

# FDO

COSHH essentials  
for foundries

## Advice for managers

**The Control of Substances Hazardous to Health Regulations 2002 (COSHH) require employers to ensure that exposure is prevented or, where this is not reasonably practicable, adequately controlled. This guidance gives practical advice on how this can be achieved by applying the principles of good practice for the control of exposure to substances hazardous to health, as required by COSHH.**

It is aimed at people whose responsibilities include the management of substances hazardous to health at work, eg occupational health specialists, anyone undertaking COSHH assessments and supervisors. It is also useful for trade union and employee safety representatives. It will help you carry out COSHH assessments, review existing assessments, deliver training and supervise activities involving substances hazardous to health.

This guidance is issued by the Health and Safety Executive. Following the guidance is not compulsory, unless specifically stated, and you are free to take other action. But if you do follow the guidance you will normally be doing enough to comply with the law. Health and safety inspectors seek to secure compliance with the law and may refer to this guidance.

See Essential information near the end of the sheet.

### Introduction

HSE has produced these advice sheets to help employers assess and control risks from hazardous substances in the workplace.

For some common tasks the sheets take into account the health hazards (and exposure potential) of substances used or produced to identify an approach appropriate to control the risks.

The FD series describes good practice for controlling exposure to hazardous substances in foundries. The sheets cover the key points you need to follow to reduce exposure to an adequate level. This is achieved by following good control practice (ie follow all points described in the sheets or use equally effective measures) and by reducing exposure to below the relevant workplace exposure limits (WELs).

The FD series contains the following sheets:

FD1	Withdrawn
FD2	Furnace work
FD3	Pouring, casting and cooling molten metal
FD4	Sand reclamation
FD5	Mould and core making
FD6	Knock-out / shake-out
FD7	Fettling
FD8	Withdrawn
FD9	Shot-blasting castings
FD10	Withdrawn
FD11	Pattern assembly (investment casting)
FD12	Spray coating a large casting (open workshop)
FD13	Withdrawn
FD14	Furnace relining

### What the sheets cover

Reducing exposure to an adequate level always involves a mixture of equipment and ways of working. This means employers should:

- choose the most effective and reliable control measures;
- ensure controls work effectively when first used, and continue to protect people by carrying out regular maintenance;
- ensure controls are used properly by instructing, training and supervising workers;
- regularly check and review all elements of your control measures to ensure they are protecting workers, taking corrective action when needed.

## Hazards

Health hazards in foundries include dusts (foundry sands, fettlings and kiln linings contain silica), metal fumes, products of combustion and thermal decomposition, and substances associated with binder systems.

Crystalline silica dust, which is fine enough to reach deep inside the lung, is known as respirable crystalline silica (RCS). Exposure to RCS can cause silicosis, where irreversible lung damage can be present before any symptoms develop. Silicosis may continue to worsen even after exposure to RCS stops. RCS can also cause other serious diseases such as chronic obstructive pulmonary disease (COPD) and lung cancer. The workplace exposure limit for RCS is detailed in HSE publication EH40/2005 Workplace Exposure Limits (see Essential information).

Inhaling RCS can lead to:

- Silicosis
  - Exposure to RCS over a long period can cause scarring of the lung tissue with a loss of lung function.
  - In the early stages of disease there are often no symptoms.
  - As the disease gets worse there is shortness of breath and eventually individuals may find it difficult to walk short distances.
  - Acute silicosis is a rare complication of short-term exposure to very large amounts of crystalline silica; this condition is life-threatening.
  - Workers with silicosis are also at an increased risk of tuberculosis, kidney disease and arthritis.
- Lung cancer
  - Chronic obstructive pulmonary disease (COPD is a long-term illness that develops gradually over several years). The lungs are permanently damaged making it difficult to breathe. The risk of COPD is increased by smoking.

RCS dust is also abrasive and drying when in contact with skin and can lead to contact dermatitis. Wet working can also lead to dermatitis.

Substances found in binder systems can include furfuryl alcohol, phenol-formaldehyde, benzene and isocyanates. Some of these substances or their decomposition products can cause asthma, dermatitis and skin allergies, and some can cause cancer.

Metals found in fume and dust can include nickel, chromium, manganese, cobalt and lead. If inhaled, ferrous foundry fume can cause cancer; other foundry fume can cause asthma. Some metals such as nickel and cobalt can cause dermatitis and skin allergies.

Gases, such as carbon monoxide, can be formed from furnace combustion processes and the thermal decomposition of organic binder systems. A brief exposure to small amounts of carbon monoxide may cause headache, skin reddening, nausea, dizziness, vertigo, muscle pain or personality changes. Exposure to higher amounts may cause movement problems, weakness, confusion, lung and heart problems, loss of consciousness and death.

Dehydration can be a risk when working in a hot environment – only if this is the case, should drinking fluids from covered containers, eg water bottles, be allowed. Workers should not normally eat or drink in contaminated areas.

## How to use the sheets

- Follow all points described in the sheets or use equally effective measures.
- Consider the processes/tasks and hazardous substances in your workplace.
- Look for opportunities to substitute with less hazardous materials.
- Examine the advice sheets for each of the tasks.
- Examine the essential information sheets listed on each advice sheet.
- Compare operations in your workplace with recommendations in the advice sheets for all of the relevant tasks.
- Record your findings and any actions you need to take covering: issues identified, planned actions, target completion date, person responsible, status of any issues, and a review of effectiveness (this forms part of your risk assessment).
- Keep a record of your actions to control exposure of workers to hazardous materials.

## Essential information

EH40/2005 Workplace exposure limits HSE 2020  
[www.hse.gov.uk/pubns/books/eh40.htm](http://www.hse.gov.uk/pubns/books/eh40.htm)

You can find the full COSHH essentials series at Foundry - COSHH e-tool ([hse.gov.uk](http://hse.gov.uk))

## Further information

Information on other hazards and safety risks prevalent in the industry can be found at <http://www.hse.gov.uk/moltenmetals/index.htm>

Control of exposure to silica dust - A guide for employees. INDG463.  
[indg463.pdf](http://indg463.pdf) ([hse.gov.uk](http://hse.gov.uk))

Controlling airborne contaminants at work: A guide to local exhaust ventilation (LEV) HSG258. [www.hse.gov.uk/pubns/books/hsg258.htm](http://www.hse.gov.uk/pubns/books/hsg258.htm)

Respiratory protective equipment at work - A practical guide HSG53.  
[www.hse.gov.uk/pubns/books/hsg53.htm](http://www.hse.gov.uk/pubns/books/hsg53.htm)

Guidance on respiratory protective equipment (RPE) fit testing Leaflet INDG479(rev1) HSE 2019 [www.hse.gov.uk/pubns/indg479.htm](http://www.hse.gov.uk/pubns/indg479.htm)

Health surveillance for those exposed to respirable crystalline silica (RCS) - Guidance for occupational health professionals. Published 2015  
<http://www.hse.gov.uk/pubns/priced/healthsurveillance.pdf>

G402 – Health surveillance for occupational asthma.  
<https://www.hse.gov.uk/pubns/guidance/g402.pdf>

G403 – Health surveillance for occupational contact dermatitis (OCD).  
<https://www.hse.gov.uk/pubns/guidance/g403.pdf>

G404 – Health surveillance for silicosis.  
<https://www.hse.gov.uk/pubns/guidance/g404.pdf>

Control of substances hazardous to health: The Control of Substances Hazardous to Health Regulations 2002. Approved Code of Practice and guidance L5 (Sixth edition) HSE 2013  
<https://www.hse.gov.uk/pubns/books/l5.htm>

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Control of Lead at Work Regulations 2002 Approved Code of Practice and guidance. L132 (Third edition). HSE 2002.  
<https://www.hse.gov.uk/pubns/priced/l132.pdf>

BOHS Directory of Occupational Hygiene Consultants:  
[www.bohs.org/find-expertise/](http://www.bohs.org/find-expertise/)

Institute of Local Exhaust Ventilation Engineers Accredited members  
Institute of Local Exhaust Ventilation Engineers (ILEVE) | CIBSE

For information about health and safety, visit <https://books.hse.gov.uk> or <http://www.hse.gov.uk>

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To report inconsistencies or inaccuracies in this guidance, email:  
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