



Control approach 2

Foundry fume from melting

FD02

Engineering control



This guidance sheet is for **employers** to help them 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 *COSHH essentials: easy steps to control chemicals*. It describes the key points you need to follow to help reduce exposure to an adequate level. It is important to follow **all** the points, or use equally effective measures.

Molten metal fume (foundry fume) is hazardous to health. Ferrous foundry fume can cause lung cancer. This sheet does not apply to aluminium.

Some metal fumes cause metal fume fever. Lead and lead alloys have special provisions.

Melting metal for recycling can cause fume that contains dioxins.

This sheet does not cover fume from drossing. Seek expert advice if you suspect that slags or drosses can emit poisonous gases when wet.

Get safety data sheets from your chemical suppliers. Use these to identify the more dangerous chemicals, and less dangerous substitutes.

Control approach 2 (engineering control) is recommended to control foundry fume in melting metal.

You need also to control exposure to noise.

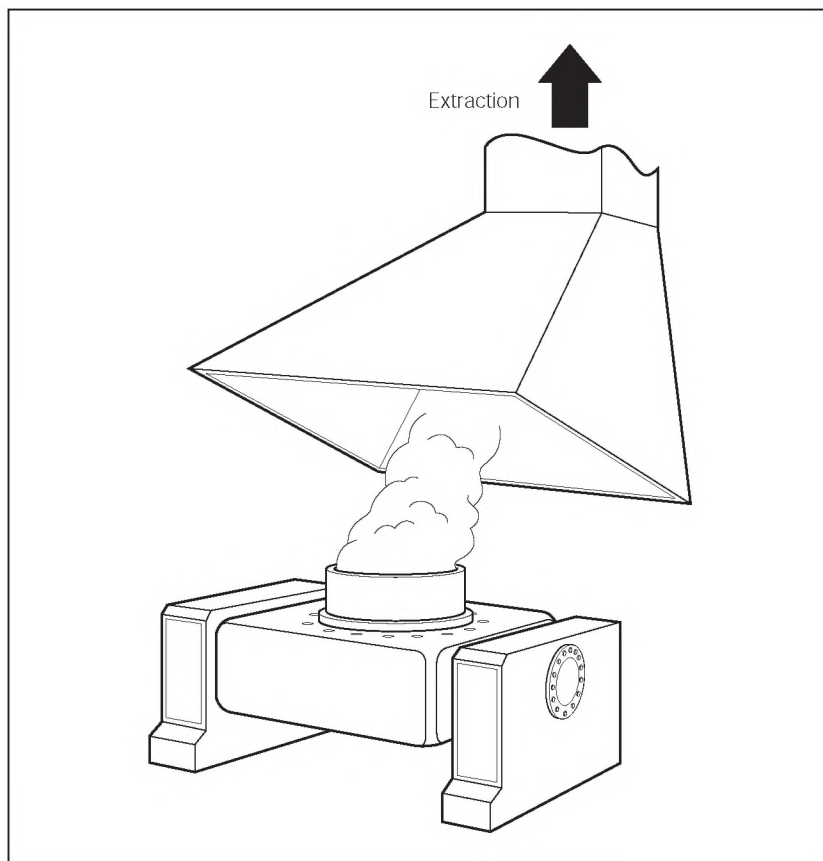
For environmental advice see Further information on the back page.

Access

- ✓ Restrict access to those staff who need to be there.

Design and equipment

- ✓ Keep foundry fume under control - don't let it contaminate the whole workshop.
- ✓ Foundry fume rises. An extractor hood above the furnace will capture as much fume as possible. Ensure moveable hoods are put in the right position.
- ✓ You need enough extraction to stop fume spilling out of the hood.
- ✓ Make sure a manometer or pressure gauge is fitted near the extraction point, to show that the extraction is working properly.
- ✓ Always confirm that the extraction is turned on and working at the start of work. Check the gauge.
- ✓ Discharge cleaned, extracted air to a safe place outside the building, away from doors, windows and air inlets.
- ✓ Have a supply of clean air coming into the workroom to replace extracted air.
- ✓ Consult a qualified ventilation engineer to design new control systems (see Control guidance sheet FD14).



Maintenance

- ✓ Follow instructions in maintenance manuals.
- ✓ If the extractor fan stops, or is faulty, get it repaired immediately.
- ✓ Keeping equipment in effective and efficient working order.

Examination and testing

- ✓ Look daily for signs of damage to the ducting, fan and air filter. Noisy or vibrating fans can indicate a problem. Repair damage immediately.
- ✓ At least once a week, check that the extraction system and gauge work properly.
- ✓ You need to know the manufacturer's performance specification to know if extraction is working properly.
- ✓ If this information isn't available, hire a competent ventilation engineer to determine its performance.
- ✓ The engineer's report must show the target air speeds.
- ✓ Keep this information in your testing logbook.
- ✓ Get a competent ventilation engineer to examine the system thoroughly and test its performance at least once every six months (non-ferrous metal) or once every 14 months (ferrous metal) (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.
- ✓ Review records to see if there are failure patterns that make planning maintenance easier.

Cleaning and housekeeping

- ✓ Every day, clear up accumulations of dirt in areas where people work all the time.
- ✓ Clean general workrooms once a week to stop dust being stirred up and to reduce slips.
- ✓ Use a Type H vacuum cleaner fitted with a HEPA filter to clear up dust.
- ✗ Don't clean up with a brush or with compressed air.

Personal protective equipment (PPE)

- ✓ Ask your safety-clothing supplier to help you get the right PPE.
- ✓ Respiratory protective equipment (RPE) is not normally needed for melting metal.
- ✓ 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 your supplier. Throw away disposable masks after one use.
- ✓ Keep RPE clean and store it away from dust.
- ✓ Protective gloves are needed for maintenance and cleaning.
- ✓ 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.

Health surveillance

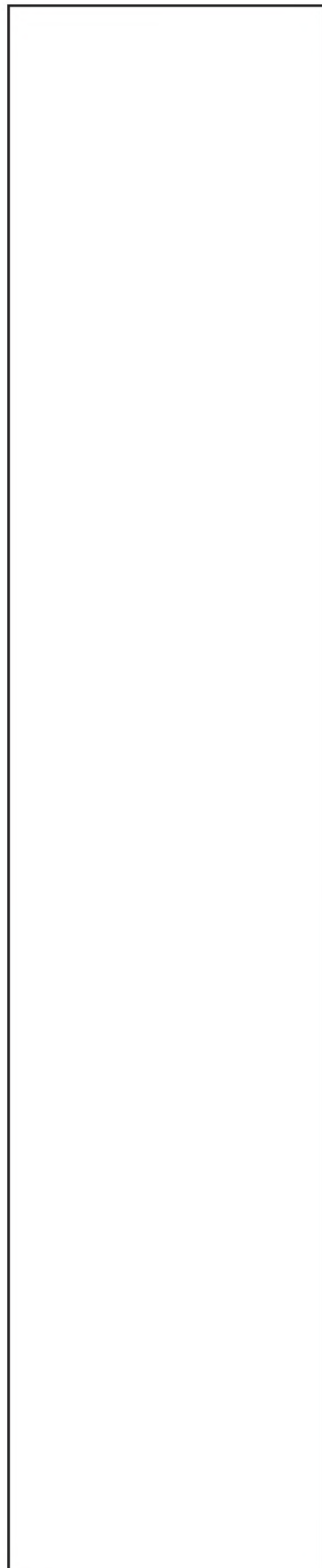
- ✓ Consider health surveillance for lung function and other health effects.
- ✓ Consult an occupational health professional (see Further information).

Training

- ✓ Tell workers that foundry fume is hazardous to health when breathed in.
- ✓ Warn workers if slags or drosses can emit poisonous gases when wet.
- ✓ Provide health and safety training. Include supervisors and managers.
- ✓ Ensure training includes how to keep exposures low; how to check that the extraction system is working; how to use and look after PPE and RPE; and what to do if something goes wrong.

Supervision

- ✓ Check that the extraction is working properly; PPE is being used properly; and the rules on personal hygiene are being followed.
- ✓ Ensure the health surveillance programme is being carried out for everyone that needs it.
- ✓ Ask your workers to check their skin for dryness or soreness every six months. If these effects appear, check the proper use of skin creams and personal protective equipment.



Further information

- *The selection, use and maintenance of molten metal protective clothing* Guidance HSE Books 1996 **ISBN 0 7176 1162 0**
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 (Second edition) HSE Books 1998 **ISBN 0 7176 1485 9**
- *An introduction to local exhaust ventilation* HSG37 (Second edition) HSE Books 1993 **ISBN 0 7176 1001 2**
- *The selection, use and maintenance of respiratory protective equipment: A practical guide* HSG53 (Second edition) HSE Books 1998 **ISBN 0 7176 1537 5**
- *Lead and you: A guide to working safely with lead* Leaflet INDG305(rev1) HSE Books 1998 (single copy free or priced packs of 15 **ISBN 0 7176 1523 5**)
- *How to reduce exposure to dioxins in (aluminium) recycling* Leaflet INDG377
- *Controlling airborne contaminants in the workplace* Technical Guide TG7 British Occupational Hygiene Society 1987 **ISBN 0 9059 2742 7**
- Health and safety consultants: the BOHS Faculty of Occupational Hygiene keeps lists of qualified hygienists who can help you. Contact BOHS on 0133 229 8087 or at www.bohs.org/
- Occupational health professionals: details of doctors and nurses can be found in the Yellow Pages under 'Health and safety consultants' and 'Health authorities and services'. Also visit the NHS website at www.nhsplus.nhs.uk

Depending on the scale of work, releases into the atmosphere may be regulated within the pollution prevention and control (PPC) framework. You should consult your local authority or the Environment Agency. In Scotland, consult the Scottish Environment Protection Agency (SEPA). They will advise you if PPC legislation applies to your company, and about air cleaning and discharging emissions into the air. Otherwise, minimise emissions into the air.

Employee checklist

- ☐ Always follow the standard operating procedures.
- ☐ Is the extraction in the right position, switched on and working properly?
- ☐ Check the gauge.
- ☐ Look for signs of leaks, wear and damage.
- ☐ If you find any problems, tell your supervisor. Don't just carry on working.
- ☐ Co-operate with health surveillance schemes.
- ☐ Use, maintain and store your PPE in accordance with instructions.
- ☐ Wash your hands before and after eating, drinking, smoking and using the lavatory.
- ☐ Never use solvents to clean your skin.
- ☐ Use skin creams provided as instructed.



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