

4 Steps to Respiratory Protection

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Disclaimer

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The guidance and information in these slide are in "general" and each business will require its own risk assessment, method statement, and controls based on their unique circumstances. Employers have specific regulatory requirements in different countries, including making determinations of what PPE to use. Information correct at time of writing, users should check legislation and guidance from the HSE or local governing body, to ensure they are following up to date guidance and instruction.





Eyewear

Welding

Hearing

Coveralls

Head and Face

Respiratory

Fall Protection



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UK Application Engineer

Supporting customers with expert technical information and training at a local level.







Agenda

Four Steps to Respiratory Protection

1) Identify the Hazard

2) Assess the Risk

3) Product Selection

4) Product Training







UK Safety and Health Statistics

147

deaths in the workplace in Great Britain in 2018/19*

12,000

(approx.) lung disease deaths each year linked to past exposures at work to primarily chemicals or dusts**







*http://www.hse.gov.uk/statistics/pdf/fatalinjuries.pdf
**http://www.hse.gov.uk/statistics/overall/hssh1819.pdf





99% Health



Introduction

Limitations of the respiratory system's defences...

Our defence mechanisms have problems with the following:



X The body cannot filter out harmful gases



Hierarchy of controls



Four Steps to Respiratory Protection





Four Steps to Respiratory Protection





Step 1 – Identify the Hazard





Gases & Vapours





Oxygen deficiency

Good quality air



Oxygen deficient < 19.5% oxygen 1. Identify Hazard Step 1 – Identify the Hazard

1. Identify Hazard

Types of RPE for different hazards





Step 1 – Identify the Hazard **1. Identify** What is the substance or what does it contain? Hazard **Commercial product** Chemical **Process Generated** 80345 Granite 前:#11102日 Servery Party Man Wood? --- Maderson 1.1 Streething Con .: 1.4 mit baudent, 371 Builds Fridade Bart The Property Stratters, Asbestos?



Step 1 – Identify the Hazard

What are the other special situations to look out for?

Explosive atmospheres







Coal dust / silica



Wood dust



Pharmaceuticals



Chromium / Nickel



Nanoparticles





Welding Fume



Grain dust



Bio-aerosols



Examples (not inclusive)

1. Identify

Hazard

Four Steps to Respiratory Protection





Step 2 – Assess the Risk



The **risk** depends on a number of factors which include...



Step 2 – Assess the Risk Measuring workplace exposures

A <u>W</u>orkplace <u>P</u>rotection <u>F</u>actor study

Measuring exposure while wearing a filtering facepieces



2. Assess Risk



Step 2 – Assess the Risk

How to assess the risk

How much is in the air?





2. Assess Risk

How long are they exposed to it?

8 hours Long-term exposure

15 mins Short-term exposure



What are the exposure limits for it?

National Exposure Limits (EH40)





Step 2 – Assess the Risk UK: COSHH – Direct Advice Sheets



Rubber

Rubber [RB]

This information will help employers, the self employed and franchisees to comply with the Control of Substances Hazardous to Health Regulations 2002. (COSHH) as amended to control exposure to rubber dust and time, etc. and protect workers health.

RB00: Advice for managers

RB01: Fume control and general ventilation

RB02: Dust from bag opening and weighing

- RB03: Dust from mixing
- RB04: Dust and fume from milling
- RB05: Fume from rubber presses (smaller articles)
- RB06: Fume from cooling racks for smaller articles
- RB07: Fume from trimming and finishing smaller articles

		2. Assess
4	Dust from bag	Risk
HSE Control approach 2	Opening and Weighing	02 Personal protective equipment (PPE) Ask your safety-clothing supplier to help you get the right PPE
comply with the requirements of the Control of Substances Hazardous to Health Regulations 2002 (COSHH) by controlling exposure to chemicals and protecting workers' health. The sheet is part of HSE guidance <i>COSHH</i> essentiatic easy steps to control chemicals, it directites the key points you need to follow to help roduce exposure to an adoquate level. It is important to follow all the points, or use equally effective measures. Rubber process dust arises in rubber mosting where ingredients are handled, weighted, added to or mixed with uncured natural rubber or synthetic elastomers. Rubber process dust does not include dual time abraiser of cured nubber.	 Notice access to inserved with the other table index. Reep dual exposures as two as possible. Use pre-weighed as process-dompsticle bags or in 'pre-dispersed' forms such as passible, granules with tinder or dust-induced powhers. Extract all at bag opening and powder weighing operations. You need an air speed between 1 and 1.5 metres per secured. Make sure a manometer or pre-sure gauge is find neer the a to show that the extraction is working property. Always continn that the extraction is burned on and working at work. Check the gauge. Discharge cleaned, extracted at to a safe place outside the to from doors, windows and all infas. Have a supply of clean all coming into the workcom to replac context that workers to bags with the open end away trum the corraction catches the shorme dust. Bag crushing croates a tori of dust. Use an extracted bag cole bags rolled up with the open end in the catracter hood. Workers should scoop powder genty - not dump it. Consult a qualifies working to the sole of the discipation of the sole of the discipation of the sole of the singer role of away from the contracter bags rolled up with the open end in the extractor hood. 	Respiratory protective equipment (RPE) should not be needed if the extraction is designed correctly and working properly. RPE is needed for maintenance and cleaning, and for clearing up spills. Use a P3 standard of RPE (Assigned Protection Factor 20). Consult your supplier for advice. Replace RPE filters as recommended by the supplier. Throw away disposable masks after one use. Keep RPE clean and store it away from dust. Protective gloves are needed. Use nitrile gloves. Throw away single-use gloves every time you take them off. Skin creams are important for skin protection and help in washing
	××	contamination from the skin. These are not 'barrier creams'. After work creams help to replace skin oils. Never allow compressed air use for removing dust from clothing. Workers must not take their coveralls home for washing. Use a contract laundry.



Step 2 – Assess the Risk Material Safety Datasheets (MSDS)

MATERIAL SAFETY DATA SHEET

Product Name:	ISOPAR G FLUID	Page 1
PRODUCT AND	COMPANY IDENTIFICATION	
I. Product Nat	me: ISOPAR G FLUID	
II Intended Uk	(r:	
Chemical R	eaction Solvent	
Restriction	of use : No reference	
III. Supplier Co	mpany information	
Supplier :	EconMobil Chemical Company	
Address . 1	3501 Katy Freeway Flouston, TX 77079-13	90 USA
Emergency	Telephone: +1-281-570-6000	
HAZARDS IDEN	TIFICATION	
I. Hazards Cla	ssification	
Etammabl	e liquid. Category 3	
Severe ey	e damage/ irritation: Category 2	
Skin corro	sion/irritation : Category 2	
Specific ta	rget organ toxicity(one time exposure) : Cate	egory 3 (Respiratory tract imitation)
Acute ad	juatic toxicity. Category 1	
Chronic at	quatic toxicity: Category 1	
II. GHS Label	Elements	
 Pictogram 	3111	
\sim	~ ~	
 Signal \ 	Word: Warning	

- o Hazard Statements:
 - H226 Flammable liquid and vapor
 - H315 Causes skin imtation
 - H319 Causes serious eye irritation

MATERIAL SAFETY DATA SHEET Product Name. ISOPAR & FLUID

Store in the continued container. Store in apart from a sewage. Store in clean and cool area. Use and store in accordance with related government rules and regulations. Store in well-ventilated place. Avoid contact with ignition source.

Page 6

8. EXPOSURE CONTROLS & PERSONAL PROTECTIONS

ł.	Exposure limits & Biological standards				
	 Domestic standards 	C9-11 ISOALKANES No reference			
		C10-13 ISOALKANES: No reference			
	 ACGIH standards 	C9-11 ISOALKANES: No reference			
		C10-13 ISOALKANES: No reference			
	 Biological exposure standards 	C9-11 ISOALKANES : No reference			
		C10-13 ISOALKANES: No reference			
11	Proper Engineering controls Install local ventilation system and control to keep proper wind speed. Personal Protections				
	 Respiratory protection 				
	C9-11 ISOALKANES Use authentic respiratory protect (Korea Occupational Safety and C10-13 ISOALKANES	tion certified by KOSHA. Health agency)			
	Use authentic respiratory protect	ion certified by KOSHA			

- (Korea Occupational Safety and Health agency
- Eye protection

Install washing facilities and emergency clean facilities to use easily. Emergent washing facilities and watering system are recommended to access easily. If contact is likely, safety glasses are recommended

Hand protection

2. Assess Risk



Step 2 – Assess the Risk Material Safety Datasheets (MSDS)

MSDS Realities

- 1. No exposure data
- 2. Incomplete set of MSDS (where is Part B?)
- 3. No information on how materials will be applied
- 4. No information on environment of use ventilation, confined space, etc.
- 5. No information on duration of use
- 6. No information on other chemicals or processes
- 7. MSDS can be poorly written, vague and/or wrong!





Four Steps to Respiratory Protection





3. Respiratory Selection









Adequate versus Suitable

3. Respiratory Selection

ADEQUATE

It is right for the hazard and reduces exposure to the level required to protect the wearer's health.

SUITABLE

It is right for the wearer, task and environment, such that the wearer can work freely and without additional risks due to the RPE.



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Product selection criteria

Protection

- Is it suitable for hazard?
 - Particulates, gases & vapours or combination
- Does it provide enough protection?
- Is it suitable for job
- Is additional protection required too?

User

- Is it comfortable?
 Comfortable fit, higher work rates, different temperatures etc
- Does it fit & seal properly?
- Is it acceptable?
- Compatibility

Business

- Cost?
- Productivity?
- Usage?
- Maintenance?
- Other?



3. Respiratory Selection



3. Respiratory Selection





Powered filtering respirators



Supplied air respirators



Breathing Apparatus (BA or SCBA)





Filtering Facepiece Respirators Protection Levels FFP1: Particulates up to 4x WEL FFP2: Particulates up to 10x the WEL FFP3: Particulates up to 20x the WEL*

*Workplace Exposure Limit – see HSG 53



Reusable Respirators Filter Markings organic vapours >65°C Α В inorganic gases Е acid gases Κ ammonia P particulates P1 (particulates up to 4x WEL) P2 (particulates up to 10x WEL) P3 (particulates up to 20x WEL*) Hg mercury vapour AX organic vapours <65°C



Powered Air TH1 – 10 x WEL TH2 – 20 x WEL TH3 – 40 x WEL

Supplied Air 1A/1B – 10 x WEL 2A/2B – 20 x WEL 3A/3B – 20/40 x WEL*





3. Respiratory Selection

http://www.hse.gov.uk/pubns/priced/hsg53.pdf



It makes It interferes it awkward with my other to work PPE



Separate items of PPE

3. Respiratory Selection

Provide integrated solutions



Source: HSE







Step 3 – Respiratory Selection Facial Hair – Loose Fitting Headtops

3. Respiratory Selection







Step 3 – Respiratory Selection Face Fit Testing





3M

Which types of RPE require to be fit tested?





Step 3 – Respiratory Selection Face Fit Testing

- Means of assessing how well a respirator seals to a face
- Two Principle Methods used:

Qualitative taste test



Quantitative test using Portacount





Face Fit Testing: Which method should I use?



Qualitative or Quantitative



Quantitative





3. Respiratory

Selection

Who can perform fit testing?





ompetence 2 ACCREDITED RPE Fit Test it Provider 00 ompetence



Four Steps to Respiratory Protection





Step 4 – Training

Key issues good training should tackle...



Step 4 – Training

How can manufacturers help with training?



Fit testing



User instructions

4. Training



Online training materials



On site training

Step 4 – Trainingthe wearer





Minutes for which a respirator is not worn during an 8hr working day



Step 4 – Trainingthe wearer



4. Training

Stress to the wearers the importance of wearing RPE even when they can't see the hazard

Make it easy for wearers to obtain their RPE

Think about RPE locker/store in relation to where people work



Four Steps to Respiratory Protection





Further reading

- 3M Worker Health and Safety www.3m.co.uk/3M/en_GB/worker-health-safety-uk/
- HSG53 Respiratory protective equipment at work: A practical guide Available from: www.hse.gov.uk/pubns/books/hsg53.htm
- 3M RPE fit testing <u>www.3m.co.uk/fittestrespirator</u>
- Fit2Fit competency scheme www.fit2fit.org
- HSE INDG479 Guidance on respiratory protective equipment (RPE) fit testing. Available from: www.hse.gov.uk/pubns/indg479.pdf
- HSG53 Respiratory protective equipment at work: A practical guide Available from: www.hse.gov.uk/pubns/books/hsg53.htm
- The effect of wearer stubble on the protection given by Filtering Facepieces Class 3 (FFP3) and Half Masks. Available from: <u>www.hse.gov.uk/research/rrpdf/rr1052.pdf</u>



Thank you



Contact / Connect

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