Types of Hazardous Substances (COSHH)

Level 3 Health and Safety in the Workplace

Introduction

In the previous section of the course, we looked at how to work safely with hazardous substances and how to undertake a COSHH risk assessment.

In this part of the course, you'll learn more about the different types of hazardous substances that you may come across in the workplace, including specific information on asbestos, lead, and flammable liquids, dusts and gases.

Topics to be Covered

The topics covered in this section are:

- Flammable substances
- Dangerous substances
- Employer responsibilities
- Flammable liquids, dusts and gases
- Asthma-causing substances
- Asbestos
- Lead
- Emergency procedures

Flammable Substances

Flammable substances are volatile gases, liquids and solids that continually give off potentially dangerous vapours. When combined with air, these vapours will ignite and burn.

Typical examples of flammable substances include:

- Paint thinners.
- Welding gases.
- Petrol.
- Dust from wood working.
- Dust from flour and sugar.
- Alcohol.
- Packaging materials.
- Polyester wadding.
- Textiles, such as cotton.

In order to work safely with flammable substances, five principles should be followed:

1. Ventilation - there should be a good supply of air wherever flammable liquids or gases are being stored or used.
2. Ignition - the dangers posed by ignition sources must be removed, e.g. sparks from electrical equipment, heating equipment and open flames.
3. Containment - flammable substances should be kept in containers with lids and spillage catchment trays.
4. Exchange - where possible, the use of flammable substances should be avoided or replaced with less flammable ones.
5. Separation - flammable liquids should be used and stored away from other processes and plant.

Dangerous Substances

The Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSEAR) aim to ensure that risks are controlled from 'dangerous substances'. A dangerous substance is anything that can be classified as:

- Having flammable, explosive or oxidising properties.
- Having the ability to create explosive atmospheres.

The regulations also cover all work activities involving other substances that have the potential to create a fire or explosion.

Employer Responsibilities

In the last module, we learnt that employers are required to carry out a risk assessment and eliminate risks, either by substitution of a non-hazardous substance or by substituting a new or modified working process.

Where it is not possible to avoid risk, employers must follow a hierarchy of control measures:

- Reduce the quantity of dangerous substances to a minimum.
- Avoid or minimise the release of a dangerous substance.
- Control the release of a dangerous substance at its source.
- Prevent the formation of an explosive atmosphere.
- Ensure that any release of a dangerous substance is suitably collected, safely contained and removed to a safe place.

When following the hierarchy, employers must ensure:

- Where explosive atmospheres may occur, the workplace is classified into zones and marked with warning signs.
- Employees operating in a hazardous zone are provided with PPE.
- The workplace is verified as meeting the standards of DSEAR by a competent person before coming into operation for the first time.
- Work equipment used in hazardous zones is safe.

Flammable Liquids, Dusts and Gases

To help reduce the risk of explosions from flammable liquids, dusts and gases, the following steps should be taken:

- Always dispense liquids over a tray and ensure any materials provided to mop up spills are non-flammable.
- Dispose of contaminated material safely.
- Ensure that plant is dust tight.
- Keep the working area clean.
- Ensure hoses are regularly checked for wear and replaced when necessary.
- Keep valves to cylinders protected from damage.
- Ensure cylinders are secured properly.

Asthma-Causing Substances

The following list shows some of the substances you may come across in the workplace that have the potential to cause occupational asthma:

- Castor bean dust from castor oil.
- Some antibiotics and penicillin.
- Some disinfectants.
- Coffee bean dust.
- Dust from cow hair.
- Salts used in dyes and photocopier paper.
- Egg and fish proteins from processing.
- Some hardwood dusts.
- Latex.
- Soybean dust.

When carrying out a COSHH risk assessment in regards to asthma-causing substances, employers must:

- Consider all workers who could potentially be exposed to asthma-causing substances.
- Pay particular attention to any workers who have already developed occupational asthma or who may have symptoms at low levels that are not easily identified.
- Draw up procedures for dealing with confirmed cases of asthma if the working environment contains asthma-causing substances.
- Carry out suitable health surveillance if employees are likely to be exposed to asthma-causing substances.
- Provide employees with suitable training and information on the symptoms and health effects of asthma.

The risk assessment will need to be reviewed if a worker develops asthma that may have been caused by exposure to a substance at work.

Asbestos

Asbestos is the single greatest cause of work-related deaths in the UK: it causes around 4,500 deaths every year. When asbestos fibres are inhaled they can cause serious diseases, including mesothelioma and lung cancer.

Although asbestos is no longer imported or used in the UK (it was banned in 1999), harmful asbestos materials are still common in existing buildings. This puts workers at risk of exposure to asbestos fibres whilst working on refurbishments, repairs or maintenance of older buildings.

The people most at risk are:

- Asbestos removal workers.
- Plumbers.
- Joiners.
- Electricians.
- Gas fitters.

To control the risks from asbestos, the law requires employers to:

- Presume that all materials contain asbestos, unless there is evidence to the contrary.
- Keep an up to date written record of the location and condition of any asbestos containing materials (ACMs) or presumed ACMs.
- Ensure written records are sufficient to allow another person to identify the materials.
- Assess the risk of anyone being exposed to fibres from ACMs.
- Monitor the condition of ACMs to ensure they are not deteriorating.
- Prepare and implement a management plan setting out how the risks from ACMs or presumed ACMs are to be managed.
- Provide information about the location and condition of any ACMs to any person who is liable to work on or disturb them.

Lead

The ingestion or inhalation of lead dust or lead fumes can result in abnormally high levels of lead in the body. Ill health effects can include headaches, stomach pains, anaemia and kidney damage.

The Control of Lead at Work Regulations 2002 (CLAW) provide specific requirements for employers to consider when undertaking a risk assessment.

Work processes that may create lead dust, fumes or vapour include:

- Stripping or burning of old lead paint.
- Hot cutting in demolition operations.
- Recovering lead from scrap.
- Manufacturing lead components or leaded-glass.
- Some painting or spraying of buildings and vehicles.
- Lead-acid battery manufacture.
- Lead smelting, refining, alloying and casting.

To prevent exposure to lead, employers must:

- Assess the nature and degree of exposure to lead at work.
- Provide employees with adequate information about the risks and which precautions to take.
- Provide control measures, such as extraction, to reduce exposure.
- Issue PPE or respiratory protective equipment (RPE) wherever necessary.
- Provide adequate washing facilities and appropriate rest areas for employees who work with lead.
- Arrange for employees who are exposed to significant amounts of lead at work to see a doctor on a regular basis.

Employees who work with lead must ensure that they:

- Have their lead levels checked every three months.
- Keep all medical appointments.
- Do not eat or drink in a lead contaminated area.
- Use any control measures or PPE that are provided.

Where lead levels in the body are too high, the worker will be prohibited from working in areas containing lead until the levels reduce to satisfactory figures.

Emergency Procedures

If there is a risk that your employees could be exposed to hazardous substances on a significant scale, either by accident or due to the failure of control measures, then you must be prepared and have emergency procedures in place.

For example, if there is risk of a chemical spill that would significantly affect workers' health and safety.

Everybody in the workplace needs to be familiar with the emergency plans. Involve safety representatives and employees when you put the plans in place to ensure that they are sufficient and will work in practice.

Emergency procedures should consist of:

- Effective safety drill procedures.
- Regular practising of safety drills.
- Emergency communication systems, such as alarms.
- Any necessary arrangements with the emergency services.
- Equipment to deal with the emergency, such as protective equipment and decontamination products.
- Procedures for dealing with any injuries.
- Details of which people are trained to implement procedures and raise the alarm.
- Arrangements to deal with any waste created.

Exercise

In order to work safely with flammable substances, five principles should be followed. Can you remember what they are?

- [x] Containment
- [ ] Protection
- [x] Ventilation
- [x] Separation
- [x] Ignition
- [x] Exchange

Summary

In this second module about hazardous substances, you've learnt about some of the different types of substances that you may come across in the workplace.

Where flammable substances are used, there must be good ventilation, the dangers posed by sources of ignition must be removed, and they must be kept in secure containers that are stored away from other processes.

To prevent explosions, only the minimum amount of the substance should be used, the release of the substance must be carefully controlled, appropriate PPE must be provided and the area should be clearly marked with warning signs.

Particular care should be taken where workers may come into contact with asbestos or lead containing materials. Asbestos fibres are hazardous when inhaled, and lead can cause ill health if the dust or fumes are inhaled or ingested.

Employers must also ensure that there are effective emergency procedures in place, including suitable safety drills, communication systems and first aid arrangements.