

Ensuring compliance with legislation in regard to worker health protection in metalworking

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What We Do

We are highly experienced health and safety professionals who provide specialist health and safety advice.

Sectors

As a team we have decades of Occupational Hygiene experience in the metals industry.

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Our well known and highly regarded expert witness service sits as the heart of Pragma + Associates.



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Substances hazardous to health in casting and ancillary processes

- Metal fume and individual constituents
- Welding fumes
- Inhalable and respirable dust
- Respirable crystalline silica (RCS)
- Benzene
- Oil mist
- PAHs

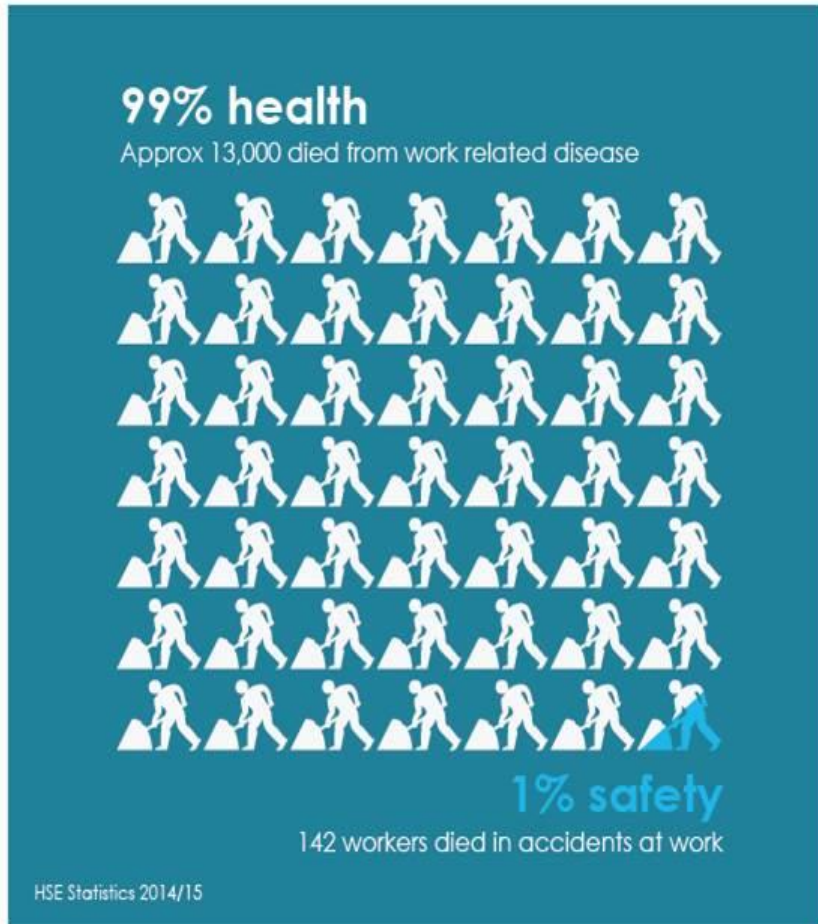


Health effects from exposure to metal fume



“Molten metal fume (foundry fume) is hazardous to health. Ferrous foundry fume can cause lung cancer. Other foundry fume and spray mists can cause lung diseases including asthma.”
(HSE,2021)

Work Related Disease and Occupational Lung Disease



17,000 Estimated annual **new** cases of self-reported breathing or lung problems caused or made worse by work.

An estimated 135,000 people who have ever worked currently have “*breathing or lung problems*” they regard as caused or made worse by work.

12,000 Lung disease deaths each year estimated to be linked to past exposures at work.

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The benefits of good exposure control - Moral

All employers owe a duty of reasonable care to their employees



Source: <https://safetycartoon.com/page/2/>

The benefits of good exposure control - Financial

- Avoidance of direct worker costs
 - Temporary/ permanent replacement costs
 - Training costs
 - Potential litigation, claims, prosecution and associated costs
- Avoidance of reputational costs
 - Loss of revenue
 - Increased scrutiny from authoritative bodies
 - Increases in premiums



The benefits of good exposure control - Legal



Assess risk (COSHH Regulation 6)

Prevent/control exposure (COSHH Regulations 7 & 8)

Maintain and check controls (COSHH Regulation 9)

Check efficacy through workplace monitoring and health surveillance (COSHH Regulations 10 & 11)

Information, instruction and training (COSHH Regulation 12)

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Assess risk (COSHH Regulation 6) – Common issues

A risk assessment should:

- Be task based (not substance based)
- Carried out where possible before the start of the process
- Consider all processes from raw materials handling to housekeeping tasks
- Consider all hazardous substances (inc. by-products, waste products, biological agents, etc.) and routes of exposure
- Be carried out by a competent person with worker involvement
- Provide sufficient detail
- Be dynamic



Prevent/control exposure (COSHH Regulations 7 & 8)

COSHH Regulation 7(7):

“...control of that exposure shall only be treated as adequate if:

*(a) the **principles of good practice** for the control of exposure to substances hazardous to health set out in Schedule 2A are applied;*

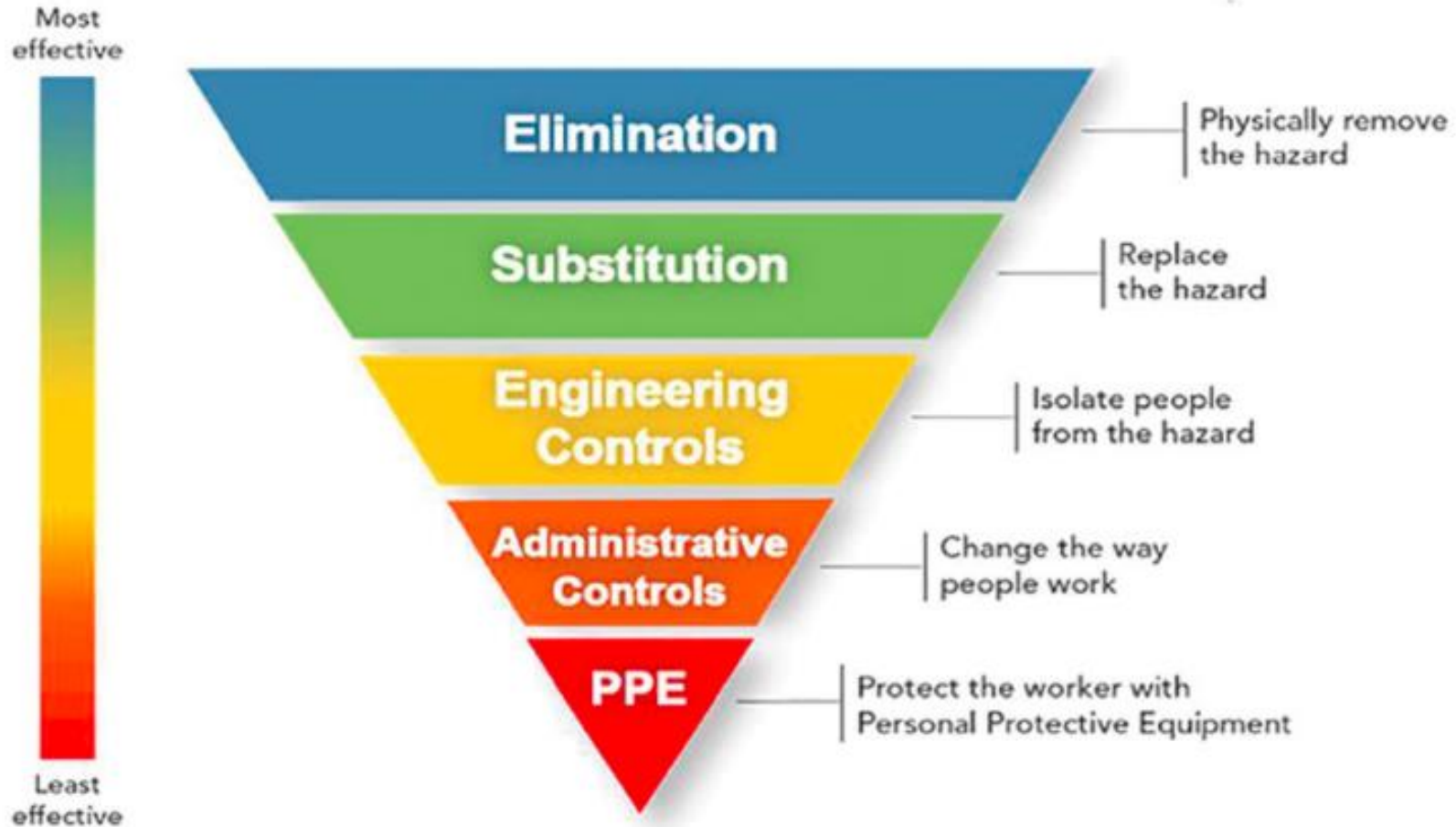
*(b) any **workplace exposure limit approved for that substance is not exceeded; and***

*(c) for a substance which carries the risk phrase R45 (H350), R46 (H340) or R49 (H350i), or for substance which is identified or has shown to be a potential cause of occupational asthma, exposure is reduced to **as low a level as is reasonably practicable.**”*

Workplace Exposure Limits (WELs)

Substance	Current UK WEL (mg/m ³ 8-hour TWA)	Notes
Inert/ non-toxic Dust	10 (for total inhalable) 4 (for respirable)	Pseudo WEL. Ill health effects can occur at 5 (for inhalable) and 1 (for respirable)
Hexavalent chromium (Cr VI)	0.01 to 0.025 (process generated)	Proposed reduction to 0.005 (direct use and process generated) in 2025. Notations: Carc, Sen, BMGV
Cobalt and Cobalt compounds (as Co)	0.1	Notations: Carc (cobalt dichloride and sulphate), Sen
Manganese and its organic compounds (as Mn)	0.2 (inhalable); 0.05 (respirable)	
Nickel and its organic compounds (except nickel tetracarbonyl)	0.1 (water soluble Ni compounds); 0.5 (Ni and water-insoluble nickel compounds)	Notations: Sk, Carc (nickel oxides and sulphides) Sen (nickel sulphate)

Hierarchy of control



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Provision of Information, instruction and training (COSHH Regulation 12)



- Can make a substantial difference
- Empower the workforce
- Encourages ownership
- Allows involvement
- Early recognition of issues and/or improvements which can present cost savings
- Including for use of control measures e.g. LEV and PPE/RPE

How do you demonstrate compliance?

Once adequate controls are in place you need to demonstrate that they work and that they continue to work.

- Commissioning (including workplace air monitoring)
- Records of maintenance and servicing (where required)
- TExT (thorough examination and testing of LEV) by a competent person
- Personal air monitoring
 - Consider the requirements of COSHH
 - Provide enough detail to allow interpretation of results
 - Provide recommendations in respect of further control/ issues where noted
- Face fit testing for RPE (where RPE is identified as required)
- Biological monitoring and health surveillance
- Workplace auditing



Summary

- A range of potential health hazards are encountered during casting and associated processes, including metal fume and individual constituents.
- Control of exposures should be considered at design stage; although retrofittable solutions are available
- Control of exposures ensures that moral and legal duties are met by the employers, often with financial benefits
- Occupational Hygienists can assist in ensuring compliance with these duties and with demonstrating effectiveness and efficacy of exposure controls

Sources for further advice and guidance:



The Chartered
Society for Worker
Health Protection



Questions?

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