



TECHNICAL DEVELOPMENTS - COSHH ESSENTIALS

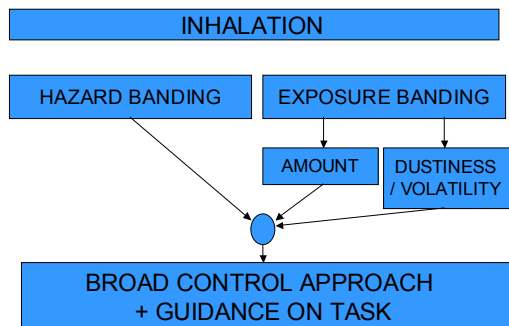
RPE, Skin and Emergencies

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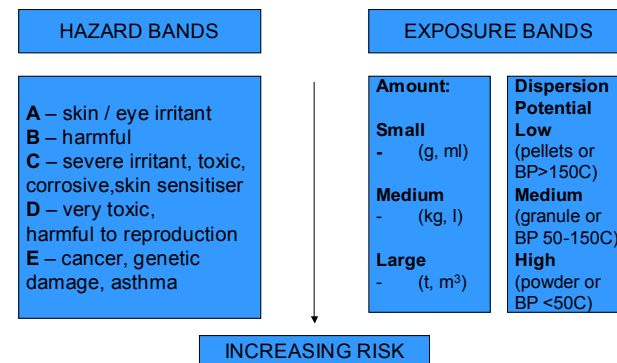
TECHNICAL DEVELOPMENTS - COSHH ESSENTIALS

- Selecting respiratory protective equipment
- Improved advice for risk to skin (CGS S100, S101)
- Selecting protective gloves
- Emergencies – chemical health hazards

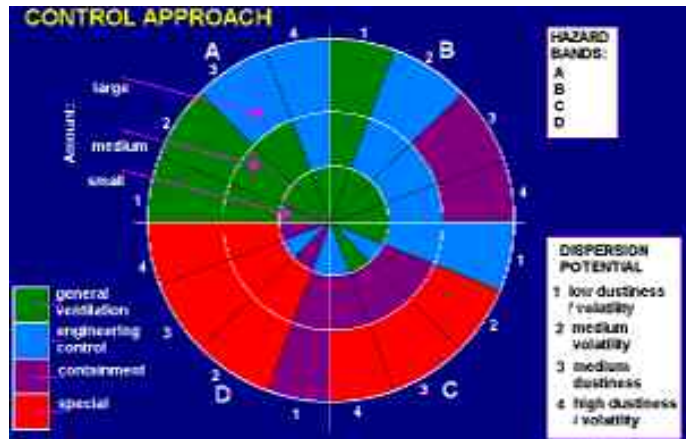
COSHH ESSENTIALS - RECAP



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TECHNICAL DEVELOPMENTS - COSHH ESSENTIALS (C-E) : RPE

- Respiratory protective equipment
- for work of short duration
- for emergency escape and rescue
- for maintenance and emergency repair
- for control of residual risk, e.g. belt-sanding wood where LEV control can have limited effectiveness
- No substitute for engineering control, etc.
- RPE manufacturers consulted

C-E TECHNICAL DEVELOPMENTS : ASSIGNING APF VALUES

Hazard Group	Upper boundary – dust	Upper boundary – vapour
A	10 mg/m ³	500 ppm
B	1 mg/m ³	50 ppm
C	0.1 mg/m ³	5 ppm
D	0.01 mg/m ³	0.5 ppm

C-E TECHNICAL DEVELOPMENTS : RPE

Hazard Band	Amount in task with RPE	Dustiness & Volatility		
		Low	Medium	High
Assigned Protection Factor (APF)				
A	Small	-	-	-
	Medium	-	4	10
	Large	4	10	20
B	Small	-	4	4
	Medium	-	10	20
	Large	10	20	40
C	Small	-	4	4
	Medium	10	10	20
	Large	20	20	40 BA
D	Small	10	20	40
	Medium	20	40	40 BA
	Large	20	40 BA	2000
E	Small	10	20	40
	Medium	20	40 BA	40 BA
	Large	20	40 BA	2000

TECHNICAL DEVELOPMENTS -
RPE SELECTION – DATA FOR SUPPLIER

- Task description
- Task duration
- Chemicals in product
- Amount handled
- Product's physical form
- If solid, dustiness?
- If liquid, Boiling Point?
- Solvent or water based
- Temperature of product
- Humidity
- Confined space
- Explosive / flammable in air
- Work rate
- Space to do task
- Mobility requirements
- Vision requirements
- Spoken communication
- Wearer's aspect
- Other PPE used

Initial fit-testing and training also needed

TECHNICAL DEVELOPMENTS -
COSHH ESSENTIALS : SKIN

- Classification (R -phrase) for skin – uneven
- Three routes for skin exposure
- Skin uptake – reservoir effects and time -line
- Protective gloves – the truth
- Potential and actual dermal exposure
- Skin exposure is complex:
(also, effects on skin and/or uptake via the skin)

TECHNICAL DEVELOPMENTS -
COSHH ESSENTIALS (C-E) : SKIN

BANDING HAZARD

Hazard to skin & via skin

"medium" – all in C-E groups A, B and C, bar R34, R35, R43 and R37
(500 mg dust / 10 mg liquid)
"high" – all in C-E group D plus R34, R35
(50 mg dust / 1 mg liquid)
"special" – C-E group E plus R43

CLASSIFY EXPOSURE

Deposit on skin

"immersion - hand"
"deposition of splash and aerosol"
"contact surface residues"
Duration
splash, immediate removal
all other scenarios

TECHNICAL DEVELOPMENTS -
COSHH ESSENTIALS (C-E) : SKIN

PROTECTIVE GLOVES

+

PROTECTIVE CLOTHING

Contamination is common inside protective gloves.

Contamination occurs the 2nd time gloves are put on.

Effect of washing gloves - planned investigation

75th percentile (190 data)
250 mg product / hour

Potential dermal exposure

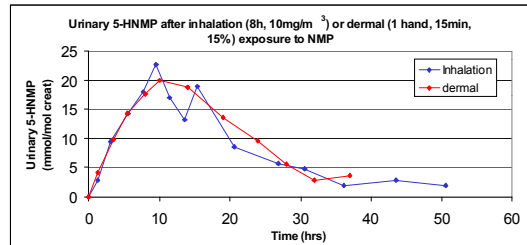
75th percentile data
(all clothing, not hands)

Dipping (window frames)
11 g product / hour

Airless (paint) spraying
15 g product / hour

Penetration & permeation
2% through 2 layers

TECHNICAL DEVELOPMENTS -
COSHH ESSENTIALS (C-E) : SKIN



Comparing inhalation with dermal uptake and elimination (biomonitoring)

TECHNICAL DEVELOPMENTS -
COSHH ESSENTIALS (C-E) : SKIN

- Skin exposure - complex and often significant (plus effects of water)
- Hazard bands – feasible
- Insufficient current knowledge to band skin exposure
- Control options are limited
 - but can be arranged in a hierarchy

TECHNICAL DEVELOPMENTS -
COSHH ESSENTIALS (C-E) : SKIN

- | | |
|---|---|
| <ul style="list-style-type: none"> • Medium toxicity <ul style="list-style-type: none"> - modify process - substitute physical form - segregate “clean” and “dirty” areas - cleaning routines - hygiene procedures - skin care - training - use PPE | <ul style="list-style-type: none"> • High toxicity <ul style="list-style-type: none"> - as medium plus full containment, <u>or</u> permit to work - biomonitoring as appropriate • Special (R43 etc.) <ul style="list-style-type: none"> - measures as medium or high toxicity - skin surveillance - seek special advice |
|---|---|

TECHNICAL DEVELOPMENTS -
COSHH ESSENTIALS (C-E) : **PPE**

- Personal Protective Equipment
 - head (hood, helmet)
 - face / eyes (visor / goggles)
 - body (coverall, apron)
 - hands (gloves, skin cream)
 - feet (boots)

TECHNICAL DEVELOPMENTS -
COSHH ESSENTIALS (C-E) : CLOTHING

- Selecting protective clothing:
 - permeation versus run-off
 - “bellows effect” of impervious fabrics
 - polycotton or microporous polypropylene offer some protection (75th % value = 25% breakthrough)
 - work clothing beneath coveralls cuts skin exposure (75th % value = 2% breakthrough)
- Laundry - vitally important

TECHNICAL DEVELOPMENTS -
COSHH ESSENTIALS (C-E) : GLOVES

- Select protective gloves by “challenge group”
- Gloves’ inner surfaces always contaminated
- Single use gloves – throw away after one use
- Latex – low protein, low dust only
- All gloves – dispose at the end of the work day unless you can show they are not contaminated and their protective capacity is sound. *Expensive!*

TECHNICAL DEVELOPMENTS -
GLOVE SELECTION – DATA FOR SUPPLIER

- | | |
|-----------------------------|-------------------------------|
| • Task description | • What extent of hand contact |
| • Task duration | • Product spread up arms |
| • Chemicals in product | • What other hazards |
| • Product’s physical form | • Range of glove sizes |
| • If solid, dustiness? | • Compatibility with PPE |
| • If liquid, Boiling Point? | • Disposal |
| • Temperature | |

Has the worker any skin condition that would affect his wearing protective gloves?

TECHNICAL DEVELOPMENTS -
COSHH ESSENTIALS (C-E) : EMERGENCIES

- Health hazard banding for emergencies
 - First Aid advice
- Banding based on product label
- Used for planning.
- Other emergency issues (e.g. fire) can be put in later.

TECHNICAL DEVELOPMENTS - COSHH ESSENTIALS (C-E) : EMERGENCIES

5 BANDS

P Q R S T



5 ROUTES:

- breathed in
- swallowed
- on skin
- in eye
- injected

Just 15 instructions are sufficient !

TECHNICAL DEVELOPMENTS - SUMMARY

- Risk to skin can't yet be banded. Hazard can be.
- All products should be assumed to show risk to or via the skin, so procedures and PPE are needed
- Skin surveillance is needed where skin sensitisers occur in products
- Even low concentrations of sensitisers are important - *concentrations increase as products dry.*
- Glove selection is important
- Personal hygiene and skin care is also important

TECHNICAL DEVELOPMENTS - SUMMARY

- Residual inhalation risks can be banded.
- Selection of RPE is a specialised task, but the user can be prompted to provide the supplier with all necessary information.
- Health hazards can be banded for emergencies.
- It is possible to devise a limited set of advice for planning purposes.

TECHNICAL DEVELOPMENTS - COSHH ESSENTIALS

Acknowledgements:

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