the design performance of the equipment from the supplier.
- ✓ Keep this information to compare with future test results.
- ✓ Inspect the equipment at least once a month to ensure the equipment is functioning properly and effectively.
- ✓ Ensure the ventilation equipment is examined and tested against its performance specification by hygiene technician at least every 12 months.
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Clean work equipment and the work area daily. Clean other equipment and the workroom regularly, once a week is recommended.
- ✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
- ✓ Store containers in a safe place, and dispose off empty containers safely (refer CGS G101).
- ✓ Put lids on containers immediately after use.
- ✗ Do not clean up with a dry brush or compressed air.
- ✓ Vacuum dry dust or use wet cleaning method.

Personal protective equipment (PPE)

- ✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101 and S102 for more specific advice.
- ✓ Refer to the product label or SDS or ask PPE supplier for advice on selection of suitable PPE.
- ✓ Respiratory protective equipment may be needed for some cleaning and maintenance activities, e.g. dealing with spills.
- ✓ Keep any PPE clean and replace at recommended intervals.
- ✓ Store PPE in appropriate places to avoid contamination.

Training

- ✓ Give workers information on the risk of using the chemicals.
- ✓ Provide workers with training on:
  - handling chemicals safely;
  - how to use control equipment properly and ensure the controls is working;
  - when and how to use any PPE provided;
  - any safe work procedure; and
  - what to do if something goes wrong.
- ✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

- ✓ Provide supervision to ensure safe work procedure are followed.
- ✓ Establish a system to monitor that control measures are in place and being followed.

Worker's Checklist

- ☐ Make sure the engineering control equipment is switched on and is working.
- ☐ Make sure it is working properly.
- ☐ Look for signs of damage, wear or poor operation of any equipment used. If worker finds any problems, inform the supervisor. Do not carry on working if there is a problem.
- ☐ Make sure large items do not obstruct the opening to the workbench.
- ☐ Wash hands before and after eating, drinking or using the washroom.
- ☐ Do not use solvents to clean skin.
- ☐ Clear up spills immediately. Follow spillage procedure.
- ☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

- Safety Data Sheets
- Guidelines on Occupational Safety and Health for Design, Inspection, Testing and Examination of Local Exhaust Ventilation System, DOSH 2008
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Guidelines on the Control of Chemicals Hazardous to Health, DOSH 2001
- Control Guidance Sheets G101, G204, S100, S101, S102 and R001

Useful links

- DOSH portal: https://www.dosh.gov.my
- SiRAC Online: sirac.dosh.gov.my
- HSE COSHH essentials website: https://www.hse.gov.uk/coshh/essentials/index.htm
- ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Control Approach 2

Removing Waste from Dust Extraction Unit
G204
Engineering Control

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

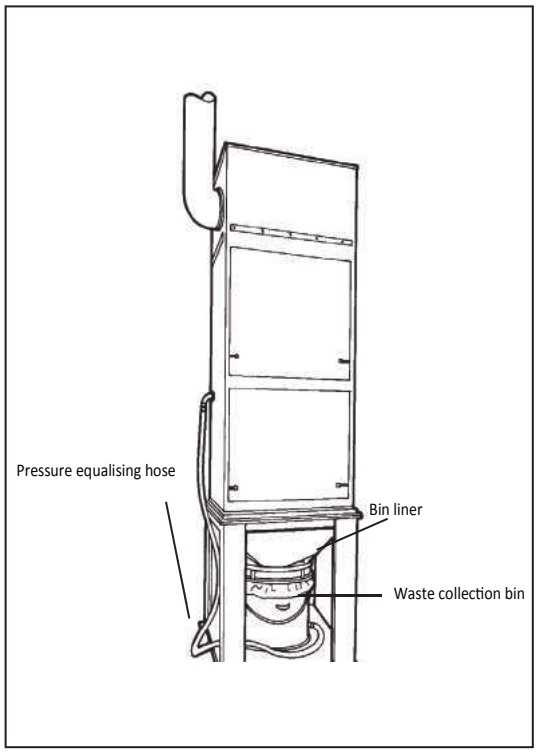
This sheet is used where the assessment recommends Control Approach 2 (Engineering control) as the suitable approach for chemical(s) and task(s). This sheet provides control measure and good practice recommendation on removing waste from a dust extraction or air cleaning unit. It describes the key points that need to be followed to help reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to the Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Restrict access to the working area to authorised workers only.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ Where possible, locate the extraction unit outside of the main work area, but away from draughts and the prevailing wind.
- ✓ Consider the need for explosion relief for combustible solids, and ensure that equipment is appropriately earthed.
- ✓ Have a pressure equalising mechanism at the base of the waste bin to prevent the bag being sucked out.
- ✓ Determine how often the waste bin will require emptying.
- ✓ Consider providing a shut-off valve to isolate the bin for removal.
- ✓ Consider how the bin will be lifted for emptying, and provide mechanical help if necessary.



Removing waste from dust extraction unit

- ✓ Manage hazardous waste according to requirements by the Department of Environment (DOE).
- ✓ Provide an easy way of checking the control is working, e.g. airflow indicator or equivalent.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✓ Clean filtered air can be re-circulated into the workroom.
- ✓ Ensure all components are appropriate for the chemical being captured, i.e. suitable for explosive, corrosive and flammable chemicals.

Maintenance

- ✓ Ensure the extraction unit is maintained as advised by the supplier/installer. It should be in efficient and effective working order.
- ✓ Adopt a permit-to-work system for maintenance work.

Inspection, testing and examination

- ✓ Get information on the design performance of the equipment from the supplier. Keep this information to compare with future test results.
- ✓ Inspect the equipment at least once a month to ensure the equipment is functioning properly and effectively.
- ✓ Ensure the engineering control equipment is examined and tested against its performance specification by hygiene technician at least every 12 months.
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Ensure the bin is emptied on a regular basis.
- ✓ Tie the dust bag top before removal from the bin.
- ✗ Do not allow the waste bin to overfill.
- ✓ Clean work equipment and the work area daily. Clean other equipment regularly, once a week is recommended.
- ✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
- ✗ Do not clean up with a dry brush or compressed air.
- ✓ Vacuum dry dust or use wet cleaning method.

Personal protective equipment (PPE)

- ✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100, S101 and S102 for more specific advice.
- ✓ Refer to the product label or SDS or ask PPE supplier for advice on selection of suitable PPE.
- ✓ Respiratory protective equipment may be necessary for emptying the waste bin.
- ✓ Keep PPE clean and replace it at recommended intervals.
- ✓ Store PPE in appropriate places to avoid contamination

Training

- ✓ Give workers information on the risk of using the chemicals.
- ✓ Provide workers with training on:
  - handling chemicals safely;
  - how to use control equipment properly and ensure the control is working;
  - when and how to use any PPE provided;
  - any safe work procedure; and
  - what to do if something goes wrong.
- ✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

- ✓ Provide supervision to ensure safe work procedure is followed.
- ✓ Establish a system to monitor that control measures are in place and being followed.

Worker's Checklist

- ☐ Empty the bin on a regular basis, as per instructions and before it overfills.
- ☐ Stand upwind when removing the waste bin from the extraction unit.
- ☐ Look for signs of damage, wear or poor operation of the extraction unit. If worker finds any problems, inform the supervisor. Do not carry on working if there is a problem.
- ☐ Make sure that the bag or other waste is not drawn into the filter unit.
- ☐ Wash hands before and after eating, drinking or using the washroom.
- ☐ Clear up spills immediately. Follow spillage procedure.
- ☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

- Safety Data Sheets
- Guidelines on Occupational Safety and Health for Design, Inspection, Testing and Examination of Local Exhaust Ventilation System, DOSH 2008
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Guidelines on the Control of Chemicals Hazardous to Health, DOSH 2001
- Control Guidance Sheets 101, 302, S100, S101 S102 and R001

Useful links

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Control Approach 2

Conveyor Transfer
G205
Engineering Control

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

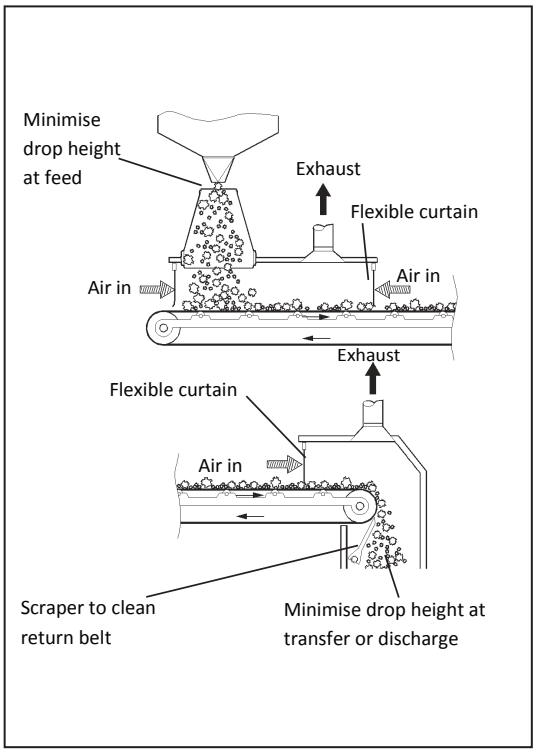
This sheet can be used where the assessment recommends Control Approach 2 (Engineering control) as the suitable approach for chemical(s) and task(s). This sheet provides control measure and good practice recommendation on using a conveyor for transferring medium and large quantities of solids. It describes the key points that need to be followed to help reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to the Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ Provide local exhaust ventilation (LEV) at the feed chute and drop points (see illustration).
- ✓ The inward airflow at all openings on the conveyor or enclosure must be sufficient to effectively capture any airborne contaminant. This will depend on the design, size of opening and the type of process and chemical being controlled.
- ✓ Ensure LEV equipment complies with the requirement of USECHH Regulations.
- ✓ Consider wetting to reduce the dustiness of the material.
- ✓ Enclose the belt as much as possible, and particularly at the feed and discharge points.
- ✓ Provide dust curtains at the open ends of the enclosures and skirting at the sides of the belt.



Design of conveyor transfer

- ✓ Design the enclosure in sections to allow easy access for cleaning and maintenance.
- ✓ Hinged doors should be provided for routine inspection tasks.
- ✓ Provide as much space as possible within the enclosures. This will help contain the dust.
- ✓ Position the feed chute so material joins the centre of the belt, moving in the same direction and at the same speed as the belt.
- ✓ Minimize the height that the material falls from the chute to the belt.
- ✓ Fit a scraper to clean the return belt.
- ✓ Use a similar approach for bucket elevators and screw conveyors.
- ✓ Where possible, site the working area away from doors, windows and walkways to stop draughts interfering with the ventilation and spreading dust.
- ✓ Provide an air supply to the workroom to replace extracted air.
- ✓ Provide an easy way of checking the LEV is working, e.g. airflow indicator or equivalent.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✗ With vapours air re-circulation is not recommended.
- ✓ Ensure all components are appropriate for the chemical being captured, i.e suitable for explosive, corrosive and flammable chemicals.

Maintenance

✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer in effective and efficient working order and good repair.

Inspection, testing and examination

✓ Get information on the design performance of the ventilation equipment from the supplier. Keep this information for future reference.
✓ Inspect the equipment at least once a month to ensure the equipment is functioning properly and effectively.
✓ Ensure the ventilation equipment is examined and tested against its performance specification by hygiene technician at least every 12 months.
✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

✓ Clean work equipment and the work area daily. Clean other equipment and the workroom regularly, once a week is recommended.
✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
✓ Store packages/containers in a safe place (refer CGS G101).
✗ Do not clean up with a dry brush or compressed air.
✓ Vacuum dry dust or use wet cleaning method.

Personal protective equipment (PPE)

✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101 and S102 for more specific advice.
✓ Refer to the product label or SDS or ask PPE supplier for advice on selection of suitable PPE. Keep PPE clean and replace it at recommended intervals.
✓ Store PPE in appropriate places to avoid contamination.

Training

✓ Give workers information on the risk of using the chemicals.
✓ Provide workers with training on:
- handling chemicals safely;
- how to use control equipment properly and ensure the control is working,
- when and how to use any PPE provided;
- any safe work procedure; and
- what to do if something goes wrong.

✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

✓ Provide supervision to ensure safe work procedure is followed.
✓ Establish a system to monitor that control measures are in place and being followed.

Worker's Checklist

☐ Make sure the skirting and curtains are intact, and the LEV is switched on and is working.
☐ Make sure it is running properly.
☐ Look for signs of leaks and spills from the belt or poor operation of any equipment used. If worker finds any problems, inform the supervisor. Do not carry on working if there is a problem.
☐ Wash hands before and after eating, drinking or using the washroom.
☐ Do not use solvents to clean skin.
☐ Clear up spills immediately. Follow spillage procedure
☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information
- Safety Data Sheets
- Guidelines on Occupational Safety and Health for Design, Inspection, Testing and Examination of Local Exhaust Ventilation System, DOSH 2008
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Guidelines on the Control of Chemicals Hazardous to Health, DOSH 2001
- Control Guidance Sheets G101, G204, S100, S101, S102 and R001

Useful links
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Control Approach 2

Sack Filling
G206
Engineering Control

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

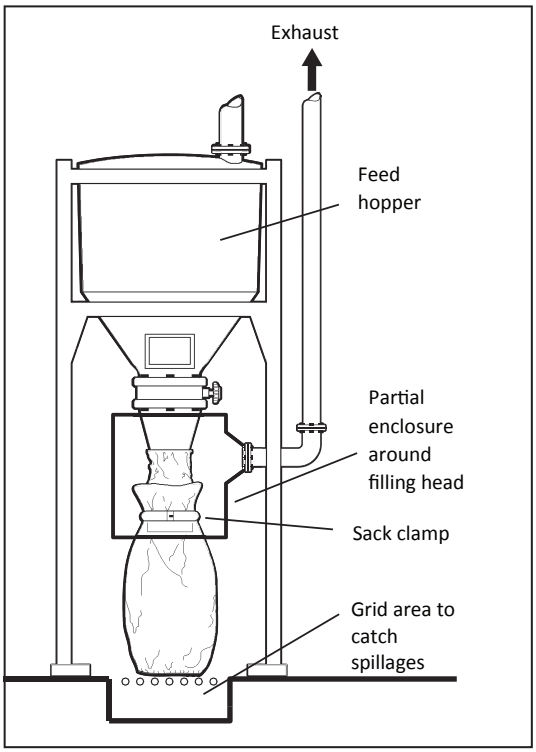
This sheet is used where the assessment recommends Control Approach 2 (Engineering control) as the suitable approach for chemical(s) and task(s). This sheet provides control measure and good practice recommendation on sack and bag filling, and can be applied to tasks involving medium quantities of solids. It describes the key points that need to be followed to help reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to the Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ Ensure bags/sacks and filling equipment are compatible and well maintained.
- ✓ Enclose the filling head as much as possible (refer figure). Provide a ventilated enclosure around the filling point with an inward airflow.
- ✓ Airflow must be sufficient to control airborne contaminants effectively. This will depend on the design, size of opening and the type of process and chemicals being controlled.
- ✓ Make sure the enclosure is large enough to allow the bag/sack to be closed before it leaves the enclosure.
- ✓ Check for dust emission during filling. Provide clamps and seals, and make arrangements to discharge air displaced during filling.



Sack filling

- ✓ Provide a ventilated hopper at floor level to capture spills.
- ✓ Ensure the filling head does not discharge dust when the bag/sack is removed.
- ✓ Provide good lighting. It should be suitable for the chemical(s) and task(s), e.g. dust tight or flameproof.
- ✓ Avoid manual handling.
- ✓ Where possible, site the work area away from doors, windows and walkways, to stop draughts interfering with the ventilation and spreading dust.
- ✓ Provide an air supply to the workroom to replace extracted air.
- ✓ Provide an easy way of checking the LEV is working, e.g. airflow indicator or equivalent.
- ✓ Ensure that extracted air is cleaned before discharge to the environment.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✓ Provide a good standard of general ventilation. Use powered wall or window mounted fans to supply clean air, greater than five air changes per hour, with a through draught.
- ✓ Clean filtered air can be re-circulated into the workroom.
- ✓ Ensure all components are appropriate for the chemical being captured, i.e. suitable for explosive, corrosive and flammable chemicals.

Maintenance

✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer in effective and efficient working order and good repair.

Inspection, testing and examination

✓ Get information on the design performance of the ventilation equipment from the supplier to compare with future test results.
✓ Inspect the equipment at least once a month to ensure the equipment is functioning properly and effectively.
✓ Ensure the ventilation and engineering control equipment is examined and tested against its performance specification by hygiene technician at least every 12 months.
✓ Keep records of all examinations and tests for at least five years

Cleaning and housekeeping

✓ Clean work equipment and the work area daily. Clean other equipment and the workroom regularly, once a week is recommended.
✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
✓ Store sacks/bags in a safe place and dispose off empty sacks/bags safely (refer CGS G101).
✗ Do not clean up with a dry brush or compressed air.
✓ Vacuum dry dust or wet cleaning method.

Personal protective equipment (PPE)

✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101 and S102 for more specific advice.
✓ Refer to the product label or SDS or ask PPE supplier for advice on selection of suitable PPE.
✓ Respiratory protective equipment may be necessary for some cleaning and maintenance activities, e.g. cleaning up spills.
✓ Keep PPE clean and replace it at recommended intervals.
✓ Store PPE in appropriate places to avoid contamination.

Training

✓ Give workers information on the risk of using the chemicals.
✓ Provide workers with training on:
  • handling chemicals safely;
  • how to use control equipment properly and ensure the control is working;
  • when and how to use any PPE provided;
  • any safe work procedure; and
  • what to do if something goes wrong.
✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

✓ Provide supervision to ensure safe work procedures are followed.
✓ Establish a system to monitor that control measures are in place and being followed.

Worker's Checklist

☐ Make sure the ventilation equipment is switched on and is working.
☐ Make sure it is running properly.
☐ Look for signs of damage, wear or poor operation of any equipment used. If worker finds any problems, inform the supervisor. Do not carry on working if there is a problem.
☐ Make sure that bags and other waste are not drawn into the ventilation duct.
☐ Use handling aids when provided.
☐ Wash hands before and after eating, drinking or using the washroom.
☐ Do not use solvents to clean skin.
☐ Clear up spills immediately. Follow spillage procedure.
☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

• Safety Data Sheets
• Guidelines on Occupational Safety and Health for Design, Inspection, Testing and Examination of Local Exhaust Ventilation System, DOSH 2008
• Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
• Control Guidance Sheets G101, G204, S100, S101, S102 and R001

Useful links

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Control Approach 2

High-Throughput Sack Filling
G207
Engineering Control

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

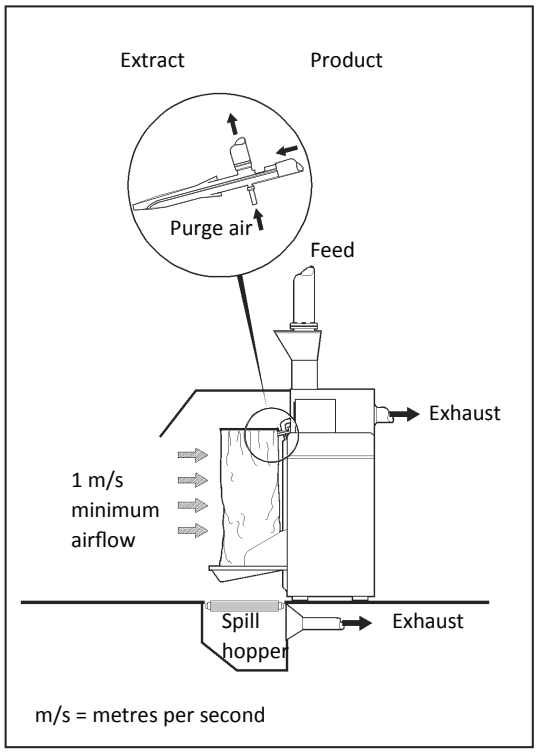
This sheet is used where the assessment recommends Control Approach 2 (Engineering control) as the suitable approach for chemical(s) and task(s). This sheet provides control measure and good practice recommendation on high-throughput sack and bag filling, and can be applied to tasks involving large quantities of solids. It describes the key points that need to be followed to help reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to the Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ Ensure the bags/sacks and filling equipment is compatible and well maintained.
- ✓ Enclose the filling head as much as possible.
- ✓ Airflow must be sufficient to control airborne contaminants effectively. This will depend on the design, size of opening and the type of process and chemical being controlled.
- ✓ Special care should be taken in designing the filling nozzle to prevent dust emissions during filling, and to provide a route for air displaced from the bag during filling (refer figure).
- ✓ Provide a ventilated hopper at floor level to capture spills.



High-throughput sack filling

- ✓ Make sure the enclosure is large enough to allow the bag/sack to be closed and sealed before it leaves the enclosure.
- ✓ Consider mechanical/pneumatic assistance with bag/sack handling.
- ✓ Provide good lighting. It should be suitable for the chemical(s) and task(s), e.g. dust tight or flameproof.
- ✓ Where possible, site the work area away from doors, windows and walkways to stop draughts interfering with the ventilation and spreading dust.
- ✓ Provide an air supply to the workroom to replace extracted air.
- ✓ Provide an easy way of checking the LEV is working, e.g. airflow indicator or equivalent.
- ✓ Ensure that extracted air is cleaned before discharge to the environment.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.

Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer in effective and efficient working order and good repair.

Inspection, testing and examination

✓ Get information on the design performance of the engineering control equipment from the supplier. Keep this to compare with future test results.
✓ Inspect the engineering control equipment at least once a month to ensure the equipment is functioning properly and effectively.
✓ Ensure the engineering control equipment is examined and tested against its performance specification by hygiene technician at least every 12 months.
✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

✓ Clean work equipment and the working area daily. Clean other equipment and the workroom regularly, once a week is recommended.
✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
✓ Store bags/sacks in a safe place and dispose off empty bags/sacks safely (refer CGS G101).
✗ Do not clean up with a dry brush or compressed air for removing dust from skin and clothing. Avoid the use of brushes or compressed air for removing dust from surfaces or from inside machinery.
✓ Vacuum dry dust or use wet cleaning method.

Personal protective equipment (PPE)

✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101 and S102 for more specific advice. Refer to the SDS to see what PPE is necessary.
✓ Ask PPE supplier for advice on selection of suitable protective equipment.
✓ Respiratory protective equipment may be necessary for some cleaning and maintenance activities, e.g. cleaning up spills.
✓ Keep PPE clean, and replace it at recommended intervals.
✓ Store PPE in appropriate places to avoid contamination.

Training

✓ Give workers information on the risk of using the chemicals.
✓ Provide workers with training on:
  • handling chemicals safely;
  • how to use control equipment properly and ensure the control is working;
  • when and how to use any PPE provided;
  • any safe work procedure; and
  • what to do if something goes wrong.
✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

✓ Provide supervision to ensure that safe work procedures are followed.
✓ Establish a system to monitor that control measures are in place and being followed.

Worker's Checklist

☐ Check the room is well ventilated, and any extraction or air supply is switched on and working properly.
☐ Make sure it is running properly.
☐ Look for signs of damage, wear or poor operation of any equipment used. If worker finds any problems, inform the supervisor. Do not carry on working if there is a problem.
☐ Ensure sacks/bags are properly tied.
☐ Ensure wastes are not drawn into the ventilation duct.
☐ Use handling aids when available.
☐ Wash hands before and after eating, drinking or using the washroom.
☐ Do not use solvents to clean skin.
☐ Clear up spills immediately. Use vacuum cleaning or wet mopping. Dispose of spills safely.
☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

• Safety Data Sheets
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Control Approach 2

Sack Emptying
G208
Engineering Control

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

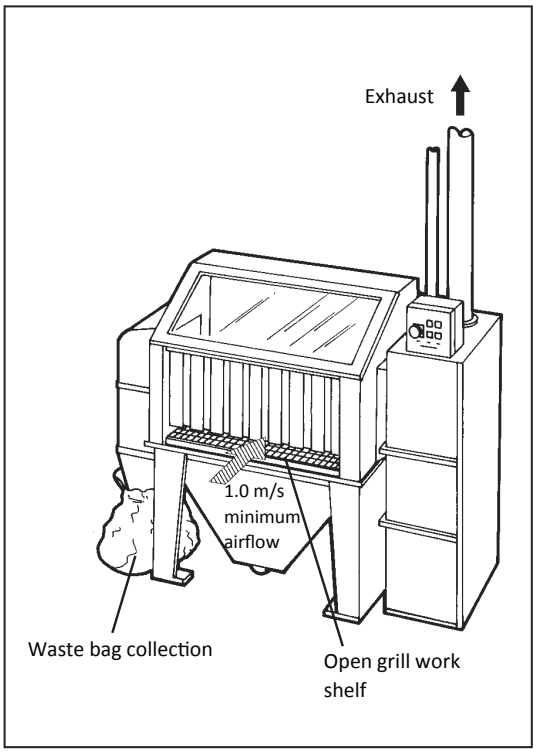
This sheet is used where the assessment recommends Control Approach 2 (Engineering control) as the suitable approach for chemical(s) and task(s). This sheet provides control measure and good practice recommendation on emptying sacks and bags, and can be applied to tasks involving medium quantities of solids. It describes the key points that need to be followed to help reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to the Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ Use bulk transfer methods where possible. Provide enclosed weighing hoppers for bulk solids.
- ✓ Apply local exhaust ventilation (LEV) at the source of exposure to capture the airborne contaminant and enclose the process as much as possible.
- ✓ Airflow must be sufficient to control airborne contaminants effectively. This will depend on the design, size of opening and the type of process and chemical being controlled.
- ✓ Ensure LEV equipment complies with the requirement of USECHH Regulations.
- ✓ Enclose the bench and empty sack chute as much as possible.



Sack emptying

- ✓ Keep the open area as small as possible, but allow enough room for safe working. Use see-through panels and plastic strips to reduce the opening.
- ✓ Ensure solids are poured gently and sack/bag is not aggressively shaken, rely on gravity.
- ✓ Make the enclosure deep enough to contain bags/sacks and allow access to the empty sack chute.
- ✓ Ensure gloves are worn. Sacks often have dust on the outer surface.
- ✓ Ensure the empty sack chute can be reached easily without the operator placing their head within the enclosed area. Consider additional ventilation at the disposal point.
- ✓ Ensure empty sacks are rolled up in the extracted zone and put into a polythene sack.
- ✓ Provide good lighting. It should be suitable for the chemical(s) and tasks, e.g. dust tight or flameproof.
- ✓ Consider providing mechanical/ pneumatic assistance with bag/sack handling.
- ✓ Where possible, site the work area away from doors, windows and walkways to stop draughts interfering with the local exhaust ventilation (LEV) and spreading dust.
- ✓ Provide a clean air supply to the workroom to replace extracted air.
- ✓ Provide an easy way of checking the LEV is working, e.g. airflow indicator or equivalent.

✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
✓ Ensure all components are appropriate for the chemicals being captured, i.e suitable for explosive, corrosive and flammable chemicals.

Maintenance

✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer in effective and efficient working order and good repair.

Inspection, testing and examination

✓ Get information on the design performance of the LEV equipment from the supplier. Keep this information to compare with future test results.
✓ Inspect the LEV equipment at least once a month to ensure the equipment is functioning properly and effectively.
✓ Ensure the LEV is examined and tested against its performance specification by hygiene technician at least every 12 months.
✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

✓ Clean work equipment and the work area daily. Clean other equipment and the workroom regularly, once a week is recommended.
✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
✓ Store bags/sacks in a safe place and dispose off empty bags/sacks safely (refer CGS G101).
✗ Do not clean up with a dry brush or compressed air for removing dust from skin and clothing. Avoid the use of brushes or compressed air for removing dust from surfaces or from inside machinery.
✓ Vacuum dry dust or use wet cleaning method.

Personal protective equipment (PPE)

✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101 and S102 for more specific advice. Refer to the SDS to see what PPE is necessary.
✓ Ask PPE supplier for advice on selection of suitable PPE.
✓ Respiratory protective equipment may be necessary for some cleaning and maintenance activities, e.g. cleaning up spills.
✓ Keep PPE clean, and replace it at recommended intervals.
✓ Store PPE in appropriate places to avoid contamination.

Training

✓ Give workers information on the risk of using the chemicals.
✓ Provide workers with training on:
- handling chemicals safely;
- how to use control equipment properly and ensure the control is working;
- when and how to use any PPE provided;
- any safe work procedure; and
- what to do if something goes wrong.

✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

✓ Provide supervision to ensure that safe work procedures are followed.
✓ Establish a system to monitor that control measures are in place and being followed.

Worker's Checklist

☐ Check the room is well ventilated, and any extraction or air supply is switched on and is working properly. Check the airflow indicator or equivalent.
☐ Look for signs of leaks, damage, wear or poor operation of any equipment used. If worker finds any problems, inform the supervisor. Do not carry on working if there is a problem.
☐ Make sure the air movement is across or away from face.
☐ Make sure that bags and other waste are not drawn into the ventilation duct.
☐ Use handling aids when provided.
☐ Wash hands before and after eating, drinking or using the washroom.
☐ Do not use solvents to clean skin.
☐ Clear up spills immediately. Use vacuum cleaning or wet mopping. Dispose of spills safely.
☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

- Safety Data Sheets
- Guidelines on Occupational Safety and Health for Design, Inspection, Testing and Examination of Local Exhaust Ventilation System, DOSH 2008
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Control Guidance Sheets G101, G204, S100, S101, S102 and R001

Useful links

- DOSH portal: https://www.dosh.gov.my
- SiRAC Online: sirac.dosh.gov.my
- HSE COSHH essentials website: https://www.hse.gov.uk/coshh/essentials/index.htm
- ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Control Approach 2

Filling Kegs
G209
Engineering Control

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

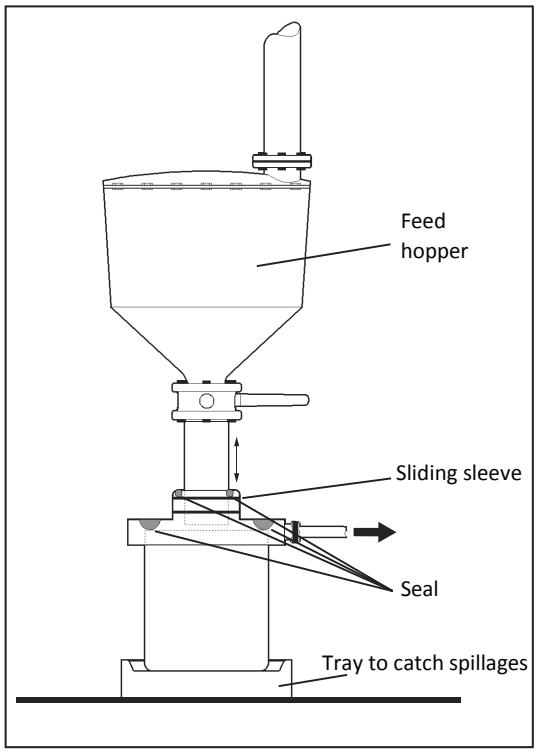
This sheet is used where the assessment recommends Control Approach 2 (Engineering control) as the suitable approach for chemical(s) and task(s). This sheet provides control measure and good practice recommendation on filling kegs, and can be applied to tasks involving medium quantities of solids. It describes the key points that need to be followed to help reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to the Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ Apply local exhaust ventilation (LEV) at the source of exposure to capture the airborne contaminant and enclose the process as much as possible.
- ✓ Airflow must be sufficient to control airborne contaminants effectively. This will depend on the design, size of opening and the type of process and chemical being controlled.
- ✓ Ensure LEV equipment complies with the requirement of USECHH Regulations.
- ✓ Ensure the kegs and filling equipment is compatible and well maintained.
- ✓ Provide suitable seals between the keg and filling head.
- ✓ Provide keg liners compatible with the material(s) being handled.



Kegs filling

- ✓ Where there is manual check weighing and/or weight adjusting, this should be done within a ventilated enclosure.
- ✓ Ensure the filling head doesn't discharge dust into the workroom when the keg is removed by ensuring the filling head is within the ventilated enclosure.
- ✓ Provide a ventilated hopper at floor level to capture spills.
- ✓ Provide a tray or grid below the filling point to minimize the spread of material.
- ✓ Provide good lighting. It should be suitable for the chemical(s) and task(s), e.g. dust tight or flame proof.
- ✓ Consider providing handling aids to minimise manual handling.
- ✓ Clean the outside of the keg by vacuum or wet wiping.
- ✓ Where possible, locate the work area away from doors, windows and walkways to stop draughts interfering with the ventilation and spreading dust.
- ✓ Provide a clean air supply to the workroom to replace extracted air.
- ✓ Keep extraction ducts short and simple - avoid long sections of flexible duct.
- ✓ Provide an easy way of checking the control is working, e.g. airflow indicator or equivalent.
- ✓ Fit an indicator or alarm to show if filters have blocked or failed.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.

✓ Always confirm that the extraction is turned on and working at the start of work. Check the gauge.
✓ Ensure that extracted air is cleaned before discharge to the environment.
✓ Ensure all components are appropriate for the materials being captured, i.e. suitable for explosive, corrosive and flammable substances.

Maintenance

✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer in effective and efficient working order and good repair.

Inspection, testing and examination

✓ Get information on the design performance of the LEV equipment from the supplier. Keep this information to compare with future test results.
✓ Inspect the LEV at least once a month to ensure the equipment is functioning properly and effectively.
✓ Ensure the LEV equipment is examined and tested against its performance specification by hygiene technician at least every 12 months.
✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

✓ Clean work equipment and the work area daily. Clean other equipment and the workroom regularly, once a week is recommended.
✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
✓ Store kegs in a safe place and dispose off empty kegs safely (refer CGS G101).
✓ Put lids on kegs immediately after use.
✓ Vacuum dry dust or use wet cleaning methods.
✗ Do not clean up with a dry brush or compressed air for removing dust from skin and clothing. Avoid the use of brushes or compressed air for removing dust from surfaces or from inside machinery.

Personal protective equipment (PPE)

✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101 and S102 for more specific advice. Refer to the SDS to see what PPE is necessary.
✓ Ask PPE supplier for advice on selection of suitable PPE.
✓ Respiratory protective equipment may be necessary for some cleaning and maintenance activities, e.g. cleaning up spills. CGS R001 for more specific advice.
✓ Keep PPE clean, and replace it at recommended intervals.
✓ Store PPE in appropriate places to avoid contamination.

Training

✓ Give workers information on the risk of using the chemicals.
✓ Provide workers with training on:
- handling chemicals safely;
- how to use control equipment properly and ensure the control is working;
- when and how to use any PPE provided;
- any safe work procedure; and
- what to do if something goes wrong.

✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

✓ Provide supervision to ensure that safe work procedures are followed.
✓ Establish a system to monitor that control measures are in place and being followed.

Worker's Checklist

☐ Check the room is well ventilated, and any extraction or air supply is switched on and is working properly. Check the airflow indicator or equivalent.
☐ Look for signs of leaks, damage, wear or poor operation of any equipment used. If worker finds any problems, inform the supervisor. Do not carry on working if there is a problem.
☐ Make sure that keg liners and other waste material are not drawn into the ventilation duct.
☐ Use handling aids when provided.
☐ Wash hands before and after eating, drinking or using the washroom.
☐ Clear up spills immediately. Follow spillage procedure. Dispose of spills safely.
☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

- Safety Data Sheets
- Guidelines on Occupational Safety and Health for Design, Inspection, Testing and Examination of Local Exhaust Ventilation System, DOSH 2008
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Control Guidance Sheets G101, G204, S100, S101, S102 and R001

Useful links

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Control Approach 2

Charging Reactors and Mixers from a Sack or Keg
G210
Engineering Control

This guidance sheet is aimed at employers to help them comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

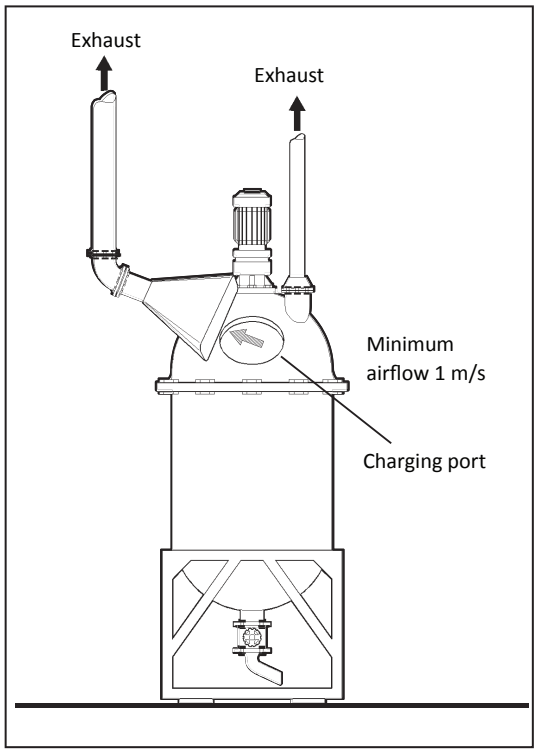
This sheet is used where the assessment recommends Control Approach 2 (Engineering control) as the suitable approach for chemical(s) and task(s). This sheet provides control measure and good practice recommendation on charging reactors and mixers from a sack or keg, and can be applied to task involving small and medium quantities of solids. It is also suitable for occasional (once a day) use with solids needing control approach 3. It describes the key points that need to be followed to help reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Look at the Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ Apply local exhaust ventilation (LEV) at the source of exposure to capture the airborne contaminant and enclose the process as much as possible.
- ✓ Ensure LEV equipment complies with the requirement of USECHH Regulations.
- ✓ Airflow must be sufficient to control airborne contaminants effectively. This will depend on the design, size of opening and the type of process and chemicals being controlled.
- ✓ Ensure kegs and filling equipment is compatible and well maintained.
- ✓ Consider providing mechanical / pneumatic assistance with keg/sack handling.
- ✓ Any lifting and tipping equipment should be correctly designed for the task, and be suitable for the size of sack or keg being lifted.
- ✓ The tipping mechanism should operate smoothly to allow controlled emptying.
- ✓ Bag/sack crushing creates a lot of dust. Ensure workers roll up empty bags/sacks with the open end in the extraction zone.
- ✓ Provide good lighting. It should be suitable for the chemical(s) and task, e.g. dust tight or flameproof.
- ✓ Where possible, locate the working area away from doors, windows and walkways to stop draughts interfering with the LEV and spreading dust.
- ✓ Provide a clean air supply to the workroom to replace extracted air.
- ✓ Keep ducts short and simple, and avoid long sections of flexible duct.
- ✓ Provide an easy way of checking the LEV is working, e.g. airflow indicator or equivalent.
- ✓ Fit an indicator or alarm to show if filters have blocked or failed.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✓ Ensure that extracted air is cleaned before discharge to the environment.
- ✓ Always confirm that the extraction is turned on and working at the start of work. Check the gauge.



Charging reactors and mixers from a sack or keg

✓ Ensure all components are appropriate for the materials being captured, i.e. suitable for explosive, corrosive and flammable substances.
✗ Do not re-circulate air into the workroom unless it has been adequately cleaned.

Maintenance

✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer in effective and efficient working order and good repair.

Inspection, testing and examination

✓ Get information on the design performance of the LEV from the supplier. Keep this information to compare with future test results.
✓ Inspect the LEV equipment at least once a month to ensure the equipment is functioning properly and effectively.
✓ Ensure the LEV equipment is examined and tested against its performance standard by hygiene technician at least every 12 months.
✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

✓ Clean work equipment and the work area daily. Clean other equipment and the workroom regularly, once a week is recommended.
✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
✓ Store sacks or kegs in a safe place and when empty, dispose off them safely (refer CGS G101).
✓ Put lids on kegs immediately after use.
✓ Vacuum dry dust or use wet cleaning method.
✗ Do not clean up with a dry brush or compressed air for removing dust from skin and clothing. Avoid the use of brushes or compressed air for removing dust from surfaces or from inside machinery.

Personal protective equipment (PPE)

✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101 and S102 for more specific advice. Refer to the SDS to see what PPE is necessary.
✓ Ask PPE supplier for advice on selection of suitable PPE.
✓ Respiratory protection equipment may be necessary for some cleaning and maintenance activities, e.g. cleaning up spills.
✓ Keep PPE clean and replace it at recommended intervals.
✓ Store PPE in appropriate places to avoid contamination.

Training

✓ Give workers information on the risk of using the chemicals.
✓ Provide workers with training on:
- handling chemicals safely;
- how to use control equipment properly and ensure the control is working;
- when and how to use any PPE provided;
- any safe work procedure; and
- what to do if something goes wrong.

✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

✓ Provide supervision to ensure that safe work procedures are followed.
✓ Establish a system to monitor that control measures are in place and being followed.

Worker's Checklist

☐ Make sure the LEV system is switched on and is working.
☐ Make sure the LEV is running properly; check the airflow indicator or equivalent.
☐ Look for signs of leaks, damage, wear or poor operation of any equipment used. If worker finds any problems, inform the supervisor. Do not carry on working if there is a problem.
☐ Make sure that paper bags and other waste material are not drawn into the ventilation duct.
☐ Use handling aids, avoid manual handling.
☐ Wash hands before and after eating, drinking or using the washroom.
☐ Do not use solvents to clean skin.
☐ Clear up spills immediately. Follow spillage procedure.
☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information
- Safety Data Sheets
- Guidelines on Occupational Safety and Health for Design, Inspection, Testing and Examination of Local Exhaust Ventilation System, DOSH 2008
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Guidelines on Monitoring of Airborne Contaminant for Chemicals Hazardous to Health, DOSH 2002
- Guidelines on the Control of Chemicals Hazardous to Health, DOSH 2001
- Control Guidance Sheets G101, G204, S100, S101, S102 and R100

Useful links

- DOSH portal: https://www.dosh.gov.my
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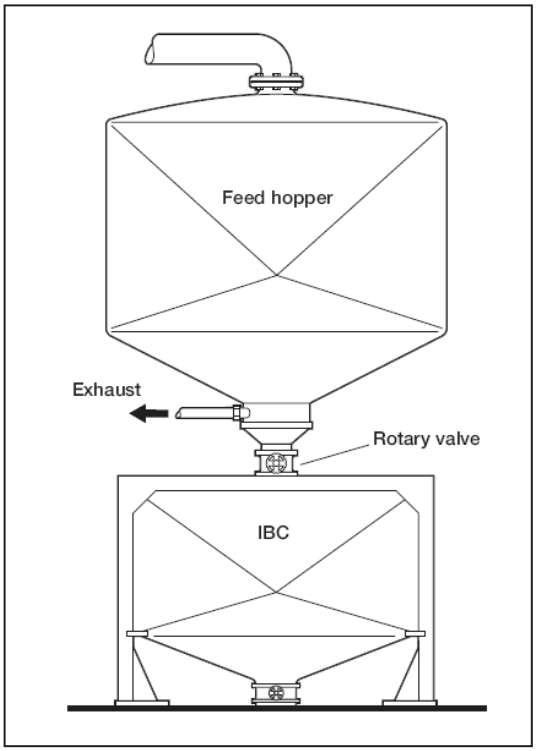
- ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Control Approach 2

IBC Filling and Emptying
G211
Engineering Control

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

This sheet is used where the assessment recommends Control Approach 2 (Engineering control) as the suitable approach for chemical(s) and task(s). This sheet provides control measure and good practice recommendation on filling and emptying an IBC (intermediate bulk carrier) with large quantities of solids. It describes the key points that need to be followed to help reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to the Safety Data Sheet (SDS) for more information.



IBC filling and emptying

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ Ensure the IBC is designed and constructed for the chemical it will contain.
- ✓ Take precautions to prevent over-filling, e.g. load cells.
- ✓ Ensure air displaced during filling is vented to a safe place, e.g. back into the supply tank. Provide seals on access hatches.
- ✓ Provide a means to isolate or control the filling/ emptying rate, e.g. a rotary valve.
- ✓ Ensure the connections do not leak.
- ✓ Provide good access for fork-lift trucks.
- ✓ Provide barriers and notices.
- ✓ Consider the need for explosion relief for combustible solids, and ensure equipment is appropriately earthed.
- ✓ Keep extraction ducts short and simple, and avoid long sections of flexible duct.

Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer in effective and efficient working order and good repair.

Inspection, testing and examination

- ✓ Get information on the design performance of the engineering control equipment from the supplier. Keep this information to compare with future test results.
- ✓ Inspect the engineering control equipment at least once a month to ensure the equipment is functioning properly and effectively.
- ✓ Ensure the engineering control equipment is examined and tested against its performance s pecification by hygiene technician at least every 12 months.
- ✓ Keep records of all examinations and tests for at least five years.

Inspection, testing and examination

✓ Clean work equipment and the work area daily. Clean other equipment and the workroom regularly, once a week is recommended.
✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
✓ Store materials in a safe place (refer CGS G101).
✗ Do not clean up with dry brushing or compressed air.
✓ Vacuum dry dust or use wet cleaning method.

Personal protective equipment (PPE)

✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101 and S102 for more specific advice. Refer to the SDS to see what PPE is necessary.
✓ Ask PPE supplier for advice on selection of suitable PPE.
✓ Respiratory protective equipment may be necessary for some cleaning and maintenance activities, e.g. cleaning up spills.
✓ Keep PPE clean and replace it at recommended intervals.
✓ Store PPE in appropriate places to avoid contamination.

Training

✓ Give workers information on the risk of using the chemicals.
✓ Provide workers with training on:
  • handling chemicals safely;
  • how to use control equipment properly and ensure the control is working;
  • when and how to use any PPE provided;
  • any safe work procedure; and
  • what to do if something goes wrong.
✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

✓ Provide supervision to ensure that safe work procedures are followed.
✓ Establish a system to monitor that control measures are in place and being followed.

Worker's Checklist

☐ Make sure the engineering control equipment is switched on and is working.
☐ Take special care not to overfill the IBC.
☐ Ensure barriers and warning notices are in position.
☐ Look for signs of leaks, wear or damage of any equipment used. If worker finds any problems, inform the supervisor. Do not carry on working if there is a problem.
☐ Wash hands before and after eating, drinking or using the washroom.
☐ Do not use solvents to clean skin.
☐ Clear up spills immediately. Follow spillage procedure.
☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

- Safety Data Sheets
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Guidelines on Monitoring of Airborne Contaminant for Chemicals Hazardous to Health, DOSH 2002
- Guidelines on the Control of Chemicals Hazardous to Health, DOSH 2001
- Control Guidance Sheets G101, S100, S101, S102 and R001

Useful links

- DOSH portal: https://www.dosh.gov.my
- SiRAC Online: sirac.dosh.gov.my
- HSE COSHH essentials website: https://www.hse.gov.uk/coshh/essentials/index.htm
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Control Approach 2

Drum Filling
G212
Engineering Control

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

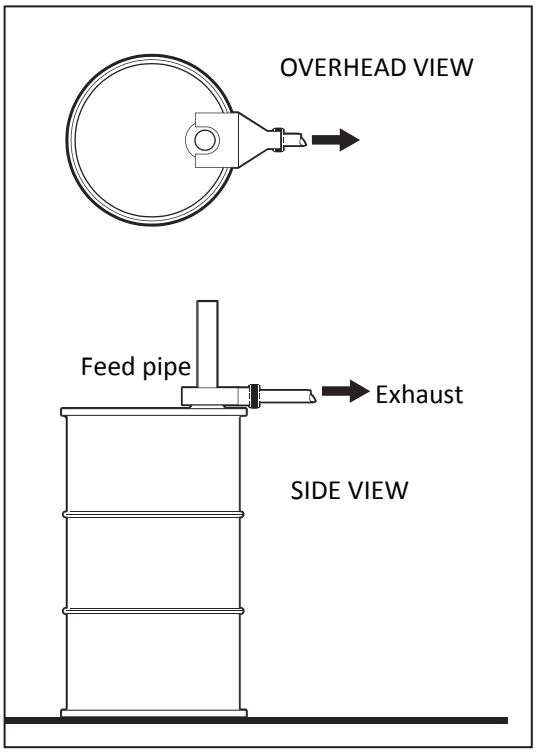
This sheet is used where the assessment recommends Control Approach 2 (Engineering control) as the suitable approach for chemical(s) and task(s). This sheet provides control measure and good practice recommendation on filling drums, and can be applied to tasks involving medium quantities of liquids. It describes the key points that need to be followed to help reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to the Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ Apply local exhaust ventilation (LEV) at the source of exposure to capture the airborne contaminant and enclose the process as much as possible.
- ✓ Airflow must be sufficient to control airborne contaminants effectively. This will depend on the design, size of opening and the type of process and chemical being controlled.
- ✓ Ensure LEV equipment complies with the requirement of USECHH Regulations.
- ✓ Carry out drum filling only in a designated area with spillage containment.
- ✓ Position the LEV slot as near to the top of the drum as possible.
- ✓ The length of the feed pipe should enable it to be submerged during filling.



Drum filling

- ✓ Prevent splashing by using funnels, guards etc.
- ✓ Ensure drums can be easily positioned close to the LEV slot. Guides should be used for positioning drums and adjustable for different size drums.
- ✗ Avoid touching the dip pipe after removal from the drum.
- ✓ Provide containment around the drum to catch drips and leaks.
- ✓ Use a load cell or metered flow to prevent overfilling.
- ✓ For flammable liquids, use suitable pumps/fans and appropriately earthed equipment.
- ✓ Where possible, site the work area away from doors, windows and walkways to stop draughts interfering with the ventilation and spreading contamination.
- ✓ Provide an air supply to the workroom to replace extracted air.
- ✓ Provide an easy way of checking the control is working, e.g. airflow indicator or equivalent.
- ✓ Consider providing mechanical / pneumatic handling aids to minimize manual handling.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✓ Ensure that extracted air is cleaned before discharging to the environment.
- ✗ With vapours, re-circulation is not recommended.

Maintenance

✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer in effective and efficient working order and good repair.

Inspection, testing and examination

✓ Get information on the design performance of the LEV from the supplier. Keep this information to compare with future test results.
✓ Inspect the LEV at least once a month to ensure the equipment is functioning properly and effectively.
✓ Ensure the LEV is examined and tested against its performance specification by hygiene technician at least every 12 months.
✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

✓ Clean work equipment and the work area daily. Clean other equipment and the workroom regularly, once a week is recommended.
✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
✓ Store drums in a safe place and dispose of empty drums safely (refer CGS G101).

Personal protective equipment (PPE)

✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101 and S102 for more specific advice. Refer to the SDS to see what PPE is necessary.
✓ Ask PPE supplier for advice on selection of suitable PPE.
✓ Respiratory protective equipment may be necessary for some cleaning and maintenance activities, e.g. cleaning up spills.
✓ Keep PPE clean and replace it at recommended intervals.
✓ Store PPE in appropriate places to avoid contamination.

Training

✓ Give workers information on the risk of using the chemicals.
✓ Provide workers with training on:
  • handling chemicals safely;
  • how to use control equipment properly and ensure the control is working;
  • when and how to use any PPE provided;
  • any safe work procedure; and
  • what to do if something goes wrong.
✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

✓ Provide supervision to ensure that safe work procedures are followed.
✓ Establish a system to monitor that control measures are in place and being followed.

Worker's Checklist

☐ Make sure the LEV is switched on and is working.
☐ Make sure it is running properly.
☐ Look for signs of damage, wear or poor operation of any equipment used. If worker finds any problems, inform the supervisor. Do not carry on working if there is a problem.
☐ Make sure that bags and other waste are not drawn into the ventilation duct.
☐ Prevent splashing by using funnels and guards, and by ensuring that fill pipes are submerged in the drum.
☐ Wash hands before and after eating, drinking or using the washroom.
☐ Use handling aids when provided.
☐ Do not use solvents to clean skin.
☐ Clear up spills immediately. Follow spillage procedure.
☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

- Safety Data Sheets
- Guidelines on Occupational Safety and Health for Design, Inspection, Testing and Examination of Local Exhaust Ventilation System, DOSH 2008
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Guidelines on Monitoring of Airborne Contaminant for Chemicals Hazardous to Health, DOSH 2002
- Guidelines on the Control of Chemicals Hazardous to Health, DOSH 2001
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Useful links

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- ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Control Approach 2

Drum Emptying Using a Drum Pump
G213
Engineering Control

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

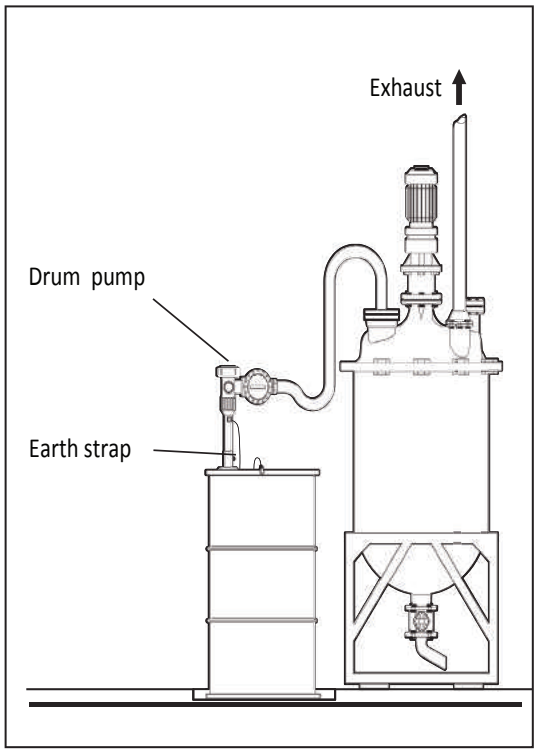
This sheet is used where the assessment recommends Control Approach 2 (Engineering control) as the suitable approach for chemical(s) and task(s). This sheet provides control measure and good practice recommendation on using a drum pump to empty drums, and can be applied to tasks involving medium quantities of liquids. It describes the key points that need to be followed to help reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to the Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ Ensure the area is well ventilated.
- ✓ Design the work area for ease of maintenance and, when possible, use equipment designed for easy maintenance.
- ✗ Avoid touching the dip pipe after removal from the drum.
- ✓ Provide containment around the drum to catch drips and leaks.
- ✓ Ensure the pump is suitable for the liquid to be transferred.
- ✓ Provide transfer/storage arrangements for the pump and dip pipe to minimise contact with the liquid and to stop contamination.



Drum emptying using a drum pump

- ✓ Consider how the drum will be moved to the transfer area. Avoid manual handling.
- ✓ Provide a suitable 'key' for removing and replacing the drum stopper.
- ✓ For flammable liquids, use suitable pumps/fans and appropriately earthed equipment to prevent sparking from build-up of static electricity.
- ✓ Where possible, locate the work area away from doors, windows and walkways.
- ✓ Discharge exhausts air to a safe place away from doors, windows and air inlets.
- ✗ With vapours, re-circulation is not recommended.

Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer in effective and efficient working order and good repair.

Inspection, testing and examination

- ✓ Get information on the design performance of the engineering control equipment from the supplier. Keep this information to compare with future test results.
- ✓ Inspect the engineering control equipment at least once a month to ensure the equipment is functioning

properly and effectively.
- ✓ Ensure the engineering control equipment is examined and tested against its performance specification by hygiene technician at least every 12 months.
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Clean work equipment, and the work and storage area daily. Clean other equipment and the workroom regularly, once a week is recommended.
- ✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
- ✓ Store drums in a safe place and dispose of empty drums safely (refer CGS G101).

Personal protective equipment (PPE)

- ✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101 and S102 for more specific advice. Refer to the SDS to see what PPE is necessary.
- ✓ Ask PPE supplier for advice on selection of suitable PPE.
- ✓ Respiratory protective equipment may be necessary for some cleaning and maintenance activities, e.g. cleaning up spills.
- ✓ Keep PPE clean, and replace it at recommended intervals.
- ✓ Store PPE in appropriate places to avoid contamination.

Training

- ✓ Give workers information on the risk of using the chemicals.
- ✓ Provide workers with training on:
  - handling chemicals safely;
  - how to use control equipment properly and ensure the control is working;
  - when and how to use any PPE provided;
  - any safe work procedure; and
  - what to do if something goes wrong.
- ✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

- ✓ Provide supervision to ensure that safe work procedures are followed.
- ✓ Establish a system to monitor that control measures are in place and being followed.

Worker's Checklist

- ☐ Make sure any engineering control equipment is switched on and is working.
- ☐ Always remove and replace the drum stopper using a 'key'.
- ☐ Always use the earth strap.
- ☐ Use handling aids when provided.
- ☐ Take care when removing the pump from the drum to minimise vapours and skin contact. Return the pump to its storage position.
- ☐ Look for signs of damage, wear or poor operation of any equipment used. If worker finds any problems, inform the supervisor. Do not carry on working if there is a problem.
- ☐ Wash hands before and after eating, drinking or using the washroom.
- ☐ Do not use solvents to clean skin.
- ☐ Clear up spills immediately. Follow spillage procedure.
- ☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information
- Safety Data Sheets
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Guidelines on the Control of Chemicals Hazardous to Health, DOSH 2001
- Control Guidance Sheets G101, S100, S101, S102 and R001

Useful links
- DOSH portal: https://www.dosh.gov.my
- SiRAC Online: sirac.dosh.gov.my
- HSE COSHH essentials website: https://www.hse.gov.uk/coshh/essentials/index.htm
- ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Control Approach 2

Weighing Solids
G214
Engineering Control

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

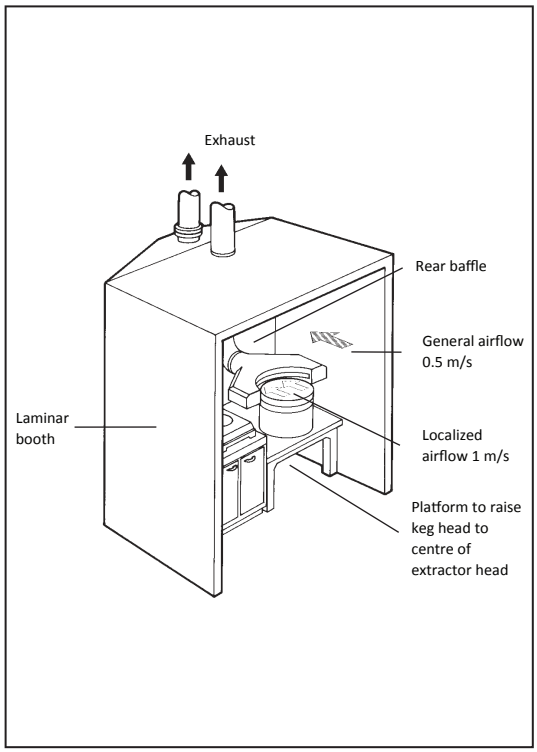
This sheet is used where the assessment recommends Control Approach 2 (Engineering control) as the suitable approach for chemical(s) and task(s). This sheet provides control measure and good practice recommendation on weighing medium quantities of solids. It describes the key points that need to be followed to help reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for the hazards too. Refer to Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ Apply local exhaust ventilation (LEV) at the source of exposure to capture the airborne contaminant and enclose the process as much as possible.
- ✓ Airflow must be sufficient to control airborne contaminants effectively. This will depend on the design, size of opening and the type of process and chemical being controlled.
- ✓ Ensure LEV complies with the requirement of USECHH Regulations.
- ✓ Enclose the weigh station as much as possible (see figure).
- ✓ Make the enclosure deep enough to contain equipment and materials.
- ✓ Keep the open area as small as possible - while allowing enough room for safe working. Use see-through panels and plastic strips to reduce the open area.
- ✓ Keep extraction ducts short and simple - avoid long sections of flexible duct.
- ✓ Provide good lighting. It should be suitable for the chemical(s) and task(s), e.g. dust tight or flameproof.
- ✗ Avoid using deep kegs or kegs over 25 kg.
- ✓ Where possible, locate the work area away from doors, windows and walkways to stop draughts interfering with the ventilation and spreading dust.
- ✓ Provide clean air supply to the workroom to replace extracted air.
- ✓ Provide an easy way of checking the control is working, e.g. airflow indicator or equivalent.
- ✓ Always confirm that the extraction is turned on and working at the start of work.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets. Ensure that extracted air is cleaned before discharge to the environment.



Weighing solids

Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer in effective and efficient working order and good repair.

Cleaning and housekeeping

- ✓ Get information on the design performance of the LEV from the supplier. Keep this information to compare with future test results.
- ✓ Inspect the LEV at least once a month to ensure the equipment is functioning properly and effectively.
- ✓ Ensure the LEV is examined and tested against its performance specification by hygiene technician at least every 12 months.
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Clean work equipment, and the work area daily. Clean other equipment and the workroom regularly, once a week is recommended.
- ✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
- ✓ Store containers in a safe place and dispose off containers drums safely (refer CGS G101).
- ✓ Put lids on containers immediately after use.
- ✗ Do not clean up with a dry brush or compressed air.
- ✓ Vacuum dry dust or use wet cleaning method.

Personal protective equipment (PPE)

- ✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101 and S102 for more specific advice. Refer to the SDS to see what PPE is necessary.
- ✓ Ask PPE supplier for advice on selection of suitable PPE.
- ✓ Respiratory protective equipment may be necessary for some cleaning and maintenance activities, e.g. cleaning up spills.
- ✓ Keep PPE clean, and replace it at recommended intervals.
- ✓ Store PPE in appropriate places to avoid contamination.

Training

- ✓ Give workers information on the risk of using the chemicals.
- ✓ Provide workers with training on:
  - handling chemicals safely;
  - how to use control equipment properly and ensure the control is working;
  - when and how to use any PPE provided;
  - any safe work procedure; and
  - what to do if something goes wrong.
- ✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

- ✓ Provide supervision to ensure that safe work procedures are followed.
- ✓ Establish a system to monitor that control measures are in place and being followed.

Worker's Checklist

- ☐ Make sure the LEV is switched on and is working.
- ☐ Make sure it is running properly.
- ☐ Look for signs of damage, wear or poor operation of any equipment used. If worker finds any problems, inform the supervisor. Do not carry on working if there is a problem.
- ☐ Make sure that paper bags and other waste material are not drawn into the ventilation duct.
- ☐ Make sure that large items do not obstruct the working opening.
- ☐ Wash hands before and after eating, drinking or using the washroom.
- ☐ Do not use solvents to clean skin.
- ☐ Clear up spills immediately. Follow spillage procedure.
- ☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

- Safety Data Sheets
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Guidelines on the Control of Chemicals Hazardous to Health, DOSH 2001
- Control Guidance Sheets G101, G204, S100, S101, S102 and R001

Useful links

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- SiRAC Online: sirac.dosh.gov.my
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- ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Control Approach 2

Mixing Solids with Other Solids or Liquids

G215

Engineering Control

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

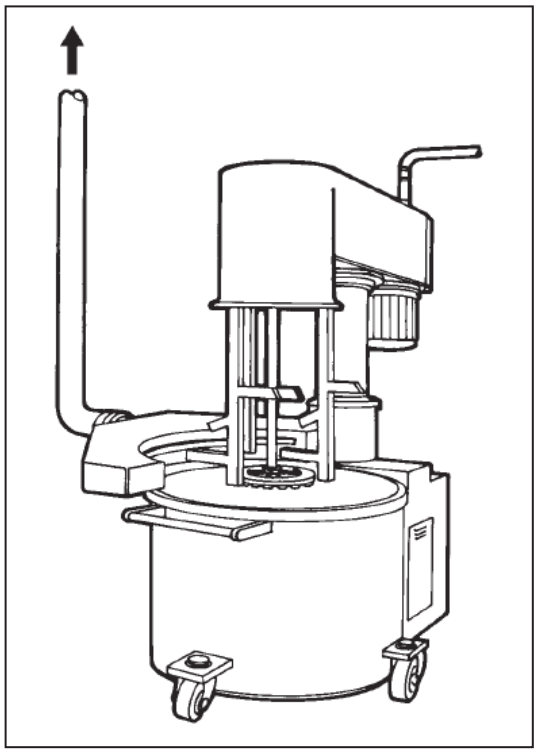
This sheet is used where the assessment recommends Control Approach 2 (Engineering control) as the suitable approach for chemical(s) and task(s). This sheet provides control measure and good practice recommendation on mixing medium quantities of solids with other solids or liquids. It describes the key points that need to be followed to help reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ Enclose the mixer as much as possible, and provide seals on the lid and other access points.
- ✓ Position the local exhaust ventilation (LEV) hood as close to the source of the dust as possible.
- ✓ Airflow across the whole mixer top towards the LEV should be sufficient to control airborne contaminants effectively. This will depend on the design, size of opening and the type of process and chemical being controlled. Where possible, use lids on the mixer to contain dust and vapours.
- ✓ Where possible, locate the working area away from doors, windows and walkways to stop draughts interfering with the ventilation and spreading dusts.
- ✓ Provide an air supply to the workroom to replace extracted air.



Mixing solids with other solids or liquids

- ✓ Provide an easy way of checking the control is working, e.g. airflow indicator or equivalent.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✓ Ensure that extracted air is cleaned before discharge to the environment.

Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/ installer, in effective and efficient working order and good repair.

Inspection, testing and examination

- ✓ Get information on the design performance of the LEV from the supplier. Keep this information to compare with future test results.
- ✓ Inspect the LEV at least once a month to ensure the equipment is functioning properly and effectively.
- ✓ Ensure the LEV is examined and tested against its performance specification by hygiene technician at least every 12 months.
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

✓ Clean work equipment, and the work area daily. Clean other equipment and the workroom regularly, once a week is recommended.
✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
✓ Store containers in a safe place and dispose off containers drums safely (Refer CGS G101).
✓ Put lids on containers immediately after use.
✗ Do not clean up with a dry brush or compressed air.
✓ Vacuum dry dust or use wet cleaning method.

Personal protective equipment (PPE)

✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101 and S102 for more specific advice. Refer to the SDS to see what PPE is necessary.
✓ Ask PPE supplier for advice on selection of suitable PPE.
✓ Respiratory protective equipment may be necessary for some cleaning and maintenance activities, e.g. cleaning up spills.
✓ Keep PPE clean, and replace it at recommended intervals.
✓ Store PPE in appropriate places to avoid contamination.

Training

✓ Give workers information on the risk of using the chemicals.
✓ Provide workers with training on:
  • handling chemicals safely;
  • how to use control equipment properly and ensure the control is working;
  • when and how to use any PPE provided;
  • any safe work procedure; and
  • what to do if something goes wrong.
✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

✓ Provide supervision to ensure that safe work procedures are followed.
✓ Establish a system to monitor that control measures are in place and being followed.

Worker's Checklist

☐ Make sure the LEV is switched on and is working.
☐ Make sure it is running properly.
☐ Make sure the air movement is across or away from your face, and try not to lean into the mixer when adding materials.
☐ Look for signs of damage, wear or poor operation of any equipment used. If worker finds any problems, inform the supervisor. Do not carry on working if there is a problem.
☐ Make sure that paper bags and other waste material are not drawn into the ventilation duct.
☐ Wash hands before and after eating, drinking or using the washroom.
☐ Do not use solvents to clean skin.
☐ Clear up spills immediately. Follow spillage procedure.
☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

• Safety Data Sheets
• Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
• Guidelines on the Control of Chemicals Hazardous to Health, DOSH 2001
• Control Guidance Sheets G101, G204, S100, S101, S102 and R001

Useful links

• DOSH portal: https://www.dosh.gov.my
• SiRAC Online: sirac.dosh.gov.my
• HSE COSHH essentials website: https://www.hse.gov.uk/coshh/essentials/index.htm
• ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Control Approach 2

Mixing Solids
G216
Engineering Control

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

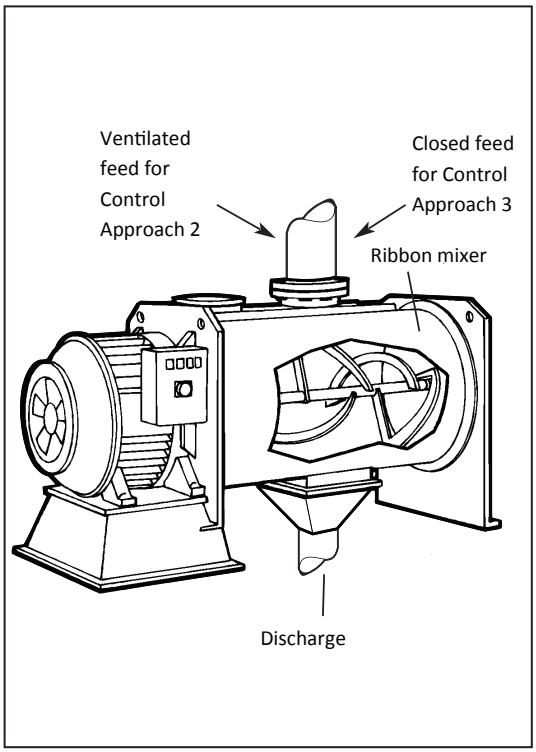
This sheet is used where the assessment recommends Control Approach 2 (Engineering control) as the suitable approach for chemical(s) and task(s). This sheet provides control measure and good practice recommendation on mixing large quantities of solids using the example of a ribbon mixer. It describes the key points that need to be followed to help reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ Enclose the mixer as much as possible.
- ✓ Provide suitable seals on the lid and other access points to minimize dust leakage.
- ✓ Ensure that lids and other access points can be securely closed before operation of the mixer.
- ✓ Ensure the mixer; seals, gaskets etc. are suitable for the intended use.
- ✓ Provide a ventilated enclosure around the filling point with sufficient inward airflow (unless a closed feed is used).
- ✓ Consider arrangements for dust-free discharge from the mixer, e.g. discharge direct to an enclosed conveyor system. Alternatively, provide local exhaust ventilation (LEV) at the discharge point with sufficient airflow.



Mixing solids

- ✓ Where possible, locate the working area away from doors, windows and walkways to stop draughts interfering with the ventilation and spreading dust.
- ✓ Provide an air supply to the workroom to replace extracted air.
- ✓ Provide an easy way of checking the control is working, e.g. airflow indicator or equivalent.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✓ Ensure that extracted air is cleaned before discharge to the environment.

Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/ installer, in effective and efficient working order and good repair.

Inspection, testing and examination

- ✓ Get information on the design performance of the engineering control equipment from the supplier.
- ✓ Keep this information to compare with future test results.
- ✓ Inspect the engineering control equipment at least once a month to ensure the equipment is functioning properly and effectively.

✓ If the equipment is equipped with the LEV, ensure that the LEV is examined and tested against its performance specification by hygiene technician at least every 12 months.
✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

✓ Clean work equipment, and the work area daily. Clean other equipment and the workroom regularly, once a week is recommended.
✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
✓ Store containers in a safe place and dispose off containers drums safely (Refer CGS G101).
✓ Put lids on containers immediately after use.
✗ Do not clean up with a dry brush or compressed air.
✓ Vacuum dry dust or use wet cleaning method.

Personal protective equipment (PPE)

✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101 and S102 for more specific advice. Refer to the SDS to see what PPE is necessary.
✓ Ask PPE supplier for advice on selection of suitable PPE.
✓ Respiratory protective equipment may be necessary for some cleaning and maintenance activities, e.g. cleaning up spills.
✓ Keep PPE clean, and replace it at recommended intervals.
✓ Store PPE in appropriate places to avoid contamination.

Training

✓ Give workers information on the risk of using the chemicals.
✓ Provide workers with training on:
  • handling chemicals safely;
  • how to use control equipment properly and ensure the control is working;
  • when and how to use any PPE provided;
  • any safe work procedure; and
  • what to do if something goes wrong.
✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

✓ Provide supervision to ensure that safe work procedures are followed.
✓ Establish a system to monitor that control measures are in place and being followed.

Worker's Checklist

☐ Make sure any engineering control equipment is switched on and is working.
☐ Make sure it is running properly.
☐ Look for signs of leaks, wear or damage of any equipment used. If worker finds any problems, inform the supervisor. Do not carry on working if there is a problem.
☐ Make sure that paper bags and other waste material aren't drawn into the ventilation duct.
☐ Wash hands before and after eating, drinking or using the washroom.
☐ Do not use solvents to clean skin.
☐ Clear up spills immediately. Follow spillage procedure.
☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

- Safety Data Sheets
- Guidelines on Occupational Safety and Health for Design, Inspection, Testing and Examination of Local Exhaust Ventilation System, DOSH 2008.
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Guidelines on the Control of Chemicals Hazardous to Health, DOSH 2001
- Control Guidance Sheets G101, G204, S100, S101, S102 and R001

Useful links

- DOSH portal: https://www.dosh.gov.my
- SiRAC Online: sirac.dosh.gov.my
- HSE COSHH essentials website: https://www.hse.gov.uk/coshh/essentials/index.htm
- ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Control Approach 2

Mixing Liquids with Other Liquids or Solids
G217
Engineering Control

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

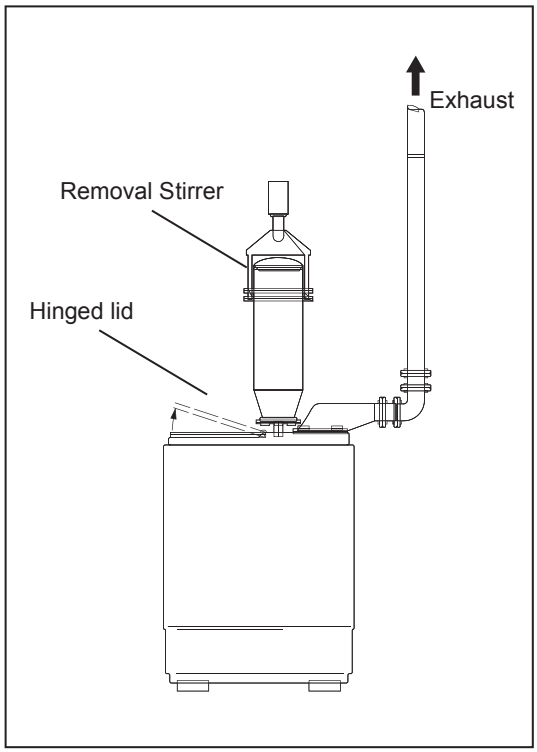
This sheet is used where the assessment recommends Control Approach 2 (Engineering control) as the suitable approach for chemical(s) and task(s). This sheet provides control measure and good practice recommendation on mixing medium and large quantities of liquids with other liquids or solids. It describes the key points that need to be followed to help reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ Position the local exhaust ventilation (LEV) hood as near to the source of the vapour as possible.
- ✓ Enclose the top of the mixer as much as possible.
- ✓ Airflow across the whole mixer top towards the LEV should be sufficient to control airborne contaminants effectively. This will depend on the design, size of opening and the type of process and chemicals being controlled.
- ✓ Where possible, site the work area away from doors, windows and walkways to stop draughts interfering with the ventilation and spreading vapours.
- ✓ Provide an air supply to the workroom to replace extracted air.
- ✓ Keep ducts short and simple, and avoid long sections of flexible duct.



Mixing liquids with other liquids or solids

- ✓ Provide an easy way of checking the control is working, e.g. airflow indicator or equivalent.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✗ With vapours, air re-circulation is not recommended.
- ✓ Ensure that extracted air is cleaned before discharging to the environment.

Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/ installer, in effective and efficient working order and good repair.

Inspection, testing and examination

- ✓ Get information on the design performance of the LEV from the supplier. Keep this information to compare with future test results.
- ✓ Inspect the LEV at least once a month to ensure the equipment is functioning properly and effectively.
- ✓ Ensure the LEV is examined and tested against its performance specification by hygiene technician at least every 12 months.
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

✓ Clean work equipment, and the work and storage area daily. Clean other equipment and the workroom regularly, once a week is recommended.
✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
✓ Store containers in a safe place and dispose off containers drums safely (refer CGS G101).
✓ Put lids on containers immediately after use.

Personal protective equipment (PPE)

✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101 and S102 for more specific advice. Refer to SDS to see what PPE is necessary.
✓ Ask PPE supplier on advice on selection of suitable PPE.
✓ Respiratory protective equipment may be necessary for some cleaning and maintenance activities, e.g. cleaning up spills.
✓ Keep PPE clean, and replace it at recommended intervals.
✓ Store PPE in appropriate places to avoid contamination.

Training

✓ Give workers information on the risk of using the chemicals.
✓ Provide workers with training on:
  • handling chemicals safely;
  • how to use control equipment properly and ensure the control is working;
  • when and how to use any PPE provided;
  • any safe work procedure; and
  • what to do if something goes wrong.
✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

✓ Provide supervision to ensure that safe work procedures are followed.
✓ Establish a system to monitor that control measures are in place and being followed.

Worker's Checklist

☐ Make sure the LEV is switched on and is working.
☐ Make sure it is running properly.
☐ Make sure the air movement is across or away from face.
☐ Look for signs of damage, wear or poor operation of any equipment used. If worker finds any problems, inform the supervisor. Do not carry on working if there is a problem.
☐ Make sure that paper bags and other waste material are not drawn into the ventilation duct.
☐ Wash hands before and after eating, drinking or using the washroom.
☐ Do not use solvents to clean skin.
☐ Clear up spills immediately. Follow spillage procedure.
☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

- Safety Data Sheets
- Guidelines on Occupational Safety and Health for Design, Inspection, Testing and Examination of Local Exhaust Ventilation System, DOSH 2008
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Guidelines on the Control of Chemicals Hazardous to Health, DOSH 2001
- Control Guidance Sheets G101, S100, S101, S102 and R001

Useful links

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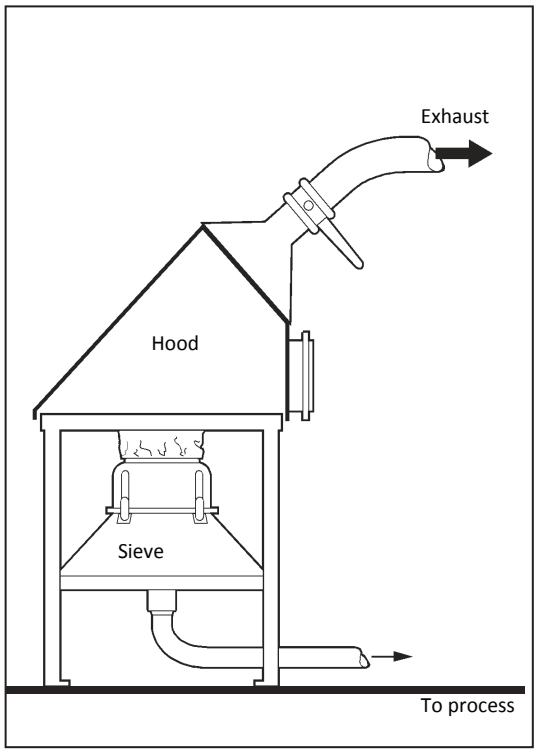
- ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Control Approach 2

Sieving
G218
Engineering Control

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

This sheet is use where the assessment recommends Control Approach 2 (Engineering control) as the suitable approach for chemical(s) and task(s). This sheet provides good practice advice on sieving medium quantities of solids. It describes the key points that need to be followed to help reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to Safety Data Sheet (SDS) for more information.



Sieving

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ Provide an enclosure around the filling point for the sieve (refer figure).
- ✓ Airflow must be sufficient to control airborne contaminants effectively. This will depend on the design, size of opening and the type of process and chemical being controlled.
- ✓ Ensure that seals and/or clamps are provided to stop dust leaking between the sieve and other components.
- ✓ Provide facilities to safely dispose of empty bags. Consider the need for additional ventilation at the disposal point.
- ✓ Control the speed of sieving to the slowest speed consistent with efficient production.
- ✓ Discharge into an enclosed system, e.g. vacuum transfer, or provide additional local exhaust ventilation (LEV) to control dust at the point of discharge.
- ✓ Consider the need for explosion relief for combustible solids, and ensure equipment is appropriately earthed.
- ✓ Where possible, locate the work area away from doors, windows and walkways to stop draughts interfering with the LEV and spreading dust.
- ✓ Provide an air supply to the workroom to replace extracted air.
- ✓ Keep ducts short and simple, and avoid long sections of flexible duct.
- ✓ Provide an easy way of checking the control is working, e.g. airflow indicator or equivalent.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✓ Ensure that extracted air is cleaned before discharge to the environment.

Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/ installer, in effective and efficient working order and good repair.

Inspection, testing and examination

- ✓ Get information on the design performance of the engineering control equipment from the supplier. Keep this information to compare with future test results.
- ✓ Inspect the equipment at least once a month to ensure the engineering control equipment is functioning properly and effectively.
- ✓ Ensure that the engineering control equipment is examined and tested against its performance specification by hygiene technician at least every 12 months.
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Clean work equipment, and the work area daily. Clean other equipment and the workroom regularly, once a week is recommended.
- ✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
- ✓ Store containers in a safe place and dispose off containers drums safely (Refer CGS G101).
- ✓ Put lids on containers immediately after use.

Personal protective equipment (PPE)

- ✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101 and S102 for more specific advice. Refer to the SDS to see what PPE is necessary.
- ✓ Ask PPE supplier for advice on selection of suitable PPE.
- ✓ Respiratory protective equipment may be necessary for some cleaning and maintenance activities, e.g. cleaning up spills.
- ✓ Keep PPE clean, and replace it at recommended intervals.
- ✓ Store PPE in appropriate places to avoid contamination.

Training

- ✓ Give workers information on the risk of using the chemicals.
- ✓ Provide workers with training on:
  - handling chemicals safely;
  - how to use control equipment properly and ensure the control is working;
  - when and how to use any PPE provided;
  - any safe work procedure; and
  - what to do if something goes wrong.
- ✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

- ✓ Provide supervision to ensure that safe work procedures are followed.
- ✓ Establish a system to monitor that control measures are in place and being followed.

Worker's Checklist

- ☐ Make sure the engineering control equipment is switched on and working.
- ☐ Make sure it is running properly.
- ☐ Look for signs of damage, wear or poor operation of any equipment used. If worker finds any problems, inform the supervisor. Do not carry on working if there is a problem.
- ☐ Make sure that paper bags and other waste are not drawn into the ventilation duct.
- ☐ Wash hands before and after eating, drinking or using the washroom.
- ☐ Do not use solvents to clean skin.
- ☐ Clear up spills immediately. Follow spillage procedure.
- ☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

- Safety Data Sheets
- Guidelines on Occupational Safety and Health for Design, Inspection, Testing and Examination of Local Exhaust Ventilation System, DOSH 2008
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Guidelines on the Control of Chemicals Hazardous to Health, DOSH 2001
- Control Guidance Sheets G101, S100, S101, S102 and R001

Useful links

- DOSH portal: https://www.dosh.gov.my
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Control Approach 2

Screening
G219
Engineering Control

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulation) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

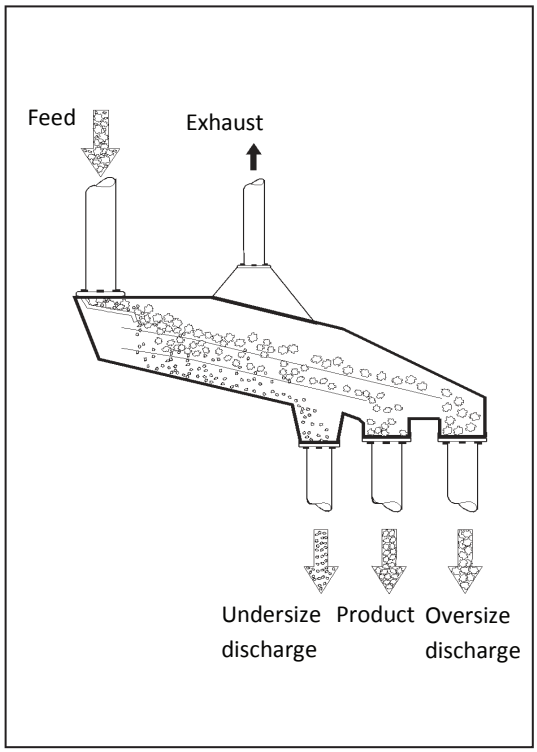
This sheet is used where the assessment recommends Control Approach 2 (Engineering control) as the suitable approach for chemical(s) and task(s). This sheet provides control measure and good practice recommendation on screening large quantities of solids. It describes the key points that need to be followed to help reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ Enclose the screen as much as possible, particularly at the feed and discharge points.
- ✓ Provide local exhaust ventilation (LEV) at the feed chute and drop points (refer figure). Additional ventilation may be required for the receiving hopper.
- ✓ Airflow must be sufficient to control airborne contaminants effectively. This will depend on the design, size of opening and the type of process and chemical being controlled.
- ✓ Design the enclosure in sections to allow easy access for cleaning and maintenance.
- ✓ Hinged doors should be provided for routine inspection.
- ✓ Provide as much space as possible within the enclosures. This will help contain the dust.



Screening

- ✓ Consider the use of dust seals between fixed and moving parts of the screen.
- ✓ Consider the need for explosion relief for combustible solids and ensure equipment is appropriately earthed.
- ✓ Where possible, locate the work area away from doors, windows and walkways to stop draughts interfering with the ventilation and spreading contamination.
- ✓ Provide an air supply to the workroom to replace extracted air.
- ✓ Keep ducts short and simple, and avoid long sections of flexible duct.
- ✓ Provide an easy way of checking the control is working, e.g. airflow indicator or equivalent.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✓ Ensure that extracted air is cleaned before discharge to the environment.

Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/ installer, in effective and efficient working order and good repair.
- ✓ Maintain system at least on monthly basis.

Inspection, testing and examination

- ✓ Get information on the design performance of the LEV from the supplier. Keep this information to compare with future test results.
- ✓ Inspect the LEV at least once a month to ensure the equipment is functioning properly and effectively.
- ✓ Ensure the LEV is examined and tested against its performance specification by hygiene technician at least every 12 months.
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Clean work equipment, and the work area daily. Clean other equipment and the workroom regularly, once a week is recommended.
- ✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
- ✓ Store containers in a safe place and dispose off containers drums safely (refer CGS G101).
- ✓ Put lids on containers immediately after use.
- ✗ Do not clean up with a dry brush or compressed air.
- ✓ Vacuum dry dust or use wet cleaning method.

Personal protective equipment (PPE)

- ✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101and S102 for more specific advice. Refer to the SDS to see what PPE is necessary.
- ✓ Ask PPE supplier for advice on selection of suitable PPE.
- ✓ Respiratory protective equipment may be necessary for some cleaning and maintenance activities, e.g. cleaning up spills.
- ✓ Keep PPE clean, and replace it at recommended intervals.
- ✓ Store PPE in appropriate places to avoid contamination.

Training

- ✓ Give workers information on the risk of using the chemicals.
- ✓ Provide workers with training on:
  - handling chemicals safely;
  - how to use control equipment properly and ensure the control is working;
  - when and how to use any PPE provided;
  - any safe work procedure; and
  - what to do if something goes wrong.
- ✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

- ✓ Establish a system to monitor that control measures are in place and being followed.
- ✓ Provide supervision to ensure that safe work procedures are followed.

Worker's Checklist

- ☐ Make sure the LEV is switched on and is working.
- ☐ Make sure it is running properly.
- ☐ Look for signs of damage, wear or poor operation of any equipment used. If worker finds any problems, inform the supervisor. Do not carry on working if there is a problem.
- ☐ Wash hands before and after eating, drinking or using the washroom.
- ☐ Do not use solvents to clean skin.
- ☐ Clear up spills immediately. Follow spillage procedure.
- ☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

- Safety Data Sheets
- Guidelines on Occupational Safety and Health for Design, Inspection, Testing and Examination of Local Exhaust Ventilation System, DOSH 2008
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Guidelines on the Control of Chemicals Hazardous to Health, DOSH 2001
- Control Guidance Sheets G101, G204, S100, S101, S102 and R001

Useful links

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Control Approach 2

Spray Painting (Small Scale)
G220
Engineering Control

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

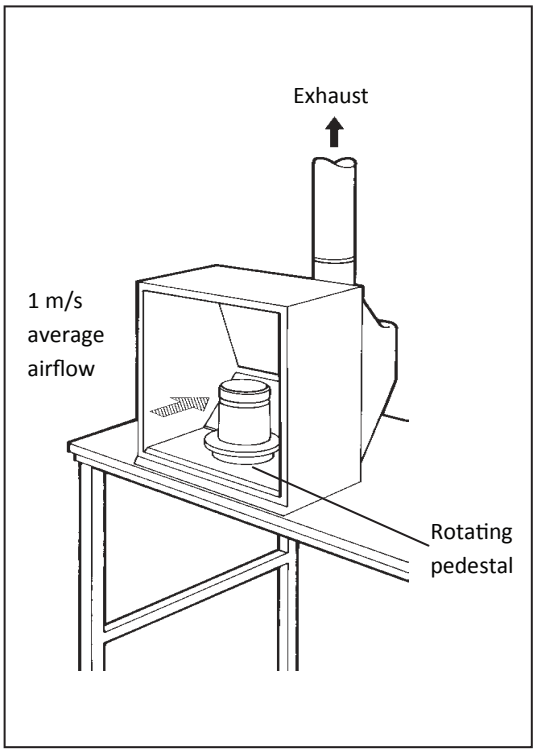
This sheet is used where the assessment recommends Control Approach 2 (Engineering control) as the suitable approach for chemical(s) and task(s). This sheet provides control measure and good practice recommendation for small-scale spray painting tasks. It describes the key points that need to be followed to help reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ Apply local exhaust ventilation (LEV) at the source of exposure to capture the airborne contaminant and enclose the process as much as possible.
- ✓ Airflow must be sufficient to control airborne contaminants effectively. This will depend on the design, size of opening and the type of process and chemicals being controlled.
- ✓ Ensure LEV equipment complies with the requirement of USECHH Regulations.
- ✓ Enclose the work area fully (refer figure). Make the enclosure deep enough to contain equipment and materials.
- ✓ Keep the open area as small as possible, while allowing enough room for safe working.
- ✓ Provide a turntable to make it easier to cover all surfaces.



Small scale spray painting

- ✗ Do not store items inside the ventilated area, they will obstruct the airflow.
- ✓ Provide good lighting. It should be suitable for the chemical(s) and task(s), e.g. dust tight or flameproof.
- ✓ Use filters to avoid paint deposits on electric motors, fan blades and ventilation ducts.
- ✓ Ensure large items do not obstruct the work opening.
- ✓ Consider where sprayed items are to be located whilst drying. A second ventilated area may be required.
- ✓ Where possible, locate the work area away from doors, windows and walkways to stop draughts interfering with the ventilation and spreading vapour.
- ✓ Provide an air supply to the workroom to replace extracted air.
- ✓ Provide an easy way of checking the control is working, e.g. airflow indicator or equivalent.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✗ With vapours, air re-circulation is not recommended.
- ✓ Ensure that extracted air is cleaned before discharge to the environment.

Maintenance

✓ Ensure all equipment used in the task is maintained as advised by the supplier/ installer, in effective and efficient working order and good repair.
✓ Maintain system at least on monthly basis.

Inspection, testing and examination

✓ Get information on the design performance of the LEV from the supplier. Keep this information to compare with future test results.
✓ Inspect the LEV at least once a month to ensure the equipment is functioning properly and effectively.
✓ Ensure that the LEV is examined and tested against its performance specification by hygiene technician at least every 12 months.
✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

✓ Clean work equipment, and the work area daily. Clean other equipment and the workroom regularly, once a week is recommended.
✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
✓ Store containers in a safe place and dispose off containers drums safely (refer CGS G101).
✓ Put lids on containers immediately after use.

Personal protective equipment (PPE)

✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100, S101and S102 for more specific advice. Refer to the SDS to see what PPE is necessary.
✓ Ask PPE supplier for advice on selection of suitable PPE.
✓ Respiratory protective equipment may be necessary for some cleaning and maintenance activities, e.g. cleaning up spills.
✓ Keep PPE clean, and replace it at recommended intervals.
✓ Store PPE in appropriate places to avoid contamination.

Training

✓ Give workers information on the risk of using the chemicals.
✓ Provide workers with training on:
  • handling chemicals safely;
  • how to use control equipment properly and ensure the control is working;
  • when and how to use any PPE provided;
  • any safe work procedure; and
  • what to do if something goes wrong.
✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

✓ Provide supervision to ensure that safe work procedures are followed.
✓ Establish a system to monitor that control measures are in place and being followed.

Worker's Checklist

☐ Make sure the LEV is switched on and is working.
☐ Make sure it is running properly.
☐ Look for signs of damage, wear or poor operation of any equipment used. If worker finds any problems, inform the supervisor. Do not carry on working if there is a problem.
☐ Make sure that paper bags and other waste material are not drawn into the ventilation duct.
☐ Make sure that large items do not obstruct the work opening.
☐ Wash hands before and after eating, drinking or using the washroom.
☐ Do not use solvents to clean skin.
☐ Clear up spills immediately. Follow spillage procedure.
☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

• Safety data sheets
• Guidelines on Occupational Safety and Health for Design, Inspection, Testing and Examination of Local Exhaust Ventilation System, DOSH 2008
• Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
• Guidelines on the Control of Chemicals Hazardous to Health, DOSH 2001
• Control Guidance Sheets G101, S100, S101, S102 and R001

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Control Approach 2

Spray Painting (Medium Scale)
G221
Engineering Control

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

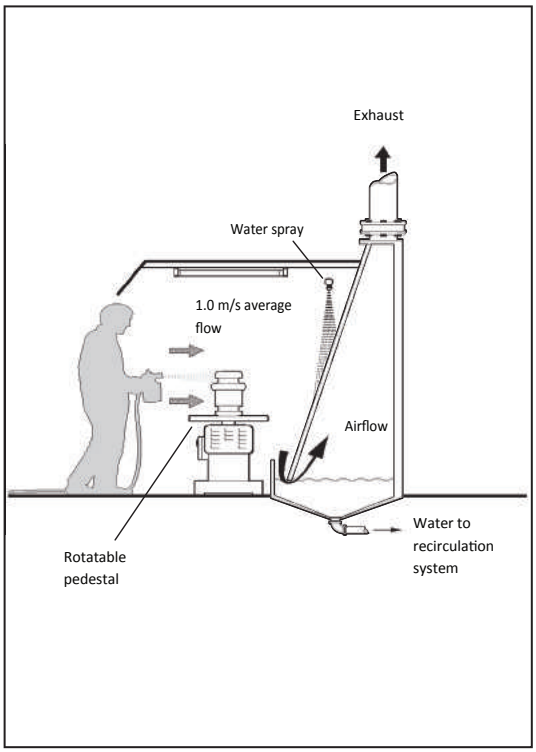
This sheet is used where the assessment recommends Control Approach 2 (Engineering control) as the suitable approach for chemical(s) and task(s). This sheet provides control measure and good practice recommendation on medium-scale spray painting tasks. It describes the key points that need to be followed to help reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ Use a spray booth to capture the airborne contaminants and enclose the process as much as possible. The booth should be large enough to contain all plant and equipment required for the process.
- ✓ Air should be exhausted from the booth across the full cross-sectional area.
- ✓ Airflow must be sufficient to control airborne contaminants effectively. This will depend on the design, size of opening and the type of process and chemical being controlled.
- ✓ Provide a turntable so that objects can be rotated and the operator does not need to spray into the airflow.
- ✓ Ensure that the water level in the reservoir is kept just above the base of the baffle (refer figure).



Medium scale spray painting

- ✓ Provide good lighting. It should be suitable for the chemical(s) and task, e.g. vapour tight or flameproof.
- ✓ Ensure large items do not obstruct the work opening.
- ✓ Consider where sprayed items are to be located whilst drying. A second ventilated area may be required.
- ✓ Where possible, locate the work area away from doors, windows and walkways to stop draughts interfering with the ventilation.
- ✓ Provide an air supply to the workroom to replace extracted air.
- ✓ Provide an easy way of checking the control is working, e.g. a airflow indicator or equivalent.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✓ Ensure that extracted air is cleaned before discharge to the environment.
- ✗ With vapours, air re-circulation is not recommended.

Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/ installer, in effective and efficient working order and good repair.
- ✓ Maintain system at least on monthly basis.

Inspection, testing and examination

- ✓ Get information on the design performance of the engineering control equipment from the supplier. Keep this information to compare with future test results.
- ✓ Inspect the engineering control equipment at least once a month to ensure the equipment is functioning properly and effectively.
- ✓ Ensure that the engineering control equipment is examined and tested against its performance specification by hygiene technician at least every 12 months.
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Clean work equipment, and the work area daily. Clean other equipment and the workroom regularly, once a week is recommended.
- ✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
- ✓ Store containers in a safe place and dispose off containers drums safely (refer CGS G101). Put lids on containers immediately after use.

Personal protective equipment (PPE)

- ✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101and S102 for more specific advice. Refer to the SDS to see what PPE is necessary.
- ✓ Ask PPE supplier for advice on selection of suitable PPE.
- ✓ Keep PPE clean, and replace it at recommended intervals.
- ✓ Store PPE in appropriate places to avoid contamination.

Training

- ✓ Give workers information on the risk of using the chemicals.
- ✓ Provide workers with training on:
  - handling chemicals safely;
  - how to use control equipment properly and ensure the control is working;
  - when and how to use any PPE provided;
  - any safe work procedure; and
  - what to do if something goes wrong.
- ✓ Training programme should be reviewed and conducted at least once in 2 years.

Supervision

Provide supervision to ensure that safe work procedures are followed.
Establish a system to monitor that control measures are in place and being followed.

Worker's Checklist

- ☐ Make sure the engineering control equipment is switched on and is working.
- ☐ Make sure it is running properly.
- ☐ Make sure the air movement is across or away from your face. Do not spray into the airflow.
- ☐ Look for signs of damage, wear or poor operation of any equipment used. If worker finds any problems, inform the supervisor. Do not carry on working if there is a problem.
- ☐ Check that the water in the reservoir is at the correct level.
- ☐ Make sure that paper bags and other waste material are not drawn into the ventilation duct.
- ☐ Make sure large items do not obstruct the work opening.
- ☐ Wash hands before and after eating, drinking or using the washroom.
- ☐ Do not use solvents to clean skin.
- ☐ Clear up spills immediately. Follow spillage procedure.
- ☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

- Safety Data Sheets
- Guidelines on Occupational Safety and Health for Design, Inspection, Testing and Examination of Local Exhaust Ventilation System, DOSH 2008
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- Guidelines on the Control of Chemicals Hazardous to Health, DOSH 2001
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Useful links

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Control Approach 2

Powder Coating (Medium Scale)
G222
Engineering Control

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

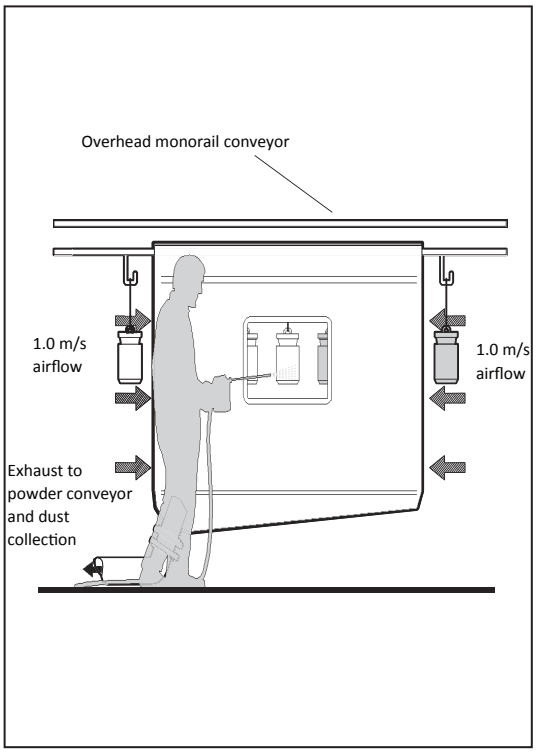
This sheet is used where the assessment recommends Control Approach 2 (Engineering control) as the suitable approach for chemical(s) and task(s). This sheet provides control measure and good practice recommendation on medium and large-scale powder coating tasks. It describes the key points that need to be followed to help reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to Safety Data Sheet (SDS) for more information

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ Use a spray booth to capture the airborne contaminants and enclose the process as much as possible (refer figure). The booth should have smooth and impervious internal surfaces with arrangements to contain and recycle overspray powder.
- ✓ Air should be exhausted from the booth across the full cross-sectional area.
- ✓ Airflow must be sufficient to control airborne contaminants effectively. This will depend on the design, size of opening and the type of process and chemical being controlled.
- ✓ Consider the use of 'air curtains' at the entrance and exit to contain dust.
- ✓ Use 'direct from box' powder feed systems where possible.



Powder coating unit

- ✓ Adjust the application equipment to minimize powder use.
- ✓ Ensure work pieces are properly earthed to maximize powder attraction and minimize overspray.
- ✓ Make the booth large enough to contain overspray.
- ✓ Keep the open areas as small as possible – while allowing enough room for safe working.
- ✓ Provide good lighting. It should be suitable for the chemical(s) and task(s) e.g. dust tight or flameproof.
- ✓ Consider the need for explosion relief for combustible solids, and ensure that all equipment is appropriately earthed.
- ✓ Ensure workers are properly trained, and avoid bad working practices such as leaning into the booth when spraying.
- ✓ Where possible, locate the work area away from doors, windows and walkways to stop draughts interfering with the ventilation.
- ✓ Provide an air supply to the workroom to replace extracted air.
- ✓ Provide an easy way of checking the control is working, e.g. a airflow indicator or equivalent.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✓ Ensure that extracted air is cleaned before discharge to the environment.

Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer.
- ✓ Keep all equipment in effective and efficient working order and good repair.
- ✓ Maintain system at least on monthly basis.

Inspection, testing and examination

- ✓ Get information on the design performance of the engineering control equipment from the supplier. Keep this information to compare with future test results.
- ✓ Inspect the engineering control equipment at least once a month to ensure the equipment is functioning properly and effectively.
- ✓ Ensure the engineering control equipment is examined and tested against its performance specification by hygiene technician at least every 12 months.
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Clean work equipment, and the work area daily. Clean other equipment and the workroom regularly, once a week is recommended.
- ✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
- ✓ Store containers in a safe place and dispose off containers drums safely (refer CGS G101).
- ✓ Put lids on containers immediately after use.
- ✗ Do not clean up with a dry brush or compressed air.
- ✓ Vacuum dry dust or use wet cleaning method.

Personal protective equipment (PPE)

- ✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100, S101and S102 for more specific advice. Refer to the SDS to see what PPE is necessary.
- ✓ Ask PPE supplier for advice on selection of suitable PPE.
- ✓ Keep PPE clean, and replace it at recommended intervals.
- ✓ Store PPE in appropriate places to avoid contamination.

Training

- ✓ Give workers information on the risk of using the chemicals.
- ✓ Provide workers with training on:
  - handling chemicals safely;
  - how to use control equipment properly and ensure the control is working;
  - when and how to use any PPE provided;
  - any safe work procedure; and
  - what to do if something goes wrong.
- ✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

- ✓ Provide supervision to ensure that safe work procedures are followed.
- ✓ Establish a system to monitor that control measures are in place and being followed.

Worker's Checklist

- ☐ Make sure the engineering control equipment is switched on and is working.
- ☐ Make sure it is running properly.
- ☐ Look for signs of damage, wear or poor operation of any equipment used. If worker finds any problem, inform the supervisor. Do not carry on working if there is a problem.
- ☐ Minimise the use of compressed air during booth cleaning.
- ☐ Do not lean into the booth during spraying or cleaning.
- ☐ Wash hands before and after eating, drinking or using the washroom.
- ☐ Clear up spills immediately. Follow spillage procedure.
- ☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

- Safety Data Sheets
- Guidelines on Occupational Safety and Health for Design, Inspection, Testing and Examination of Local Exhaust Ventilation System, DOSH 2008
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- Guidelines on the Control of Chemicals Hazardous to Health, DOSH 2001
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Control Approach 2

Batch Lamination
G223
Engineering Control

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

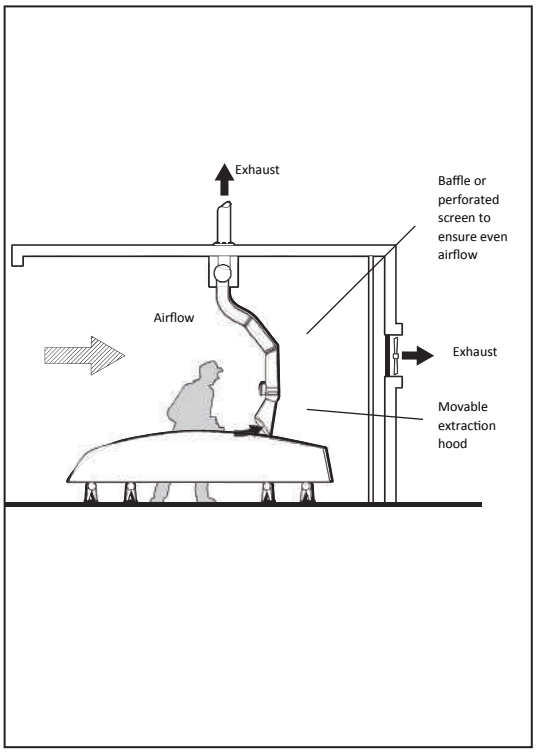
This sheet is used where the assessment recommends Control Approach 2 (Engineering control) as the suitable approach for chemical(s) and task(s).This sheet provides control measure and good practice recommendation on medium and large scale GRP (glass reinforced plastic) batch lamination. It describes the key points that need to be followed to help reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to the Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ Apply local exhaust ventilation (LEV) at the source of exposure to capture the airborne contaminant and enclose the process as much as possible.
- ✓ Airflow must be sufficient to control airborne contaminants effectively. This will depend on the design, size of opening and the type of process and chemical being controlled.
- ✓ Ensure LEV equipment complies with the requirement of USECHH Regulations.
- ✓ Ensure the air enters the work area across the full cross-sectional area of the room. A positive pressure plenum with diffusers should be considered.
- ✓ The inlet airflow should be low to avoid turbulence.
- ✓ Position the lay-up area so that air flows across the mould and generally across the body of the operator.



Batch lamination activity under an LEV system

- ✓ Provide movable LEV hoods as near to the source of vapour as possible.
- ✓ Ensure there are sufficient LEV hoods to cover the working areas.
- ✓ Design the enclosure in sections to allow easy access for cleaning and maintenance.
- ✓ Consider the use of 'air curtains' at the entrance and exit to contain dust.
- ✓ Keep extraction ducts short and simple - avoid long sections of flexible duct.
- ✓ Provide good lighting. It should be suitable for the chemical(s) and task(s), e.g. dust tight or flameproof.
- ✓ Where possible, site the work area away from doors, windows and walkways, to stop draughts interfering with the LEV and spreading the airborne contaminant.
- ✓ Provide an air supply to the workroom to replace extracted air.
- ✓ Provide an easy way of checking the control is working, e.g. airflow indicator or equivalent.
- ✓ Fit an indicator or alarm to show if filters have blocked or failed. Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✓ Always confirm that the extraction is turned on and working at the start of work.
- ✗ With vapours, re-circulation is not recommended.
- ✓ Ensure all components are appropriate for the materials being captured, ie suitable for explosive, corrosive and flammable substances.

✓ Consider the need for explosion relief for combustible solids, and ensure equipment is appropriately earthed.

Maintenance

✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer.
✓ Keep all equipment in effective and efficient working order and good repair.
✓ Maintain system at least on monthly basis.

Inspection, testing and examination

✓ Get information on the design performance of the LEV from the supplier. Keep this information to compare with future test results.
✓ Inspect the LEV at least once a month to ensure the equipment is functioning properly and effectively.
✓ Ensure the LEV is examined and tested against its performance specification by hygiene technician at least every 12 months.
✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

✓ Clean work equipment, and the work area daily. Clean other equipment and the workroom regularly, once a week is recommended.
✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
✓ Store containers in a safe place and dispose off containers drums safely (refer CGS G101).
✓ Put lids on containers immediately after use.
✗ Do not clean up with a dry brush or compressed air.
✓ Vacuum dry dust or use wet cleaning method.

Personal protective equipment (PPE)

✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101and S102 for more specific advice. Refer to the SDS to see what PPE is necessary.
✓ Ask PPE supplier for advice on selection of suitable PPE.
✓ Respiratory protective equipment may be necessary for some cleaning and maintenance activities, e.g. cleaning up spills. Refer CGS R001.
✓ Keep PPE clean, and replace it at recommended intervals.
✓ Store PPE in appropriate places to avoid contamination.

Training

✓ Give workers information on the risk of using the chemicals.
✓ Provide workers with training on:
- handling chemicals safely;
- how to use control equipment properly and ensure the control is working;
- when and how to use any PPE provided;
- any safe work procedure; and
- what to do if something goes wrong.

✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

✓ Provide supervision to ensure that safe work procedures are followed.
✓ Establish a system to monitor that control measures are in place and being followed.

Worker's Checklist

☐ Make sure the LEV is switched on and is working.
☐ Make sure it is running properly.
☐ Make sure the air movement is across or away from your face.
☐ Look for signs of damage, wear or poor operation of any equipment used. If worker finds any problems, inform the supervisor. Do not carry on working if there is a problem.
☐ Wash hands before and after eating, drinking or using the washroom.
☐ Do not use solvents to clean skin.
☐ Clear up spills immediately. Follow spillage procedure.
☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

- Safety Data Sheets
- Guidelines on Occupational Safety and Health for Design, Inspection, Testing and Examination of Local Exhaust Ventilation System, DOSH 2008
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Guidelines on the Control of Chemicals Hazardous to Health, DOSH 2001
- Control Guidance Sheets G101, S100, S101, S102 and R001

Useful links

- DOSH portal: https://www.dosh.gov.my
- SiRAC Online: sirac.dosh.gov.my
- HSE COSHH essentials website: https://www.hse.gov.uk/coshh/essentials/index.htm
- ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Control Approach 2

Continuous Lamination
G224
Engineering Control

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

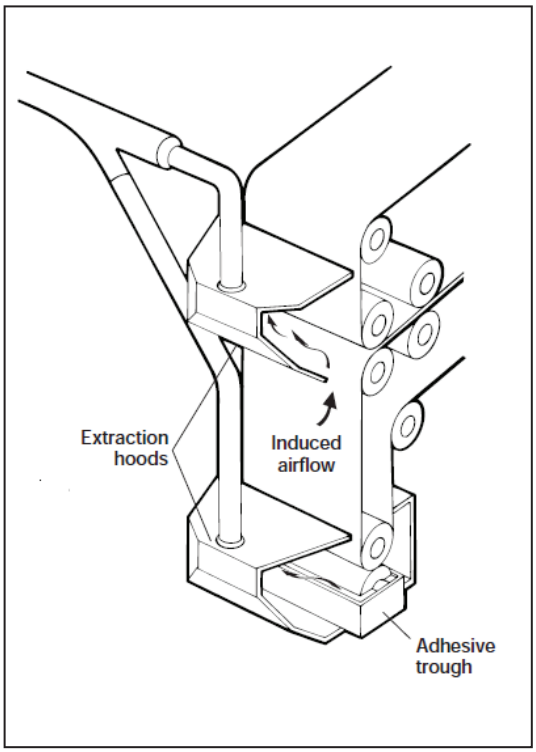
This sheet is used where the assessment recommends Control Approach 2 (Engineering control) as the suitable approach for chemical(s) and task(s). This sheet provides control measure and good practice recommendation on medium and large scale continuous lamination tasks. It describes the key points that need to be followed to help reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ Apply local exhaust ventilation (LEV) at the source of exposure to capture the airborne contaminant and enclose the process as much as possible.
- ✓ Airflow must be sufficient to control airborne contaminants effectively. This will depend on the design, size of opening and the type of process and substance being controlled.
- ✓ Ensure there are sufficient LEV hoods to cover the working areas.
- ✓ Ensure LEV equipment comply to the requirement of USECHH Regulations.
- ✓ Position the receiving hood as close to the source of vapour as possible (see illustration).
- ✓ Position the receiving hood to make maximum use of the airflow induced by the movement of the material.



Continuous lamination equipped with an LEV system

- ✓ The hood should extend to the full width of the material.
- ✓ The exhaust rate from the hood should exceed the air volume flowing into the hood.
- ✓ Design the enclosure in sections to allow easy access for cleaning and maintenance.
- ✓ Consider providing handling aids to minimise manual handling.
- ✓ Provide good lighting. It should be suitable for the nature of the chemical(s) and task(s), e.g. dust tight or flameproof, if needed.
- ✓ Additional ventilation may be required at the adhesive trough.
- ✓ Where possible, site the work area away from doors, windows and walkways to stop draught interfering with the ventilation and spreading the airborne contamination.
- ✓ Keep ducts short and simple, and avoid long sections of flexible duct.
- ✓ Provide an easy way of checking the control is working, e.g. airflow indicator or equivalent.
- ✓ Fit an indicator or alarm to show if filters have blocked or failed.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✓ Always confirm that the extraction is turned on and working at the start of work.

✓ Have a clean air supply coming into the workroom to replace extracted air.
✗ With vapours, air re-circulation is not recommended.
✓ Ensure all components are appropriate for the materials being captured, ie suitable for explosive, corrosive and flammable substances.
✓ Consider the need for explosion relief for combustible solids, and ensure equipment is appropriately earthed.

Maintenance

✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer.
✓ Keep all equipment in effective and efficient working order and good repair.
✓ Maintain system at least on monthly basis.

Inspection, testing and examination

✓ Get information on the design performance of the LEV from the supplier. Keep this information to compare with future test results.
✓ Inspect the LEV at least once a month to ensure the equipment is functioning properly and effectively.
✓ Ensure the LEV is examined and tested against its performance specification by hygiene technician at least every 12 months.
✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

✓ Clean work equipment, and the work area daily. Clean other equipment and the workroom regularly, once a week is recommended.
✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
✓ Store containers in a safe place and dispose off containers drums safely (refer CGS G101).
✓ Put lids on containers immediately after use.

Personal protective equipment (PPE)

✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101 and S102 for more specific advice. Refer to the SDS to get information on suitable PPE.
✓ Ask PPE supplier for advice on selection of suitable PPE.
✓ Respiratory protective equipment may be necessary for some cleaning and maintenance activities, e.g. cleaning up spills. Refer CGS R001 for more specific advice.
✓ Keep PPE clean, and replace it at recommended intervals.
✓ Store PPE in appropriate places to avoid contamination.

Training

✓ Give workers information on the risk of using the chemicals.
✓ Provide workers with training on:
- handling chemicals safely;
- how to use control equipment properly and ensure the control is working;
- when and how to use any PPE provided;
- any safe work procedure; and
- what to do if something goes wrong.

✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

✓ Provide supervision to ensure that safe work procedures are followed.
✓ Establish a system to monitor that control measures are in place and being followed.

Worker's Checklist

☐ Make sure the LEV is switched on and is working.
☐ Make sure it is running properly; check the airflow indicator or other equipment;
☐ Look for signs of damage, wear or poor operation of any equipment used. If worker finds any problems, inform the supervisor. Do not carry on working if there is a problem.
☐ Make sure that paper bags and other waste material are not drawn into the ventilation duct.
☐ Wash hands before and after eating, drinking or using the washroom.
☐ Do not use solvents to clean skin.
☐ Clear up spills immediately. Follow spillage procedure.
☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

- Safety Data Sheets
- Guidelines on Occupational Safety and Health for Design, Inspection, Testing and Examination of Local Exhaust Ventilation System, DOSH 2008.
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Guidelines on the Control of Chemicals Hazardous to Health, DOSH 2001
- Control Guidance Sheets G101, S100, S101, S102

Useful links

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Control Approach 2

Pickling Bath (Medium Scale)
G225
Engineering Control

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

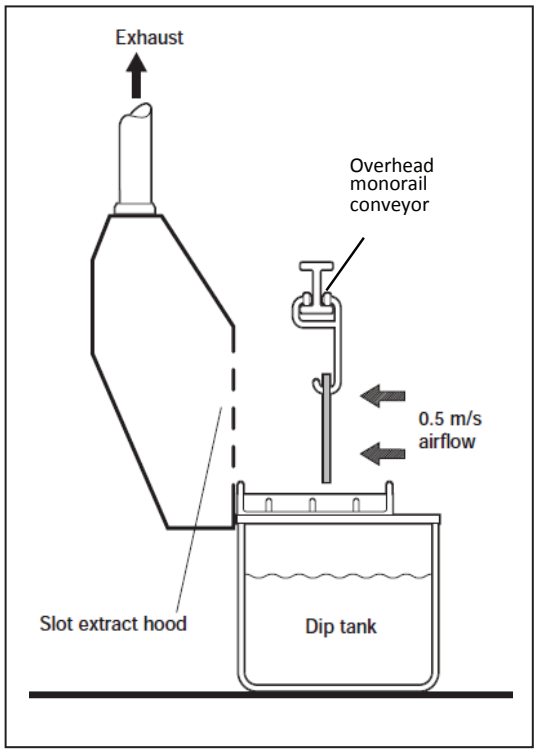
This sheet is used where the assessment recommends Control Approach 2 (Engineering control) as the suitable approach for chemical(s) and task(s). This sheet provides control measure and good practice recommendation on pickling using medium-scale pickling bath. It describes the key points that need to be followed to help reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ Apply local exhaust ventilation (LEV) at the source of exposure to capture the airborne contaminant and enclose the process as much as possible.
- ✓ Airflow must be sufficient to control airborne contaminants effectively. This will depend on the design, size of opening and the type of process and chemicals being controlled.
- ✓ Ensure LEV equipment complies with the requirement of USECHH Regulations.
- ✗ Avoid the use of air agitation for the tank.
- ✓ Ensure replacement air is supplied evenly across the tank.
- ✓ Consider the need for corrosion resistant ductwork and hoods.
- ✓ Ensure the incompatible exhaust gas are segregated, such as acidic vapours, alkali mists etc.



Pickling bath equipped with an LEV (push-pull system)

- ✓ Consider using plastic balls/beads, anti-foams or chips etc to reduce vapour and mist formation on the surface of the tank.
- ✓ For an electroplating bath, select plating solutions that reduce electrode gassing.
- ✓ Design the enclosure in sections to allow easy access for cleaning and maintenance.
- ✓ Where possible, locate the work area away from doors, windows and walkway to stop draught interfering with the ventilation and spreading the airborne contaminant.
- ✓ Keep ducts short and simple, and avoid long sections of flexible duct.
- ✓ Provide an easy way of checking the control is working, e.g. airflow indicator or equivalent.
- ✓ Fit an indicator or alarm to show if filters have blocked or failed.
- ✓ Always confirm that the extraction is turned on and working at the start of work. Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✗ With vapours, air re-circulation is not recommended.
- ✓ Ensure all components are appropriate for the materials being captured, i.e. suitable for explosive, corrosive and flammable substances.
- ✓ Consider the need for explosion relief for combustible solids, and ensure equipment is appropriately earthed.

Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer.
- ✓ Keep all equipment in effective and efficient working order and good repair.
- ✓ Maintain system at least on monthly basis.

Inspection, testing and examination

- ✓ Get information on the design performance of the LEV from the supplier. Keep this information to compare with future test results.
- ✓ Inspect the LEV at least once a month to ensure the equipment is functioning properly and effectively.
- ✓ Ensure the LEV is examined and tested against its performance specification by hygiene technician at least every 12 months.
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Clean work equipment and the work area daily. Clean other equipment and the workroom regularly, once a week is recommended.
- ✓ Clean the interior of the tank from the outside using long handled tools, with the extraction on. Do not lean into the bath to remove debris.
- ✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure. Store containers in a safe place and dispose off containers drums safely (refer CGS G101).
- ✓ Put lids on containers immediately after use.

Personal protective equipment (PPE)

- ✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101 and S102 for more specific advice. Refer to the SDS to get information on suitable PPE.
- ✓ Ask PPE supplier for advice on selection of suitable PPE.
- ✓ Respiratory protective equipment may be necessary for some cleaning and maintenance activities, e.g. cleaning up spills. Refer CGS R001 for more specific advice.
- ✓ Keep PPE clean, and replace it at recommended intervals.
- ✓ Store PPE in appropriate places to avoid contamination.

Training

- ✓ Give workers information on the risk of using the chemicals.
- ✓ Provide workers with training on:
  - handling chemicals safely;
  - how to use control equipment properly and ensure the control is working;
  - when and how to use any PPE provided;
  - any safe work procedure; and
  - what to do if something goes wrong.
- ✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

- ✓ Provide supervision to ensure that safe work procedures are followed.
- ✓ Establish a system to monitor that control measures are in place and being followed.

Worker's Checklist

- ☐ Make sure the LEV is switched on and is working.
- ☐ Make sure it is running properly, check the airflow indicator or other equipment.
- ☐ Look for signs of damage, wear or poor operation of any equipment used. If worker finds any problems, inform the supervisor. Do not carry on working if there is a problem.
- ☐ Make sure that paper bags and other waste material are not drawn into the ventilation duct.
- ☐ Make sure that the tanks are covered when not in use.
- ☐ Wash hands before and after eating, drinking or using the washroom.
- ☐ Do not use solvents to clean skin.
- ☐ Clear up spills immediately. Follow spillage procedure.
- ☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

- Safety Data Sheets
- Guidelines on Occupational Safety and Health for Design, Inspection, Testing and Examination of Local Exhaust Ventilation System, DOSH 2008
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Guidelines on the Control of Chemicals Hazardous to Health, DOSH 2001
- Control Guidance Sheets G101, S100, S101, S102 and R001

Useful links

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- ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Control Approach 2

Pickling Bath (Large Scale)
G226
Engineering Control

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

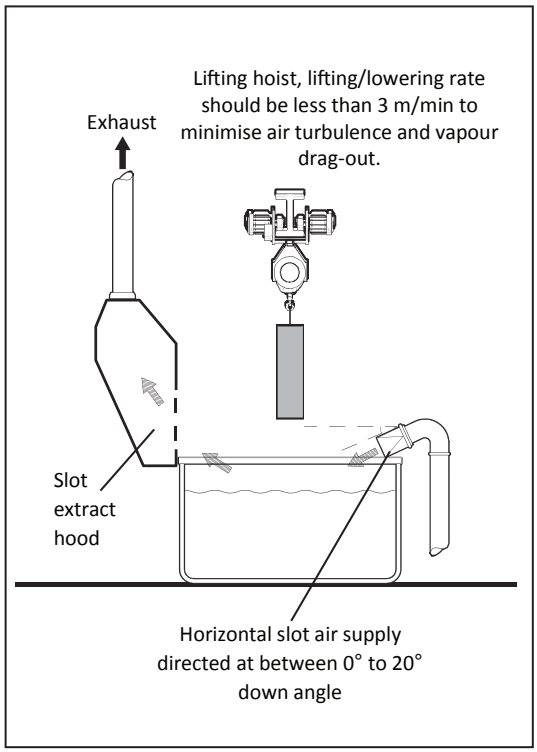
This sheet is used where the assessment recommends Control Approach 2 (Engineering control) as the suitable approach for chemical(s) and task(s). This sheet provides control measure and good practice recommendation on pickling using a large-scale pickling bath. It describes the key points that need to be followed to help reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ Apply local exhaust ventilation (LEV) at the source of exposure to capture the airborne contaminant and enclose the process as much as possible.
- ✓ Airflow must be sufficient to control airborne contaminants effectively. This will depend on the design, size of opening and the type of process and chemicals being controlled.
- ✓ Ensure LEV equipment complies with the requirement of USECHH Regulations.
- ✓ Ensure jet airflow across the surface of the tank directs the vapour, mist etc away from the operator.
- ✗ Avoid the use of air agitation for the tank.
- ✓ Consider a partial cover for the tank.
- ✓ Consider the need for corrosion resistant ductwork and hoods.



Pickling bath equipped with an LEV (push-pull system)

- ✓ Ensure incompatible exhaust gases are segregated, such as acidic vapours, alkali mists, oil vapour etc.
- ✓ Consider using plastic balls/beads, anti-foams or chips etc to reduce vapour and mist formation on the surface of the tank.
- ✓ For an electroplating bath, select plating solutions that reduce electrode gassing.
- ✓ Design the enclosure in sections to allow easy access for cleaning and maintenance.
- ✓ Avoid manual handling. Consider mechanical/ pneumatic assistance.
- ✓ Where possible, locate the work area away from doors, windows and walkways to stop draughts interfering with the ventilation and spreading the airborne contaminant.
- ✓ Provide an air supply to the workroom to replace extracted air.
- ✓ Keep ducts short and simple, and avoid long sections of flexible duct.
- ✓ Provide an easy way of checking the control is working, e.g. airflow indicator or equivalent. Fit an indicator or alarm to show if filters have blocked or failed.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✓ Always confirm that the extraction is turned on and working at the start of work.
- ✓ Have a clean air supply coming into the

workroom to replace extracted air.
✗ With vapours, air re-circulation is not recommended.
✓ Ensure all components are appropriate for the materials being captured, i.e. suitable for explosive, corrosive and flammable chemicals.

Maintenance

✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer.
✓ Keep all equipment in effective and efficient working order and good repair.
✓ Maintain system at least on monthly basis.

Inspection, testing and examination

✓ Get information on the design performance of the LEV from the supplier. Keep this information to compare with future test results.
✓ Inspect the LEV at least once a month to ensure the equipment is functioning properly and effectively.
✓ Ensure the LEV is examined and tested against its performance specification by hygiene technician at least every 12 months.
✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

✓ Clean work equipment, and the work area daily. Clean other equipment and the workroom regularly, once a week is recommended.
✓ Clean the interior of the tank from the outside using long handled tools, with the extraction on. Do not lean into the bath to remove debris
✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure. Store containers in a safe place and dispose off containers drums safely (refer CGS G101).
✓ Put lids on containers immediately after use.

Personal protective equipment (PPE)

✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101and S102 for more specific advice. Refer to the SDS to get information on suitable PPE.
✓ Ask PPE supplier for advice on selection of suitable PPE.
✓ Respiratory protective equipment may be necessary for some cleaning and maintenance activities, e.g. cleaning up spills. Refer CGS R001 for more specific advice.
✓ Keep PPE clean, and replace it at recommended intervals.
✓ Store PPE in appropriate places to avoid contamination.

Training

✓ Give workers information on the risk of using the chemicals.
✓ Provide workers with training on:
- handling chemicals safely;
- how to use control equipment properly and ensure the control is working;
- when and how to use any PPE provided;
- any safe work procedure; and
- what to do if something goes wrong.

✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

✓ Provide supervision to ensure that safe work procedures are followed.
✓ Establish a system to monitor that control measures are in place and being followed.

Worker's Checklist

☐ Make sure the LEV is switched on and is working.
☐ Make sure it is running properly; check airflow indicator or other equipment.
☐ Look for signs of damage, wear or poor operation of any equipment used. If worker finds any problems, inform the supervisor. Do not carry on working if there is a problem.
☐ Make sure the tanks are covered when not in use.
☐ Wash hands before and after eating, drinking or using the washroom.
☐ Do not use solvents to clean skin.
☐ Clear up spills immediately. Follow spillage procedure.
☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

- Safety Data Sheets
- Guidelines on Occupational Safety and Health for Design, Inspection, Testing and Examination of Local Exhaust Ventilation System, DOSH 2008
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Guidelines on the Control of Chemicals Hazardous to Health, DOSH 2001
- Control Guidance Sheets G101, S100, S101, S102 and R001

Useful links

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- HSE COSHH essentials website: https://www.hse.gov.uk/coshh/essentials/index.htm
- ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Control Approach 2

Vapour Degreasing Bath
G227
Engineering Control

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

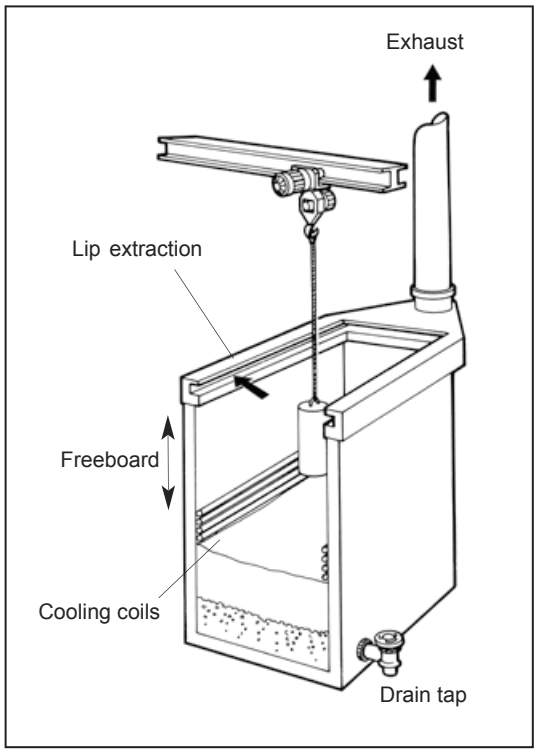
This sheet is used where the assessment recommends Control Approach 2 (Engineering control) as the suitable approach for chemical(s) and task(s). This sheet provides good practice advice on medium and large-scale vapour degreasing baths. It describes the key points that need to be followed to help reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ Ensure the bath has rim ventilation.
- ✓ The freeboard height (refer figure) should be at least 75% of the width of the open area of the bath.
- ✓ Allow components to fully dry in the freeboard zone.
- ✓ Cover the bath when not in use.
- ✓ Ensure operators are trained not to withdraw work pieces too quickly from the bath as this will drag out vapour.
- ✓ Ensure the bath has a bottom drain for removing the solvent.
- ✓ Set the bath thermostat correctly and balance the heating and cooling systems so as not to overload the cooling coils.
- ✓ Where possible, locate the work area away from doors, windows and walkways to stop draught interfering with the ventilation and spreading vapour.



Vapour degreasing bath equipped an LEV (push-pull system)

- ✓ Provide an air supply to the workroom to replace extracted air.
- ✓ Keep ducts short and simple, and avoid long sections of flexible duct.
- ✓ Provide an easy way of checking the control is working, e.g. airflow indicator or equivalent.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✓ Ensure that extracted air is cleaned before discharge to the environment.
- ✗ With vapours, re-circulation is not recommended.

Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer. Keep all equipment in effective and efficient working order and good repair.
- ✓ Maintain system at least on monthly basis.

Inspection, testing and examination

- ✓ Get information on the design performance of the equipment from the supplier. Keep this information to compare with future test results.
- ✓ Inspect the equipment at least once a month to ensure the equipment is functioning properly and effectively.
- ✓ Ensure the engineering control equipment is examined and tested against its performance specification by hygiene technician at least every 12 months.
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Clean work equipment and the work area daily. Clean other equipment and the workroom regularly, once a week is recommended.
- ✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
- ✓ Store containers in a safe place and dispose off containers drums safely (refer CGS G101).
- ✓ Put lids on containers immediately after use.

Personal protective equipment (PPE)

- ✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101 and S102 for more specific advice. Refer to the SDS to get information on suitable PPE.
- ✓ Ask PPE supplier for advice on selection of suitable PPE.
- ✓ Respiratory protective equipment may be necessary for some cleaning and maintenance activities, e.g. cleaning up spills. Refer CGS R001 for more specific advice.
- ✓ Keep PPE clean, and replace it at recommended intervals.
- ✓ Store PPE in appropriate places to avoid contamination.

Training

- ✓ Give workers information on the risk of using the chemicals.
- ✓ Provide workers with training on:
  - handling chemicals safely;
  - how to use control equipment properly and ensure the control is working;
  - when and how to use any PPE provided;
  - any safe work procedure; and
  - what to do if something goes wrong.
- ✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

- ✓ Provide supervision to ensure that safe work procedures are followed.
- ✓ Establish a system to monitor that control measures are in place and being followed.

Worker's Checklist

- ☐ Make sure the ventilation and cooling system are switched on and are working.
- ☐ Make sure it is running properly.
- ☐ Look for signs of damage, wear or poor operation of any equipment used. If worker finds any problems, inform the supervisor. Do not carry on working if there is a problem.
- ☐ Do not withdraw work pieces too quickly from the bath.
- ☐ Make sure the vapour degreasing baths are covered when not in use.
- ☐ Do not enter a vapour degreasing bath to clean it without taking suitable precautions.
- ☐ Wash hands before and after eating, drinking or using the washroom.
- ☐ Do not use solvents to clean skin.
- ☐ Clear up spills immediately. Follow spillage procedure.
- ☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

- Safety Data Sheets
- Guidelines on Occupational Safety and Health for Design, Inspection, Testing and Examination of Local Exhaust Ventilation System, DOSH 2008
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Guidelines on the Control of Chemicals Hazardous to Health, DOSH 2001
- Control Guidance Sheets G101, S100, S101, S102 and R001

Useful links

- DOSH portal: https://www.dosh.gov.my
- SiRAC Online: sirac.dosh.gov.my
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Control Approach 2

Tray Drying Oven
G228
Engineering Control

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

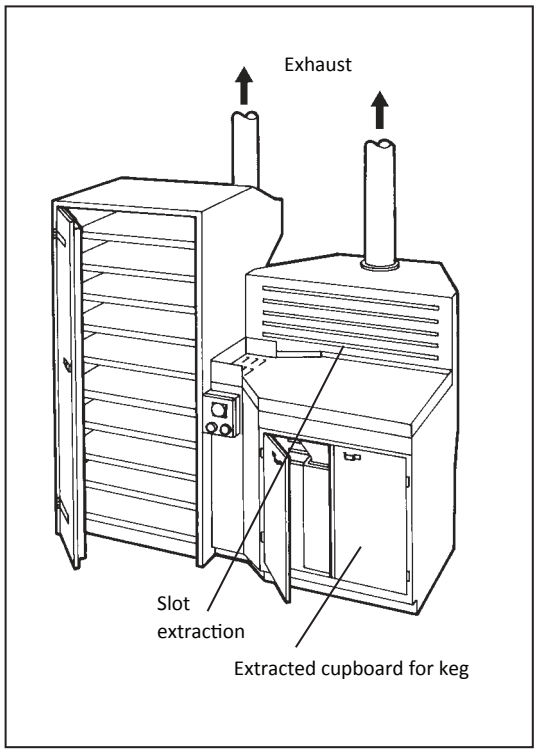
This sheet is used where the assessment recommends Control Approach 2 (Engineering control) as the suitable approach for chemical(s) and task(s). This sheet provides control measure and good practice recommendation on medium scale drying tasks using a tray drying oven. It describes the key points that need to be followed to help reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ Apply local exhaust ventilation (LEV) at the source of exposure to capture the airborne contaminant and enclose the process as much as possible.
- ✓ LEV should be applied to the oven to remove vapour generated during drying.
- ✓ Airflow must be sufficient to control airborne contaminants effectively. This will depend on the design, size of opening and the type of process and chemical being controlled.
- ✓ Ensure LEV equipment comply to the requirement of USECHH Regulations.
- ✓ Provide arrangements for filling and emptying trays.
- ✓ Provide LEV at the tray emptying point (refer figure).
- ✓ Oven doors should be sturdy and close securely.
- ✓ Oven ventilation should be sufficient to maintain the oven at a lower pressure than the surrounding air.



Tray drying oven equipped with LEV system

- ✓ Where flammable solvents are used, the ventilation of the oven should be sufficient to ensure that the solvent vapour in air concentration never exceeds 25% of the lower explosive limit. Refer to the Safety Data Sheet for information.
- ✓ Ensure the workers are trained not to withdraw work pieces too quickly from the bath as this will drag out vapour.
- ✓ Explosion relief should be provided on the oven if flammable solvents are used, and should also be considered for combustible solids.
- ✓ Where possible, locate the work area away from doors, windows and walkways to stop draughts interfering with the ventilation and spreading vapour.
- ✓ Provide an air supply to the workroom to replace extracted air.
- ✓ Provide an easy way of checking the control is working, e.g. airflow indicator or equivalent.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✓ For dusts, clean filtered air can be recirculated to the workroom.
- ✗ With vapours, air re-circulation is not recommended.

Maintenance

✓ Ensure all equipment used in the task is maintained as advised by supplier/installer
✓ Keep all equipment in effective and efficient working order and good repair.
✓ Maintain system at least on monthly basis.

Inspection, testing and examination

✓ Get information on the design performance of the LEV from the supplier. Keep this information to compare with future test results.
✓ Inspect the LEV at least once a month to ensure the equipment is functioning properly and effectively.
✓ Ensure the LEV is examined and tested against its performance specification by hygiene technician at least every 12 months.
✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

✓ Clean work equipment, and the work area daily. Clean other equipment and the workroom regularly, once a week is recommended.
✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
✓ Store containers in a safe place and dispose off containers drums safely (refer CGS G101).
✓ Put lids on containers immediately after use.

Personal protective equipment (PPE)

✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101 and S102 for more specific advice. Refer to the SDS to see what PPE is necessary.
✓ Ask PPE supplier for advice on selection of suitable PPE.
✓ Respiratory protective equipment may be necessary for some cleaning and maintenance activities, e.g. cleaning up spills. Refer CGS R001 for more specific advice.
✓ Keep PPE clean, and replace it at recommended intervals.
✓ Store PPE in appropriate places to avoid contamination.

Training

✓ Give workers information on the risk of using the chemicals.
✓ Provide workers with training on:
  • handling chemicals safely;
  • how to use control equipment properly and ensure the control is working;
  • when and how to use any PPE provided;
  • any safe work procedure; and
  • what to do if something goes wrong.
✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

✓ Provide supervision to ensure that safe work procedures are followed.
✓ Establish a system to monitor that control measures are in place and being followed.

Worker's Checklist

☐ Make sure the LEV is switched on and is working.
☐ Make sure it is running properly.
☐ Look for signs of damage, wear or poor operation of any equipment used. If worker finds any problems, inform the supervisor. Do not carry on working if there is a problem.
☐ Make sure that paper bags and other waste material are not drawn into the ventilation duct.
☐ Wash hands before and after eating, drinking or using the washroom.
☐ Do not use solvents to clean skin.
☐ Clear up spills immediately. Follow spillage procedure.
☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

• Safety Data Sheets
• Guidelines on Occupational Safety and Health for Design, Inspection, Testing and Examination of Local Exhaust Ventilation System, DOSH 2008
• Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
• Guidelines on the Control of Chemicals Hazardous to Health, DOSH 2001
• Control Guidance Sheets G101, S100, S101, S102 and R001

Useful links

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Control Approach 2

Continuous Drying Labyrinth Oven
G229
Engineering Control

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

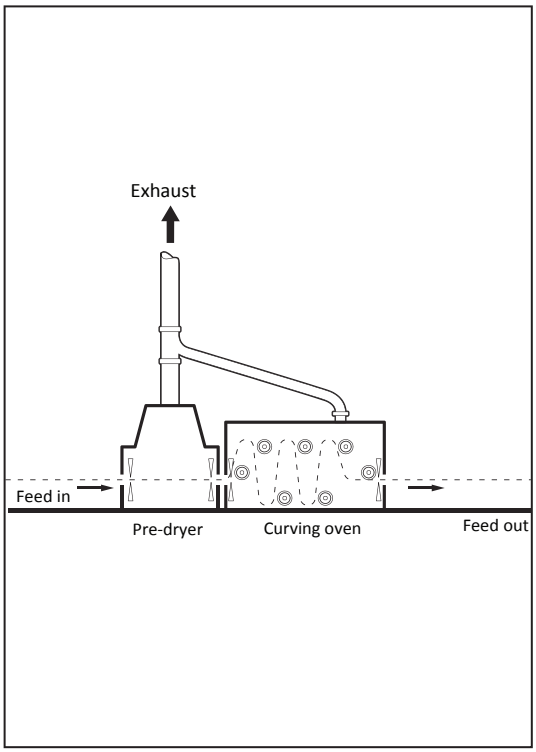
This sheet is used where the assessment recommends Control Approach 2 (Engineering control) as the suitable approach for chemical(s) and task(s). This sheet provides control measure and good practice recommendation on medium and large scale drying tasks using a continous drying labyrinth oven. It describes the key points that need to be followed to help reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to the Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ Apply local exhaust ventilation (LEV) at the source of exposure to capture the airborne contaminant and enclose the process as much as possible.
- ✓ Airflow must be sufficient to control airborne contaminants effectively. This will depend on the design, size of opening and the type of process and chemical being controlled.
- ✓ Ensure LEV complies with the requirement of USECHH Regulations.
- ✓ Design the enclosure in sections to allow easy access for cleaning and maintenance.
- ✓ Good thermal insulation should be applied.
- ✓ Air knives should be applied to the entry and exit points to the pre-dryer and labyrinth oven (to prevent vapour loss and contamination).



Continuous drying labyrinth oven

- ✓ Lights/signs should clearly indicate when the oven is in use.
- ✓ Exhaust ventilation systems should be easily controllable, interlocked to the oven heating controls and fitted with warning lights/alarms.
- ✓ When the oven is in use, the extraction should be balanced to a minimum level to maintain a slight negative pressure within the oven. Airflow should be sufficient to ensure that vapour concentrations within the oven are kept well below lower explosive concentration limits (refer to the SDS).
- ✓ Where flammable solvents are used, the ventilation of the oven should be sufficient to ensure that the solvent vapour in air concentration never exceeds 25% of the lower explosive limit. Refer to the SDS for information.
- ✓ Explosion relief should be provided on the oven if flammable solvents are used.
- ✓ Where possible, locate the work area away from doors, windows and walkways to stop draughts interfering with the ventilation and spreading vapour.
- ✓ Provide an air supply to the workroom to replace extracted air.
- ✓ Provide an easy way of checking the control is working, e.g. airflow indicator or equivalent.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✓ Ensure that extracted air is cleaned before discharge

to the environment.
✗ With vapours, air re-circulation is not recommended.

Maintenance

✓ Ensure all equipment used in the task is maintained as advised by supplier/installer, in effective and efficient working order and good repair.
✓ Maintain system at least on monthly basis.

Inspection, testing and examination

✓ Get information on the design performance of the LEV from the supplier. Keep this information to compare with future test results.
✓ Inspect the LEV at least once a month to ensure the equipment is functioning properly and effectively.
✓ Ensure the LEV is examined and tested against its performance specification by hygiene technician at least every 12 months.
✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

✓ Clean work equipment, and the work area daily. Clean other equipment and the workroom regularly - once a week is recommended.
✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
✓ Store containers in a safe place and dispose off containers drums safely (refer CGS G101).
✓ Put lids on containers immediately after use.

Personal protective equipment (PPE)

✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101and S102 for more specific advice. Refer to the SDS to see what PPE is necessary.
✓ Ask PPE supplier for advice on selection of suitable PPE.
✓ Respiratory protective equipment may be necessary for some cleaning and maintenance activities, e.g. cleaning up spills. Refer CGS R001 for more specific advice.
✓ Keep PPE clean, and replace it at recommended intervals.
✓ Store PPE in appropriate places to avoid contamination.

Training

✓ Give workers information on the risk of using the chemicals.
✓ Provide workers with training on:
- handling chemicals safely;
- how to use control equipment properly and ensure the control is working;
- when and how to use any PPE provided;
- any safe work procedure; and
- what to do if something goes wrong.

✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

✓ Provide supervision to ensure that safe work procedures are followed.
✓ Establish a system to monitor that control measures are in place and being followed.

Worker's Checklist

☐ Make sure the LEV is switched on and is working.
☐ Make sure it is running properly.
☐ Look for signs of damage, wear or poor operation of any equipment used. If worker finds any problems, inform the supervisor. Do not carry on working if there is a problem.
☐ Wash hands before and after eating, drinking or using the washroom.
☐ Do not use solvents to clean skin.
☐ Clear up spills immediately. Follow spillage procedure.
☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information
- Safety Data Sheets
- Guidelines on Occupational Safety and Health for Design, Inspection, Testing and Examination of Local Exhaust Ventilation System, DOSH 2008
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Guidelines on the Control of Chemicals Hazardous to Health, DOSH 2001
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Control Approach 2

Palletising
G230
Engineering Control

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

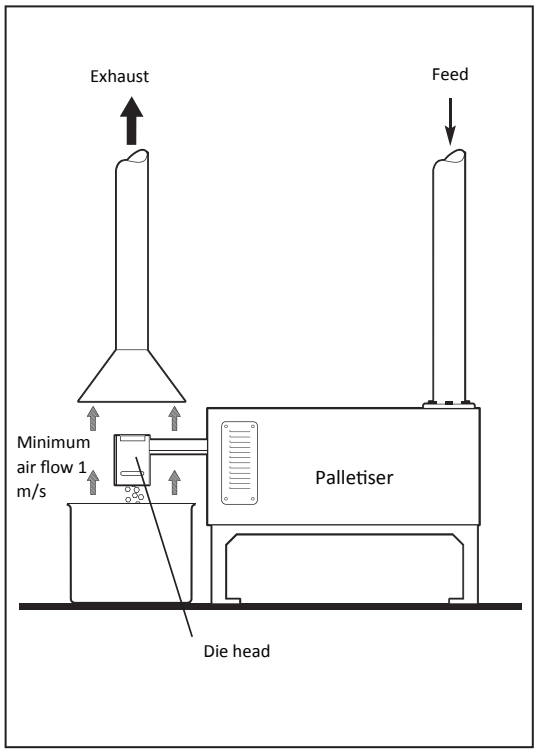
This sheet is used where the assessment recommends Control Approach 2 (Engineering control) as the suitable approach for chemical(s) and task(s). This sheet provides control measure and good practice recommendation on palletising medium and large scale quantities of solids. It describes the key points that need to be followed to help reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to the Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ Apply local exhaust ventilation (LEV) at the source of exposure to capture the airborne contaminant and enclose the process as much as possible.
- ✓ Airflow must be sufficient to control airborne contaminants effectively. This will depend on the design, size of opening and the type of process and chemical being controlled.
- ✓ Ensure LEV comply to the requirement of USECHH Regulations.
- ✓ Design the enclosure in sections to allow easy access for cleaning and maintenance.
- ✓ Position the exhaust hood close to and over the discharge point.
- ✓ If necessary, provide articulated joints in the exhaust duct to allow the hood to be moved, e.g. to allow good access to the pelletising head for maintenance



Palletising

or repair. Alternatively, a short section of flexible duct may be used.

- ✓ Ensure that safeguards are provided to minimise the risks arising from other hazards, e.g. contacts with hot surfaces and ejection of liquid under high pressure.
- ✓ Where flammable solvents are used, the ventilation of the oven should be sufficient to ensure that the solvent vapour in air concentration never exceeds 25% of the lower explosive limit. Refer to the SDS for information.
- ✓ Provide good lighting. It should be suitable for the chemical(s) and task, e.g. dust tight or flameproof.
- ✓ Where possible, locate the work area away from doors, windows and walkways to stop draughts interfering with the ventilation and spreading dust or vapour.
- ✓ Provide an air supply to the workroom to replace extracted air.
- ✓ Keep ducts short and simple, and avoid long sections of flexible duct.
- ✓ Provide an easy way of checking the control is working, e.g. airflow indicator or equivalent.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✓ Ensure that extracted air is cleaned before discharge to the environment.
- ✗ With vapours, re-circulation is not recommended.

Maintenance

✓ Ensure all equipment used in the task is maintained as advised by supplier/installer, in effective and efficient working order and good repair.
✓ Maintain system at least on monthly basis.

Inspection, testing and examination

✓ Get information on the design performance of the LEV from the supplier. Keep this information to compare with future test results.
✓ Inspect the LEV at least once a month to ensure the equipment is functioning properly and effectively.
✓ Ensure the LEV is examined and tested against its performance specification by hygiene technician at least every 12 months.
✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

✓ Clean work equipment, and the work and daily. Clean other equipment and the workroom regularly, once a week is recommended.
✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
✓ Store containers in a safe place and dispose off containers drums safely (refer CGS G101).
✓ Put lids on containers immediately after use.

Personal protective equipment (PPE)

✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101 and S102 for more specific advice. Refer to the SDS to get information on suitable PPE.
✓ Ask PPE supplier for advice on selection of suitable PPE.
✓ Respiratory protective equipment may be necessary for some cleaning and maintenance activities, e.g. cleaning up spills. Refer CGS R001 for more specific advice.
✓ Keep PPE clean, and replace it at recommended intervals.
✓ Store PPE in appropriate places to avoid contamination.

Training

✓ Give workers information on the risk of using the chemicals.
✓ Provide workers with training on:
  • handling chemicals safely;
  • how to use control equipment properly and ensure the control is working;
  • when and how to use any PPE provided;
  • any safe work procedure; and
  • what to do if something goes wrong.
✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

✓ Provide supervision to ensure that safe work procedures are followed.
✓ Establish a system to monitor that control measures are in place and being followed.

Worker's Checklist

☐ Make sure the LEV is switched on and is working.
☐ Make sure it is running properly.
☐ Look for signs of damage, wear or poor operation of any equipment used. If worker finds any problems, inform the supervisor. Do not carry on working if there is a problem.
☐ Make sure that paper bags and other waste material are not drawn into the ventilation duct.
☐ Wash hands before and after eating, drinking or using the washroom.
☐ Do not use solvents to clean skin.
☐ Clear up spills immediately. Follow spillage procedure.
☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

• Safety Data Sheets
• Guidelines on Occupational Safety and Health for Design, Inspection, Testing and Examination of Local Exhaust Ventilation System, DOSH 2008
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• Guidelines on the Control of Chemicals Hazardous to Health, DOSH 2001
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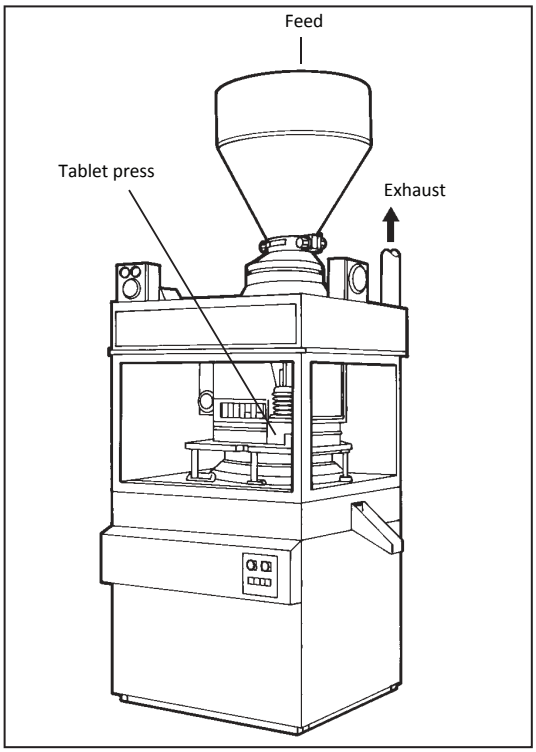
Control Approach 2

Tablet Press
G231
Engineering Control

This guidance sheet is aimed at employers to help them comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

This sheet is used where the assessment recommends Control Approach 2 (Engineering control) as the suitable approach for chemical(s) and task(s). This sheet provides good practice advice on pressing tablets from medium-scale quantities of solids. It describes the key points that need to be followed to help reduce exposure to an adequate level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to the Safety Data Sheet (SDS) for more information.



Tablet press

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ Apply local exhaust ventilation (LEV) at the source of exposure to capture the airborne contaminant and enclose the process as much as possible.
- ✓ Airflow must be sufficient to control airborne contaminants effectively. This will depend on the design, size of opening and the type of process and chemical being controlled.
- ✓ Ensure LEV comply to the requirement of USECHH Regulations.
- ✓ Where possible, enclose the solids transfer system.
- ✓ Consider the need for additional ventilation at the tablet discharge and transfer points.
- ✓ Ensure air discharges from pneumatic systems do not interfere with the dust control measures.
- ✓ Locate the tablet machine within an enclosure to help contain dust.
- ✓ Design any enclosure in sections to allow easy access for cleaning and maintenance. For food and drug products, take account of cleaning requirements.
- ✓ Hinged doors should be provided for routine inspection.
- ✓ Ensure that safeguards are provided to prevent contact with moving parts of machines and other hazards, e.g. hot sealing.
- ✓ Where possible, locate the work area away from doors, windows and walkways to stop draughts interfering with the ventilation and spreading dust and vapour.
- ✓ Provide an air supply to the workroom to replace extracted air.
- ✓ Keep ducts short and simple, and avoid long sections of flexible duct.
- ✓ Provide an easy way of checking the control is working, e.g. airflow indicator or equivalent.
- ✓ Discharge extracted air to a safe place away from windows and air inlets.
- ✓ Ensure that extracted air is cleaned before discharge to the environment.
- ✗ With vapours, re-circulation is not recommended.

Maintenance

✓ Ensure all equipment used in the task is maintained as advised by supplier/installer, in effective and efficient working order and good repair.
✓ Maintain system at least on monthly basis.

Inspection, testing and examination

✓ Get information on the design performance of the LEV from the supplier. Keep this information to compare with future test results.
✓ Inspect the LEV at least once a month to ensure the equipment is functioning properly and effectively.
✓ Ensure the LEV is examined and tested against its performance specification by hygiene technician at least every 12 months.
✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

✓ Clean work equipment, and the work daily. Clean other equipment and the workroom regularly, once a week is recommended.
✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
✓ Store containers in a safe place and dispose off containers drums safely (refer CGS G101).
✓ Put lids on containers immediately after use.
✗ Do not use dry brushing or cleaning with compressed air.
✓ Vacuum dry dust or use wet cleaning method.

Personal protective equipment (PPE)

✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101 and S102 for more specific advice. Refer to the SDS to get information on suitable PPE.
✓ Ask PPE supplier for advice on selection of suitable PPE.
✓ Respiratory protective equipment may be necessary for some cleaning and maintenance activities, e.g. cleaning up spills. Refer CGS R001 for more specific advice.
✓ Keep PPE clean, and replace it at recommended intervals.
✓ Store PPE in appropriate places to avoid contamination.

Training

✓ Give workers information on the risk of using the chemicals.
✓ Provide workers with training on:
- how to handle chemicals safely;
- how to use control equipment properly and ensure the control is working;
- when and how to use any PPE provided;
- any safe work procedure; and
- what to do if something goes wrong.

✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

✓ Provide supervision to ensure that safe work procedures are followed.
✓ Establish a system to monitor that control measures are in place and being followed.

Worker's Checklist

☐ Make sure any LEV is switched on and is working.
☐ Make sure it is running properly.
☐ Look for signs of damage, wear or poor operation of any equipment used. If worker finds any problems, inform the supervisor. Do not carry on working if there is a problem.
☐ Make sure that paper bags and other waste are not drawn into the ventilation duct.
☐ Wash hands before and after eating, drinking or using the washroom.
☐ Do not use solvents to clean skin.
☐ Clear up spills immediately. Follow spillage procedure.
☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

- Safety Data Sheets
- Guidelines on Occupational Safety and Health for Design, Inspection, Testing and Examination of Local Exhaust Ventilation System, DOSH 2008
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Guidelines on the Control of Chemicals Hazardous to Health, DOSH 2001
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Useful links

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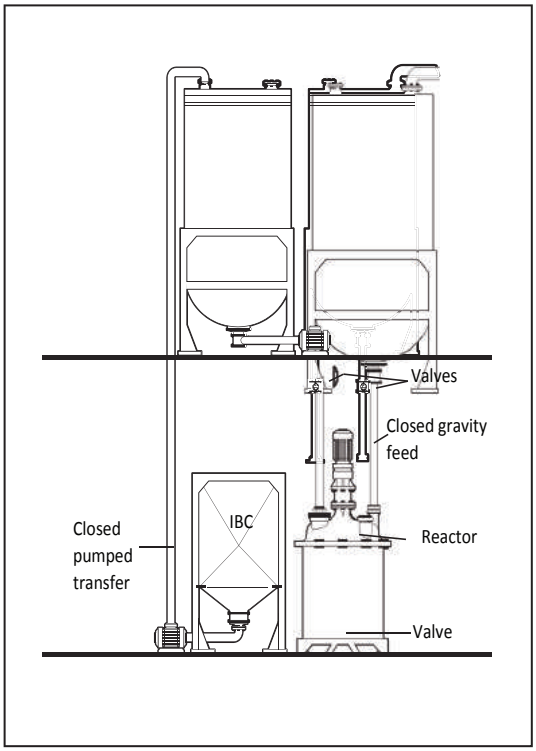
- ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Control Approach 3

Containment
G300
Containment

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

This sheet is use where the assessment recommends Control Approach 3 (Containment) as the suitable approach for chemical(s) and task(s). This sheet provides control measure and good practice recommendation on containment, and can be applied to a range of tasks involving small, medium or large scale use of solids and liquids. It describes the key points that need to be followed to reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to the Safety Data Sheet (SDS) for more information.



Containment

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer, in effective and efficient working order and good repair.
- ✓ Be aware that some maintenance activity may involve entry into confined spaces. Refer to requirements under Industry Code of Practice for Safe Working in a Confined Space.

Inspection, testing and examination

- ✓ Get information on the design performance of the engineering control equipment from the supplier.
- ✓ Keep this information to compare with future test results.
- ✓ Inspect the engineering control equipment at least once a month to ensure the equipment is functioning properly and effectively.
- ✓ Ensure the engineering control equipment is examined and tested against its performance specification by hygiene technician at least every 12 months.
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Clean work equipment, and the work and storage area daily. Clean other equipment and the workroom regularly, once a week is recommended.
- ✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
- ✓ Store containers in a safe place and dispose off containers drums safely (refer CGS G101).
- ✓ Put lids on containers immediately after use.

✗ Do not use dry brushing or cleaning with compressed air.
✓ Vacuum dry dust or use wet cleaning method.

Personal protective equipment (PPE)

✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101 and S102 for more specific advice. Refer to the SDS to see what PPE is necessary.
✓ Ask PPE supplier for advice on selection of suitable PPE.
✓ Respiratory protective equipment (RPE) may be needed for some cleaning and maintenance activities, e.g. cleaning up spills. Refer to CGS R001 for more specific advice.
✓ Be aware that some maintenance activity may involve entry into confined spaces. Decide if supplied air is needed when RPE is used.
✓ Ensure PPE is kept in a clean condition and replaced when necessary.
✓ Store PPE in appropriate places to avoid contamination.

Training

✓ Give workers information on the risk of using the chemicals.
✓ Provide workers with training on:
- handling chemicals safely;
- how to use control equipment properly and ensure the control is working;
- when and how to use any PPE provided;
- any safe work procedure; and
- what to do if something goes wrong.

✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

✓ Provide supervision to ensure that safe work procedures are followed.
✓ Establish a system to check that control measures are in place and are being followed.

Worker's Checklist

☐ Make sure any engineering control equipment is switched on and working.
☐ Look for signs of leaks, wear or damage of any equipment used. If worker finds any problems, inform the supervisor. Do not carry on working if there is a problem.
☐ Wash hands before and after eating, drinking or using the washroom.
☐ Do not use solvents to clean skin.
☐ Clear up spills immediately. Follow spillage procedure. Dispose of spills safely.
☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information
- Safety Data Sheets
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Guidelines on Occupational Safety and Health for Design, Inspection, Testing and Examination of Local Exhaust Ventilation System, DOSH 2008
- Industry Code of Practice for Safe Working in a Confined Space, DOSH 2010
- Control Guidance Sheets G101, G204, G302, S100, S101, S102 and R001

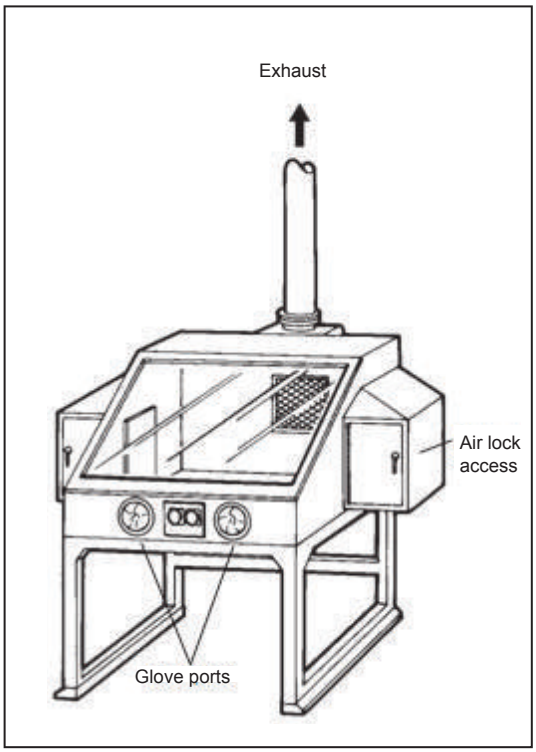
Useful links
- DOSH portal: https://www.dosh.gov.my
- SiRAC Online: sirac.dosh.gov.my
- HSE COSHH essentials website: http://www.hse.gov.uk/coshh/essentials/index.htm
- ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Control Approach 3

Glove Box
G301
Containment

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

This sheet is use where the assessment recommends Control Approach 3 (Containment) as the suitable approach for chemical(s) and task(s). This sheet provides control measure and good practice recommendation on using a glove box, and can be applied to a range of tasks involving small-scale use of solids and liquids. It describes the key points that need to be followed to reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to the Safety Data Sheet (SDS) for more information.



Glove box

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ Surface inside the glove box should be smooth, impermeable and easily decontaminated. Strippable plastic coating can be used to simplify decontamination.
- ✓ Provide one or more air locks.
- ✓ In some situations (for example, where gas flames are required within the unit), filter units must be fitted on the access doors to allow airflow into the unit.
- ✓ Electrical and other services required within the glove box should have their controls positioned outside the unit.
- ✓ Gloves should be resistant to the chemicals being used, and sealed to the glove ports.
- ✓ Provide good lighting. Select lighting equipment. suitable for the nature of the chemicals and processes, e.g. dust tight or flameproof.
- ✓ Apply ventilation to achieve a slight negative pressure. Use a disposable filter on the inlet to the system.
- ✓ The exhaust from the glove box usually needs to be passed through a suitable scrubber or high efficiency particle arrestor (HEPA) filter before discharge.
- ✓ Design the glove box to allow easy maintenance.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.

Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer, in effective and efficient working order and good repair.
- ✓ Adopt a 'permit to work' system for maintenance work.
- ✓ Follow any special procedures that are needed before the system is opened or entered, e.g. purging and washing.
- ✓ Disposable and HEPA filters should be replaced as required.

Inspection, testing and examination

✓ Get information on the design performance of the engineering control equipment from the supplier. Keep this information to compare with future test results.
✓ Inspect the engineering control equipment at least once a month to ensure the equipment is functioning properly and effectively.
✓ Ensure the engineering control equipment is examined and tested against its performance specification by hygiene technician at least every 12 months.
✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

✓ Thoroughly clean work equipment and the working area daily. Clean other equipment and the workroom regularly, once a week is recommended.
✓ Store packages/containers in a safe place, and dispose off empty packages/containers safely (refer CGS G101).
✓ Put lids on containers immediately after use.
✓ Deal with any spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
✗ For dusts, do not clean up with a dry brush or compressed air.
✓ Vacuum dry dust or use wet cleaning method.

Personal protective equipment (PPE)

✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101 and S102 for more specific advice. Refer to the SDS to see what PPE is necessary.
✓ Ask PPE supplier for advice on selection of suitable PPE.
✓ Respiratory protective equipment may be needed for some cleaning and maintenance activities, e.g. cleaning up spills. Refer to CGS R001 for more specific advice.
✓ Ensure PPE is kept in a clean condition and replaced when necessary.
✓ Store PPE in appropriate places to avoid contamination.

Training

✓ Give workers information on the risk of using the chemicals.
✓ Provide workers with training on:
- handling chemicals safely;
- how to use control equipment properly and ensure the control is working;
- when and how to use any PPE provided;
- any safe work procedure; and
- what to do if something goes wrong.

Training programme should be reviewed and conducted at least once in two years.

Supervision

✓ Provide supervision to ensure that safe work procedures are followed.
✓ Establish a system to monitor that all control measures are in place and being followed.

Worker's Checklist

☐ Make sure the engineering control equipment is switched on and working.
☐ Look for signs of damage, wear or poor operation of any equipment used. If worker finds any problems, inform the supervisor. Do not carry on working if there is a problem.
☐ Make sure that paper bags and other waste material are not drawn into the ventilation duct.
☐ Wash hands before and after eating, drinking or using the washroom.
☐ Do not use solvents to clean skin.
☐ Clear up spills immediately. Follow spillage procedure.
☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information
- Safety Data Sheets
- Guidelines on Occupational Safety and Health for Design, Inspection, Testing and Examination of Local Exhaust Ventilation System, DOSH 2008
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Guidelines on the Control of Chemicals Hazardous to Health, DOSH 2001
- Control Guidance Sheets G101, S100, S101, S102 and R001

Useful links
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Control Approach 3

Removing Waste from a Dust Extraction Unit

G302

Containment

G302

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

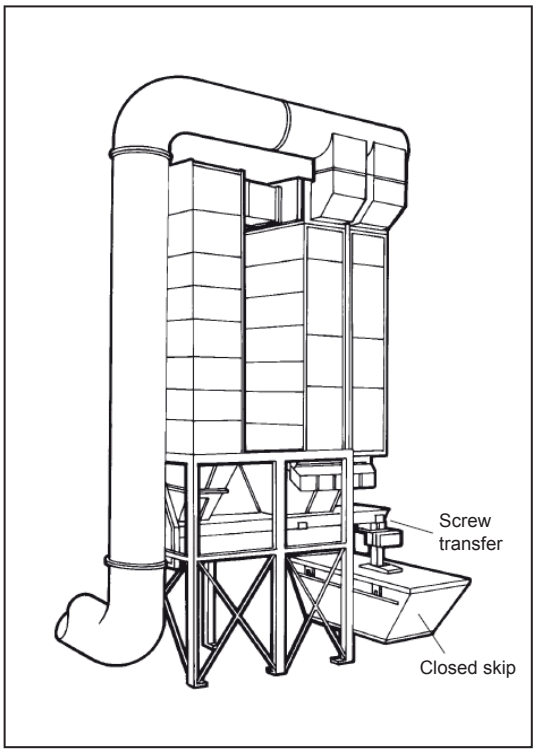
This sheet is use where the assessment recommends Control Approach 3 (Containment) as the suitable approach for chemical(s) and task(s). This sheet provides control measure and good practice recommendation on removing waste from a dust extraction unit. It describes the key points that need to be followed to reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ The work area and equipment should be clearly labelled.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ Locate the dust extraction unit outside, away from doors, windows and from air inlets.
- ✓ Consider the need for explosion relief for combustible solids and ensure that equipment is appropriately earthed.
- ✓ Avoid overfilling - provide a means of telling when the waste skip is full.
- ✓ Provide a shut-off valve on the discharge line.
- ✓ Dispose off waste in accordance with environmental legislation.
- ✓ Design the work area and closed system for ease of maintenance and, when possible, use equipment designed for easy maintenance.
- ✓ Where operational factors permit, keep the process equipment under negative pressure to prevent leakage.



Removing waste from a dust extraction unit

- ✓ With dusts, clean filtered air can be re-circulated into the workroom.
- ✗ With vapours, air re-circulation is not recommended.
- ✓ Ensure all components are appropriate for the materials being captured i.e. suitable for explosive, corrosive and flammable substances.

Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer, in effective and efficient working order and good repair.
- ✓ Adopt a 'permit to work' system for maintenance work.
- ✓ Follow any special procedures that are needed before the system is opened or entered, e.g. purging and washing.

Inspection, testing and examination

- ✓ Get information on the design performance of the engineering control equipment from the supplier. Keep this information to compare with future test results.
- ✓ Inspect the engineering control equipment at least once a month to ensure the equipment is functioning

properly and effectively.
- ✓ The effectiveness of the engineering control equipment can be checked by monitoring of worker exposure where appropriate.
- ✓ Ensure the engineering control equipment is examined and tested against its performance specification by hygiene technician at least every 12 months.
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Ensure the skip is replaced regularly.
- ✓ Thoroughly clean work equipment and the working area daily. Clean other equipment and the workroom regularly, once a week is recommended.
- ✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
- ✗ Do not use dry brushes or clean with compressed air.
- ✓ Vacuum dry dust or use wet cleaning method.

Personal protective equipment (PPE)

- ✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101and S102 for more specific advice. Refer to the SDS to see what PPE is necessary.
- ✓ Ask PPE supplier for advice on selection of suitable PPE.
- ✓ Respiratory protective equipment may be necessary for some cleaning and maintenance activities, e.g. dealing with spills. Refer CGS R001 for more specific advice
- ✓ Ensure PPE is kept in a clean condition and replaced when necessary.
- ✓ Store PPE in appropriate places to avoid contamination.

Training

- ✓ Give workers information on the risk of using the chemicals.
- ✓ Provide workers with training on:
  - handling chemicals safely;
  - how to use control equipment properly and ensure the control is working;
  - when and how to use any PPE provided;
  - any safe work procedure; and
  - what to do if something goes wrong.
- ✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

- ✓ Provide supervision to ensure that safe work procedures are followed.
- ✓ Establish a system to monitor that all control measures are in place and being followed.

Worker's Checklist

- ☐ Replace the skip on a regular basis, as per instructions and before it overfills.
- ☐ Look for signs of leaks, wear or damage of any equipment used. If worker finds any problems, inform the supervisor. Do not carry on working if there is a problem.
- ☐ Wash hands before and after eating, drinking or using the washroom.
- ☐ Do not use solvents to clean skin.
- ☐ Clear up spills immediately. Follow spillage procedure.
- ☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information
- Safety Data Sheets
- Industry Code of Practice for Safe Working in a Confined Space, DOSH 2010
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Control Guidance Sheets G204, S100, S101, S102 and R001

Useful links
- DOSH portal: https://www.dosh.gov.my
- SiRAC Online: sirac.dosh.gov.my
- HSE COSHH essentials website: http://www.hse.gov.uk/coshh/essentials/index.htm
- ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Control Approach 3

Transferring Solids
G303
Containment

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

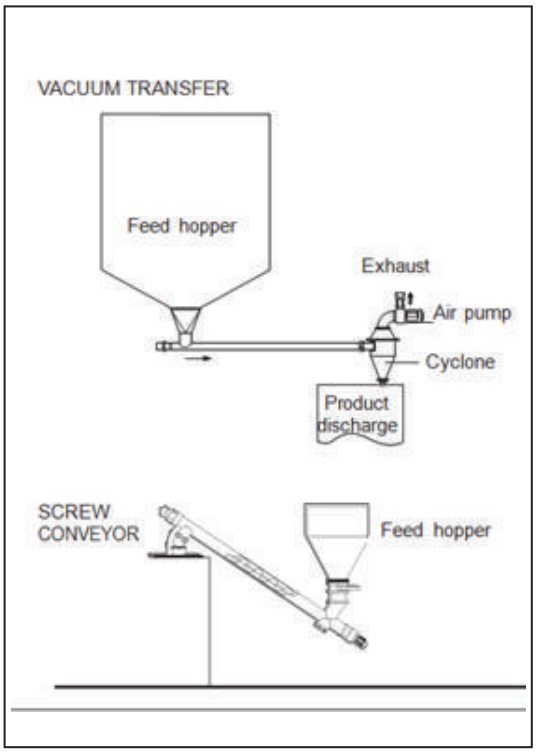
This sheet is used where the assessment recommends Control Approach 3 (Containment) as the suitable approach for chemical(s) and task(s). This sheet provides control measure and good practice recommendation on transferring medium and large quantities of solids. It describes the key points that need to be followed to reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ The work area and equipment should be clearly labelled.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ Ensure the work area is well ventilated.
- ✓ Ensure the system is free of leaks and all joints have suitable seals.
- ✓ Take account of possible abrasion from the solids being transferred, and ensure suitably robust materials are used.
- ✓ Design the system in sections to allow easy access for cleaning and maintenance.
- ✓ Consider the need for explosion relief for combustible solids and ensure equipment is appropriately earthed.
- ✓ Provide an easy way of checking the local exhaust ventilation (LEV) is working e.g. airflow indicator or equivalent.



Transferring solids

- ✓ Ensure LEV equipment complies with the requirement of USECHH Regulations.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.

Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer, in effective and efficient working order and good repair.
- ✓ Adopt a 'permit to work' system for maintenance work.
- ✓ Follow any special procedures that are needed before the system is opened or entered, e.g. purging and washing.

Inspection, testing and examination

- ✓ Obtain information from the supplier on all parameters needed to safely operate the system.
- ✓ Inspect the engineering control equipment at least once a month to ensure the equipment is functioning properly and effectively.
- ✓ Ensure the engineering control equipment is examined and tested against its performance specification by hygiene technician at least every 12 months.
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Thoroughly clean work equipment and the working area daily. Clean other equipment and the workroom regularly, once a week is recommended.
- ✓ Store packages/containers in a safe place. Refer CGS G101 for more specific advice on storage.
- ✓ Dispose off empty packages/containers safely.
- ✓ Put lids on containers immediately after use.
- ✓ Deal with spills immediately.
- ✗ Do not clean up with a dry brush or compressed air.
- ✓ Vacuum dry dust or use wet cleaning method.

Personal protective equipment (PPE)

- ✓ Materials allocated to hazard group S can harm the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101and S102 for more specific advice. Refer to the SDS to see what PPE is necessary.
- ✓ Ask PPE supplier for advice on selection of suitable PPE.
- ✓ Respiratory protective equipment may be necessary for some cleaning and maintenance activities, e.g. cleaning up spills. Refer CGS R001 for more specific advice.
- ✓ Ensure PPE is kept in a clean condition and replaced when necessary.
- ✓ Store PPE in appropriate places to avoid contamination.

Training

- ✓ Give workers information on the risk of using the chemicals.
- ✓ Provide workers with training on:
  - handling chemicals safely;
  - how to use control equipment properly and ensure the control is working;
  - when and how to use any PPE provided;
  - any safe work procedure; and
  - what to do if something goes wrong.
- ✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

- ✓ Provide supervision to ensure that safe work procedures are followed.
- ✓ Establish a system to monitor that all control measures are in place and being followed.

Worker's Checklist

- ☐ Make sure any engineering control equipment is switched on and working.
- ☐ Look for signs of leaks, wear or damage of any equipment used. If worker finds any problems, inform the supervisor. Do not carry on working if there is a problem.
- ☐ Wash hands before and after eating, drinking or using the washroom.
- ☐ Do not use solvents to clean skin.
- ☐ Clear up spills immediately. Follow spillage procedure.
- ☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

- Safety Data Sheets
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Control Guidance Sheets G101, G204, G302, S100, S101, S102 and R001

Useful links

- DOSH portal: https://www.dosh.gov.my
- SiRAC Online: sirac.dosh.gov.my
- HSE COSHH essentials website: http://www.hse.gov.uk/coshh/essentials/index.htm
- ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Control Approach 3

Sack Emptying
G304
Containment

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

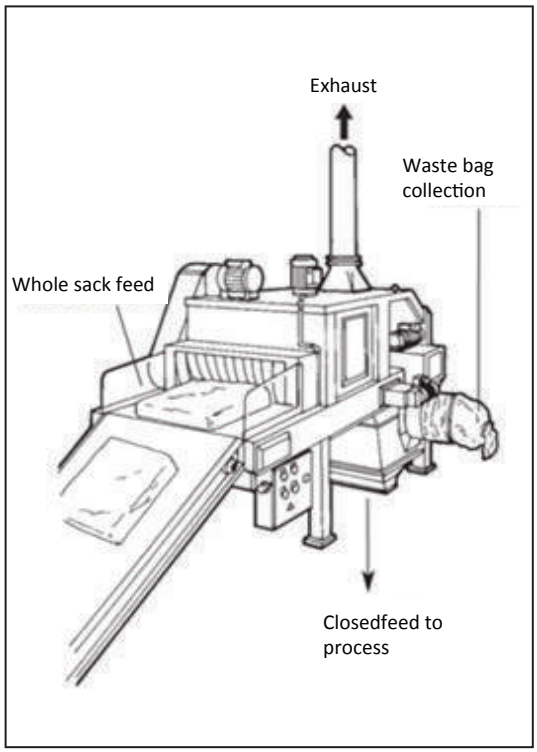
This sheet is used where the assessment recommends Control Approach 3 (Containment) as the suitable approach for chemical(s) and task(s). This sheet provides control measure and good practice recommendation on sack emptying, and can be applied to tasks involving medium quantities of solids. It describes the key points that need to be followed to help reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ The work area and equipment should be clearly labelled.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ Provide arrangements to strip and vacuum or wet clean the conveyor belt.
- ✓ Enclose the slitter as much as possible (refer figure).
- ✓ Ensure an inward airflow is sufficient to effectively control airborne contaminants. It will depend on the design and size of openings. Keep all openings as small as possible, while allowing enough room for safe working. Use see-through panels and plastic strips to reduce the open area.
- ✓ Consider additional ventilation at the bag disposal point.
- ✓ Provide good lighting.
- ✓ Select lighting equipment suitable for the nature of the substances and processes, e.g. dust tight or flameproof, if needed.
- ✓ Design the system to allow easy maintenance.
- ✓ Where operational factors permit, keep the process equipment under negative pressure to prevent leakage.
- ✓ Discharge exhausts air to a safe place away from doors, windows and air inlets.



Sack emptying

Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer, in effective and efficient working order and good repair.
- ✓ Adopt a 'permit to work' system for maintenance work.
- ✓ Follow any special procedures that are needed before the system is opened or entered, e.g. purging and washing.

Inspection, testing and examination

- ✓ Get information from the supplier on all parameters needed to safely operate the system.
- ✓ Inspect the engineering control equipment at least once a month to ensure the equipment is functioning properly and effectively.

- ✓ Ensure the engineering control equipment is examined and tested against its performance specification by hygiene technician at least every 12 months.
- ✓ The effectiveness of the ventilation system can be checked by monitoring of airborne chemicals where appropriate.
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Thoroughly clean work equipment and the work area daily. Clean other equipment and the workroom regularly, once a week is recommended.
- ✓ Store packages/containers in a safe place (refer CGS G101).
- ✓ Dispose off empty packages/containers safely.
- ✓ Put lids on containers immediately after use.
- ✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
- ✗ Do not clean up with a dry brush or compressed air.
- ✓ Vacuum dry dust or use wet cleaning method.

Personal protective equipment (PPE)

- ✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101 and S102 for more specific advice. Refer to SDS to see what PPE is necessary.
- ✓ Ask PPE supplier for advice on selection of suitable PPE.
- ✓ Respiratory protective equipment may be necessary for some cleaning and maintenance activities, e.g. cleaning up spills. Refer CGS R001 for more specific advice.
- ✓ Ensure every PPE used is kept in a clean condition and replaced when necessary.
- ✓ Store PPE in appropriate places to avoid contamination.

Training

- ✓ Give workers information on the risk of using the chemicals.
- ✓ Provide workers with training on:
  - handling chemicals safely;
  - how to use control equipment properly and ensure the control is working;
  - when and how to use any PPE provided;
  - any safe work procedure; and
  - what to do if something goes wrong.
- ✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

- ✓ Provide supervision to ensure that safe work procedures are followed.
- ✓ Establish a system to monitor that all control measures are in place and being followed.

Worker's Checklist

- ☐ Make sure any engineering control equipment is switched on and working.
- ☐ Look for signs of leaks, wear or damage of any equipment used. If worker finds any problems, inform the supervisor. Do not carry on working if there is a problem.
- ☐ Avoid manual handling, use handling aids.
- ☐ Any damaged or leaking bags should be repacked away from the main storage area or disposed of safely. A responsible person should be involved to ensure this process is carried out safely.
- ☐ Wash hands before and after eating, drinking or using the washroom.
- ☐ Do not use solvents to clean skin.
- ☐ Clear up spills immediately. Follow spillage procedure.
- ☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

- Safety Data Sheets
- Guidelines on Occupational Safety and Health for Design, Inspection, Testing and Examination of Local Exhaust Ventilation System, DOSH 2008
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Guidelines on the Control of Chemicals Hazardous to Health, DOSH 2001
- Guidelines on Monitoring of Airborne Contaminant for Chemicals Hazardous to Health, DOSH 2002
- Control Guidance Sheets G101, G204, G302, S100, S101 and S102

Useful links

- DOSH portal: https://www.dosh.gov.my
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- ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Control Approach 3

Drum filling
G305
Containment

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

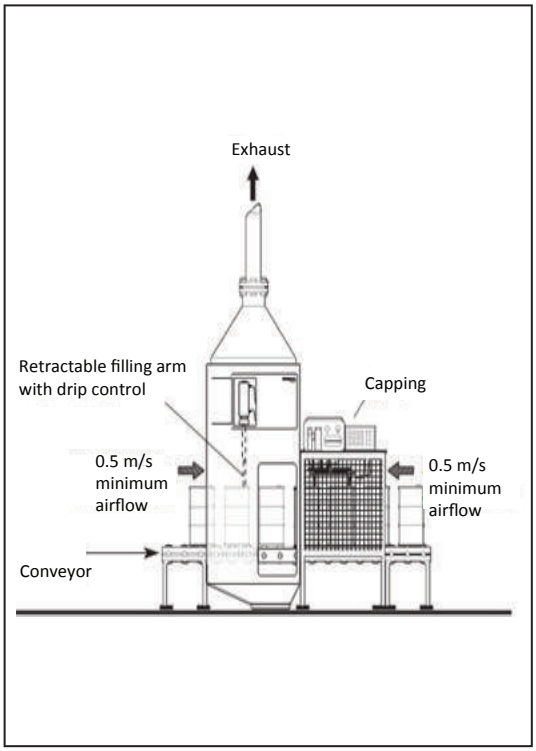
This sheet is used where the assessment recommends Control Approach 3 (Containment) as the suitable approach for chemical(s) and task(s). This sheet provides control measure and good practice recommendation on drum filling involving medium or large quantities of liquids. It describes the key points that need to be followed to reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ The work area and equipment should be clearly labelled.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ Ensure the work area is well ventilated.
- ✓ Design the work area for ease of maintenance and, where possible, use equipment that has been designed for easy maintenance.
- ✓ Ensure airflow at openings into the filling area and stopper fitting area is sufficient to effectively control airborne contaminants. It will depend on the design and size of openings. Use a load cell or metered flow to prevent overfilling.
- ✓ Ensure a drip collector is fitted to the auto filling arm.
- ✓ Provide good lighting in the filling and stopper fitting area. Select lighting equipment suitable for the nature of the substances and processes, e.g. flameproof, if needed.



Drum filling

- ✓ Provide spillage containment in the filling area.
- ✓ For flammable liquids, ensure that suitable pumps/fans are used and ensure equipment is appropriately earthed.
- ✓ Where operational factors permit, keep the process equipment under negative pressure to prevent leaks.
- ✓ Discharge exhausts air to a safe place away from doors, windows and air inlets.
- ✓ Ensure that exhaust air is cleaned before discharge to the environment.

Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer, in effective and efficient order and good repair.
- ✓ Adopt a 'permit to work' system for maintenance work.
- ✓ Follow any special procedures that are needed before the system is opened or entered, e.g. purging and washing.

Inspection, testing and examination

- ✓ Get information from the supplier on all parameters needed to safely operate the system.
- ✓ Inspect the engineering control equipment at least once a month to ensure the equipment is functioning

properly and effectively.
- ✓ Ensure the engineering control equipment is examined and tested against its performance specification by hygiene technician at least every 12 months.
- ✓ The effectiveness of the engineering control can be checked by monitoring of worker exposure where appropriate.
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Thoroughly clean work equipment and the working area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
- ✓ Store packages/containers in a safe place (refer CGS G101).
- ✓ Dispose off empty packages/containers safely.
- ✓ Put lids on containers immediately after use.

Personal protective equipment (PPE)

- ✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100 and S101 for more specific advice. Refer to SDS of each chemical to see what PPE is necessary.
- ✓ Ask PPE supplier for advice on selection of suitable PPE.
- ✓ Respiratory protective equipment may be necessary for some cleaning and maintenance activities, e.g. cleaning up spills. Refer CGS R001 for more specific advice
- ✓ Ensure every PPE used is kept in a clean condition and replaced when necessary.
- ✓ Store PPE in appropriate places to avoid contamination.

Training

- ✓ Give workers information on the risk of using the chemicals.
- ✓ Provide workers with training on:
  - handling chemicals safely;
  - how to use control equipment properly and ensure the control is working;
  - when and how to use any PPE provided;
  - any safe work procedure; and
  - what to do if something goes wrong.
- ✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

- ✓ Provide supervision to ensure that safe work procedures are followed.
- ✓ Establish a system to monitor that all control measures are in place and being followed.

Worker's Checklist

- ☐ Make sure any engineering control equipment is switched on and working
- ☐ Look for signs of leaks, wear or damage of any equipment used. If worker finds any problems, inform the supervisor. Do not carry on working if there is a problem.
- ☐ Wash hands before and after eating, drinking or using the washroom.
- ☐ Do not use solvents to clean skin.
- ☐ Clear up spills immediately. Follow spillage procedure.
- ☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information
- Safety Data Sheets
- Guidelines on Monitoring of Airborne Contaminant for Chemicals Hazardous to Health, DOSH 2002
- Guidelines on Occupational Safety and Health for Design, Inspection, Testing and Examination of Local Exhaust Ventilation System, DOSH 2008
- Guidelines on the Control of Chemicals Hazardous to Health, DOSH 2001
- Industry Code of Practice for Safe Working in a Confined Space, DOSH 2010
- Control guidance sheets G101, S100, S101 and R001

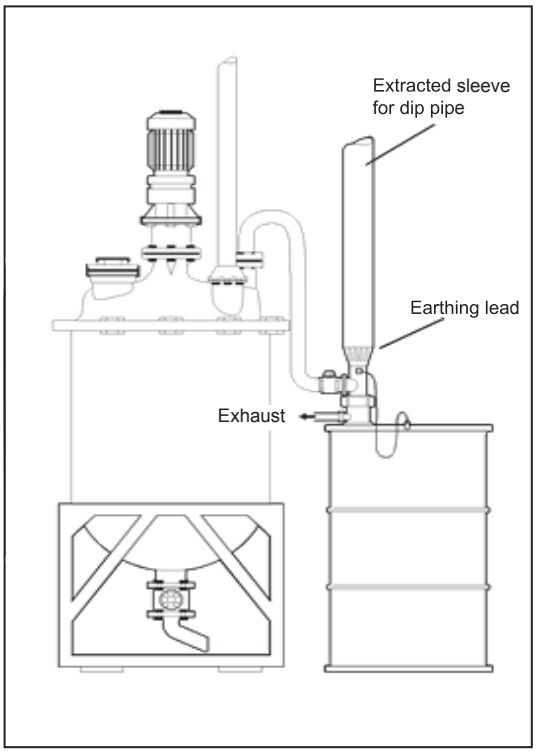
Useful links
- DOSH portal: https://www.dosh.gov.my
- SiRAC Online: sirac.dosh.gov.my
- HSE COSHH essentials website: http://www.hse.gov.uk/coshh/essentials/index.htm
- ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Control Approach 3

Drum Emptying
G306
Containment

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

This sheet is used where the assessment recommends Control Approach 3 (Containment) as the suitable approach for chemical(s) and task(s). This sheet provides control measure and good practice recommendation on drum emptying involving medium quantities of liquids. It describes the key points that need to be followed to reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to Safety Data Sheet (SDS) for more information.



Drum emptying

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ The work area and equipment should be clearly labelled.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ Ensure the work area is well ventilated.
- ✓ Design the work area for ease of maintenance and, when possible, use equipment that has been designed for easy maintenance.
- ✓ Provide containment or an extracted sleeve to prevent drips and leaks when the dip pipe is removed.
- ✓ Ensure the pump is suitable for the liquid to be transferred.
- ✓ Avoid manual handling. Consider how the drum will be moved to the transfer area.
- ✓ Provide a suitable 'key' for removing and replacing the drum stopper.
- ✓ For flammable liquids, ensure that suitable pumps/fans are used and that they are properly earthed to prevent sparks from static electricity.
- ✓ Where operational factors permit, keep the process equipment under negative pressure to prevent leaks.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✓ Ensure that extracted air is cleaned before discharge to the environment.

Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer, in effective and efficient working order and good repair.
- ✓ Adopt a 'permit to work' system for maintenance work.
- ✓ Follow any special procedures that are needed before the system is opened or entered, e.g. purging and washing.

Inspection, testing and examination

- ✓ Get information from the supplier on all parameters needed to safely operate the system.
- ✓ Inspect the engineering control equipment at least once a month to ensure the equipment is functioning

properly and effectively.
- ✓ Ensure the engineering control equipment is examined and tested against its performance specification by hygiene technician at least every 12 months.
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Thoroughly clean work equipment and the work area daily. Clean other equipment and the workroom regularly, once a week is recommended.
- ✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
- ✓ Store drums in a safe place. Refer CGS G101 for more specific advice on storage.
- ✓ Dispose off empty drums safely.
- ✓ Put lids on containers immediately after use.

Personal protective equipment (PPE)

- ✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101and S102 for more specific advice. Refer to SDS to see what PPE is necessary.
- ✓ Ask PPE supplier for advice on selection of suitable PPE.
- ✓ Respiratory protective equipment may be necessary for some cleaning and maintenance activities, e.g. dealing with spills. Refer CGS R001 for more specific advice.
- ✓ Ensure PPE is kept in a clean condition and replaced when necessary.
- ✓ Store PPE in appropriate places to avoid contamination.

Training

- ✓ Give workers information on the risk of using the chemicals.
- ✓ Provide workers with training on:
  - handling chemicals safely;
  - how to use control equipment properly and ensure the control is working;
  - when and how to use any PPE provided;
  - any safe work procedure; and
  - what to do if something goes wrong.
- ✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

- ✓ Provide supervision to ensure that safe work procedures are followed.
- ✓ Establish a system to monitor that all control measures are in place and being followed.

Worker's Checklist

- ☐ Make sure any engineering control equipment is switched on and is working
- ☐ Look for signs of leaks, wear or damage of any equipment used. If worker finds any problems, inform the supervisor. Do not carry on working if there is a problem.
- ☐ Always remove and replace the drum stopper using a 'key'.
- ☐ Always use the earth strap.
- ☐ Wash hands before and after eating, drinking or using the washroom.
- ☐ Do not use solvents to clean skin.
- ☐ Clear up spills immediately. Follow spillage procedure.
- ☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information
- Safety Data Sheets
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Control Guidance Sheets G101, S100, S101, S102 and R001

Useful links
- DOSH portal: https://www.dosh.gov.my
- SiRAC Online: sirac.dosh.gov.my
- HSE COSHH essentials website: http://www.hse.gov.uk/coshh/essentials/index.htm
- ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Control Approach 3

IBC Filling and Emptying (Solids)

G307

Containment

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

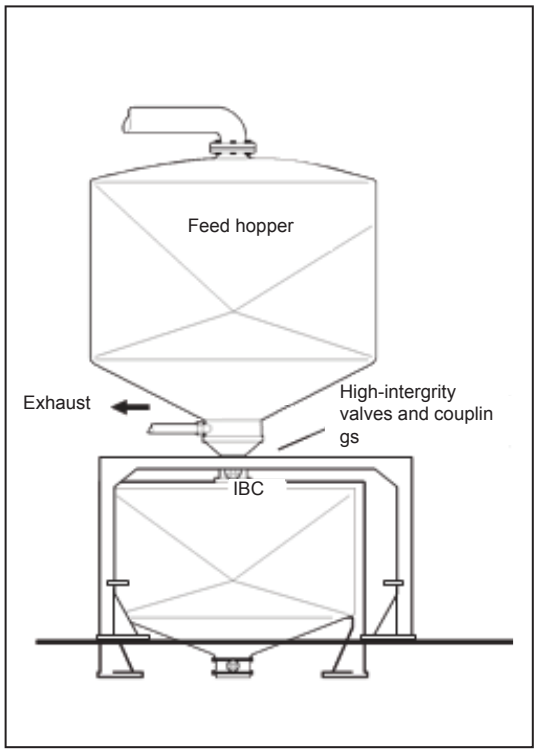
This sheet is used where the assessment recommends Control Approach 3 (Containment) as the suitable approach for chemical (s) and task(s). This sheet provides control measure and good practice recommendation on filling and emptying IBCs (intermediate bulk containers) with large quantities of solids. It describes the key points that need to be followed to reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to the Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ The work area and equipment should be clearly labelled.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ Ensure the IBC is designed and constructed for the material it will contain.
- ✓ Use high-integrity valves and couplings to make connections.
- ✓ Take precautions to prevent overfilling, e.g. load cells.
- ✓ Provide a means to isolate and/or control the filling rate.
- ✓ Make arrangements for air displaced during filling to vent to a safe place, e.g. back into the supply tank.
- ✓ Provide seals on access hatches.
- ✓ Select lighting equipment suitable for the nature of the substances and processes, e.g. dust tight or flameproof, if needed.
- ✓ Provide good access for fork-lift trucks.
- ✓ Provide barriers and notices.
- ✓ Consider the need for explosion relief for combustible solids, and ensure equipment is appropriately earthed.
- ✓ Provide an easy way of checking the control is working, e.g. airflow indicator or equivalent.
- ✓ Discharge exhausts air to a safe place away from doors, windows and air inlets.
- ✓ Ensure that exhaust air is cleaned before discharge to the environment.



Solids IBC filling and emptying

Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer, in effective and efficient working order and good repair.
- ✓ Adopt a 'permit to work' system for maintenance work.
- ✓ Follow any special procedures that are needed before the system is opened or entered, e.g. purging and washing.

Inspection, testing and examination

- ✓ Get information from the supplier on all parameters needed to safely operate the system.
- ✓ Inspect the engineering control equipment at least once a month to ensure the equipment is functioning properly and effectively.
- ✓ Ensure the engineering control equipment is examined and tested against its performance specification by hygiene technician at least every 12 months.
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Thoroughly clean work equipment and the work area daily. Clean other equipment and the workroom regularly, once a week is recommended.
- ✓ Store containers in a safe place (refer CGS G101).
- ✓ Dispose off empty containers safely.
- ✓ Put lids on containers immediately after use.
- ✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
- ✗ Do not clean up with a dry brush or compressed air.
- ✓ Vacuum dry dust or use wet cleaning method.

Personal protective equipment (PPE)

- ✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101and S102 for more specific advice. Refer to SDS to see what PPE is necessary.
- ✓ Ask PPE supplier for advice on selection of suitable PPE.
- ✓ Respiratory protective equipment may be necessary for some cleaning and maintenance activities, e.g. dealing with spills. Refer CGS R001 for more specific advice.
- ✓ Ensure PPE is kept in a clean condition and replaced when necessary.
- ✓ Store PPE in appropriate places to avoid contamination.

Training

- ✓ Give workers information on the risk of using the chemicals.
- ✓ Provide workers with training on:
  - handling chemicals safely;
  - how to use control equipment properly and ensure the control is working;
  - when and how to use any PPE provided;
  - any safe work procedure; and
  - what to do if something goes wrong.
- ✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

- ✓ Provide supervision to ensure that safe work procedures are followed.
- ✓ Establish a system to monitor that all control measures are in place and being followed.

Worker's Checklist

- ☐ Make sure any engineering control equipment is switched on and is working.
- ☐ Look for signs of leaks, wear or damage of any equipment used. If worker finds any problems, inform the supervisor. Do not carry on working if there is a problem.
- ☐ Take care not to overfill the IBC.
- ☐ Ensure barriers and warning notices are in position.
- ☐ Wash hands before and after eating, drinking or using the washroom.
- ☐ Do not use solvents to clean skin.
- ☐ Clear up spills immediately. Follow spillage procedure.
- ☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

- Safety Data Sheets
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Control Guidance Sheets G101, G204, G302, S100, S101, S102 and R001

Useful links

- DOSH portal: https://www.dosh.gov.my
- SiRAC Online: sirac.dosh.gov.my
- HSE COSHH essentials website: http://www.hse.gov.uk/coshh/essentials/index.htm
- ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Control Approach 3

IBC Filling and Emptying (Liquids)
G308
Containment

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

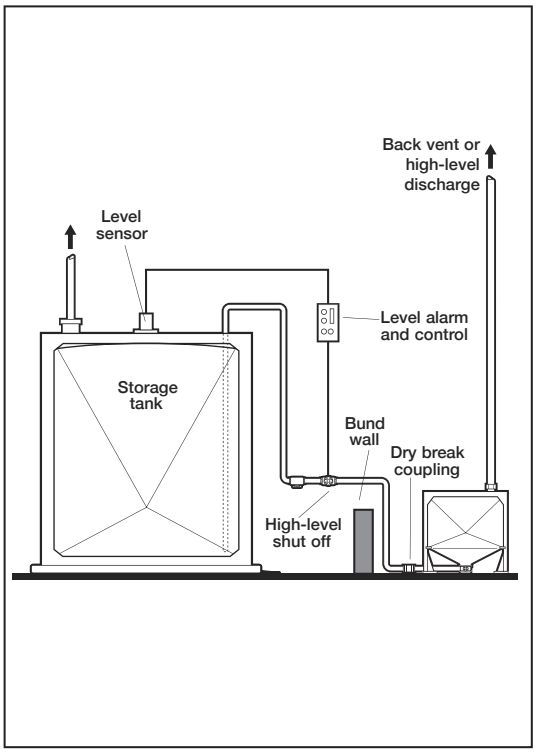
This sheet is used where the assessment recommends Control Approach 3 (Containment) as the suitable approach for chemical (s) and task(s). This sheet provides control measure and good practice recommendation on filling and emptying IBCs (intermediate bulk containers) with large quantities of liquids. It describes the key points that need to be followed to reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ The work area and equipment should be clearly labelled.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ The connection points on the vessel to be filled should comprise a fill pipe, level sensor and a vapour outlet.
- ✓ The level sensor/load cell should be connected to an automatic shut-off valve or filling pump.
- ✓ The joints around connection points should be effectively sealed.
- ✓ Bottom filling is preferred; otherwise the length of the fill pipe should enable it to be submerged during filling.
- ✓ Dedicated coupling lines should be used and dry break couplings considered.
- ✓ Hosing used for filling should be of a suitable length.



Liquid IBC filling and emptying

- ✓ Ensure connections are within areas with spillage containment.
- ✗ Do not use splash loading.
- ✓ For flammable liquids, ensure that suitable pumps/fans are used and that equipment is appropriately earthed.
- ✓ The figure shows one design of an IBC emptying installation.
- ✓ Provide good lighting in the emptying/filling area. Select lighting equipment suitable for the nature of the substances and processes, e.g. flameproof.
- ✓ Design the closed system to allow easy maintenance.
- ✓ Discharge vented air to a safe place away from doors, windows and air inlets.
- ✓ Ensure that exhaust air is cleaned before discharge to the environment.

Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer, in effective and efficient working order and good repair.
- ✓ Adopt a 'permit to work' system for maintenance work.
- ✓ Follow any special procedures that are needed before the system is opened or entered, e.g. purging and washing.

Inspection, testing and examination

- ✓ Get information on the design performance of the equipment from the supplier. Keep this information to compare with future test results.
- ✓ Inspect the engineering control equipment at least once a month to ensure the equipment is functioning properly and effectively.
- ✓ Ensure that the engineering control equipment is examined and tested against its performance specification by hygiene technician at least every 12 months.
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Clean work equipment, and the work area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
- ✓ Store containers in a safe place and dispose off containers drums safely (refer CGS G101).
- ✓ Put lids on containers immediately after use.
- ✗ Do not clean up with a dry brush or compressed air.
- ✓ Vacuum dry dust or use wet cleaning method.

Personal protective equipment (PPE)

- ✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101 and S102 for more specific advice. Refer to the SDS to see what PPE is necessary.
- ✓ Ask PPE supplier for advice on selection of suitable PPE.
- ✓ Respiratory protective equipment may be necessary for some cleaning and maintenance activities, e.g. cleaning up spills. Refer CGS R001 for more specific advice.
- ✓ Keep PPE clean, and replace it at recommended intervals.
- ✓ Store PPE in appropriate places to avoid contamination.

Training

- ✓ Give workers information on the risk of using the chemicals.
- ✓ Provide workers with training on:
  - handling chemicals safely;
  - how to use control equipment properly and ensure the control is working;
  - when and how to use any PPE provided;
  - any safe work procedure; and
  - what to do if something goes wrong.
- ✓ Training programme should be reviewed and conducted at least once in 2 years.

Supervision

- ✓ Provide supervision to ensure that safe work procedures are followed.
- ✓ Establish a system to monitor that control measures are in place and being followed.

Worker's Checklist

- ☐ Make sure any engineering control equipment is switched on and is working.
- ☐ Look for signs of leaks, wear or damage of any equipment used. If worker finds any problems, inform the supervisor. Don't carry on working if there is a problem.
- ☐ Ensure that all couplings are correctly connected.
- ☐ Barrier off the emptying area.
- ☐ Wash hands before and after eating, drinking or using the washroom.
- ☐ Do not use solvents to clean skin.
- ☐ Clear up spills immediately. Follow spillage procedure.
- ☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

- Safety Data Sheets
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Control Guidance Sheets G101, G204, S100, S101, S102 and R001

Useful links

- DOSH portal: https://www.dosh.gov.my
- SiRAC Online: sirac.dosh.gov.my
- HSE COSHH essentials website: http://www.hse.gov.uk/coshh/essentials/index.htm
- ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Control Approach 3

Tanker Filling and Emptying (Solids)

G309

Containment

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

This sheet can be used where the assessment recommends Control Approach 3 (Containment) as the suitable approach for chemical(s) and task(s). This sheet provides control measure and good practice recommendation on filling and emptying tankers with large quantities of solids. It describes the key points that need to be followed to reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ The work area and equipment should be clearly labelled.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ Ensure the silo is designed and constructed for the material it will contain.
- ✓ Provide arrangements to allow clean, preferably dry air to enter the silo as material is drawn off.
- ✓ Provide seals on access hatches.
- ✓ Provide a valve to control the rate of discharge from the base of the silo.
- ✓ Ensure the valve connection to the transfer pipe is dust tight.
- ✓ Consider means of dealing with blockages and bridging within the silo.
- ✓ Whenever possible, these should be cleared from outside the silo.
- ✓ Take precautions to avoid overfilling of the silo, e.g.

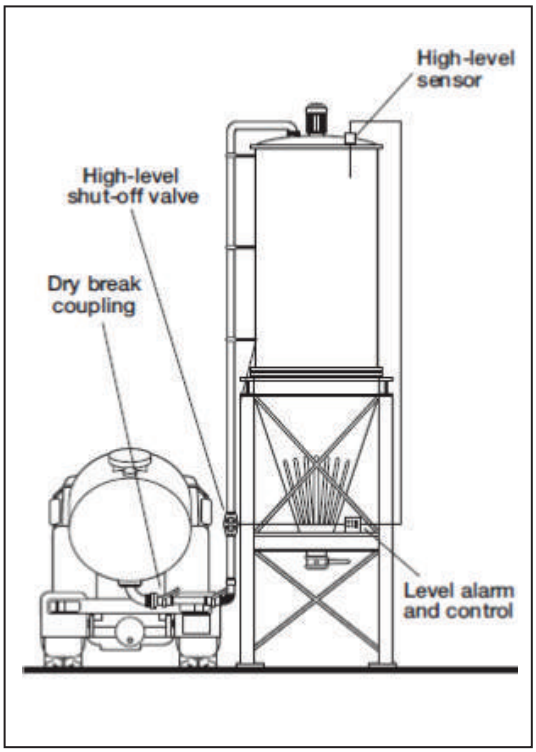


Illustration for tanker emptying

high-level indicator, load cells.

- ✓ Provide dust filtration for air displaced from the silo during filling, and discharge extracted air to a safe place away from doors, windows and air inlets.
- ✓ Consider the need for explosion relief for combustible solids, and ensure that equipment is appropriately earthed.
- ✓ Design silo to prevent over-pressurisation.
- ✓ Design the closed system to allow easy maintenance.
- ✓ Ensure that extracted air is cleaned before discharge to the environment.

Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer, in effective and efficient working order and good repair.
- ✓ Adopt a 'permit to work' system for maintenance work.
- ✓ Follow any special procedures that are needed before the system is opened or entered, e.g. purging and washing.
- ✗ Do not enter a silo until it has been checked for hazardous chemicals and oxygen content.

Inspection, testing and examination

- ✓ Get information on the design performance of the equipment from the supplier. Keep this information to compare with future test results.
- ✓ Inspect the engineering control equipment at least once a month to ensure the equipment is functioning properly and effectively.
- ✓ Ensure that the engineering control equipment is examined and tested against its performance specification by hygiene technician at least every 12 months.
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Clean work equipment, and the work area daily. Clean other equipment and the workroom regularly, once a week is recommended.
- ✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
- ✓ Store containers in a safe place and dispose off containers drums safely (refer CGS G101).
- ✓ Put lids on containers immediately after use.
- ✗ Do not clean up with a dry brush or compressed air.
- ✓ Vacuum dry dust or use wet cleaning method.

Personal protective equipment (PPE)

- ✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101 and S102 for more specific advice. Refer to SDS to see what PPE is necessary.
- ✓ Ask PPE supplier for advice on help selection of suitable PPE.
- ✓ Respiratory protective equipment may be necessary for some cleaning and maintenance activities, e.g. cleaning up spills. Refer CGS R001 for more specific advice.
- ✓ Keep PPE clean, and replace it at recommended intervals.
- ✓ Store PPE in appropriate places to avoid contamination.

Training

- ✓ Give workers information on the risk of using the chemicals.
- ✓ Provide workers with training on:
  - handling chemicals safely;
  - how to use control equipment properly and ensure the control is working;
  - when and how to use any PPE provided;
  - any safe work procedure; and
  - what to do if something goes wrong.
- ✓ Training programme should be reviewed and conducted at least once in 2 years.

Supervision

- ✓ Provide supervision to ensure that safe work procedures are followed.
- ✓ Establish a system to monitor that control measures are in place and being followed.

Worker's Checklist

- ☐ Make sure any engineering control equipment is switched on and is working.
- ☐ Look for signs of leaks, wear or damage of any equipment used. If worker finds any problems, inform the supervisor. Do not carry on working if there is a problem.
- ☐ Clear bridges/blockages from outside the silo. A 'permit to work' will be required for entry into the silo.
- ☐ Wash hands before and after eating, drinking or using the washroom.
- ☐ Do not use solvents to clean skin.
- ☐ Clear up spills immediately. Follow spillage procedure.
- ☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

- Safety Data Sheets
- Guidelines on Occupational Safety and Health for Design, Inspection, Testing and Examination of Local Exhaust Ventilation System, DOSH 2008
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Guidelines on the Control of Chemicals Hazardous to Health, DOSH 2001
- Control Guidance Sheets G101, G204, S100, S101, S102 and R001

Useful links

- DOSH portal: https://www.dosh.gov.my
- SiRAC Online: sirac.dosh.gov.my
- HSE COSHH essentials website: http://www.hse.gov.uk/coshh/essentials/index.htm
- ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Control Approach 3

Tanker Filling and Emptying (Liquids)
G310
Containment

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

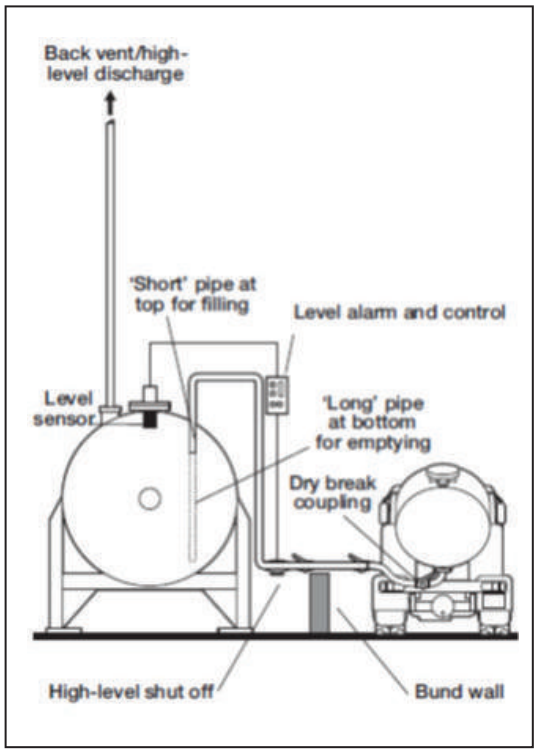
This sheet is used where the assessment recommends Control Approach 3 (Containment) as the suitable approach for chemical(s) and task(s). This sheet provides control measure and good practice recommendation on filling and emptying tankers with large quantities of liquids. It describes the key points that need to be followed to reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ The work area and equipment should be clearly labelled.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ The connection points on the vessel to be filled should comprise a fill pipe, level sensor and a vapour outlet.
- ✓ The level sensor/load cell should be connected to an automatic shut-off valve or filling pump.
- ✓ The joints around connection points should be effectively sealed.
- ✓ A pressure vacuum valve should be fitted on the tanker.
- ✓ Dedicated coupling lines should be used and dry break couplings considered.
- ✓ Provide good lighting in the emptying/filling area. Select lighting equipment suitable for the nature of the substances and processes, e.g. flameproof.



Liquids tanker filling and emptying

- ✓ Hosing used for filling should be of a suitable length.
- ✓ Ensure connections are within areas with spillage containment.
- ✗ Do not use splash loading.
- ✓ For flammable liquids, ensure that suitable pumps/fans are used and that equipment is appropriately earthed.
- ✓ Design the closed system to allow easy maintenance.
- ✓ Discharge vented air to a safe place away from doors, windows and air inlets.
- ✓ Ensure that exhaust air is cleaned before discharge to the environment.

Maintenance, inspection, testing and examination

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer, in effective and efficient working order and good repair.
- ✓ Adopt a 'permit to work' system for maintenance work.
- ✓ Follow any special procedures that are needed before the system is opened or entered, e.g. purging and washing.
- ✓ If the equipment is equipped with the engineering control equipment, ensure that the equipment is

examined and tested against its performance specification by hygiene technician at least every 12 months.
✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

✓ Clean work equipment, and the work and storage area daily. Clean other equipment and the workroom regularly - once a week is recommended.
✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
✓ Store containers in a safe place and dispose off containers drums safely (refer CGS G101).
✓ Put lids on containers immediately after use.

Personal protective equipment (PPE)

✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101 and S102 for more specific advice. Refer to SDS to see what SDS is necessary.
✓ Ask PPE supplier to help on selection of suitable PPE.
✓ Respiratory protective equipment may be necessary for some cleaning and maintenance activities, e.g. dealing with spills. Refer CGS R001 for more specific advice.
✓ Ensure PPE is kept in a clean condition and replaced when necessary.
✓ Store PPE in appropriate places to avoid contamination.

Training

✓ Give workers information on the risk of using the chemicals.
✓ Provide workers with training on:
  • handling chemicals safely;
  • how to use control equipment properly and ensure the control is working;
  • when and how to use any PPE provided;
  • any safe work procedure; and
  • what to do if something goes wrong.
✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

✓ Provide supervision to ensure that safe work procedures are followed.
✓ Establish a system to monitor that all control measures are in place and being followed.

Worker's Checklist

☐ Look for signs of leaks, wear or damage of any equipment used. If worker finds any problems, inform the supervisor. Do not carry on working if there is a problem.
☐ Ensure that all couplings are correctly connected.
☐ Barrier off the emptying area.
☐ Wash hands before and after eating, drinking or using the washroom.
☐ Do not use solvents to clean skin.
☐ Clear up spills immediately. Follow spillage procedure.
☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

• Safety Data Sheets
• Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
• Industry Code of Practice for Safe Working in a Confined Space, DOSH 2010
• Control Guidance Sheets G101, S100, S101, S102 and R001

Useful links

• DOSH portal: https://www.dosh.gov.my
• SiRAC Online: sirac.dosh.gov.my
• HSE COSHH essentials website: https://www.hse.gov.uk/coshh/essentials/index.htm
• ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Control Approach 3

Filling Kegs
G311
Containment

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

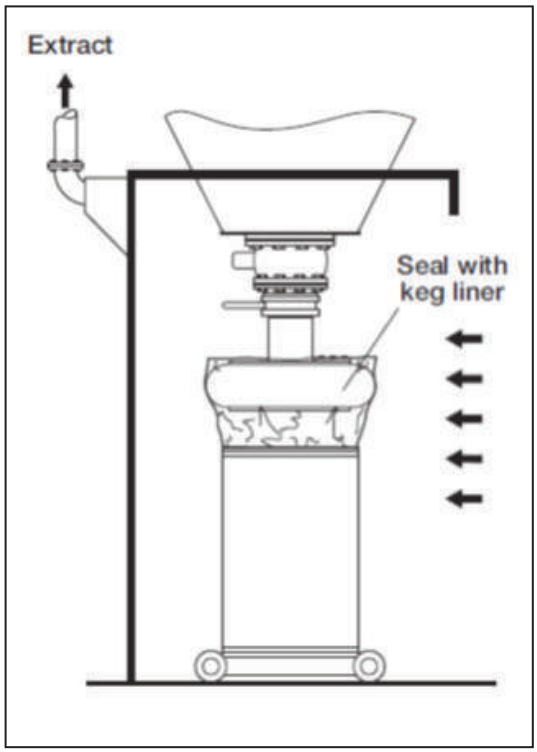
This sheet is use where the assessment recommends Control Approach 3 (Containment) as the suitable approach for chemical(s) and task(s). This sheet provides control measure and good practice recommendation on filling kegs with medium quantities of solids. It describes the key points that need to be followed to reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ The work area and equipment should be clearly labelled.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ Ensure the kegs and filling equipment are compatible and well maintained.
- ✓ Provide suitable seals (e.g. inflatable rings) between the keg and filling head.
- ✓ Provide compatible keg liners for the material(s) being handled. Ensure liners are large enough to be easily tied off.
- ✓ Select kegs for maximum air tightness, e.g. lipped and with ring clamps.
- ✓ Provide a ventilated enclosure around the filling operation with an inward airflow of at least one metre per second.
- ✓ Ensure the filling head does not discharge dust when the keg is removed.



Filling kegs

- ✓ Provide a tray or grid below the filling point to minimise the spread of contamination.
- ✓ Provide good lighting. Select lighting equipment suitable for the nature of the substances and processes, e.g. dust tight or flameproof.
- ✓ Consider handling methods, and provide suitable handling aids to minimise manual handling.
- ✓ Consider the need for explosion relief for combustible solids, and ensure that equipment is appropriately earthed.
- ✓ Discharge exhausts air to a safe place away from doors, windows and air inlets.
- ✓ Ensure that exhaust air is cleaned before discharge to the environment.

Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer, in effective and efficient working order and good repair.
- ✓ Adopt a 'permit to work' system for maintenance work.
- ✓ Follow any special procedures that are needed before the system is opened or entered, e.g. purging and washing.

Inspection, testing and examination

- ✓ Get information from the supplier on all parameters needed to safely operate the system.
- ✓ Inspect the engineering control equipment at least once a month to ensure the equipment is functioning properly and effectively.
- ✓ Ensure that the engineering control equipment is examined and tested against its performance specification by hygiene technician at least every 12 months.
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Thoroughly clean work equipment and the work area daily. Clean other equipment and the workroom regularly, once a week is recommended.
- ✓ Store containers in a safe place (refer CGS G101).
- ✓ Dispose off empty containers safely.
- ✓ Put lids on containers immediately after use.
- ✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
- ✗ Do not clean up with a dry brush or compressed air.
- ✓ Vacuum dry dust or use wet cleaning method.

Personal protective equipment (PPE)

- ✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101 and S102 for more specific advice. Refer to the SDS to see what PPE is necessary.
- ✓ Ask PPE supplier for advice on selection of suitable PPE.
- ✓ Respiratory protective equipment may be necessary for some cleaning and maintenance activities, e.g. dealing with spills. Refer CGS R001 for more specific advice.
- ✓ Store PPE in appropriate places to avoid contamination.

Training

- ✓ Give workers information on the risk of using the chemicals.
- ✓ Provide workers with training on:
  - handling chemicals safely;
  - how to use control equipment properly and ensure the control is working;
  - when and how to use any PPE provided;
  - any safe work procedure; and
  - what to do if something goes wrong.
- ✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

- ✓ Provide supervision to ensure that safe work procedures are followed.
- ✓ Establish a system to monitor that all control measures are in place and being followed.

Worker's Checklist

- ☐ Make sure any engineering control equipment is switched on and is working.
- ☐ Look for signs of leaks, wear or damage of any equipment used. If worker finds any problems, tell the supervisor. Do not carry on working if there is a problem.
- ☐ Do not use deformed containers.
- ☐ Wash hands before and after eating, drinking or using the washroom.
- ☐ Do not use solvents to clean skin.
- ☐ Clear up spills immediately. Follow spillage procedure.
- ☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

- Safety Data Sheets
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Guidelines on Occupational Safety and Health for Design, Inspection, Testing and Examination of Local Exhaust Ventilation System, DOSH 2008
- Guidelines on the Control of Chemicals Hazardous to Health, DOSH 2001
- Control Guidance Sheets G101, G204, S100, S101, S102 and R001

Useful links

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Control Approach 3

Transferring Liquid by Pump
G312
Containment

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

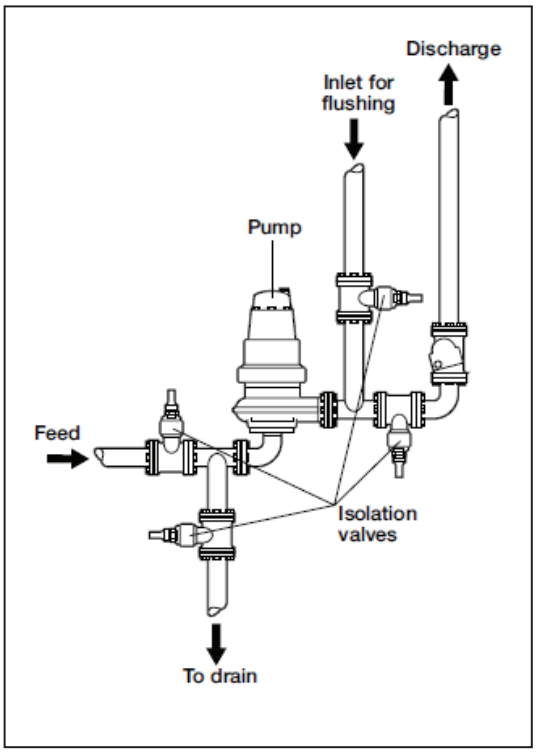
This sheet is use where the assessment recommends Control Approach 3 as the suitable approach for chemical(s) and task(s). This sheet provides control measure and good practice recommendation on transferring medium and large quantities of liquids by pump. It describes the key points that need to be followed to reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ The work area and equipment should be clearly labelled.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ Design the closed system to allow easy maintenance.
- ✓ Ensure seals, gaskets and valve packing are suitable for the intended use.
- ✓ Ensure that the pipeline, including branches, is designed to relevant standards.
- ✓ Minimise the number of branches and dead legs.
- ✓ All pipelines should be properly supported and protected from damage by vehicles.
- ✓ Ensure pipelines have sufficient flexibility to allow for thermal expansion.
- ✓ Provide compatible gaskets and seals for flanges and connections.
- ✓ Provide slip plates or valves to isolate sections of pipe from plant.



Transferring liquid by pump

- ✓ Provide arrangements for draining/flushing sections of pipe, and for safe disposal of residues.
- ✓ Provide precautions against static discharge.
- ✓ Consider means of dealing with blockages, e.g. steam inlets or rodding eyes.
- ✓ Provide a written procedure.
- ✓ Ensure the hose and coupling are to the appropriate standard.
- ✓ Use bolted clips not jubilee clips.
- ✓ Consider the need for rapid isolation in the event of an emergency.
- ✓ Select a pump (and seals/gaskets) suitable for the material to be pumped and for the required flow rate.
- ✓ Protect the pump against overheating and over-pressure, e.g. pressure relief valves.
- ✓ Provide arrangements for draining/flushing sections of pumps and for safe disposal of residues.
- ✓ Make provision for the maintenance and replacement of the pump, e.g. isolation valves, slip plates.

Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer, in effective and efficient working order and good repair.
- ✓ Adopt a 'permit to work' system for maintenance work.

✓ Provide written procedures for all maintenance tasks.
✓ Follow any special procedures that are needed before the system is opened or entered, e.g. purging and washing.

Inspection, testing and examination

✓ Get information from the supplier on all parameters needed to safely operate the system.
✓ Inspect the engineering control equipment at least once a month to ensure the equipment is functioning properly and effectively.
✓ Ensure the engineering control equipment is examined and tested against its performance specification by hygiene technician at least every 12 months.
✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

✓ Thoroughly clean work equipment and the work area daily. Clean other equipment and the workroom regularly - once a week is recommended.
✓ Store containers in a safe place (refer CGS G101).
✓ Dispose off empty containers safely
✓ Dispose off hazardous wastes safely.
✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.

Personal protective equipment (PPE)

✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101 and S102 for more specific advice. Refer to SDS to see what PPE is necessary.
✓ Ask PPE supplier to help on selection of suitable PPE.
✓ Respiratory protective equipment may be necessary for some cleaning and maintenance activities, e.g. dealing with spills. Refer CGS R001 for more specific advice.
✓ Store PPE in appropriate places to avoid contamination.

Training

✓ Give workers information on the risk of using the chemicals.
✓ Provide workers with training on:
  • handling chemicals safely;
  • how to use control equipment properly and ensure the control is working;
  • when and how to use any PPE provided;
  • any safe work procedure; and
  • what to do if something goes wrong.
✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

✓ Provide supervision to ensure that safe work procedures are followed.
✓ Establish a system to monitor that all control measures are in place and being followed.

Worker's Checklist

☐ Make sure any engineering control equipment is switched on and is working
☐ Look for signs of leaks, wear or damage of any equipment used. If worker finds any problems, tell the supervisor. Do not carry on working if there is a problem.
☐ Wash hands before and after eating, drinking or using the washroom.
☐ Do not use solvents to clean skin.
☐ Clear up spills immediately. Follow spillage procedure.
☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

• Safety Data Sheets
• Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
• Guidelines on Occupational Safety and Health for Design, Inspection, Testing and Examination of Local Exhaust Ventilation System, DOSH 2008
• Guidelines on the Control of Chemicals Hazardous to Health, DOSH 2001
• Control Guidance Sheets g101, S100, S101 and S102

Useful links

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• SiRAC Online: sirac.dosh.gov.my
• HSE COSHH essentials website: https://www.hse.gov.uk/coshh/essentials/index.htm
• ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Control Approach 3

Packet Filling
G313
Containment

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

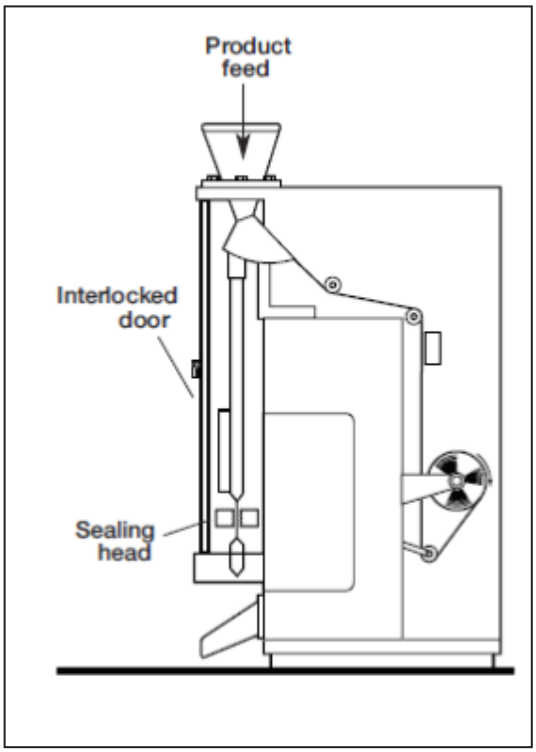
This sheet is used where the assessment recommends Control Approach 3 (Containment) as the suitable approach for chemical(s) and task(s). This sheet provides good practice advice on filling packets with medium and large quantities of solids using a form fill and seal machine as an example. It describes the key points that need to be followed to reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ The work area and equipment should be clearly labelled.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ Enclose the solids transfer system as much as possible.
- ✓ Integrate the weighing/bagging system to minimise open transfer. Provide an enclosure around the weighing/bagging heads.
- ✓ Extend the enclosure to cover the area where the packet is closed and sealed.
- ✓ Design the enclosure to ensure that the high-velocity pressure jets from pneumatic system discharges do not breach the containment.
- ✓ Design the enclosure in sections to allow easy access for cleaning and maintenance.
- ✓ Provide dust curtains at the open ends of the enclosures, e.g. transfer conveyors for filled packets.



Packet filling

- ✓ Keep the process equipment under negative pressure to prevent leakage.
- ✓ The inward airflow at all openings in the enclosure should be at least one metre per second.
- ✓ Hinged doors should be provided for routine inspection.
- ✓ Provide safeguards to prevent contact with moving parts of machines and other hazards, e.g. hot glue application.
- ✓ Discharge exhausts air to a safe place away from doors, windows and air inlets.
- ✓ Consider the need for explosion relief for combustible solids.

Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer, in effective and efficient working order and good repair.
- ✓ Adopt a 'permit to work' system for maintenance work.
- ✓ Follow any special procedures that are needed before the system is opened or entered, e.g. purging and washing.

Inspection, testing and examination

- ✓ Get information from the supplier on all parameters needed to safely operate the system.
- ✓ Inspect the engineering control equipment at least once a month to ensure the equipment is functioning properly and effectively.
- ✓ Ensure the engineering control equipment is examined and tested against its performance specification by hygiene technician at least every 12 months.
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Thoroughly clean work equipment and the work area daily. Clean other equipment and the workroom regularly, once a week is recommended.
- ✓ Store containers in a safe place (Refer CGS G101).
- ✓ Dispose off empty containers safely.
- ✓ Put lids on containers immediately after use.
- ✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
- ✗ Do not clean up with a dry brush or compressed air.
- ✓ Use a vacuum system or wet cleaning.

Personal protective equipment (PPE)

- ✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101 and S102 for more specific advice. Refer to SDS to see what PPE is necessary.
- ✓ Ask PPE supplier to help on selection of suitable PPE.
- ✓ Respiratory protective equipment may be necessary for some cleaning and maintenance activities, e.g. dealing with spills.
- ✓ Ensure PPE is kept in a clean condition and replaced when necessary.
- ✓ Store PPE in appropriate places to avoid contamination.

Training

- ✓ Give workers information on the risk of using the chemicals.
- ✓ Provide workers with training on:
  - handling chemicals safely;
  - how to use control equipment properly and ensure the control is working;
  - when and how to use any PPE provided;
  - any safe work procedure; and
  - what to do if something goes wrong.
- ✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

- ✓ Provide supervision to ensure that safe work procedures are followed.
- ✓ Establish a system to monitor that all control measures are in place and being followed.

Worker's Checklist

- ☐ Make sure any engineering control equipment is switched on and is working.
- ☐ Look for signs of leaks, wear or damage of any equipment used. If worker finds any problems, tell the supervisor. Do not carry on working if there is a problem.
- ☐ Wash hands before and after eating, drinking or using the washroom.
- ☐ Do not use solvents to clean skin.
- ☐ Clear up spills immediately. Follow spillage procedure.
- ☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

- Safety Data Sheets
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Guidelines on Occupational Safety and Health for Design, Inspection, Testing and Examination of Local Exhaust Ventilation System, DOSH 2008.
- Control Guidance Sheets G101, G204, G302, S100, S101 and S102

Useful links

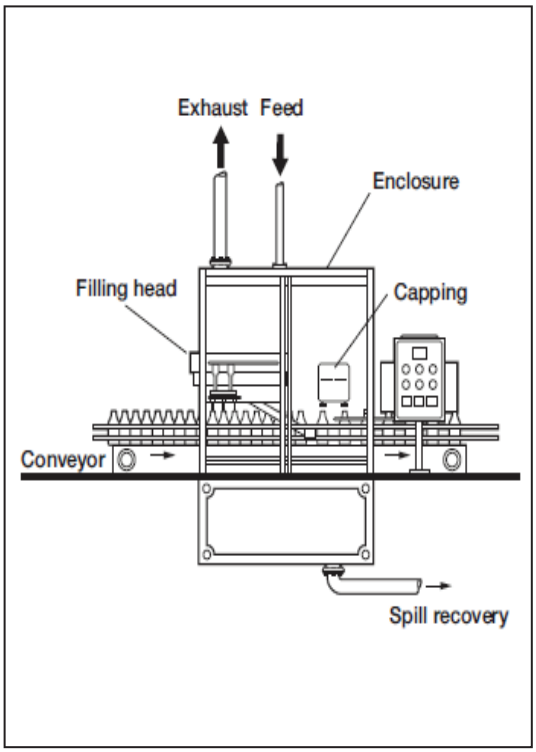
- DOSH portal: https://www.dosh.gov.my
- SiRAC Online: sirac.dosh.gov.my
- HSE COSHH essentials website: https://www.hse.gov.uk/coshh/essentials/index.htm
- ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Control Approach 3

Bottle Filling
G314
Containment

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

This sheet is used where the assessment recommends Control Approach 3 (Containment) as the suitable approach for chemical(s) and task(s). This sheet provides good practice advice on filling bottles with medium and large quantities of liquids. It describes the key points that need to be followed to reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to the Safety Data Sheet (SDS) for more information.



Bottle filling

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ The work area and equipment should be clearly labelled.

Design and equipment

- ✓ Clearly label the work area and equipment.
- ✓ Enclose the liquid transfer system as much as possible. Airflow into openings must be sufficient to effectively control airborne contaminants. This will depend on the design and size of openings.
- ✓ Integrate the weighing/volume measurement system to minimise open transfer.
- ✓ Provide an enclosure around the filling heads.
- ✓ Design the enclosure to ensure that the high-velocity pressure jets from pneumatic system discharges do not breach the containment.
- ✓ Design the enclosure in sections to allow easy access for cleaning and maintenance.
- ✓ Provide curtains at the open ends of the enclosures, e.g. on transfer conveyors for filled containers.
- ✓ Keep the process equipment under negative pressure to prevent leakage.
- ✓ The inward airflow at all openings in the enclosure should be at least 0.5 metres per second.
- ✓ Hinged doors should be provided for routine inspection.
- ✓ Provide a spillage containment/removal system.
- ✓ Consider the need for an inert atmosphere for flammable material.
- ✓ Discharge exhausts air to a safe place away from doors, windows and air inlets.

Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer, in effective and efficient working order and good repair.
- ✓ Adopt a 'permit to work' system for maintenance work.
- ✓ Follow any special procedures that are needed before the system is opened or entered, e.g. purging and washing.
- ✗ Do not enter a confined space until it has been checked for hazardous chemicals and oxygen content.

Inspection, testing and examination

- ✓ Get information from the supplier on all parameters needed to safely operate the system.
- ✓ Inspect the engineering control equipment at least once a month to ensure the equipment is functioning properly and effectively.
- ✓ Ensure the engineering control equipment is examined and tested against its performance specification by hygiene technician at least every 12 months.
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Thoroughly clean work equipment and the work area daily. Clean other equipment and the workroom regularly, once a week is recommended.
- ✓ Store containers in a safe place (refer CGS G101).
- ✓ Dispose off empty containers safely.
- ✓ Put lids on containers immediately after use.
- ✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.

Personal protective equipment (PPE)

- ✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101 and S102 for more specific advice. Refer to SDS to see what PPE is necessary.
- ✓ Ask PPE supplier to help on selection of suitable PPE.
- ✓ Respiratory protective equipment may be necessary for some cleaning and maintenance activities, e.g. dealing with spills. Refer CGS R001 for more specific advice.
- ✓ Ensure PPE is kept in a clean condition and replaced when necessary.
- ✓ Store PPE in appropriate places to avoid contamination.

Training

- ✓ Give workers information on the risk of using the chemicals.
- ✓ Provide workers with training on:.
  - handling chemicals safely;
  - how to use control equipment properly and ensure the control is working;
  - when and how to use any PPE provided;
  - any safe work procedure; and
  - what to do if something goes wrong.
- ✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

- ✓ Provide supervision to ensure that safe work procedures are followed.
- ✓ Establish a system to monitor that control measures are in place and being followed.

Worker's Checklist

- ☐ Make sure any engineering control equipment is switched on and is working.
- ☐ Look for signs of leaks, wear or damage of any equipment used. If worker finds any problems, tell the supervisor. Do not carry on working if there is a problem.
- ☐ Wash hands before and after eating, drinking or using the washroom.
- ☐ Do not use solvents to clean skin.
- ☐ Clear up spills immediately. Follow spillage procedure.
- ☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

- Safety Data Sheets
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Industry Code of Practice for Safe Working in a Confined Space, DOSH 2010
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Control Approach 3

Weighing (Solids)
G315
Containment

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

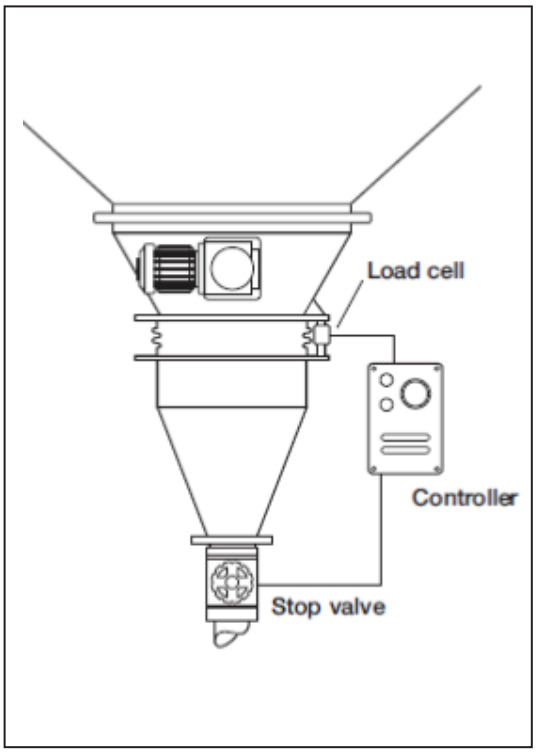
This sheet is used where the assessment recommends Control Approach 3 (Containment) as the suitable approach for chemical(s) and task(s). This sheet provides control measures and good practice recommendations on weighing medium and large quantities of solids. It describes the key points that need to be followed to reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to the Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ The work area and equipment should be clearly labelled.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ Clearly label the work area and equipment.
- ✓ Ensure the weigh vessel and associated pipework, valves and instrumentation are suitable for intended use.
- ✓ Ensure dust-tight connections between feed hopper, load cell and receiving container.
- ✓ Provide a controlled feeding device between the feed hopper and load cell.
- ✓ Provide as much space as possible within the enclosures. This will help contain the dust.
- ✓ Consider how to prevent or deal with blockages without breaching the integrity of the closed system, e.g. vibrating pads or pneumatic jets.



Solids weighing

- ✓ Design the enclosure in sections to allow easy access for cleaning and maintenance.
- ✗ Do not allow entry to a feed hopper to remove a blockage without isolating the equipment, checking the atmosphere for oxygen deficiency and toxic gases and selecting suitable personal protective equipment.
- ✓ Consider the need for explosion relief for combustible solids, and ensure that equipment is appropriately earthed.
- ✓ Keep the process equipment under negative pressure to prevent leaks.
- ✓ Discharge exhausts air to a safe place away from doors, windows and air inlets.

Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer, in effective and efficient working order and good repair.
- ✓ Adopt a 'permit to work' system for maintenance work.
- ✓ Follow any special procedures that are needed before the system is opened or entered, e.g. purging and washing.

Inspection, testing and examination

- ✓ Get information from the supplier on all parameters needed to safely operate the system.
- ✓ Inspect the engineering control equipment at least once a month to ensure the equipment is functioning properly and effectively.
- ✓ Ensure the engineering control equipment is examined and tested against its performance specification by hygiene technician at least every 12 months.
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Thoroughly clean work equipment and the work area daily. Clean other equipment and the workroom regularly, once a week is recommended.
- ✓ Store packages/containers in a safe place (refer CGS G101).
- ✓ Dispose off empty packages/containers safely.
- ✓ Put lids on containers immediately after use.
- ✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
- ✗ Do not clean up with a dry brush or compressed air.
- ✓ Vacuum dry dust or use wet cleaning methods.

Personal protective equipment (PPE)

- ✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101and S102 for more specific advice. Refer to the SDS to see what PPE is necessary.
- ✓ Ask PPE supplier to help on selection of suitable PPE.
- ✓ Respiratory protective equipment may be necessary for some cleaning and maintenance activities, e.g. dealing with spills. Refer CGS R001 for more specific advice.
- ✓ Ensure PPE is kept in a clean condition and replaced when necessary.
- ✓ Store PPE in appropriate places to avoid contamination.

Training

- ✓ Give workers information on the risk of using the chemicals.
- ✓ Provide workers with training on:
  - handling chemicals safely;
  - how to use control equipment properly and ensure the control is working;
  - when and how to use any PPE provided;
  - any safe work procedure; and
  - what to do if something goes wrong.
- ✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

- ✓ Provide supervision to ensure that safe work procedures are followed.
- ✓ Establish a system to monitor that control measures are in place and being followed.

Worker's Checklist

- ☐ Make sure any extraction system is switched on and is working.
- ☐ Look for signs of leaks, wear or damage of any equipment used. If worker finds any problems, tell the supervisor. Do not carry on working if there is a problem.
- ☐ Wash hands before and after eating, drinking or using the washroom.
- ☐ Do not use solvents to clean skin.
- ☐ Clear up spills immediately. Follow spillage procedure.
- ☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

- Safety Data Sheets
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Industry Code of Practice for Safe Working in a Confined Space, DOSH 2010
- Control Guidance Sheets G101, G204, G302, S100, S101, S102 and R001

Useful links

- DOSH portal: https://www.dosh.gov.my
- SiRAC Online: sirac.dosh.gov.my
- HSE COSHH essentials website: https://www.hse.gov.uk/coshh/essentials/index.htm
- ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Control Approach 3

Weighing (Liquids)
G316
Containment

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

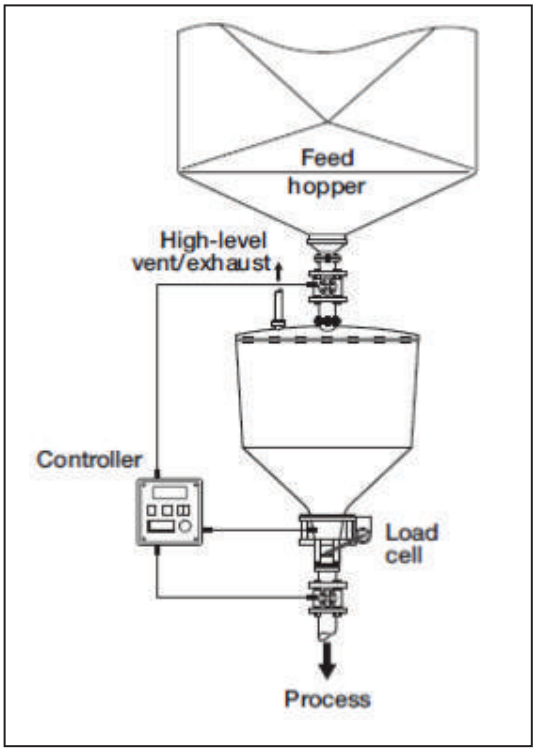
This sheet is used where the assessment recommends Control Approach 3 (Containment) as the suitable approach for chemical(s) and task(s). This sheet provides control measure and good practice recommendation on weighing medium and large quantities of liquids. It describes the key points that need to be followed to reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to the Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ The work area and equipment should be clearly labelled.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ Use load cells or metered flow devices to dispense fixed quantities of liquid.
- ✓ Ensure the weigh vessel; associated pipe-work, valves and instrumentation are suitable for the intended use.
- ✓ Where necessary, incorporate an agitation device within the weigh vessel.
- ✓ Provide venting to the weigh vessel. Either vent back to the storage vessel or discharge to a safe place away from doors, windows and air inlets.
- ✓ Provide a high-level alarm, e.g. to stop delivery pump and/or close the supply valve.



Liquids weighing

- ✓ Consider the need for additional protection against overfilling.
- ✓ For flammable liquids, ensure that suitable pumps /fans are used and that equipment is appropriately earthed.
- ✗ Do not allow entry to vessels for maintenance before ensuring the atmosphere is free of hazardous substances and contains sufficient oxygen.
- ✓ Design the closed system to allow easy maintenance.
- ✓ Keep the process equipment under negative pressure to prevent leaks.

Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer, in effective and efficient working order and good repair.
- ✓ Adopt a 'permit to work' system for maintenance work.
- ✓ Follow any special procedures that are needed before the system is opened or entered, e.g. purging or cleaning.

Inspection, testing and examination

- ✓ Get information from the supplier on all parameters needed to safely operate the system.
- ✓ Inspect the engineering control equipment at least once a month to ensure the equipment is functioning properly and effectively.
- ✓ The effectiveness of the engineering control equipment can be checked by monitoring of worker exposure where appropriate.
- ✓ Ensure the engineering control equipment is examined and tested against its performance specification by hygiene technician at least every 12 months.
- ✓ Keep records of all inspections, examinations and testing for at least five years.

Cleaning and housekeeping

- ✓ Clean work equipment and the work area daily. Clean other equipment and the workroom regularly, once a week is recommended.
- ✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
- ✓ Store containers in a safe place (refer CGS G101).
- ✓ Dispose off empty containers safely.
- ✓ Put lids on containers immediately after use.

Personal protective equipment (PPE)

- ✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101 and S102 for more specific advice. Refer to the SDS to get information on suitable PPE.
- ✓ Ask PPE supplier for advice on selection of suitable PPE.
- ✓ Respirator protective equipment may be needed for some cleaning and maintenance activities, e.g. cleaning up spills. Refer CGS R001 for more specific advice.
- ✓ Ensure PPE is kept in a clean condition and replaced when necessary.
- ✓ Store PPE in appropriate places to avoid contamination.

Training

- ✓ Give workers information on the risk of using the chemicals.
- ✓ Provide workers with training on:
  - handling chemicals safely;
  - how to use control equipment properly and ensure the control is working;
  - when and how to use any PPE provided;
  - any safe work procedure; and
  - what to do if something goes wrong.
- ✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

- ✓ Provide supervision to ensure that safe work procedures are followed.
- ✓ Establish a system to monitor that control measures are in place and being followed.

Worker's Checklist

- ☐ Make sure any engineering control equipment is switched on and is working.
- ☐ Look for signs of leaks, wear or damage of any equipment used. If worker finds any problems, tell the supervisor. Do not carry on working if there is a problem.
- ☐ Wash hands before and after eating, drinking or using the washroom.
- ☐ Do not use solvents to clean skin.
- ☐ Clear up spills immediately. Follow spillage procedure.
- ☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

- Safety Data Sheets
- Guidelines on Occupational Safety Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Industry Code of Practice for Safe Working in a Confined Space, DOSH 2010 and Health for Design, Inspection, Testing and Examination of Local Exhaust Ventilation System, DOSH 2008
- Control Guidance Sheets G101, S100, S101, S102 and R001

Useful links

- DOSH portal: https://www.dosh.gov.my
- SiRAC Online: sirac.dosh.gov.my
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- ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Control Approach 3

Mixing (Solids)
G317
Containment

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

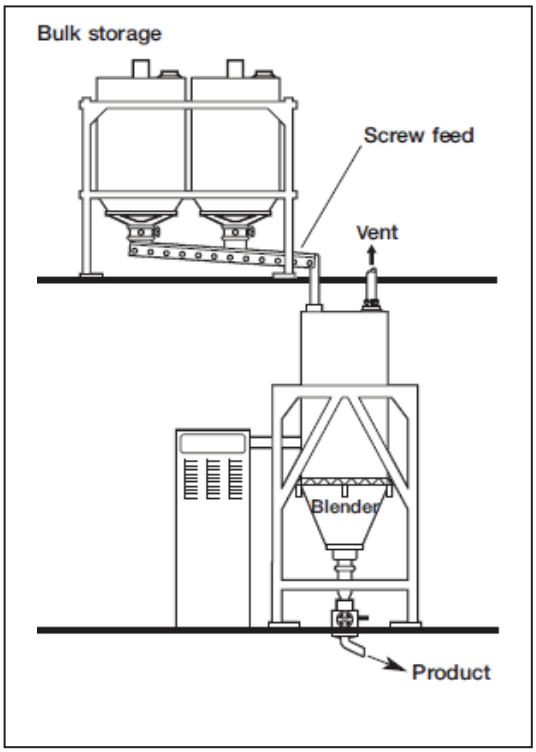
This sheet is used where the assessment recommends Control Approach 3 (Containment) as the suitable approach for chemical(s) and task(s). This sheet provides control measure and good practice recommendation on mixing medium and large quantities of solids. It describes the key points that need to be followed to reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to the Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ Clearly label the work area and equipment.
- ✓ Ensure the mixer, feed and discharge conveyors are enclosed as much as possible. Screw conveyors or pneumatic transfer are preferred.
- ✓ Provide suitable seals on the mixer, conveyor covers and other access points to minimise dust leaks.
- ✓ Ensure that lids, covers and other access points can be securely closed before operating the mixer.
- ✓ Ensure the materials used for constructions, seals, gaskets etc. are suitable for the intended use.
- ✓ Consider the need for arrangements to prevent over-pressurisation of the mixer, e.g. by venting to a safe place away from doors, windows and air inlets.
- ✓ Consider the need for explosion relief for combustible solids, and ensure that equipment is appropriately earthed.



Solids mixing

- ✓ Design the closed system to allow easy maintenance and cleaning.
- ✓ Keep the process equipment under negative pressure to prevent leaks.
- ✓ Discharge exhausts air to a safe place away from doors, windows and air inlets.

Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer, in effective and efficient working order and good repair.
- ✓ Adopt a 'permit to work' system for maintenance work.
- ✓ Follow any special procedures that are needed before the system is opened or entered, e.g. purging or cleaning.

Inspection, testing and examination

- ✓ Get information from the supplier on all parameters needed to safely operate the system.
- ✓ Inspect the engineering control equipment at least once a month to ensure the equipment is functioning properly and effectively.
- ✓ Ensure the engineering control equipment is examined and tested against its performance

✓ specification by hygiene technician at least every 12 months.
✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

✓ Thoroughly clean work equipment and the work area daily. Clean other equipment and the workroom regularly, once a week is recommended.
✓ Store packages/containers in a safe place (refer CGS G101).
✓ Dispose off empty packages/containers safely.
✓ Put lids on containers immediately after use.
✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
✗ Do not clean up with a dry brush or compressed air.
✓ Vacuum dry dust or use wet cleaning methods.

Personal protective equipment (PPE)

✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101 and S102 for more specific advice. Refer to the SDS to see what PPE is necessary.
✓ Ask PPE supplier to help on selection of suitable PPE.
✓ Respiratory protective equipment may be necessary for some cleaning and maintenance activities, e.g. cleaning up spills.
✓ Store PPE in appropriate places to avoid contamination.

Training

✓ Give workers information on the risk of using the chemicals.
✓ Provide workers with training on:
  • handling chemicals safely;
  • how to use control equipment properly and ensure the control is working;
  • when and how to use any PPE provided;
  • any safe work procedure; and
  • what to do if something goes wrong.
✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

✓ Provide supervision to ensure that safe work procedures are followed.
✓ Establish a system to monitor that all control measures are in place and being followed.

Worker's Checklist

☐ Make sure any extraction system is switched on and is working.
☐ Take special care not to overfill the mixer.
☐ Look for signs of leaks, wear or damage of any equipment used. If worker finds any problems, tell the supervisor. Do not carry on working if there is a problem.
☐ Wash hands before and after eating, drinking or using the washroom.
☐ Do not use solvents to clean skin.
☐ Clear up spills immediately. Follow spillage procedure.
☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

• Safety Data Sheets
• Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
• Control Guidance Sheets G101, G204, G302, S100, S101and S102

Useful links

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• SiRAC Online: sirac.dosh.gov.my
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• ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Control Approach 3

Mixing (Liquids)
G318
Containment

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

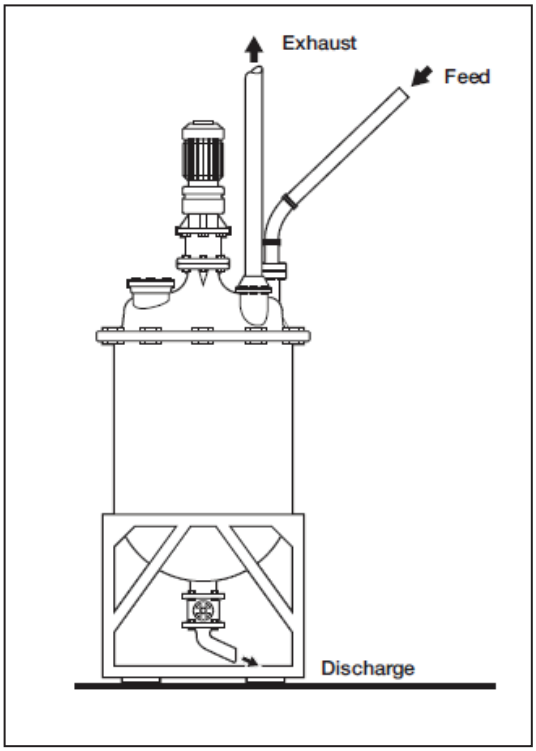
This sheet is used where the assessment recommends Control Approach 3 (Containment) as the suitable approach for chemical(s) and task(s). This sheet provides control measure and good practice recommendation on mixing medium and large quantities of liquids. It describes the key points that need to be followed to reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ The work area and equipment should be clearly labelled.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ The mixer should be fully enclosed and provided with effective seals on the lid, other access points and mixer drive shafts.
- ✓ Ensure the mixer is adequately vented to prevent pressure build-up.
- ✓ The mixer should be provided with liquid level and pressure indicators that are clearly visible.
- ✓ Consider the use of pressure relief valves and/or bursting discs for reactive materials.
- ✗ Do not allow entry to a closed mixer for cleaning or maintenance until the equipment has been isolated, made safe and the atmosphere checked for oxygen deficiency or toxic gases.



Liquid mixing

- ✓ Design the closed system to allow easy maintenance and cleaning.
- ✓ Keep the process equipment under negative pressure to prevent leakage.
- ✓ Discharge exhausts air to a safe place away from doors, windows and air inlets.

Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer, in effective and efficient working order and good repair.
- ✓ Adopt a 'permit to work' system for maintenance work.
- ✓ Follow any special procedures that are needed before the system is opened or entered, e.g. purging and washing.

Inspection, testing and examination

- ✓ Get information on the design performance of the equipment from the supplier. Keep this information to compare with future test results.
- ✓ Inspect the engineering control equipment at least once a month to ensure the equipment is functioning properly and effectively.

- ✓ The effectiveness of the engineering control equipment can be checked by monitoring of worker exposure where appropriate.
- ✓ Ensure the engineering control equipment is examined and tested against its performance specification by hygiene technician at least every 12 months.
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Clean work equipment and the work area daily. Clean other equipment and the workroom regularly, once a week is recommended.
- ✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
- ✓ Store containers in a safe place and dispose off containers drum safely (refer CGS G101).
- ✓ Put lids on containers immediately after use.
- ✗ Do not clean up with a dry brush or compressed air.
- ✓ Vacuum dry dust or use wet cleaning methods.

Personal protective equipment (PPE)

- ✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101 and S102 for more specific advice. Refer to the SDS to see what personal protective equipment is necessary.
- ✓ Ask PPE supplier for advice on selection of suitable protective equipment.
- ✓ Respiratory protective equipment may be necessary for some cleaning and maintenance activities, e.g. cleaning up spills. Refer CGS R001 for more specific advice.
- ✓ Ensure PPE is kept in a clean condition and replaced when necessary.
- ✓ Store PPE in appropriate places to avoid contamination.

Personal Decontamination

- ✓ Provide warm water, mild skin cleansers, and soft paper or fabric towels for drying. Avoid abrasive cleansers.

Training

- ✓ Give workers information on the risk of using the chemicals.
- ✓ Provide workers with training on:
  - handling chemical safely;
  - how to use control equipment properly and ensure the control is working;
  - when and how to use any PPE provided;
  - any safe work procedure; and
  - what to do if something goes wrong.
- ✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

- ✓ Provide supervision to ensure that safe work procedures are followed.
- ✓ Establish a system to monitor that all control measures are in place and being followed.

Worker's Checklist

- ☐ Make sure any engineering control equipment is switched on and working.
- ☐ Look for signs of leaks, wear and damage before every job.If worker finds any problems, tell the supervisor. Do not just carry on working.
- ☐ Clear up spills immediately. Follow spillage procedure.
- ☐ Use, maintain and store any PPE provided in accordance with instructions.
- ☐ Do not use solvents to clean skin.
- ☐ Wash hands before eating, drinking, smoking, using the washroom and after work.

Further information

- Safety Data Sheets
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Industry Code of Practice for Safe Working in a Confined Space, DOSH 2010
- Guidelines on Occupational Safety and Health for Design, Inspection, Testing and Examination of Local Exhaust Ventilation System, DOSH 2008
- Control Guidance Sheets G101, S100, S101, S102 and R001

Useful links

- DOSH portal: https://www.dosh.gov.my
- SiRAC Online: sirac.dosh.gov.my
- HSE COSHH essentials website: https://www.hse.gov.uk/coshh/essentials/index.htm
- ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Control Approach 3

Robotised Spray Booth
G319
Containment

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

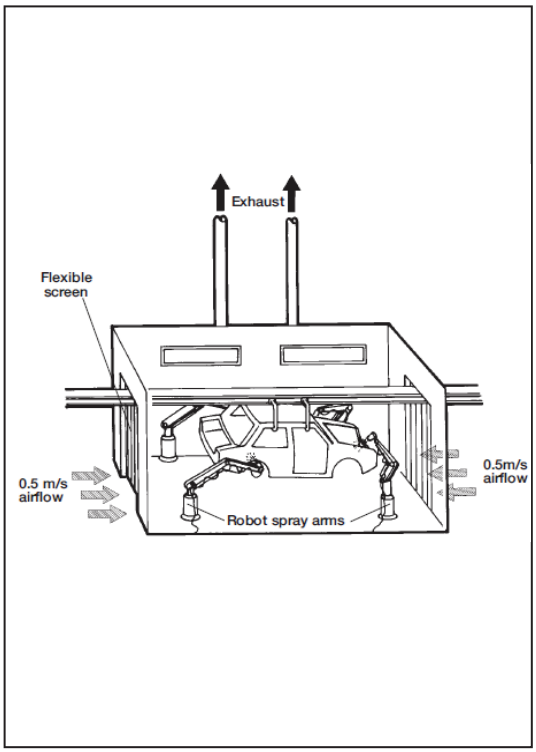
This sheet is used where the assessment recommends Control Approach 3 (Containment) as the suitable approach for chemical(s) and task(s). This sheet provides control measure and good practice recommendation on surface coating with medium and large quantities of liquids using a robotised spray booth. It describes the key points that need to be followed to reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to the Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ The work area and equipment should be clearly labelled.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ Clearly label the work area and equipment.
- ✓ Keep the open area as small as possible.
- ✓ Airflow into openings must be sufficient to effectively control airborne contaminants. This will depend on the design and size of openings.
- ✓ Use filters to prevent paint deposits on electric motors, fan blades and ventilation ducts.
- ✓ Consider where sprayed items are to be located while drying. A second ventilated area may be required.
- ✓ Provide good lighting in the booth area. Select lighting equipment suitable for the nature of the substances and processes, e.g. flameproof.



Robotised spray booth

- ✓ For flammable liquids, ensure that suitable pumps/fans are used and that appropriate earthing is undertaken.
- ✓ Design the closed system to allow easy maintenance.
- ✓ Keep the process equipment under negative pressure to prevent leaks.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.

Maintenance

- ✓ Ensure all equipment used for the task is maintained as advised by the supplier/installer, in effective and efficient working order and good repair.
- ✓ Adopt a 'permit to work' system for maintenance work.
- ✓ Follow any special procedures that are needed before the system is opened or entered, e.g. purging or cleaning.

Inspection, testing and examination

- ✓ Get information from the supplier on all parameters needed to safely operate the system.
- ✓ Inspect the engineering control equipment at least once a month to ensure the equipment is functioning properly and effectively.

- ✓ Ensure the engineering control equipment is examined and tested against its performance specification by hygiene technician at least every 12 months.
- ✓ Keep records for all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Clean work equipment and the work area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
- ✓ Store containers in a safe place (refer CGS G101).
- ✓ Dispose off empty containers safely.
- ✓ Put lids on containers immediately after use.

Personal protective equipment (PPE)

- ✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101 and S102 for more specific advice. Refer to the SDS to get information on PPE.
- ✓ Ask PPE supplier for advice on selection of suitable PPE.
- ✓ Respirator protective equipment may be necessary for some cleaning and maintenance activities, e.g. cleaning up spills. Refer CGS R001 for more specific advice.
- ✓ Ensure PPE is kept in a clean condition and replaced when necessary.
- ✓ Store PPE in appropriate places to avoid contamination.

Training

- ✓ Give workers information on the risk of using the chemicals.
- ✓ Provide workers with training on:
  - handling chemical safely;
  - how to use control equipment properly and ensure the control is working;
  - when and how to use any PPE provided;
  - any safe work procedure; and
  - what to do if something goes wrong.
- ✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

- ✓ Provide supervision to ensure that safe work procedures are followed.
- ✓ Establish a system to monitor that all control measures are in place and being followed.

Worker's Checklist

- ☐ Make sure any engineering control equipment is switched on and is working.
- ☐ Look for signs of leaks, wear or damage of any equipment used. If worker finds any problems, tell the supervisor. Do not carry on working if there is a problem.
- ☐ Wash hands before and after eating, drinking or using the washroom.
- ☐ Do not use solvents to clean skin.
- ☐ Clear up spills immediately. Follow spillage procedure.
- ☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

- Safety Data Sheets
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Industry Code of Practice for Safe Working in a Confined Space, DOSH 2010
- Guidelines on Monitoring of Airborne Contaminant for Chemicals Hazardous to Health, DOSH 2002
- Control Guidance Sheets G101, S100, S101, S102 and R001

Useful links

- DOSH portal: https://www.dosh.gov.my
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- ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Control Approach 3

Automated Powder Coating
G320
Containment

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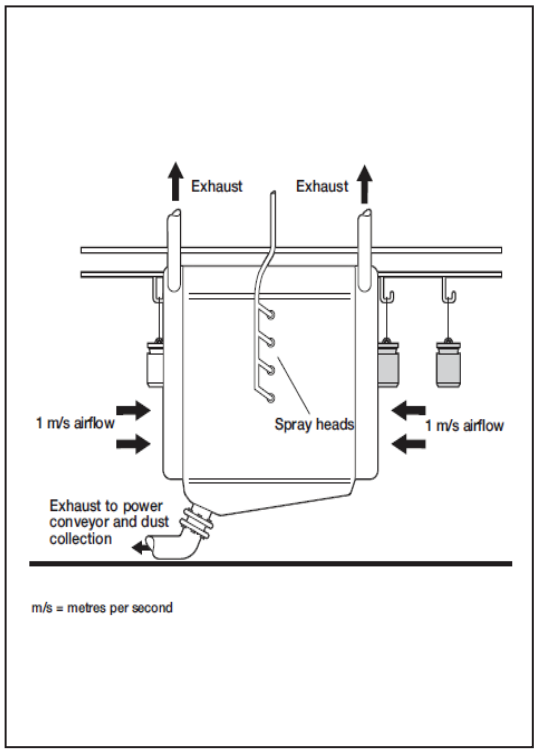
This sheet is used where the assessment recommends Control Approach 3 (Containment) as the suitable approach for chemical(s) and task(s). This sheet provides control measure and good practice recommendation on automated powder coating using medium or large quantities of solids. It describes the key points that need to be followed to reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to the Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ The work area and equipment should be clearly labelled.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ The booth should have smooth impervious internal surfaces or other arrangements to deal with overspray, e.g. strippable coating.
- ✓ Adjust the application equipment to minimise powder use.
- ✓ Provide arrangements to collect and recycle excess powder.
- ✓ Airflow into openings into the spray booth must be sufficient to effectively control airborne contaminants. This will depend on the design and size of openings.
- ✓ Use 'air curtains' at the entrance and exit to contain dust.



Automated power coating

- ✓ Make the booth large enough to contain overspray.
- ✓ Provide interlock arrangements on access doors to shut off the conveyor and paint supply when the door is opened.
- ✓ Consider the need for explosion relief for combustible solids, and ensure equipment is a appropriately earthed.
- ✓ Design the closed system to allow easy maintenance.
- ✓ Keep the process equipment under negative pressure to prevent leaks.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.

Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer, in effective and efficient working order and good repair.
- ✓ Adopt a 'permit to work' system for maintenance work.
- ✓ Follow any special procedures that are needed before the system is opened or entered, e.g. purging or cleaning.

Inspection, testing and examination

✓ Get information from the supplier on all parameters needed to safely operate the system.
✓ Inspect the engineering control equipment at least once a month to ensure the equipment is functioning properly and effectively.
✓ Ensure the engineering control equipment is examined and tested against its performance specification by hygiene technician at least every 12 months.
✓ Keep records of all inspection, examinations and tests for at least five years.

Cleaning and housekeeping

✓ Clean work equipment and the working area daily. Clean other equipment and the workroom regularly, once a week is recommended.
✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
✓ Store packages/containers in a safe place (refer CGS G101).
✓ Dispose off empty packages/containers safely.
✓ Put lids on containers immediately after use.
✗ Do not clean up with a dry brush or compressed air.
✓ Vacuum dry dust or use wet cleaning methods.

Personal protective equipment (PPE)

✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101and S102 for more specific advice. Refer to the SDS to get information on suitable PPE.
✓ Ask PPE supplier for advice on selection of suitable PPE.
✓ Respiratory protective equipment may be needed for some cleaning and maintenance activities, e.g. cleaning up spills. Refer CGS R001 for more specific advice.
✓ Ensure PPE is kept in a clean condition and replaced when necessary.
✓ Store PPE in appropriate places to avoid contamination.

Training

✓ Give workers information on the risk of using the chemicals.
✓ Provide workers with training on:
- handling chemical safely;
- how to use control equipment properly and ensure the control is working;
- when and how to use any PPE provided;
- any safe work procedure; and
- what to do if something goes wrong.

✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

✓ Provide supervision to ensure that safe work procedures are followed.
✓ Establish a system to monitor that all control measures are in place and being followed.

Worker's Checklist

☐ Make sure any engineering control equipment is switched on and working.
☐ Look for signs of damage, wear or poor operation of any equipment used. If worker finds any problems, tell the supervisor. Do not carry on working if there is a problem.
☐ Wash hands before and after eating, drinking or using the washroom.
☐ Do not use solvents to clean skin.
☐ Clear up spills immediately. Follow spillage procedure.
☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

- Safety Data Sheets
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Industry Code of Practice for Safe Working in a Confined Space, DOSH 2010
- Guidelines on Monitoring of Airborne Contaminant for Chemicals Hazardous to Health, DOSH 2002
- Guidelines on Occupational Safety and Health for Design, Inspection, Testing and Examination of Local Exhaust Ventilation System, DOSH 2008
- Guidelines on the Control of Chemicals Hazardous to Health, DOSH 2001
- Control Guidance Sheets G101, G204, G302, S100, S101, S102 and R001

Useful links

- DOSH portal: https://www.dosh.gov.my
- SiRAC Online: sirac.dosh.gov.my
- HSE COSHH essentials website: https://www.hse.gov.uk/coshh/essentials/index.htm
- ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Control Approach 3

Vapour Degreasing Bath
G321
Containment

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

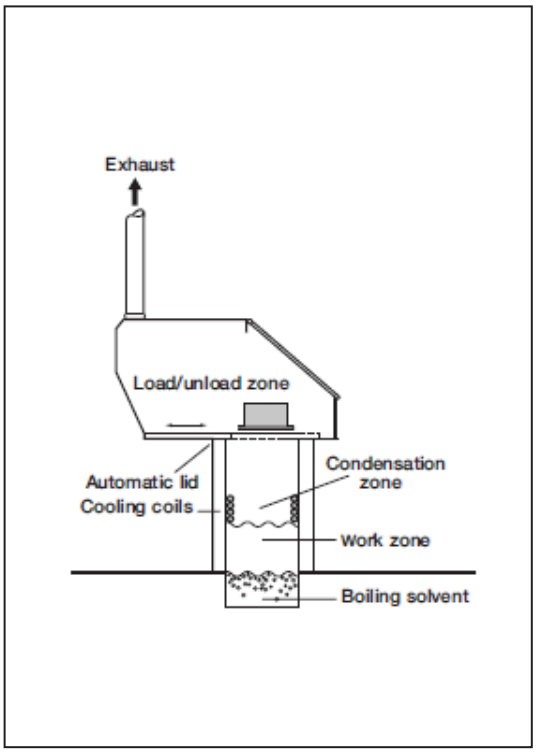
This sheet is used where the assessment recommends Control Approach 3 (Containment) as the suitable approach for chemical(s) and task(s). This sheet provides control measure and good practice recommendation on using vapour degreasing baths with medium or large quantities of liquids. It describes the key points that need to be followed to reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to the Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Restrict access to the work area to authorised workers only.
- ✓ The work area and equipment should be clearly labelled.
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ Design the equipment to fully enclose both the bath and the loading zone.
- ✓ The freeboard height should be at least 75% of the width of the open area of the bath.
- ✓ Set the thermostat correctly and balance the heating and cooling systems so as not to overload the cooling coils.
- ✓ Provide an extraction purge to remove any excess vapour from the load/unload zone.
- ✓ Provide an internal lid to reduce vapour release into the load/unload zone.



Vapour degreasing baths

- ✓ Consider the need for a mechanical hoist to reduce manual handling and reduce operator exposure during loading/unloading.
- ✓ Ensure workers are trained on how to safely clean and maintain the bath.
- ✓ Ensure the bath has a bottom drain to remove solvent for cleaning.
- ✓ Design the closed system to allow easy maintenance.
- ✓ Keep the process equipment under negative pressure to prevent leaks.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.

Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer, in effective and efficient working order and good repair.
- ✓ Adopt a 'permit to work' system for maintenance work.
- ✓ Follow any special procedures that are needed before the system is opened or entered, e.g. purging and washing.

Inspection, testing and examination

- ✓ Get information from the supplier on all parameters needed to safely operate the system.
- ✓ Inspect the engineering control equipment at least once a month to ensure the equipment is functioning properly and effectively.
- ✓ Ensure the engineering control equipment is examined and tested against its performance specification by hygiene technician at least every 12 months.
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Clean work equipment and the working area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
- ✓ Store containers in a safe place (refer CGS G101).
- ✓ Dispose off empty containers safely.
- ✓ Put lids on containers immediately after use.

Personal protective equipment (PPE)

- ✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101 and S102 for more specific advice. Refer to the SDS to get information on suitable PPE.
- ✓ Ask PPE supplier for advice on selection of suitable PPE.
- ✓ Respiratory protective equipment may be needed for some cleaning and maintenance activities, e.g. cleaning up spills. Refer CGS R001 for more specific advice.
- ✓ Ensure PPE is kept in a clean condition and replaced when necessary.
- ✓ Store PPE in appropriate places to avoid contamination.

Training

- ✓ Give workers information on the harmful nature of the chemicals.
- ✓ Provide workers with training on:
  - handling chemical safely;
  - how to use control equipment properly and ensure the control is working;
  - when and how to use any PPE provided;
  - any safe work procedure; and
  - what to do if something goes wrong.
- ✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

- ✓ Provide supervision to ensure that safe work procedures are followed.
- ✓ Establish a system to monitor that all control measures are in place and being followed.

Worker's Checklist

- ☐ Make sure the engineering control equipment is switched on and working.
- ☐ Look for signs of leaks, wear or damage before every job. If worker finds any problems, tell the supervisor. Do not carry on working if there is a problem.
- ☐ Wash hands before and after eating, drinking or using the washroom.
- ☐ Do not use solvents to clean skin.
- ☐ Clear up spills immediately. Follow spillage procedure.
- ☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information

- Safety Data Sheets
- Guidelines on Occupational Safety and Health for Design, Inspection, Testing and Examination of Local Exhaust Ventilation System, DOSH 2008
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Control Guidance Sheets G101, S100, S101, S102 and R001

Useful links

- DOSH portal: https://www.dosh.gov.my
- SiRAC Online: sirac.dosh.gov.my
- HSE COSHH essentials website: https://www.hse.gov.uk/coshh/essentials/index.htm
- ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Control Approach 3

Spray Drying
G322
Containment

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

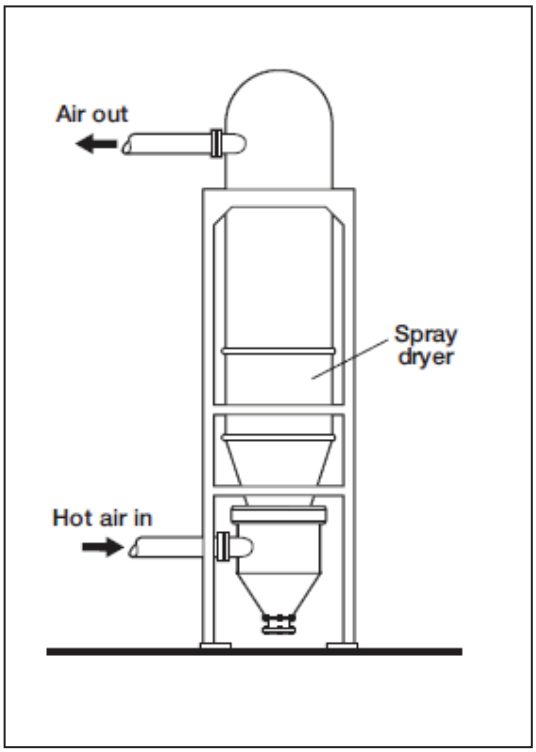
This sheet is used where the assessment recommends Control Approach 3 (Containment) as the suitable approach for chemical(s) and task(s). This sheet provides control measure and good practice recommendation on spray drying medium or large quantities of solids and liquids. It describes the key points that need to be followed to reduce exposure to an acceptable level. It is important that all the points are followed. Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to the Safety Data Sheet (SDS) for more information.

Workplace and access

- ✓ Restrict access to the work area to authorised workers only
- ✓ Put up warning sign at the entrance of work areas where chemicals hazardous to health are used.

Design and equipment

- ✓ Clearly label the work area and equipment.
- ✓ Design the feed and discharge to and from the drying chamber through pipes rather than a loading door.
- ✓ Apply good thermal insulation.
- ✓ Lights/signs should clearly indicate when the dryer is in use.
- ✓ Use a heat reclamation and air filtration system in conjunction with the dryer.
- ✓ Air throughput should be via a negative pressure fan.
- ✓ Consider the need for explosion relief for combustible solids and ensure equipment is appropriately earthed.
- ✓ Design the closed system to allow easy maintenance.
- ✓ Keep the process equipment under negative pressure to prevent leaks.



Spray drying

- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.

Maintenance

- ✓ Ensure all equipment used in the task is maintained as by the supplier/installer, in effective and efficient working order and good repair.
- ✓ Adopt a 'permit to work' system for maintenance work.
- ✓ Follow any special procedures that are needed before the system is opened or entered, e.g. purging and washing.

Inspection, testing and examination

- ✓ Get information from the supplier on all parameters needed to safely operate the system.
- ✓ Inspect the engineering control equipment at least once a month to ensure the equipment is functioning properly and effectively.
- ✓ Ensure the engineering control equipment is examined and tested against its performance specification by hygiene technician at least every 12 months.
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

✓ Thoroughly clean work equipment and the work area daily. Clean other equipment and the workroom regularly, once a week is recommended.
✓ Store packages/containers in a safe place (refer CGS G101).
✓ Dispose off empty packages/containers safely.
✓ Put lids on containers immediately after use.
✓ Deal with spills immediately. Plan procedure in case of a spill and communicate with workers and execute the procedure.
✗ For solids, do not clean up with a dry brush or compressed air.
✓ Vacuum dry dust or use wet cleaning methods.

Personal protective equipment (PPE)

✓ Chemicals in hazard group S can damage the skin and eyes, or enter the body through the skin and cause harm. Refer CGS S100, S101 and S102 for more specific advice. Refer to the SDS to see what PPE is necessary.
✓ Ask PPE supplier for help on selection of suitable PPE.
✓ Respiratory protective equipment may be needed for some cleaning and maintenance activities, e.g. cleaning up spills. Refer CGS R001 for more specific advice.
✓ Ensure PPE is kept in a clean condition and replaced when necessary.
✓ Store PPE in appropriate places to avoid contamination.

Training

✓ Give workers information on the risk of using the chemicals.
✓ Provide workers with training on:
- handling chemical safely;
- how to use control equipment properly and ensure the control is working;
- when and how to use any PPE provided;
- any safe work procedure; and
- what to do if something goes wrong.

✓ Training programme should be reviewed and conducted at least once in two years.

Supervision

✓ Provide supervision to ensure that safe work procedures are followed.
✓ Establish a system to monitor that all control measures are in place and being followed.

Worker's Checklist

☐ Before use, check that the seals are intact.
☐ Look for signs of leaks, wear or damage of any equipment used. If worker finds any problems, tell the supervisor. Do not carry on working if there is a problem.
☐ Wash hands before and after eating, drinking or using the washroom.
☐ Do not use solvents to clean skin.
☐ Clear up spills immediately. Follow spillage procedure.
☐ Use, maintain and store any PPE provided in accordance with instructions.

Further information
- Safety Data Sheets
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Control Guidance Sheets G101, G204, G302, S100, S101, S102 and R001

Useful links
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- ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

Control Approach 3

General Principles
G400
Special

This guidance sheet is aimed to guide employers to comply with the requirements of the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations (USECHH Regulations) by controlling exposure to chemicals and protecting workers' health. The sheet is part of the Simple Risk Assessment and Control for Chemicals (SiRAC).

This sheet is use where the assessment recommends Control Approach 4 (Special) as the approach needed for chemical(s) and task(s). Some chemicals can also be flammable or corrosive. Therefore, the controls must be suitable for those hazards too. Refer to Safety Data Sheet (SDS) for more information.

Background

Control Approach 4 (Special) means a situation where more specific and specialist advice needed. The advice may come from an expert such as:

• industrial hygienist;

• chemical health risk assessor;

• hygiene technician; or

• professional engineer.

These experts can give site-specific advice on risk assessment, the possibility of substituting the chemical for a less hazardous chemical, and control measures.

Control Approach 4 is selected for chemicals that can easily become airborne that are handled in large quantities for chemicals assigned to hazard group C or that are handled in medium to large quantities for chemicals assigned to hazard group D. Different types of control will be needed for different chemicals in this group.

Guidance on expert advice

Expert	Area of expertise
Industrial hygienist	Risk assessment, control and chemical monitoring. The industrial hygienist prime responsibilities typically include to: • assess worker exposures to hazards (i.e. physical hazard, chemical hazard and biological hazard, etc.); • recommend specific recommendations for effective control of the risks identified; • communicate risks and control measures to workers, management, and others affected; • respond to emergencies; • develop industrial hygiene programmes; and • regulate compliance, etc.
Chemical health risk assessor	Risk assessment and control for chemicals hazardous to health. The assessor prime responsibilities typically include: • to assess worker exposures to chemical hazards; and • to recommend specific recommendations for effective control of the risks identified.
Professional engineer	Design of engineering control equipment such as local exhaust ventilation and containment.
Hygiene technician	The hygiene technician prime responsibilities typically include: • to monitor airborne contaminants; and • to examine and test the engineering control equipment.

Further information

- Safety Data Sheets
- Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, DOSH 2005
- Guidelines on Occupational Safety and Health for Design, Inspection, Testing and Examination of Local Exhaust Ventilation System, DOSH 2008.
- Guidelines on the Control of Chemicals Hazardous to Health, DOSH 2001

Useful links

- DOSH portal: https://www.dosh.gov.my
- SiRAC Online: sirac.dosh.gov.my
- HSE COSHH essentials website: https://www.hse.gov.uk/coshh/essentials/index.htm
- ILO International Chemical Control Toolkit website: https://www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/index.htm

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