

# Control of Substances Hazardous to Health (COSHH)

## Background

### What is required

The key steps in COSHH assessments are:

1. To identify the risks
2. To identify who is exposed to those risks
3. To determine how the risks shall be controlled
4. To implement these controls
5. To monitor the effectiveness of the controls

### Sources of information

The main source of information is the materials safety datasheet which must be provided by the supplier. This is discussed in more detail below. It is important to realise that the MSDS tells you only about the risks. Who is at risk and how these risks may be controlled is under the control of you, the user and therefore COSHH requires more than just the accumulation of MSDS's.

The other sources of information are:

EH40/YY Occupational Exposure limits. These change from year to year, so the YY part refers to the year. The version available at the time of writing is EH40/05. In general, it is should not be necessary to have EH40/YY to carry out COSHH assessments but the variability of MSDSs make it highly desirable.

### MSDS's

These have a common format, but be warned that the quality of MSDS's varies from supplier to supplier. The format is:

Section	Comments
1 Identification of product and company	
2 Composition/Information on ingredients	One of the prime sources of risk identification to more experienced assessors
3 Hazard identification	Very variable. Quite often is not as helpful as it sounds
4 First aid measures	Used in determining what to do if things go wrong.
5 Fire fighting measures	
6 Accidental release measures	
7 Handling and storage	
8 Exposure control/personal protection	One of the prime sources of risk identification
9 Physical and chemical properties	Not normally of much use
10 Stability and reactivity	As for 4,5,6
11 Toxicological information	One of the prime sources of risk identification
12 Ecological information	Used for determining how to minimise environmental impact.
13 Disposal considerations	
14 Transport information	Relate more to the supplier than the user
15 Regulatory information	
16 Other information	

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**Exposure limits and standards**

There are two types of limit and standard.

A Maximum Exposure Limit (MEL) is an absolute limit that you must never exceed; there is sufficient evidence to say that exposures above this level will cause harm. There are about 60 substances listed as having an MEL which gives you some idea of, out of the thousands of substances around, how hazardous they are.

An Occupational Exposure Standard (OES) is a standard which you aim for. You are allowed to exceed it if you are doing something about reducing the exposure.

With both MELs and OESs, the target is to get as low as is reasonably practical under the limit or standard.

Both standards are expressed as both short term and long term exposures. Normally short term relates to the exposure over a 15min period and long term relates to exposure over an 8-hour period.

Exposure limits may be expressed in parts per million (ppm) or mg/m<sup>3</sup> which is not quite as easy as ppm to appreciate. Note that these values relate to the constituent itself and allowance must be made for the concentration in the final product. A substance with an OES of 100ppm present at 5% effectively means that the exposure may be 2000ppm of the final substance (ie 100ppm/5%).

As a guide, beware of substances in the low 100's ppm and be very concerned when it goes below this.

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**Primary risks**

Substances in common use within the Printing Industry have effects via the following typical routes;

- Solvents breathed in in excessive concentrations cause narcotic and similar effects
- Solvents when used repeatedly defat the skin. This is not a primary cause of ill health, but it removes the skin's natural protective mechanisms and therefore secondary illnesses may occur. eg Dermatitis
- Substances may have an immediate effect when contacting the skin or eyes, eg Hydrofluoric acid. This is present in some deletion pens.
- Some substances may cause sensitisation. What this means in effect is that once a person has become sensitised to a substance, then he or she can no longer work with it. Typically the tiniest amount will trigger an allergic reaction. Also the effects are not that predictable and may vary dramatically from person to person.
- Some substances may be absorbed through the skin
- Substances given off by a process, eg ozone from UV lamps

In general, ingestion is not a primary route, though vomiting after ingestion may cause serious problems if vomited material is taken into the lungs which are far less robust than the digestive tract.

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## Hierarchy of controls

You are required to choose from the highest reasonably practical alternative in the following hierarchy. I think that it is fairly obvious that as you go further down the list, then you get closer to the substance and more and more things have to work to reduce the exposure.

Control	Comment
Elimination	Stop using the substance or process
Substitution	Use a less hazardous alternative
Engineering	eg Provide local exhaust or dilution ventilation
Administrative	eg Limit exposure to people who are trained in the process
Personal Protective Equipment	eg provide gloves

## Steps in assessing risk and assigning controls

### Assessing risk

I recommend the following steps. Note that, with experience, you will probably go to step 2 before step 1.

Step	Action
1	Review Section 11 Toxicological Information and Section 3. Are the risks caused by single or repeated contact? What damage occurs?
2	Review section 8 Exposure Control and section 2 Composition. Are there any WEL's? If so what is the nett exposure concentration? Nett exposure concentration = $\frac{\text{WEL ppm}}{\text{Concentration}}$
3	Decide from the above information, what the primary risks are. For example: A substance which cause corneal burns on contact must obviously be kept away from the eyes. A substance which causes skin defatting obviously needs to be kept away from the skin.

### Assessing exposure

Exposure really relates to those who use the substance or those who may be affected by its inadvertent release. In general, the problems due to inadvertent release are low in the Printing Industry; the predominant problem is the risk of fire if large quantities of solvent are spilled. 200L of IPA spread over a large area causes a major fire risk.

### Assigning controls

Refer to risks you have identified above.

Ask how you are going to control each one. Choose your control measure from as high up the hierarchy as possible.

What is required to make this control measure work and keep on working? eg Do extraction filters need to be changed regularly? How do you control the continued effectiveness of activated carbon filter masks?

Are there any conflicts with other control measure? eg Is the glove material incompatible with other fluids used? Do you need to colour code gloves?

## Preparing for the worst

### First aid measures

Review the first aid measures on the MSDS and transpose these onto your COSHH assessment form.

Are there any special provisions required? eg Treatment creams or eye baths. Have you got these already?

### Spill provisions

Review the required provisions on the MSDS. Have you got the measures required and are they quickly available at the point of use, storage or transport? eg How do you stop the substance entering the drains?

## Implementation

### Informing people

The whole exercise is pointless unless those who are responsible for working with the substance know about it.

The key steps are:

Step	Action
1	Make copies of the assessments available at the point of use. I would also strongly advise having a summary of substances and controls available at the point of use. You can get several substances onto one page.
2	Tell everybody about the substances, the risks involved and how these are going to be controlled. Do not assume that, because people have worked in the Printing Industry for many years they know this already.
3	If there is a potential conflict, say with glove materials, then tell people how you are going to overcome this.

### Implement the controls

If there is a phasing to the controls, eg PPE first, then local exhaust ventilation, then tell the people exposed that this is going to happen.

## Monitoring

### Health surveillance

It may be that when making your assessment, you identified the need to carry out a health check, say for Dermatitis. Set up a system to do this, record the finding and investigate what is going wrong if you start to get adverse effects.

### Are controls being used?

Periodically, review the controls being used on a substance.

Are the storage and use provisions being followed?

Are there others at risk?

Are engineering controls maintained?

Is the specified PPE being used?

Are there conflicts in PPE that come from other substances?

Does PPE impede operations and introduce other risks?

