BREATHE FREELY

Controlling exposures to prevent occupational lung disease in the construction industry

BOHS British Occupational Hygiene Society

The Chartered Society for Worker Health Protection

Construction Managers Toolkit

Recognise, evaluate, control

Steps to carrying out a practical COSHH assessment on a construction site

arco Experts in Safety

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The Control of Substances Hazardous to Health (COSHH) Regulations set down legal requirements about what employers need to do to minimize the risk to the health of their employees from exposure to hazardous substances at work.

COSHH applies to all substances in all forms, including gases, vapours, solids, dusts, liquids and even microorganisms. It covers mixtures and preparations (paints, glues, etc.) as well as pure chemicals. Substances created by the work, such as dust, fume, mists and vapours are also covered by COSHH. It doesn't apply to lead and asbestos, which have their own specific Regulations. This guidance can be applied to substances containing lead as the Control of Lead at Work Regulations are similar to COSHH. However, if it is suspected that there is a risk that workers are exposed to asbestos, work should be stopped and specialist advice obtained.

The main requirements of COSHH are:

- Identify the hazards and risks from the use of hazardous substances at work.
- Decide what control measures are needed to control the risks.
- Decide what other measures are needed to ensure that control is maintained.

A record has to be kept of the assessment, which must also be reviewed if there are any changes to the work or if there is any reason to suspect that it may no longer be valid.

The assessment is a means to an end – it helps identify what controls and other measures are needed to prevent workers health being affected by their work. Also remember that the risk is not created by hazardous substances, but by how they are used. So it's usually best to base the assessment on the task rather than the substance.

The COSHH Regulations set out what needs to be done to ensure an assessment is "suitable and sufficient", but they don't provide a set format. The level of detail required really depends on the nature and complexity of the risks. However, the risks associated with many common construction activities are relatively straightforward, and well established control measures are available.

This document provides advice on how to carry out a COSHH assessment on construction sites. A model report format for simple, straightforward activities, together with some example assessments, is included in Appendix 1.

This guidance has been produced by the British Occupational Hygiene Society (www.bohs.org), the Chartered Society for worker health protection, as part of the Breathe Freely campaign (www.breathefreely.org.uk).

Occupational hygienists are specialists in identifying, assessing and controlling health risks in the workplace.

A practical approach to COSHH assessment

1. Split up site activity into individual jobs

The level of risk from exposure to hazardous substances is largely determined by how a substance is used. Also, new substances, not originally present, may be created by the work (e.g. metal fumes and ozone are created during welding operations). So the key to an effective COSHH assessment is to base it on the task or process.

It's important to consider all the site activities and one way to do this is to split the activities up into simple, manageable units, and individual jobs within the units. For example, groundwork could be one main activity, split into smaller jobs such as trenchwork and tunnelling. Bricklaying might be another split into mixing mortar and laying bricks then concrete work, which will include the key job of cutting concrete.

Focus on the tasks where there is most potential for harm to health. Here are some pointers:

- Jobs that make **lots of dust** such as cutting, grinding or brushing, especially of wood, stone or concrete.
- Spreading materials over a **large surface area** e.g. adhesives or solvents.
- **Spraying** materials such as paints or insulation.
- Jobs that involve excessive skin contact with materials.
- Work in **confined spaces**, or where ventilation is poor, especially if you are using solvents e.g. from glues or paints, or dusty materials.
- Using **large quantities** of materials, especially if there are a lots of vapours given off e.g. some paints, thinners or paint strippers, or the material is very dusty.

A key point to remember is that you should base the assessment on the **TASK**, not the substance.

2. Recognise the hazards

Health hazards can occur from using materials brought onto site or from substances created during the work. It is important to identify ALL hazards for the task / process.

Substances brought onto site

Compile a list of materials used during the task / process. There may be an "official" list of substances purchased but double check – have a look at the work and the work area to identify other substances that may be in use.

Common substances may include:

- Cement
- Mortar
- Solvents
- Paints
- Adhesives
- Resins

Obtain the relevant **safety data sheets** (SDSs) for these substances, that suppliers have to provide, to determine the associated hazards. The information should be given in Sections 2 and 11 of the SDS. In particular, Section 2 of the data sheet should include the relevant Hazard Statements for the substance. These summarise the key health effects.

Substances created by the work

In addition, many of the health hazards on construction sites are created by the work itself and it's important that they are included in the assessment. **Common hazards include:**

- Diesel exhaust fumes
- Silica dust created when cutting bricks or concrete, or when "chasing" mortar
- Wood dust
- Metal fumes and ozone during welding
- Legionella bacteria in water systems
- Other biological hazards such as animal waste

Identifying the hazards from these substances is a little more difficult as safety data sheets won't be available, so other sources of information may need to be consulted. Information on the hazards from common processes is available on the Health and Safety Executive and the BOHS Breathe Freely websites. If you are unsure, or can't find the relevant information, seek help.

Inhalation is usually the main way in which substances can enter and affect the body but some substances, such as cement, can also damage the skin or eyes, others (e.g. lead and some solvents) can be absorbed through the skin and yet others, such as lead and bacteria, can cause harm if ingested.

3. Evaluate the risks and decide on control measures

The important thing to remember is that the purpose of a COSHH assessment is to decide on what controls are required. The assessment helps us to decide what needs to be controlled, based on the level of risk, and the degree of control required.

COSHH requires the control to be adequate, and your assessment should ask whether this is the case. Where the risk is trivial, COSHH doesn't require highly expensive or complex solutions but where risk is high, then the level of control needs to match it. In many cases more than one measure will be needed to ensure that the risk is minimized. Controls need to be suitable for the job, and need to work effectively. Engineering controls are often poorly designed, calibrated or maintained, and, too often, incorrect dust masks or gloves are provided. Implementing poorly designed and inappropriate controls can actually increase the risk and waste money, so get expert help if you need it.

COSHH specifies a "hierarchy of controls" that begins with: elimination; replacing with a less hazardous substance; considers engineering controls and safer working methods; and, as a last resort, personal protective equipment (PPE). Bear this in mind when deciding on what measures are needed for your processes.

Elimination	Can you avoid using a hazardous substance completely?
Substitution	Can you substitute the substance with a less hazardous one? This could mean using alternative fuels to diesel, pre-cut tiles and prefabricated concrete (so minimising the amount of cutting on site hence reducing exposure to dust), rosin-free solder, low-hazard solvents, etc.
Engineering controls	These might include dust extraction and local exhaust ventilation (LEV), on-tool dust extraction, water suppression, and physical enclosures that can be used to remove the hazard from the work area, or impose a barrier to contain the substance.
Safer working methods	Changing work methods and habits e.g. introducing wet working; dust-limiting and safer paint application methods; restricted access areas; job rotation; etc. can all be employed to minimise exposures, by limiting the generation of hazardous substances and / or the number of individuals who could be exposed.
Personal Protective Equipment (PPE)	PPE can include: gloves; eye protection; overalls; as well as respiratory protection (RPE). It should be a LAST RESORT. Try to find other controls that minimize exposure so that wearing PPE won't be necessary, or will only be needed as a secondary control. Making sure you have the right PPE can be difficult, and it's easy to get wrong. It's complicated and you might need specialist help to make sure that you have selected the right type. Just making it available is never going to be enough and you need to put arrangements in place to ensure that it is properly used and maintained.

A step by step approach

In the context of COSHH, a **hazard** is something that has the potential to cause a harmful effect on health, and is an intrinsic property of a substance; a **risk** is the likelihood of actual harm to health occurring in the specific workplace circumstances. With health hazards, the associated risk is a combination of the harmful effects caused by the substance and the level of exposure.

Risk = effect x exposure

Deciding on the level of exposure in order to work out the risk can be tricky, but if we remember that COSHH is about control, we can follow a simple step by step approach to help us decide on what measures are needed.

Routes of exposure

First of all it's important to identify all routes of exposure – the main ones being inhalation AND skin contact. There may be other routes of exposure too – in particular eye contact and ingestion.

For each potential route of exposure, decide what the workers and others may be exposed to.

Example 1 When applying paint, the following exposures could occur:	
Inhalation	Solvent vapours from the paints
Skin contact	Splashes of paint
Other routes	Accidental ingestion of paint contaminating hands

Example 2 Chasing mortar with a power tool can lead to:	
Inhalation	Dust containing silica
Skin contact	Dust settling out of the air on to the skin
Other routes	Dust in the eyes

Decide on what controls are needed

Once the routes of exposure have been identified, control measures should be selected based on the level of risk. Deciding on this can be tricky, and too often people carrying out COSHH assessments spend too much time and effort worrying about it. But COSHH is about deciding on which controls are required, so try the following approach, concentrating on identifying the measures needed to control exposure:

1. Experience
Where the risk is obvious and there is a well established control approach, you might be able to use your experience and judgement to decide on what's needed. Only do this if you are confident that you have the right answer.

2. Guidance from HSE and other sources
For many common processes there is good guidance on what controls should be used, from the HSE and other sources. The following websites are particularly useful:

http://www.hse.gov.uk/pubns/guidance/cnseries.htm

https://www.hse.gov.uk/Construction/healthrisks/hazardous-substances/index.htm

https://www.hse.gov.uk/coshh/essentials/direct-advice/construction-silica.htm

http://www.breathefreely.org.uk/trade-fact-sheets.html

3. COSHH Essentials
Where guidance on specific processes and substances isn't available, you may be able to use the HSE's COSHH Essentials e-tool to identify the appropriate control approach. You can access the e-tool at:

http://coshh-tool.hse.gov.uk/

Note that this can only be used for "bought in" substances and cannot be used for situations where dusts, fumes and mists are generated. Advice on skin exposure is also limited.

4. Expert Help
If you are unsure about the risks or what control measures might be needed, you should obtain help from an occupational hygienist or other suitably qualified and experienced professional.

Sometimes it might be necessary to arrange for measurements of exposure to be carried out to help you decide on the level of risk. In such cases it is important that this is done by a qualified occupational hygienist, or competent person with appropriate training and experience.

To find an occupational hygienist, consult the *BOHS Directory of Occupational Hygiene Services*, which is the definitive list of UK companies able to provide qualified and experienced occupational hygienists, and specialist occupational hygiene support services.

https://mk0bohsx5kak7rlajjs.kinstacdn.com/app/uploads/2020/07/BOHS-Buyers-Guide-Sep-19.pdf

4. Decide on other measures needed

A "suitable and sufficient" COSHH assessment should consider the measures that are needed to comply with COSHH regulations 8 to 12. These are the sorts of things that you might need to ensure that the controls you have implemented are being managed and continue to work effectively.

Supervision requirements

Workers will sometimes avoid using controls and following procedures in order to save time, or because they don't understand the consequences of not using them. So it's important to ensure that the controls are being used. In some cases, it may be necessary to arrange spot checks by supervisors. Record details of any supervision arrangements on the COSHH assessment report.

Arrangements for maintaining and testing of controls

Workers will sometimes avoid using controls and following procedures in order to save time, or because they don't understand the consequences of not using them. So it's important to ensure that the controls are being used. In some cases, it may be necessary to arrange spot checks by supervisors. Record details of any supervision arrangements on the COSHH assessment report.

Engineering control measures are subject to wear and tear and may become less effective at controlling exposure over time. So good proactive, planned maintenance will be needed. Work out what is required and specify it in the assessment.

It is good practice to check controls from time to time to ensure that they are working. With local exhaust ventilation systems, a thorough examination and test needs to be carried out by a competent person at least once every fourteen months and comprehensive records completed and kept on file for at least 5 years. In some cases, the tests may need to be carried out more frequently than this, particularly if there is a risk of the control deteriorating before then.

With reusable respirators a thorough examination and test should be carried out at least once per month, and again, records must be kept of these tests and held on file for at least 5 years.
Other types of control measures may also need testing from time to time. In these cases, it's up to you to work out what tests are needed and how often.

So, in summary:

- For LEV systems, work out how often a thorough examination and test is needed and arrange for a competent person to carry it out (must be done at least once every 14 months or more often if indicated under COSHH Schedule 4).
- For non-disposable respirators, arrange for a competent person to carry out a thorough examination and test every month.
- For other controls, consider what tests are needed and how often they need to be carried out.
- Make arrangements for suitable records to be kept, which should be held on file for at least 5 years.
- Record details of all of the above on the COSHH assessment.

Routine exposure monitoring

Air monitoring involves measuring worker exposure to hazardous substances as part of a planned programme. It's a way of ensuring that the controls are effective and exposure is below any Workplace Exposure Limits. It may be needed for hazardous substances such as silica dust, wood dust, isocyanates and some solvents.

If you think air monitoring might be needed it's best to seek advice from an occupational hygienist*. They will be able to help you decide whether it is needed and how often. The measurements need to be carried out by a competent person and an occupational hygienist will be able to help.

Once you've decided what's needed, record the details on the COSHH assessment.

Health surveillance

Health surveillance of workers using hazardous substances can involve: medical tests and examinations; inspection for symptoms (such as dermatitis) by a competent person; or simply keeping medical records. It's not an alternative control, but a supplement to ensure that the measures implemented to minimise exposure are effective. Health Surveillance is likely to be needed where there is a reasonable likelihood that an identifiable disease or adverse health effect could result from exposure to the substance, and there is a valid method available for detecting the disease.

Guidance on health surveillance:

www.hse.gov.uk/health-surveillance/index.htm

www.hse.gov.uk/pubns/guidance/g404.pdf

If you feel that health surveillance may be appropriate, advice should be sought from an occupational health specialist.

Once you've decided what's needed, record the details on the COSHH assessment.

Training and communication for employees

Employees exposed to hazardous substances must be given information on:

- The risks to health.
- The results of any air monitoring or health surveillance tests carried out.
- The control measures to be used.

They must be given appropriate instruction and training so they can use the controls effectively, and are able to follow designated procedures.

Decide what's needed and then record the details on the COSHH assessment.

5. Keep a record

Your COSHH assessment needs to be recorded, unless the situation is simple and obvious, and should include:

- Jobs/activities that involve significant risk from exposure to hazardous substances.
- The control measures in place.
- Other measures to ensure the controls are effective.
- Any identified actions.

The Regulations do not specify a standard record format, as what is needed will depend on the complexity of the job and the nature of the risk. However, a model report format for simple, straightforward activities, together with some example assessments, is provided in Appendix 1.

6. Review

COSHH assessments should be reviewed in the event of a process or workplace change, or where there has been a failure in a control e.g. if a worker reports respiratory symptoms.

In any case, it is prudent for risk assessments to be reviewed periodically, perhaps every one to five years, depending on levels of risk.

The recommended re-assessment date should be included on the assessment report.

COSHH Assessment

Company:	
Site:	
Task:	

Brief description of task:

Hazardous substances

Substances used

Substance	Hazardous components	Key health effects	Workplace Exposure Limit *

Substances created

Substance	Hazardous components	Key health effects	Workplace Exposure Limit *

* Where applicable

Significant exposures

Inhalation

Exposure	Health effects	Controls required

Skin contact

Exposure	Health effects	Controls required

Ingestion

Exposure	Health effects	Controls required

Notes

Other measures required

Supervision

Maintenance and testing of controls

Air monitoring

Health surveillance

Information, instruction and training

Actions

Actions required

No.	Action	By	Completion date

Assessment completed by: _____

Date: _____ **Review date:** _____

COSHH Assessment

Company:	XY Contractors Ltd
Site:	Old Hospital
Task:	Applying AkzoNobel floor paint with roller

Brief description of task:

Paint is applied to floor using a roller.

Hazardous substances

Substances used

Substance	Hazardous components	Key health effects	Workplace Exposure Limit *
AkzoNobel floor paint	Naptha (hydrogenated) <35% 2-butanone oxime <1%	Repeated exposure may cause skin dryness or cracking. Vapours may cause drowsiness and dizziness.	None

Substances created

Substance	Hazardous components	Key health effects	Workplace Exposure Limit *
None			

*** Where applicable**

Significant exposures

Inhalation

Exposure	Health effects	Controls required
Solvent vapours	Drowsiness and dizziness	1. Look for an alternative, less hazardous product 2. Ensure good general ventilation of area. Open doors and windows during work

Skin contact

Exposure	Health effects	Controls required
Paint splashes	Repeated exposure may cause skin dryness or cracking	1 Look for an alternative, less hazardous product 2. Wear Nitrile or Viton gloves to protect hands from minor splashes 3. Change gloves daily or sooner if they become contaminated

Ingestion

Exposure	Health effects	Controls required
None		

Notes

Assessment of risk carried out using HSE COSHH Essentials e-tool. Assessment code AF11260111
Guidance on glove type from supplier's Safety Data Sheet
Information on managing risks from skin exposure at work: **https://www.hse.gov.uk/pubns/books/hsg262.htm**

Other measures required

Supervision

Supervisors to ensure that specified controls are used and that employees know how to put the gloves on and take them off without contaminating their skin.

Maintenance and testing of controls

Gloves must be worn within their breakthrough times and disposed of after use.

Air monitoring

Review the risk assessment, COSHH regulation 10 and ACOP, and the HSG173 monitoring strategies to decide if air monitoring is required in this situation.

Health surveillance

1. Arrange for monthly skin checks by supervisor
2. Advise all employees to check their skin for dermatitis on a weekly basis recommended

Information, instruction and training

Provide the following training for all personnel who carry out the work:

- The risks to health
- The need to ensure good general ventilation
- Use of gloves
- What to do if something goes wrong
- Employees must know to report signs of glove damage or degradation to their supervisor right away

Actions

Actions required

No.	Action	By	Completion date
1	Investigate availability of an alternative, less hazardous product	AB	1/11/16
2	Arrange supply of Nitrile or Viton gloves (glove type selection should be made in accordance with the SDS information, the risk assessment, and with advice from your PPE supplier)	AB	1/10/16
3	Instruct operators on risks, operating procedures and use of controls	AB	1/10/16
4	Arrange for monthly skin checks by supervisor and advise all employees to check their skin for dermatitis on a weekly basis	EF	1/11/16

Assessment completed by: J. Smith

Date: 1/6/16 **Review date:** 1/6/18

COSHH Assessment

Company:	XY Contractors Ltd
Site:	Old Hospital
Task:	Chasing mortar

Brief description of task:

Chasing mortar using angle grinder prior to pointing.

Hazardous substances

Substances used

Substance	Hazardous components	Key health effects	Workplace Exposure Limit *
None			

Substances created

Substance	Hazardous components	Key health effects	Workplace Exposure Limit *
Dust containing crystalline silica	Respirable crystalline silica	Silicosis Lung Cancer (where generated as a result of a work process) COPD	0.1 mg/m^3 (8hr TWA) (respirable crystalline silica)

*** Where applicable**

Significant exposures

Inhalation

Exposure	Health effects	Controls required
Dust containing respirable crystalline silica	Silicosis Lung Cancer (where generated as a result of a work process) COPD	1. Water suppression on tool 2. FFP3 disposable mask or PAPR (of TH2 or higher classification) if the task is undertaken for periods over one hour. 3. Carry out face fit testing prior to first use of mask and a fit check performed before each use. 4. Enclosing the work using temporary screens to stop dust escaping 5. Provide single use disposable Tyvek overalls to prevent dust contaminating clothing

Skin contact

Exposure	Health effects	Controls required
Dust	Possible skin irritation	Cloth gloves

Ingestion

Exposure	Health effects	Controls required
None		

Notes

Information on controls from HSE Information Sheet on Construction dust
http://www.hse.gov.uk/pubns/cis36.pdf
and COSHH Essentials Guidance Sheet on chasing with hand-held power tools
http://www.hse.gov.uk/pubns/guidance/cn2.pdf

Other measures required

Supervision

Supervisors to ensure that specified controls are used

Maintenance and testing of controls

Water suppression equipment should be checked prior to use. Ensure that there is always enough water available for dust suppression. For non-disposable respirators, arrange for a competent person to carry out a thorough examination and test at suitable intervals.

Air monitoring

Review the risk assessment, COSHH regulation 10 and ACOP, and the HSG173 monitoring strategies to decide if air monitoring is required in this situation.

Health surveillance

All personnel who carry out the work should undergo the following health surveillance:

- Respiratory questionnaire
- Lung function testing

These should be undertaken annually or more or less often as deemed necessary but the occupational physician. Obtain advice from occupational health provider on whether there is a need for chest x-rays

Information, instruction and training

Provide the following training for all personnel who carry out the work:

- How the dust can harm their health
- How to use the controls and check that they are working
- How to fit and look after the dust mask
- How often to change filters (for non-disposable masks)
- What to do if something goes wrong

Actions

Actions required

No.	Action	By	Completion date
1	Install water suppression on grinder	AS	1/10/16
2	Obtain supply of FFP3 dust masks or a suitable powered respirator if the task is undertaken for periods over one hour	BD	1/9/16
3	Arrange for fit testing of masks	BD	14/9/16
4	Arrange for operator training	CF	14/9/16
5	Contact occupational health service provider regarding health surveillance	CF	1/9/16

Assessment completed by: J. Smith

Date: 1/5/16 **Review date:** 1/5/18