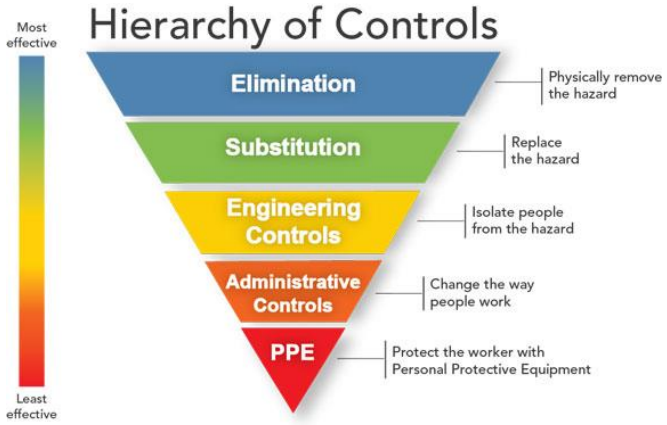



Understanding the situation at hand

IDENTIFYING CONTROL GAPS AND RECOMMENDED MEASURES




Identifying control gaps and recommended measures



- ZDHC CMS requirements
- Sources of information
- Intervention areas
- Using control guidance sheets




ZDHC CMS requirements

3.5.1 Exposure Control Measure

- control measures required to reduce risk from a specific chemical
- General occupational controls to prevent and reduce release of dust and splashes
- Selection and use of personal protective gloves, protective clothing and other required PPE to protect workers
- Maintenance and replacement of equipment so that control measures remain effective
- …




ZDHC audit question example

- Does the facility have and maintain PPE, safety showers, laboratory/factory eye wash bottles or stations, fire extinguishers, and more that are appropriate for the chemical hazards identified? (CMW 2.1.4)

- Has management established procedures that clearly define and communicate the areas in which authorised personnel are allowed to enter? (CMW 2.1.5)



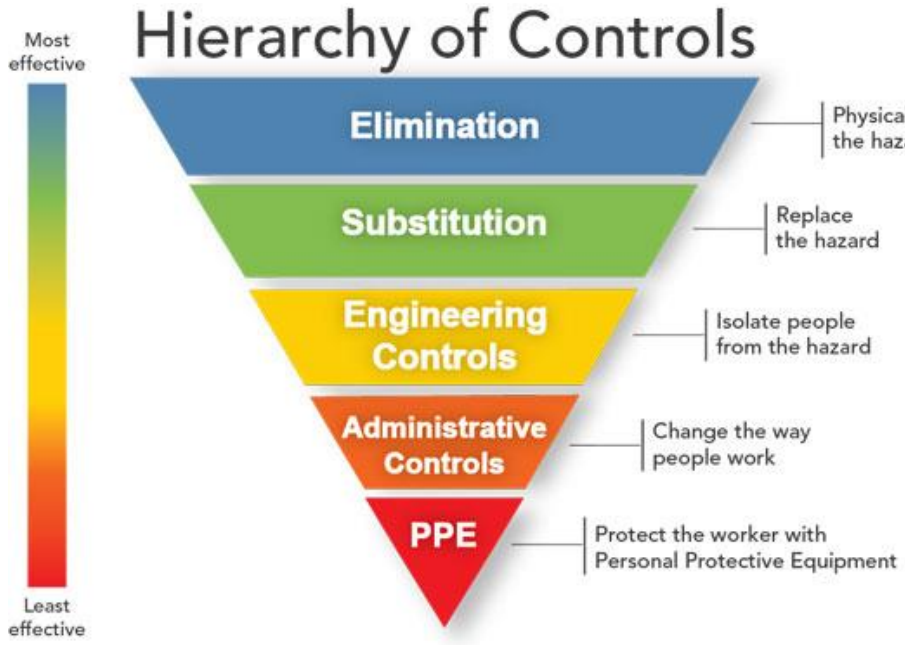

Identifying control gaps and recommended measures

Where to find information…

- Safety data sheets
- Technical data sheets
- Control guidance sheets
- Checklist, code of conducts
- Expert advise
- Publications on common good practices
- …



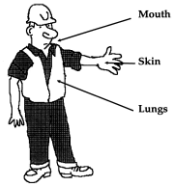

Control gaps and recommended measures – where to start?



Hazardous chemicals

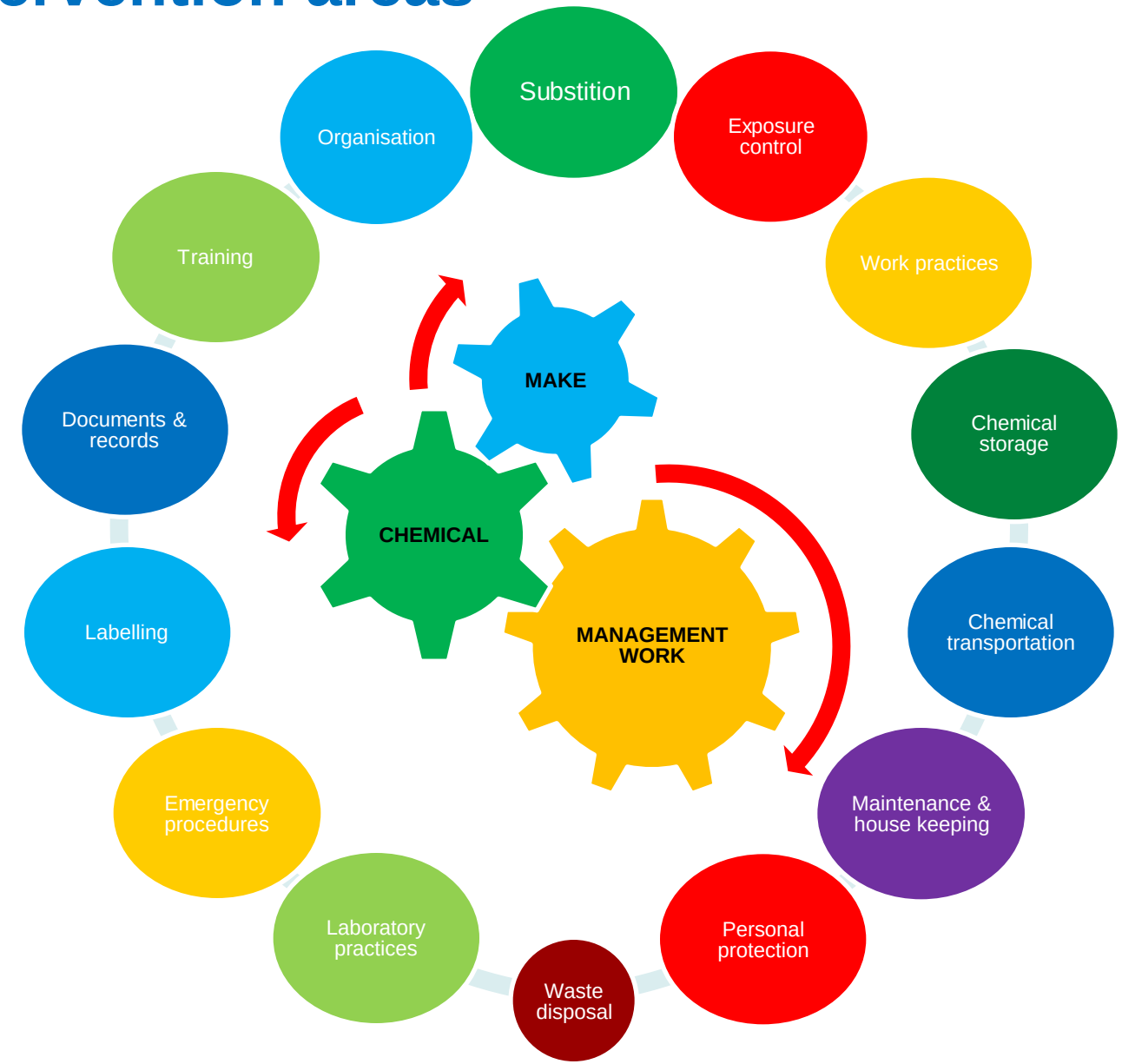
Point and condition of exposure

Personal exposure





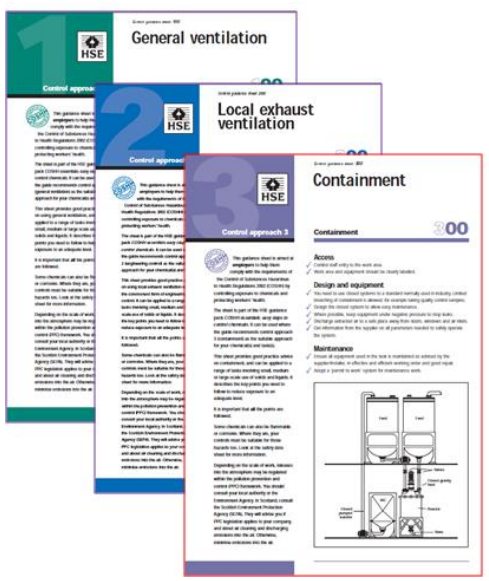

Intervention areas

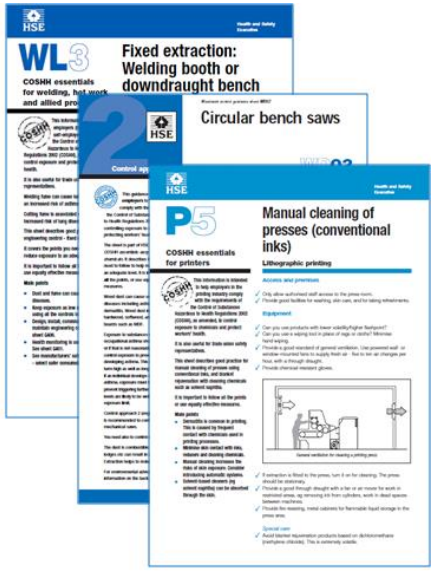





Using control guidance sheets

- Provide advice on
  - measures needed to prevent or minimise risk
  - adequate level of protection at the workplace
- Allow assessment of existing control measures and identification of control gaps on-site
- Linked to risk/control banding methodology








Linking control/risk band and control sheets

Example - Acetone

Area/ Section	Name	SDS yes/ no	R-phrases/ H-statements	P	H	E	Hazard group/ band	Amount per batch/ day	Dustiness/ volatility	Quantity on skin	Duration of exposure on skin	Risk/ control band
Printing – Cleaning screens	Acetone	Yes	H225 H315 H319 H335 H336 EUH066	✓	 ✓ ✓ ✓ ✓ ✓		4/D 2/B 2/B 2/B 2/B 2/B	Medium	Medium	Small	Short	1 (skin) 2 (inhale)




Linking control/risk band and control sheets

Amount used	Low dustiness or low volatility	Medium volatility	Medium dustiness	High dustiness or high volatility
Hazard Group A				
grams or millilitres	1	1	1	1
kilograms or litres	1	1	1	2
tonnes or cubic metres	1	1	2	2
Hazard Group B				
grams or millilitres	1	1	1	1
kilograms or litres	1	2	2	2
tonnes or cubic metres	1	2	3	3
Hazard Group C				
grams or millilitres	1	2	1	2
kilograms or litres	2	3	3	3
tonnes or cubic metres	2	4	4	4
Hazard Group D				
grams or millilitres	2	3	2	3
kilograms or litres	3	4	4	4
tonnes or cubic metres	3	4	4	4
Hazard Group E				
For all substances in hazard group E control approach 4 is required				

Control approaches for inhalation risks

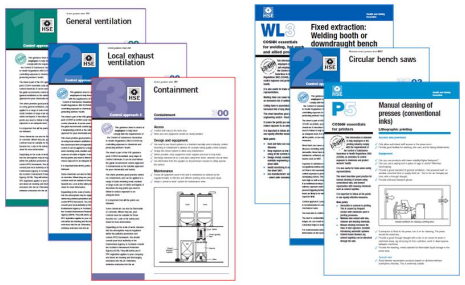
1) Good working practice
General ventilation

2) Engineering control
Local exhaust ventilator

3) Engineering control
Containment

4) Special advice
(Substitution etc.)

Control Approaches - Inhalation



Control Approach 1

- General ventilation
- Good industrial hygiene practice
- Administrative controls

Control Approach 2

- Engineering controls
- Use of Local exhaust ventilation

Control Approach 3

- Shielding/containment (enclose the process)

Control Approach 4

- Seek special expert advice e.g. substitution

Control Guidance Sheets

- For each control approach level as well as for specific operations, separate control guidance sheets available
- Refer to
  - ILO control guidance sheets www.ilo.org/legacy/english/protection/safework/ctrl_banding/toolkit/icct/sheets.htm
  - COSHH Control Guidance Sheets

    www.coshh-essentials.org.uk




List of guidance sheets

Example - ILO

Control Approach 1

100 General principles

101 Sack, bottle and drum storage

102 Bulk storage

103 Removing waste from air cleaning unit

List of guidance sheets

Example - ILO

Control Approach 2

200	General principles
201	Ventilated workbench or cupboard
204	Conveyor transfer
205	Sack emptying
207	Charging reactor or mixer from sack or keg
209	Drum filling
210	Drum emptying with a drum pump
211	Weighing solids
212	Mixing liquids with liquids or solids
213	Mixing solids
214	Sieving
215	Screening
216	Spray painting
217	Pickling / Plating bath
218	Vapour degreasing bath
219	Tray drying oven




Control guidance sheet structure and content

Control approaches relates to…

- Access
- Design and equipment
- Maintenance
- Examination and Testing
- Cleaning/Housekeeping
- Personal Protective Equipment (PPE)
- Training and supervision

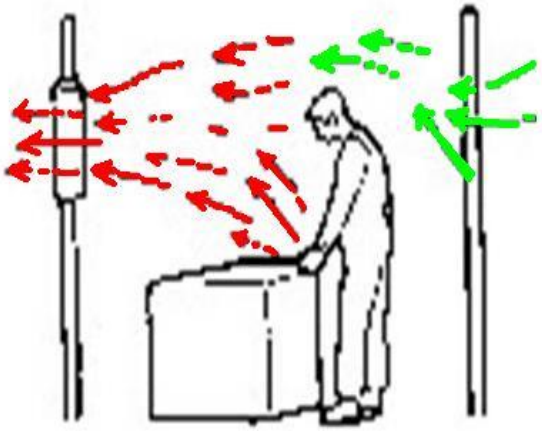
Control approach 1 - Example

- Removal/ reduction of contaminants in the general works area using general ventilation
- General cleanliness of workplaces
- Simple preventive and control measures
  - e.g. Close lids of chemical containers
- General guidance and awareness creation

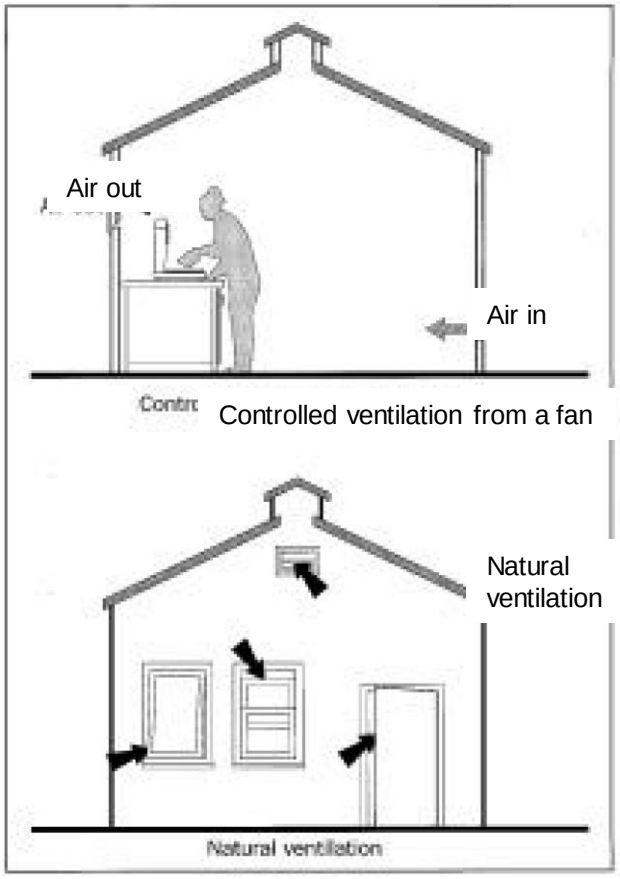



Control approach 1 - Example

General ventilation in working place



- clean air
- contaminated air

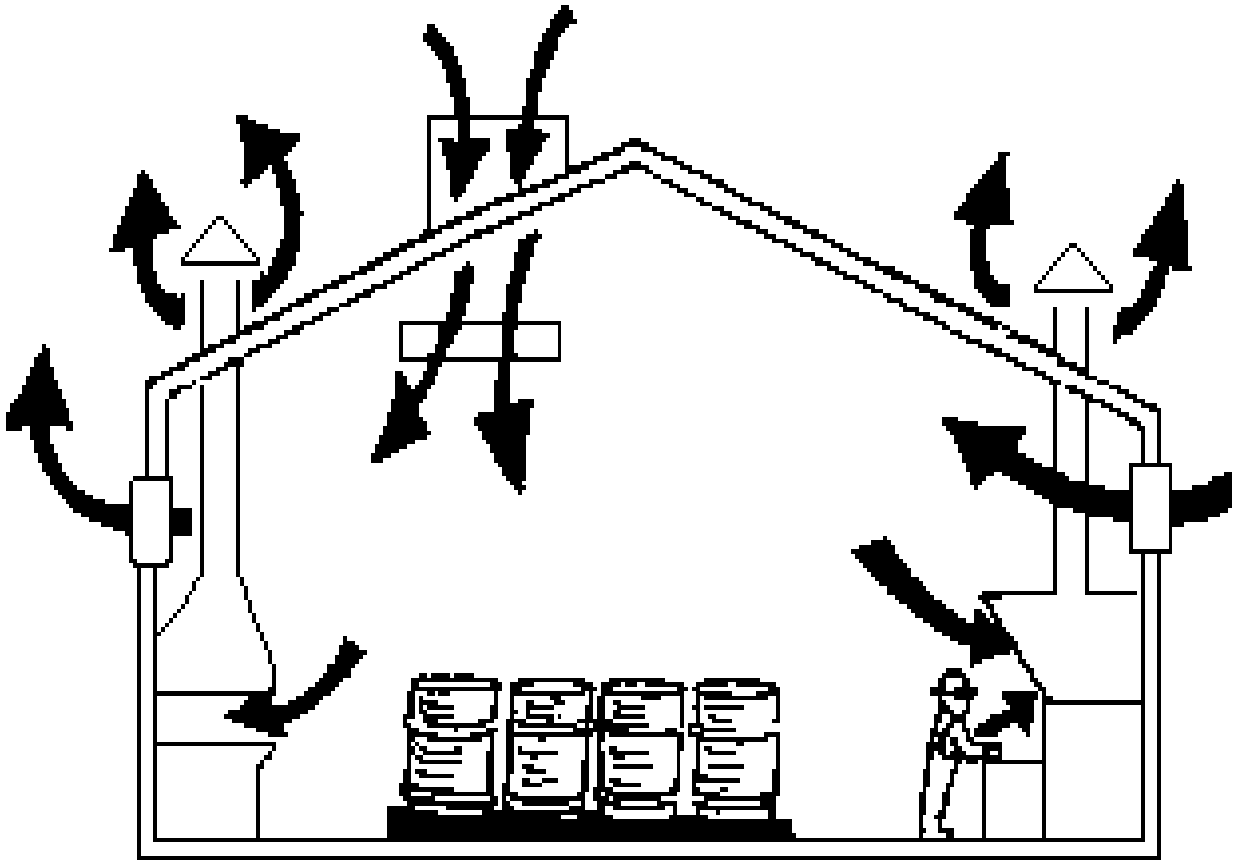


Source: ILO




Control approach 1 - Example

General ventilation in working place



Source: ILO




Control approach 1 in practice

Photo Hannak Jürgen

Effects

- Remove contaminants
- Replenish work area with fresh air
- Control ambient climate (Temperature, humidity)




Control approach 1 - Example

Administrative control measures

- Personal hygiene (including care of skin) followed
- Emergency preparedness ensured
  - fire extinguisher, first aid, evacuation routes
- Safe storage practices applied
- Personal protective equipment as immediate interim solution
- Workers' training assessed and implemented



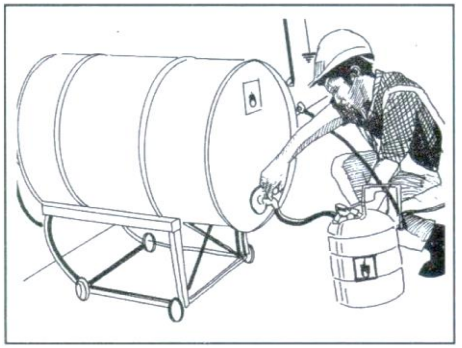

Control approach 1 - Example

Handling practices

Worker is in direct contact with chemicals

Using simple devices contact is substantially reduced

Source: ILO



Control approach 2 - Example

Local exhaust ventilation (LEV)

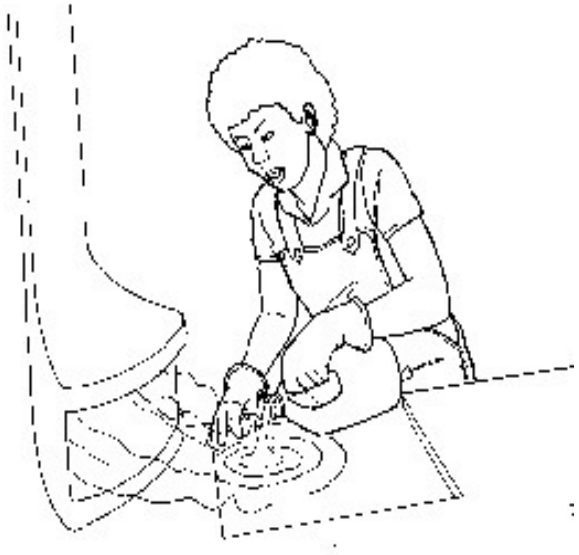
- Remove contaminants from breathing zone of workers
- Limit access of workers to affected area
- Reduce exposure time of workers
- Combine local exhaust ventilation with PPE for operators
- Suitable for small tasks




Control approach 2 - Example

Local exhaust ventilation (LEV)

BEFORE

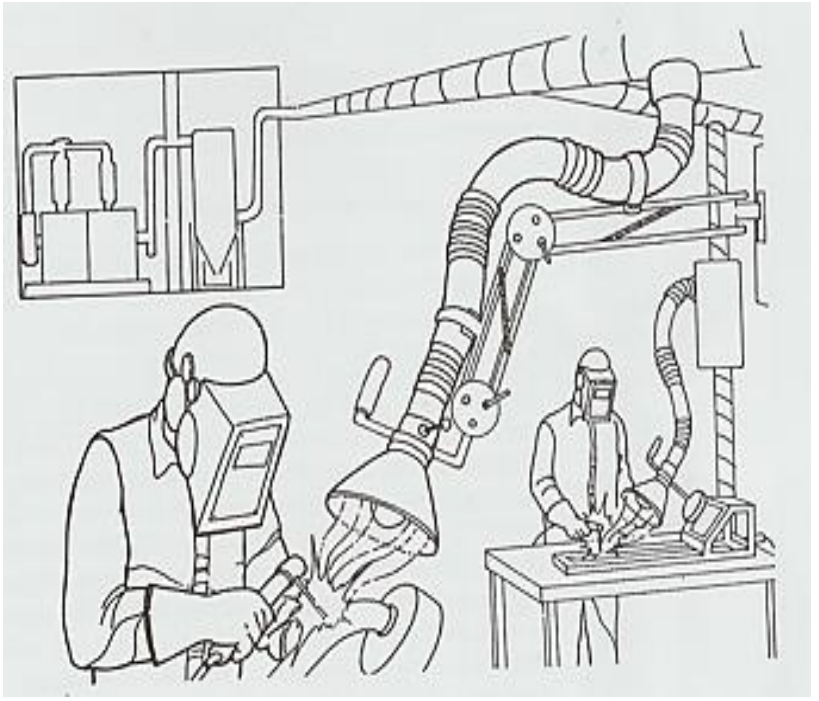


AFTER

How to improve working conditions with LEV

Control approach 2 - Example

Local exhaust ventilation (LEV)



Source: ILO




Control approach 2 in practice

LEV for bath in electroplating

Photo Hannak Jürgen

Glue application in shoe factory

Photo. AUVA

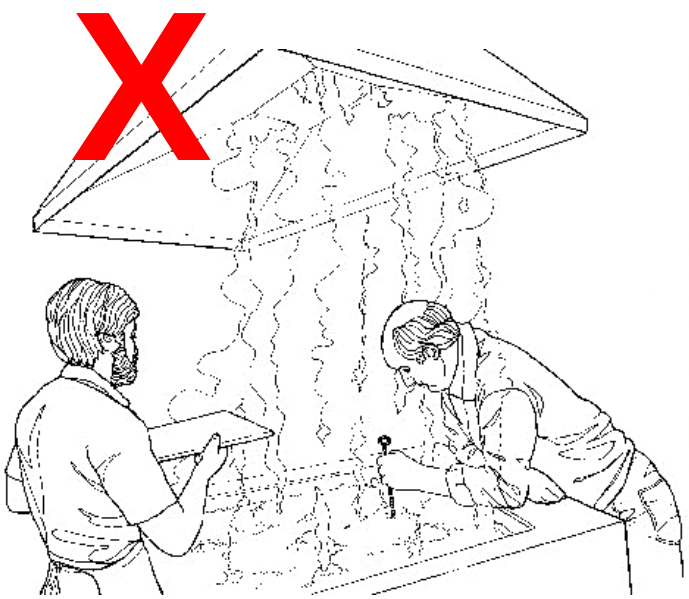



Control approach 2 in practice

Handling hazardous waste
Photo Dräger




Good LEV design is important!



Source: ILO

- Keep distance between source and hood as small as possible
- Consider air velocity
- Apply LEV at source of exposure
- Avoid air drafts interfering with the LEV

- Even though LEV is present, the workers are still in contact with the contaminants
- Reconsider the design of the workstation.



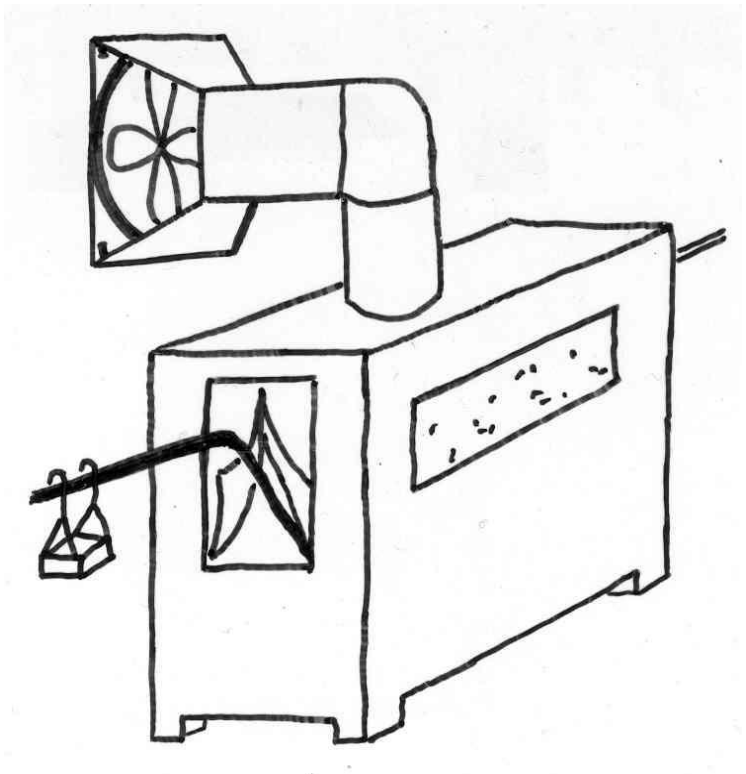

Control approach 3 - Example

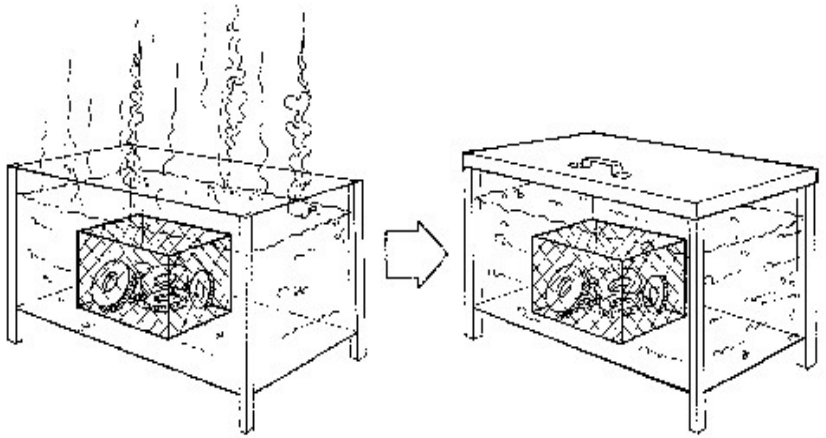
- Enclose process to restrict spread of contaminants
- Isolate source of contamination
- Ideally for processes where worker has minimum contact with the chemical
- Suitable for small/medium/large scale tasks




Control approach 2 - Example

Containment / shielding





Source: ILO

An open degreasing tank has been closed to reduce exposure of vapours




Control approach 3 in practice

Spray booth in car repair shop

Yarn dyeing in closed vessels

Photo Hannak Jürgen

Control approach 4 - Example

- Ask for advice if more specific provisions are needed
- Advice from specialists
  - Hire an expert
  - Involve concerned workers
- May consider substitution to avoid major remodelling of production unit

Control approaches – skin contact

- Control approach – 1 (Low)
- Control approach – 2 (Extended, medium)
- Control approach – 3 (High)




Linking control/risk band and control sheets

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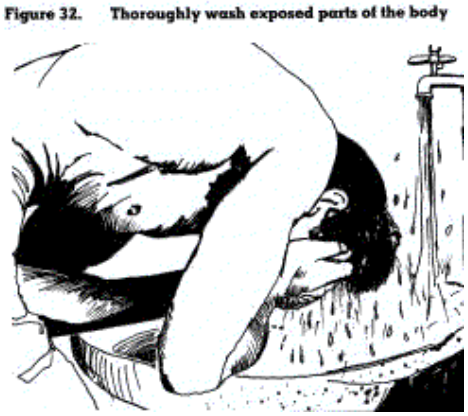
Control approach – 1 (Low) - Example



Source: ILO

- Reduce probability and amount of splashes and dust
- Follow good personal hygiene practices
  - Regularly washing of exposed body parts (e.g. hands, arms, legs)
  - Provision of washing facility close to workplace
- Use of protective creams and ointments




Control approach – 2 (Medium) - Example

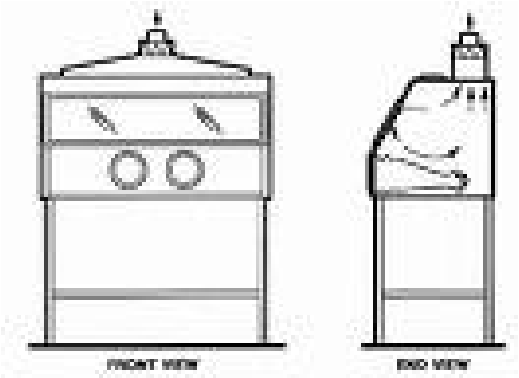
- Engineering controls to prevent and reduce release of dust and splashes
- Selection and use of personal protective gloves and clothing
  - Specific for the types of chemicals in use
- Maintenance and replacement programme

Figure 33. Personal protective clothing should be washed after use

Source: ILO




Control approach - 3 (High) - Example



Source: ILO

- Substitution of chemicals
- Use of closed system (e.g. glove box)
- Full body enclosure
- Expert advice and consultation with industrial hygienists




Everything Under Control?