

**Control of Substances Hazardous to Health Regulations 2002
(as amended in 2004)
General enforcement guidance and advice**

OC 273/20 (Version 2)

Target Audience:

All HSE inspectors and Local Authority enforcement officers

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Introduction

Summary of main changes

Regulation 2 – Definitions

Regulation 6 – Risk assessment

Regulation 7 – Prevention or control

Occupational Asthma and skin exposure

Regulation 8 – Use of control measures

Regulation 9 – Maintenance

Regulation 10 – Monitoring exposure

Regulation 11 – Health surveillance

Regulation 12 – Information, instruction and training

Regulation 13 – Emergency provisions

Regulation 14 – Fumigations

Regulation 15 - Exemption certificates

Key messages

Further information

Appendix 1 Summary points & checklist form

Introduction

1 This OC provides general guidance on the COSHH Regulations 2002, as amended which came into force 17 January 2005 with respect to restrictions relating to cement and a revision of the disapplication of COSHH to merchant ships, and on 6 April 2005 for the other amendments. It also explains the FOD enforcement policy in this area. There are several related OCs and Sector Information Minutes (SIMs) on the Intranet that provide further guidance on more specific areas of COSHH – see Table 2.

2 The amendments can be seen in full in the Statutory Instrument 2004 No 3386 (No. 165 for Northern Ireland) and in pages 1-4 of ACoP L5.

Summary of main changes

3 Summary of major changes

- The replacement of Maximum Exposure Limits (MELs) and Occupational Exposure Standards (OES) with Workplace Exposure Limits (WELs);
- Regulation 7(7) now provides an explicit definition of 'adequate control';
- The introduction of the principles of good practice (PGPs) as set out in Schedule 2A.
- Prohibition of the supply and use of cement and cement preparations containing more than 0.0002% of soluble chromium (VI).
- The requirement that packages of cement and cement preparations be marked with information on packing date, storage period, and recommended storage conditions, when a reducing agent has been used.
- Changes to the wording of the duty to maintain exposure control measures to make it clear that the scope of the duty extends to methods of work and supervision in addition to plant and equipment.

4 This OC is intended as a guide to possible areas of enforcement but each set of circumstances should be considered individually in accordance with the principles of the Enforcement Management Model. Specific guidance on the application of the EMM to chemical risks and health is extremely relevant when considering enforcement action. Existing guidance in other current OCs, particularly 273/19, refer to COSHH 1994, but the underlying principles are largely unchanged.

5 As the nature of the hazard and the degree of risk is highly dependent on the specific substance and circumstances of use, the enforcement advice given here is in general terms.

COSHH Regulation 2 — Definitions

Substance hazardous to health

6 A substance hazardous to health is defined in regulation 2(1). Subparagraph (e) now brings within the scope of COSHH certain inert gases and vapours which may act as simple asphyxiants i.e. argon, helium, neon, nitrogen etc. Other gases with flammable properties may also satisfy the definition of 'dangerous substance' in the Dangerous Substances and Explosive Atmospheres Regulations 2002. Employers will need to assess and adequately control the risks to health and safety under both COSHH and DSEAR (ACoP paragraphs 19-20).

Workplace

7 Regulation 2(1) also now includes a definition of workplace. This exempts a public road from the definition of a 'workplace'. HSE Legal Advisor's Office advises that this applies only in so far as this refers to a road as a means of getting from one place to another, not as a workplace where work activities such as road maintenance, spraying of verges with pesticides, on street car valeting, etc. are undertaken.

Control measure

8 In 2002, a new definition of control measure was introduced into regulation 2(1). Control measures are now defined as measures taken to reduce exposure to substances hazardous to health including the provision of systems of work and supervision; the cleaning of workplaces, premises, plant and equipment; the provision and use of engineering controls and PPE.

Inhalable and respirable dust

9 The term 'total inhalable dust' is no longer used. Instead 'inhalable dust' is used with reference to the British Standard BS EN 481 1993. This is a revision of terminology that has little effect on the application and scope of OELs.

Carcinogens

10 The guidance in the ACoP recommends an active precautionary policy of prevention and control' for those substances that are suspected of being carcinogenic. This term is

not further defined. Employers should have a system for identifying these substances. They should be aware of the uncertainty linked to this class of hazard and should provide effective and reliable control measures to reduce or eliminate exposure. Advice can be sought on suitable control systems from Occupational Hygiene Inspectors.

Regulation 6 - Risk assessment

11 Regulation 6(1)(a) requires that employers should not carry out work that is liable to expose employees to substances hazardous to health until all risks have been evaluated and minimised as set down in the regulations. COSHH 2002 regulation 6(1)(b) introduces a further requirement to implement the steps highlighted in the assessment before commencing any work liable to expose employees to any relevant hazardous substance(s).

12 Regulation 6(2) of COSHH 2002 (as amended), now provides a list of issues which employers should include and consider for their assessment to be deemed suitable and sufficient. This includes a requirement to consider the information provided by the supplier, including that given in safety data sheets (SDSs), when making their assessment. SDSs are a valuable source of information but inspectors and enforcement officers should be aware that a significant proportion contains inaccuracies. The ACoP 'The compilation of Safety Data Sheets' third edition (L130) is of relevance here. If employers have concerns about the accuracy of this information e.g. misclassification of a hazard or omission of a well known health effect, inspectors and enforcement officers should encourage them to raise this with their suppliers. Where such inaccuracies are serious, especially if these could lead to exposure to substances causing a serious health effect, then inspectors and enforcement officers should consider enforcement action against the supplier under the Chemicals (Hazard Information and Packaging for Supply) Regulations 2002 (to be replaced by the requirements of the Regulation Evaluation Authority and restriction of Chemicals, or REACH, between 2008-2018).

13 In view of the emphasis placed by regulation 7(2) on preventing exposure by substituting the hazardous substance or process in order to eliminate or reduce the risk, inspectors and enforcement officers should check that the employer has recorded the extent to which prevention and substitution have been considered.

14 The COSHH ACoP specifically allows the COSHH assessment to be part of the general risk assessment required under regulation 3 of the Management of Health and Safety at Work Regulations 1999. If there is also a risk to safety arising from the same substances, the ACoP also advises that the assessment under COSHH and DSEAR can be combined. If the employer has made no assessment, inspectors should judge which regulations are most appropriate for enforcement but, in general, where risks from exposure to substances hazardous to health are the most significant it would be preferable to pursue under COSHH regulation 6.

15 Regulation 12(4) states that the person who carries out the assessment must be competent to do so as described in paragraphs 58–60 in ACoP L5.

16 The purpose of Regulation 7(7) is to ensure that any control measures are adequate to control the risk. If an inspector has concerns that they are not adequate, then action

should be taken under regulation 7(7) even if this is considered to be because the risk assessment is not suitable and sufficient. Only if the risk assessment is considered to be a paper exercise and not as part of system, should enforcement to be taken under Regulation 6(1)(b).

17 Generic or general assessments are valid if they address the actual risks at specific sites or from specific processes, as well as the steps which need to be taken to comply with the Regulations. Generic assessments are more likely to be acceptable for peripatetic work activities, e.g. pest control, where it is difficult to anticipate all variations in exposure arising at different sites.

Occupational asthma

18 Regulation 7(7)(c) now requires exposure to asthmagens to be as low as reasonably practicable. This should be reflected in the assessment of the risk to health and the steps taken to reduce or prevent the risk. Where there is the potential for exposure to substances that can cause asthma, the assessment should consider whether there is any evidence of asthma among the workforce and whether it might be attributable to work activities. Where inspectors and enforcement officers come across processes that involve such substances they should ensure that the assessment adequately addresses the risks involved and the appropriate control measures, particularly substitution. Inspectors and enforcement officers should also ensure that Regulation 11 on the provision of health surveillance is being complied with.

Exposure measurement

19 Measurement of personal exposure may not be necessary for an assessment to be suitable and sufficient, e.g. where the risks to health are immediately obvious or guidance is available which can be used to evaluate exposure. It is more likely to be required where operations are complex or specialised or the substances involved have a workplace exposure limit (WEL). Measurements should be appropriate for the routes that are relevant: they may take the form of air, skin, surface or biological sampling.

20 The need for measuring exposure for the purposes of an assessment should not be confused with the requirement to monitor under regulation 10. If sampling indicates that exposure is already adequately controlled or helps identify measures, which, when implemented, are likely to lead to adequate control, then further monitoring may not be necessary under regulation 10.

Recording the assessment

21 COSHH 2002, as amended, requires all employers employing five employees or more to record the significant findings of the assessment and the steps taken to meet the requirements of the Regulations. It is important that employers tell the workforce the results of the assessments in a form that is easily understood and can be followed by workers. It is strongly recommended, therefore, that records be kept. In general where a notice is issued requiring an assessment, it should also require it to be recorded. Regulation 6(4)(a) requires the employer to record the significant findings of the risk assessment as soon as is practicable after the assessment is made.

COSHH Essentials

22 COSHH Essentials is a practical guidance package designed to help employers assess and control the risks from chemicals used in their workplace. It is specifically aimed at small and medium-sized enterprises that lack in-house expertise on health and safety matters. Employers are taken step-by-step through the process to identify the correct approach to controlling exposure. Further details of the scheme are given in OC 273/16. Where employers are experiencing difficulty with their assessments, inspectors and enforcement officers should encourage them to make use of this package. This has been made easier with the launch of e-COSHH Essentials in 2002. This is an electronic interactive package that provides employers with advice on control measures based on the hazard information contained in a safety data sheet, the amount of the substance used and the task. More recent control guidance sheets, such as those for the printing, rubber, woodworking and foundry industries are task-based and do not need risk phrases.

23 The COSHH Essentials scheme provides guidance on control and some other aspects of COSHH, but its use does not mean that the employer has fully complied with all the duties under COSHH. Other duties, such as health surveillance, monitoring, compliance with WELs etc may be relevant. Inspectors and enforcement officers need to ensure that employers also address these aspects.

24 When duty-holders need specialist advice they should talk to an Occupational Hygienist. The British Occupational Hygiene Society has a register of professional hygienists on their website.

Regulation 7 - Prevention or control

Prevention and substitution

25 Preventing exposure should always be the first consideration under Regulation 7. This is particularly critical where there is the potential for serious and irreversible health effects such as cancer and asthma. Regulation 7(2) emphasises the need for substitution of either the substance or the process to eliminate or reduce the risk of exposure. OC 273/17 provides details on this. Employers should consider whether it is possible to significantly reduce exposure by using: an alternative substance; a different form of the same substance; or a different or modified process. An example of using different processes is using brush application rather than spraying.

26 Where there is published HSE and/or external guidance that advises on prevention for particular processes, inspectors and enforcement officers should bring this to the attention of employers. If prevention is a feasible option, inspectors and enforcement officers should ensure that employers' assessments demonstrate whether or not it is reasonably practicable to implement it in their particular work circumstances.

27 The opportunities to prevent exposure can change with innovations in equipment/materials, the introduction of new substances/formulations or changes in costs. HSE industry sector teams have an important role in keeping abreast of these

developments and inspectors and enforcement officers (via their ELO) should consult them for the latest advice.

28 Employers need to meet regulations 7(3) and 7(4) to comply with their duty of control. Those in 7(3) are to be considered in the order of priority in which they are given and as such they conform to the established COSHH hierarchical approach. They are expressed in sufficiently general terms to allow employers flexibility in selecting the controls appropriate to their process, which will work best to protect the health of their employees.

29 Regulation 7(4)(c)(ii) states that employers should reduce the level and duration of exposure to the minimum required for the work concerned. A workplace exposure limit (WEL) is the maximum concentration of a substance that should be found in the air, averaged over a specific time period to give a time-weighted average. WELs are not to be used in isolation: the first duty is to apply the principles of good practice.

30 A list of the current WELs [PDF] is on HSE's website.

Carcinogens and mutagens

31 The extra measures required to deal with carcinogens are detailed in Regulation 7(5). Although fewer in number than previously, the overall duties for controlling exposure to carcinogens remain the same. This is because regulation 7(4) now requires some of the measures that were previously prescribed for carcinogens only to be applied to all substances. Those measures given in regulation 7(5) are therefore additional measures for carcinogens. The COSHH (Amendment) Regulations 2003 which came into force in April 2003 amends this regulation to include substances classified by the European Union as Category 1 or 2 mutagens.

Skin exposure

32 The risks from skin exposure are often neglected in terms of assessment and control. In particular, where processes involve substances that carry R43 risk phrase – may cause sensitisation by skin contact - (sometimes in the combination R42/R43), Inspectors and enforcement officers should ensure that the risk of skin sensitisation is adequately addressed. Where substitution is not reasonably practicable, skin exposure should be reduced as low a level as reasonably practicable. Where processes involve substances with 'sk' notation, Inspectors and enforcement officers should ensure that the principles of good practice have been applied to control dermal exposure.

Adequate control

33 Regulation 7(7) is concerned with achieving effective control. Effective control means:

a) The principles of good practice for control of exposure are being applied **and**

b) Any workplace exposure limit is not exceeded

and

c) Exposure is reduced ALARP for asthmagens, carcinogens and mutagens.

For this regulation to be complied with, all three parts must be followed. Duty holders have to follow good control practice for all routes of exposure and not just comply with inhalation exposure limits.

34 COSHH regulation 7(11) provides some legal guidance on what is meant by 'adequate'. Further guidance on adequate control is in ACoP L5. For control to be regarded as adequate there must be control of exposure by all relevant routes, including skin absorption. Where control is deemed to be inadequate on account of evidence of ill health, results of health surveillance, exposure monitoring results, or poor comparisons with good practice, enforcement action should be considered. Action will depend on the strength of evidence, the seriousness of the potential health effect and the attitude of the employer, all of which are taken into account in the EMM.

35 Exposure measurements taken by employers or even consultants should be treated with caution. It is important to consider the expertise with which the sampling and analysis have been carried out and how representative the samples are in terms of quantity taken, duration of exposure and type of work activities. Static sampling can be used to assess background air contamination levels close to where it has been undertaken and to identify the 'strength' of various sources. Personal sampling is normally required to assess exposure against a WEL. Other sampling, such as skin, surface or biological) may need to be carried out to ensure all relevant routes are controlled adequately. Occupational Hygiene Specialists can advise where necessary, but it is important to note that it may not be necessary to carry out HSE exposure monitoring where enforcement action is being considered.

36 Regulation 7(7) now specifies that adequate control must be achieved, using good control practice, instead of just complying with a 'legal minimum' exposure limit.

37 There are 8 principles of good practice (PGPs) that form a 'package'. All the principles must be properly applied in order to achieve effective, reliable and sustainable control of exposure. Employers cannot pick and choose which principles to apply – they are all important in achieving adequate control. The principles are not listed in rank order: principle (a) is not more important than principle (h), although there is a logical progression in how they are presented and should be considered.

38 The best way of understanding how to apply the principles is to read through a worked example (welding fume) shown in [Appendix 1: Summary Points and Checklist Form](#) [PDF] and ACoP L5 paragraphs 295-357. Appendix 1 was designed as a tool for Occupational Hygienists, Health & Safety Professionals and technical advisors in trade associations to help them to systematically apply the PGPs. SMEs should follow the advice in the relevant COSHH Essentials Guidance Sheets to achieve adequate control (in most cases) and seek specialist advice for more complex tasks/processes.

Exposure by inhalation: Workplace exposure limits

39 A WEL is the maximum concentration of substance that should be found in the air averaged over a specific time period to give a time-weighted average. There are two time reference periods:

15 mins – used for chemicals which cause effects such as eye irritation
8 hours for chemicals that cause long term effects.

40 Exposure should be reduced proportionate to the health risks. For asthmagens, carcinogens and mutagens exposure should be reduced so far as is reasonably practicable.

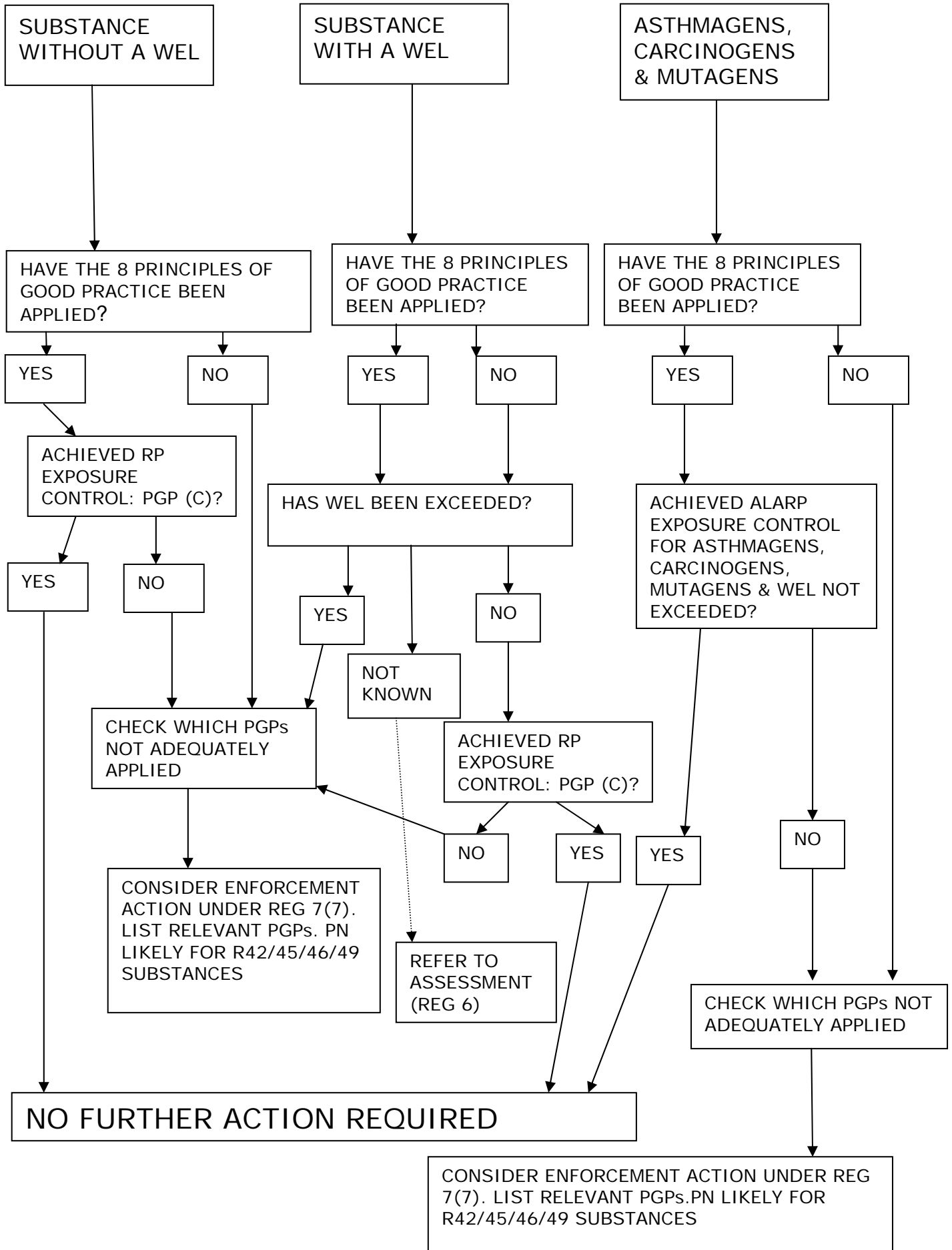
41 Enforcement action should be considered where a WEL has been exceeded or the level of airborne exposure has not been reduced proportionate to the health risks or, for asthmagens, carcinogens and mutagens, as far below it as is reasonably practicable. ACoP L5 provides guidance on determining whether isolated results, or a couple of results marginally exceeding an WEL indicate a failure to maintain adequate control of exposure. Inspectors and enforcement officers should ensure that employers have taken all reasonable measures to comply with The principles of good practice. This may vary between industries and so appropriate HSE and/or industry guidance should be consulted. In the absence of specific guidance, the initial focus should be on the extent to which good occupational hygiene control practice is being followed e.g. spillages cleaned up, lids placed on containers, control equipment properly maintained etc. Advice is available from Occupational Hygiene Specialists and/or Sectors and, in some cases, COSHH Essentials.

42 Table 1 below and the Guide to the Enforcement Process for Regulation 7(7) in Figure 1 show what to look for when considering enforcement action to achieve adequate control. The emphasis should always be on the systematic application of the PGPs rather than just achieving compliance with a specific WEL.

Table 1 – What to check when considering Reg 7(7) enforcement action

Type of Substance	Without WEL	With WEL	Used to have a OEL but limit removed	Used to have a MEL and now has a WEL
What to look for	<p>The vast majority of hazardous chemicals fall into this group.</p> <p>Apply PGPs</p> <p>Other well founded benchmarks can and should be used by the duty holder under Principle (c)</p>	<p>Apply PGPs</p> <p>If there is evidence of the WEL being exceeded by definition one or more of the Principles will not have been applied properly</p> <p>If asthmagen, carcinogen or mutagen, control exposure ALARP</p>	<p>The emphasis is on the application of the Principles rather than on compliance with a limit.</p> <p>There is nothing to stop duty holders using other well founded exposure benchmarks</p>	<p>If asthmagen, carcinogen or mutagen, control exposure ALARP</p> <p>For those substances that had a MEL without being asthmagens/ carcinogens/mutagen s e.g styrene and silica, control is not ALARP. However, Principle (c) – Controlling exposure by measures that are proportionate to the health risk – applies.</p>
Enforcement	<p>Cite Regulation 7(7) and the relevant Principle(s) from Schedule 2A</p>	<p>State the Principle(s) that has been breached and then mention any WEL that has been exceeded.</p> <p>Prohibition or Improvement Notice depends on the nature of the hazard and scale of risk R42/45/46/ 49 = PN</p>	<p>Cite Regulation 7(7) and the relevant Principle(s) from Schedule 2A</p>	<p>State the Principle(s) that has been breached and then mention any WEL that has been exceeded.</p> <p>Prohibition or Improvement Notice depends on the nature of the hazard and scale of risk R42/ 45 = PN</p>

Figure 1: A guide to the enforcement process for regulation 7(7)



Chemical hazard alert notices

43 Since 1998 HSE has issued Chemical Hazard Alert Notices (CHANs) have been suspended.

Biological monitoring

44 Biological monitoring is the measurement and assessment of hazardous substances or their metabolites in tissues, secretions, excreta or expired air. Biological Effect Monitoring is the measurement and assessment of early biological effects caused by the absorption of chemicals. Biological monitoring provides valuable information on whole body exposure. It can be used in conjunction with air sampling, or instead of it e.g. where skin absorption is an important exposure route. It can also be used to check the effectiveness of the protection provided by RPE/PPE, where this is extensively used as a control measure.

45 Biological monitoring guidance values (BMGVs) exist for some substances and details are given in EH40. There have been significant advances in biological monitoring techniques in recent years. Some have become simpler to carry out and others are less invasive, e.g. a solvent breathalyser. Inspectors and enforcement officers should consult with Medical Inspectors, Occupational Health Inspectors or Occupational Hygiene Inspectors for further advice. It should be noted that whatever the ease of carrying out biological monitoring, the values do not have any status as enforceable limits and other evidence of the inadequacy of control measures would be needed such as contaminated conditions or poor handling practices. For further information see Biological Monitoring in the workplace: A guide to its practical application to chemical exposure (HSG 167).

Personal protective equipment

46 The role of PPE in controlling exposure is clearly laid out in Regulation 7(3) i.e. it comes last in the hierarchy of control measures. Although the immediate risk gap may be closed by the provision of PPE, Inspectors and enforcement officers should not accept the use of PPE unless the employer can show that steps have already been taken to achieve adequate control by other methods. The ACoP lists situations where PPE may be necessary and Regulation 7(9) and ACoP details the standards required. In general, PPE should be suitable regarding the substance, the nature of the hazard, the type of operation and the wearer. The selection, use and maintenance of respiratory protective equipment - a practical guide (HSG 53) provides further information on RPE.

47 The ACoP covers the fit testing of RPE on initial selection. OC 282/28 Fit testing of respiratory protective equipment face pieces is essential reading when dealing with this issue. The performance of tight fitting face pieces relies heavily on the fit of the face piece to the wearer's face. An inadequate fit will significantly reduce the protection provided to the wearer - hence the need for a suitable face fit test. Qualitative fit testing is only acceptable for filtering face pieces and half mask respirators (fit factor of 100). Test results should be recorded and these should refer to the specific RPE worn by a specific worker.

48 Enforcement action should be considered if; -

- Employees are wearing tight fitting face pieces and have not passed an appropriate fit test; or
- Fit test results are not available; or
- Tests show that a particular mask did not fit the wearer yet he is continuing to wear it

49 The requirements in COSHH regarding PPE complement those in the Personal Protective Equipment at Work Regulations 1992 (as amended). The amendment to regulation 4(4) states that PPE should be hygienic and free from risks to health. Equipment should either be issued on a personal basis or be cleaned and disinfected before use by others.

50 Inspectors and enforcement officers should consider the context of adequate control under COSHH when considering enforcement on PPE. Action should be taken under COSHH rather than the PPE Regulations if the sole function of the PPE is control of exposure for health reasons. However the PPE Regulations may be more appropriate where PPE is used to protect against a range of hazards.

Welfare facilities

51 Welfare facilities can play an important part in the overall control of exposure, particularly where the route of exposure is ingestion or skin contact and where contamination can contribute significantly to secondary exposure. Good washing facilities, accommodation for clothing and changing, and facilities for eating and drinking are all relevant here. Inspectors and enforcement officers should ensure that employers comply with the Workplace (Health, Safety and Welfare) Regulations 1992 or the Construction (Design and Management) Regulations 2007 as appropriate.

Confined spaces

52 Where substances hazardous to health are used in confined spaces, inspectors and enforcement officers should ensure that the employer is in compliance with the Confined Spaces Regulations (see OC 288/7 The Confined Spaces Regulations 1997) as well as COSHH.

Biological agents

53 Most of the general requirements relevant to both deliberate and incidental working with biological agents are now in the main body of the Regulations (regulation 7(6)). Additional provisions solely relating to deliberate working are contained in Schedule 3.

54 The ACoP states that not all the listed measures are required in every case although considerable documented justification is required if measures are not implemented. The selection of measures should be based on the risk assessment, which should include consideration of the method of transmission and the ease of treatment. Inspectors and enforcement officers need to apply discretion in interpreting and enforcing them. For example, for most routine farm activities attention should be focused on hygiene measures, work practices, proper use of PPE and, in some circumstances, disinfection. It

is unlikely that specified procedures for decontamination or for transferring stock around the farm will ever be required. Relevant HSE Sectors may be able to provide advice on specific processes as well as Hazardous Installations Directorate Biological Agents Unit (HID BAU).

Exposure limits and monitoring for biological agents

55 There are no exposure limits for any biological agents and there are no plans to develop any. This is because they are living organisms and their number can rise and fall quickly and so exposure can vary significantly over a given period. There is also uncertainty over the dose required to cause infection, allergy or toxic response, which can differ significantly between individuals. Inspectors and enforcement officers should emphasise the need for good occupational hygiene control practice to control exposure. Monitoring techniques have been developed for measuring airborne microorganisms but in general their use should only be considered, where it is not apparent how good practice might be achieved, and then only after close consultation with Occupational Hygienists and/or HID BAU.

Occupational asthma and skin disease

56 The FIT3 and Disease Reduction Programmes aim to reduce chemically induced ill health in the workplace in particular, occupational asthma, Chronic Obstructive Pulmonary Disorder (COPD) and contact dermatitis.

The objectives are:

1. To raise awareness that certain chemicals can and do cause occupational asthma, COPD and contact dermatitis.
2. To ensure that employees, employers and key stakeholders understand what specific action needs to be taken to avoid or minimise exposure
3. To help change the workplace so that the actions needed become ingrained into the culture.

57 Astmagens can be found in many industries, with around 3000 people a year developing occupational asthma. Besides asthma is a group of diseases, such as Silicosis, together called pneumoconioses. Substances that cause asthma and pneumoconiosis are also associated with a group of diseases such as emphysema and bronchitis, together known as Chronic Obstructive Pulmonary Disease (COPD).

58 There is now a new Appendix dealing with the control of substances that cause occupational asthma. Several of the main causes of occupational asthma have been assigned WELs i.e. isocyanates, flour dust, grain dust, glutaraldehyde, wood dust and rosin based solder flux, the exceptions being dust from laboratory animals and latex. Employers should make every possible effort to reduce exposure below the relevant WEL as far as is reasonably practicable and inspectors and enforcement officers should enforce accordingly. Where there is no WEL, employers should reduce exposure to a minimum in accordance with regulation 7(4)(c)(ii). Where there is heavy reliance on RPE there should be particular emphasis on enforcing the requirements of regulation 11 on health

surveillance. Medical Inspectors and Occupational Health Inspectors can advise on this issue.

59 Contact dermatitis and skin sensitisation have two major causes: chemical and wet-work. Wet-work is where work require a person to have either wet hands or their hands submerged in water for 2 or more hours in the working day. This can be compounded with incorrect use of gloves and lack of adequate hand care.

60 Although wet-work is not strictly a COSHH issue, the effects of wet-work can be increased if the water contains hazardous substances, as can be seen in the hairdressing industry. If wet-work is common it may lead to an increase in the risk of exposure through the skin. Inspectors and enforcement officers should ensure that they take wet-work into account and question whether it is necessary. More information on skin disease.

61 Inspectors and enforcement officers should ensure that employers are controlling exposure of, and through the skin. There is often heavy reliance on PPE for this purpose, but employers should treat control of skin contaminants in a similar way to airborne contaminants i.e. minimising exposure in accordance with regulation 7. OC 276/1, 'Occupational Skin Disease' is useful in this context.

62 Regulation 10 covers the monitoring of skin exposure, but there are few organisations outside HSE that have the ability to perform effective skin monitoring competently. Inspectors and enforcement officers should not ask for this type of monitoring unless they are sure that the company has access to a reliable monitoring service. If it does not and skin or surface contamination is thought to be important, inspectors and enforcement officers should consider asking Occupational Hygiene Specialists for assistance. Surface sampling can be useful to check that cleaning regimes are working and to track contaminants into 'clean' areas

63 In recent years, there have been significant advances in monitoring techniques for skin and surface contamination which can provide useful information on exposure by this route as well as how contaminants spread within the workplace.

64 Table 2 lists industries that have chemically induced ill health and highlights the DRP priority topics.

65 Most chemical-induced occupational ill health does not occur immediately after exposure; on average the period of latency is about 10 years. Dutyholders therefore need to be aware of the risk and to be vigilant in ensuring that exposure is minimised.

66 The 8 principles of good practice are the best tools to ensure everything is being done to lower the risks. By enforcing Regulation 7(7), Inspectors and enforcement officers can focus on ensuring that the risks are controlled, not just assessed.

67 To help with enforcement of chemical-induced occupational ill health the Aide Memoire in Table 3 highlights what an inspector should look for when in premises where people are exposed to these risks. Table 3 also states under which Principle the matter is dealt with. If the matter is not dealt with, enforcement action should be considered using the guides in Table 1 and Figure 1. The type of chemicals and the risk of exposure will determine

whether a Notice is issued, but where the RCI score is 4 or more, prosecution should be considered. Inspectors and enforcement officers should always remember that compliance with Regulation 7(7) requires that all of the Principles have been applied. A duty holder cannot pick and choose between them.

Table 2 - A list of industries that have a high number of cases of chemically induced ill health.

* Indicates those chemicals that are specifically targeted by the DRP.

Industry	Chemical	Health Risk	Relevant Information
Agriculture	*Grain Dust *Animals Glutaraldehyde (disinfectant)	Asthmagen / COPD Asthmagen / Skin Sensitizer Asthmagen	AIS 3 (rev) AS 5 Vets and Disinfection
Construction	*Silica Cement Dust	COPD Skin Sensitizer	CIS 36 CIS 26
Engineering	*Metal Working Fluids *Stainless steel Fumes containing chromium and Nickel *Solder Machine Oil	Asthmagen Asthmagen /COPD Asthmagen Skin Sensitizer	SIM 03/2006/06 OC 668/29 SIM 03/2002/26 Used Engine Oils
Food	*Flour Dust Fungal Alpha Amylase (bread improver) Grain Dust Spice and Seasonings Tea Dust	Asthmagen Asthmagen Asthmagen Asthmagen Asthmagen	SIM 01/2001/56 OC 523/1 OC 523/3 SIM 01/2001/51 OC 520/20
Hairdressers	*Wet- Work with chemical substances	Skin Sensitizers	SIM 07/2006/12- Preventing Dermatitis in Trainee Hairdressers: Intervention in Further Education Colleges
Health Services	*Natural rubber latex *Skin Occlusion due to gloves Glutaraldehyde (disinfectant)	Asthmagen / Skin Sensitizer Skin Sanitizer Asthmagen	SIM07/2003/24 SIM 07/2003/14
Motor Vehicle Repair	*Isocyanates	Asthmagen	SIM 03/2006/03 – Inspection Intervention in the Waste/Recycli ng Industry OC 447/3 SIM 03/2006/04
Printing	Isocyanates in adhesives, lacquers, primers and some inks Epoxy systems used in some adhesives and in printing on glass and metals Rosin (colophony fumes) in adhesives Reactive Acrylates	Asthmagen Asthmagen / Skin Sensitizer Asthmagen / Skin Sensitizer Asthmagen / Skin Sensitizer	SIM 03/2006/02 P45

Polymers and Fibres	Isocyanates from Polyurethane foam Azodicarbonamide (AZDC) powder Rigid Urethanes Natural rubber latex	Asthmagen Asthmagen Asthmagen Asthmagen / Skin Sensitizer	H+S Rubber Industry
Woodworking	*Wood Dust Western Red Cedar in particular	Asthmagen	
Textiles and Footwear	Isocyanates from Polyurethane and adhesives Reactive Dyes	Asthmagen Asthmagen / Skin Sensitizer	RHS pack

Table 3 - Inspection aide

What to look for	Principle of good practice	COSHH Regulations
Senior Management Understanding of the health risks Understanding of the system in place	a and f	HSWA S2
Risk assessment that includes but is not limited to Information from the MSDS Details of exposure The work circumstances High risk activities such as maintenance Any relevant WELs The effect of control measures Health surveillance results	b, c, d, and g	Reg 6(1) Reg 6(2)
Assessment is recorded and reviewed regularly	a, and f	Reg 6(3) Reg 6(4)
Training includes but is not limited to Access to MSDS and other legislative provisions The significant finding of the risk assessments The precautions and actions necessary to safeguard everyone. Training on the control measures, including PPE. Results on health surveillance and exposure monitoring.	g	Reg 12(1) Reg 12(2)
Use of chemicals is necessary as all alternatives have been considered	a, and c	Reg 7(1) Reg 7(2)
The hierarchy of control is followed Adequate control = Principles applied, WELs not exceeded Control ALARP for asthmagens, carcinogens & mutagens	d a-g a-g	Reg 7(3) Reg 7(4) Reg 9 Reg 7(7) Reg 7(7)
Instructions available known and used for all circumstances including cleaning, storage, maintenance and breakdown	a, and f	Reg 12(1) Reg 9(1) Reg 9(2)
All controls measures (including PPE, mechanical, administrative and behavioural) used correctly and in good order	e, f, and g	Reg 8 Reg 9(1) Reg 9(2) Reg 9(4)
Health surveillance provided and records kept and carried out by competent person	a,b and f	Reg 11(1) Reg 11(3)

Regulation 8 - Use of control measures

68 Control measures usually consist of 'hardware' such as local exhaust ventilation or PPE and 'software' such as 'defined methods of work'. The ACoP makes specific mention

of 'defined methods of work' and where it is important to successfully control exposure, these work methods should be written down, understood and used by employees.

69 Evidence of poor use of control measures includes; sprayed material deposited on walls and surfaces; PPE lying around in a state of obvious disuse or a dusty work environment where local exhaust ventilation is provided. It is possible that some control measures are not used because they are not properly maintained or regarded as ineffective by employees. Lack of use may also be symptomatic of lax standards of health and safety management or poor design of control measures. Whatever the reason enforcement action should be considered under Regulation 7 (7) as there has been a failure to comply with the principles of good practice.

Regulation 9 - Maintenance

70 Proper maintenance is a vital part of any control regime and inspectors and enforcement officers should ensure that employers comply fully with regulation 9, particularly where there is exposure to substances that can cause cancer or asthma. Maintenance is not only applicable to the 'hardware' control measures but also the 'software' control measures such as the 'defined methods of work mentioned above.

71 The revised wording of regulation 9(1) requires employers to ensure, where relevant, that any control measure is kept in a clean condition - not just PPE as required by COSHH 1999.

72 Maintenance regimes can be evaluated by observing evidence of poor repair such as holes in ducting or blocked and dirty extraction systems. The records of examination and testing may be inadequate. The interval of examination for all LEV systems is at least once every 14 months or more often depending on the regulation 6 assessment or as given in Schedule 4 for specified processes. All equipment must be maintained. For guidance on the frequency of examination and testing for other types of engineering control, see ACoP L5 paragraphs 171-187. It may be necessary for inspectors and enforcement officers to consult sector guidance or seek specialist advice.

73 The ACoP states that where control measures are important for preventing sudden or serious effects on people, inspection needs to be very frequent. This may mean that local exhaust ventilation systems for very hazardous substances such as carcinogens, acutely toxic substances and substances which cause asthma should be monitored continuously and alarmed to notify control failure. Regulation 6(2) of the Workplace (Health, Safety and Welfare) Regulations 1992 should be noted here as it states that dilution ventilation plant which is provided to control dust and fumes should be fitted with a failure-warning device.

Regulation 10 - Monitoring exposure

74 Regulation 10(1) puts the onus on the employer to decide if any monitoring is required from the results of the assessment carried out under regulation 6. Regulation 10(2) now allows employers the option of using other methods of evaluation to ensure that exposure is adequately controlled. Inspectors and enforcement officers may need specialist assistance if the employer asserts 'other methods of evaluation'.

75 Enforcement on this regulation needs to be considered carefully in relation to the other duties under COSHH. Compliance with Regulation 7(7) and the principles of good practice should result with all WELs being met and the maintenance required in Reg 9 being provided. Inspectors and enforcement officers may decide to enforce a programme of monitoring to ensure that any remedial measures taken adequately controls exposure in practice.

Frequency

76 When the risk assessment indicates that monitoring is necessary, regulation 10(3) specifies that it should take place at regular intervals and when there has been any change that may affect exposure. Advice should be sought on the frequency of the monitoring, but it should be at least every 12 months.

77 If deciding on enforcement under regulation 10, it is important for inspectors and enforcement officers to consider the frequency of monitoring and, where possible, this should be specified in the schedule of any notice. If further measures are implemented to reduce exposure following such enforcement, then inspectors and enforcement officers may decide either that monitoring is no longer required or that the frequency can be decreased. It may be advisable to seek advice from Occupational Hygiene Specialists in these cases.

Regulation 11 - Health surveillance

78 Specific guidance on health surveillance is given in ACoP L5, paragraphs 214-234 lists situations where health surveillance is appropriate. Health surveillance requires a recognised policy and set of procedures and should be managed accordingly.

79 Regulation 11(9) details the duties on the employer once an employee is found to have an identifiable disease or adverse health effect. The employer should ensure that:

- the employee is notified and advised about further health surveillance;
- the risk assessment is reviewed;
- the measures taken under Regulation 7 are reviewed;
- consideration is given to assigning the employee other work; and
- the health of any other employees who may have been similarly exposed should be reviewed e.g. another medical examination is required.

80 Regulation 11(4) details the requirements regarding health records. Employees should have access to their health records, as should HSE. If an employer ceases trading, HSE should be notified and the health records should be made available.

Regulation 12 - Information, instruction and training

81 Experience indicates that a workforce that is well informed of the risks to which it is exposed, it is more likely to adhere to the relevant control measures.

82 COSHH 2002 (as amended) is more prescriptive in describing what the information, instruction and training should comprise. This is given in regulation 12(2) and is supplemented by the ACoP paragraph 239. It is not sufficient to pass on safety data

sheets because of their general nature. HSE free leaflets for specific substances can be used to provide basic information, but these are also too general to cover all requirements. Beyond what is given in the Regulations and supporting ACoP, the extent of instruction and training required will vary considerably according to the process and task involved. Employees should be adequately trained in the defined methods of working arising from the risk assessment. Inspectors and enforcement officers should advise employers to consult relevant HSE and/or industry guidance, trade/industry associations and suppliers to obtain the necessary information.

83 Regulation 12(3) requires employers to ensure that information, instruction and training is adapted to take account of significant changes in the type of work carried out or the methods used.

84 Regulation 12(4) also requires an employer to ensure that any other person who carries out work in connection with their duties under COSHH should also have the necessary information, instruction and training e.g. contractors.

85 Regulation 12(5) requires employers to ensure that the contents of containers and pipes used for hazardous substances are clearly identifiable, along with the nature of the contents and any associated hazards.

Note the requirement is not to 'label' containers and pipes. This is essential information when containers are to be opened or pipes broken into for repair/maintenance reasons.

86 If no training has been given an Improvement Notice should be issued under reg 12. If an enforcement officer or inspector thinks that the training previously given was inadequate they should use regulation 7(7) and list the requirements of Principle (g) in the accompanying Schedule.

Regulation 13 - Emergency provisions

87 Regulation 13 requires the employer to ensure that procedures are in place for the provision of safety drills and appropriate first aid facilities. Information should be available on the relevant work hazards particularly those arising during an incident. To avoid duplication of effort the ACoP allows employers to integrate the emergency procedures required by the COSHH Regulations with those required by the Management Regulations, DSEAR and COMAH.

88 Incidents involving chemicals can pose safety as well as health risks and in many cases it is the safety risk, which is of primary concern e.g. fire/explosion risks associated with the release of dusts or flammable liquids. Because of these overlapping duties between the above-mentioned Regulations, where inspectors and enforcement officers are assessing compliance on incident and emergency matters, they should start with the duties under the Management Regulations. If performance is inadequate in general, enforcement should be pursued through that legislation. If it is thought that there are significant risks to health from any potential incident involving substances hazardous to health, enforcement should be considered under COSHH as well. If arrangements under the Management Regulations are generally adequate but do not properly address the chemical health risks, then enforcement should be pursued through COSHH alone. In the

case of complex processes involving many chemicals, specialist assistance may be obtained to ascertain whether the main risk is a health or safety one.

Regulation 14 -Fumigations

89 Requirements for certain fumigations are given in regulation 14. These fumigations are where the fumigant is hydrogen cyanide, phosphine or methyl bromide.

Regulation 15 - Exemption certificates

90 COSHH 2002 has not altered the requirements of this regulation. This allows HSE to exempt 'any person', 'class of persons', 'any substance' or 'class of substances' from some of the requirements or prohibitions under COSHH (regulations 4,8,9,11(8)(10)(11)&14). In practice most exemptions fall into two categories:

- a) prohibited uses of substances listed in COSHH Schedule 2
- b) use of containment measures for certain ACDP (Advisory Committee on Dangerous Pathogens) Hazard Group 3 Biological Agents as specified in Schedule 3

Key messages

91 Prevention is still paramount. This first step when dealing with hazardous substances is to check if there is safer alternative that can be used. Only then should the Hierarchy of Control and the principles of good practice, be applied.

92 Dutyholders should concentrate on improving control of exposure using the systematic application of the principles of good practice rather than compliance with a limit. If the Principles are followed the limits should not be exceeded.

93 For information on good practices for standard processes go to the COSHH Essentials website. The website not only provides guidance on good practice, but a step-by-step package helps to identify what adequate control means in specific situations. The site also helps points out when expert help is needed. More recent guidance, such as spraying isocyanates in MVR, printing and welding is task-based.

Further information

Asthma Website

Asthmagens: Inspection Pack including Notice Templates (Appendix 1) [PDF]

COSHH: A Brief Guide [PDF]

COSHH-Essentials

ACoP L5: Control of Substances Hazardous to Health (fifth edition)

Assessing and Managing Risks at Work from Skin Exposure to Chemical Agents:

Guidance for Employers and Health and Safety Specialists HGS 205

Reactive Dyes: Safe Handling in Textile Finishing Dyeing and Finishing

Information Sheet No.5

MVR:

SIM 03/2006/04 – Reducing Ill Health in the Motor Vehicle Repair (MVR) Industry
Developing Issues

SIM 03/2006/12 - Motor vehicle repair: spraying isocyanate-containing paints - Developing
Issues - Consequences of the 'Paints' Directive - Isocyanate paints are not being banned

Appendix 1 – Summary points and checklist form

COSHH 2002 (as amended)	THIS FORM IS DESIGNED FOR USE BY OCCUPATIONAL HYGIENISTS, HEALTH & SAFETY PROFESSIONALS AND TRADE ASSOCIATIONS. IT SHOULD HELP TO SYSTEMATICALLY APPLY EACH PRINCIPLE.	Appendix 1: SUMMARY POINTS & CHECKLIST FORM Principles of good practice worked example: welding fume
Introduction to the Principles	<p>The Principles of good control practice: Regulation 7(7) on adequate control and Schedule 2A.</p> <p>Note the requirement, (Regulations 7.1 and 7.2) first to consider prevention, process change or substitution.</p> <p>The Principles are a 'package'. Apply them all to get effective, reliable and sustainable exposure control.</p> <p>You cannot pick and choose which Principles to apply – they are all important in getting adequate control.</p> <p>The Principles have no rank order, though there is a logical progression in how they are presented and considered.</p> <p>You do not need rigidly to work your way sequentially from Principle (a) to Principle (h). Apply the principles in whatever way suits your purpose, but apply them all.</p> <p>Refer also to associated COSHH Guidance.</p>	<p>This 'Summary Points and Checklist Form' helps you apply the Principles. Because these overlap in their application there are, at certain points, some repetition.</p> <p>Where there is clear repetition, the form will auto-complete.</p> <p>For instance, Principle (d) requires you to list the key elements in the exposure control measures and Principle (f) asks you to summarise the key 'Hardware' and 'Software' elements.</p> <p>Not all aspects of the Principles apply to every circumstance. For example, dust or vapour extraction is irrelevant where surface contamination and skin absorption are the source of exposure.</p> <p>It takes a little time to consider and apply the Principles. But you need to do this just once per process, activity or task.</p> <p>The Form helps you identify when, where and by whom further work is needed. Record what needs to be done.</p> <p>Once the Form is complete and agreed, take the findings and include them in your risk assessment.</p>

Use the findings recorded in the Form (and any other documents) to develop simple instructions for operators, supervisors, those who check and maintain control measures and those who review the controls. Make the key findings known as clearly as possible to all those that need to know and to act. You often need different ways to tell different people the same messages.

Note	<i>The objective of COSHH is to prevent, or adequately control, exposure to substances hazardous to health</i>	
	Name of task/job/process:	Assessor: Date:

Principle (a) Design and operate processes and activities to minimise emission, release and spread of substances hazardous to health			
	Guidance points and checklist	Responses and action notes	Action
	Identify the source(s) of exposure		
1a	How is exposure caused through emission?	Choice of welding method. Adjustment of welding settings	
1b	How is exposure caused through release?		
1c	How is exposure caused through spread?	Segregated from other work, including welding screens. Open air or general ventilation	
2a	Which groups of workers are potentially exposed?	Welders and cutters	
2b	Are other groups potentially exposed, e.g. cleaners, maintenance workers?	Others in the same workplace	
2c	What determines duration of exposure?	Welding time and trigger time	
3a	What are the main and significant <u>sources</u> of exposure?	Plume of welding fume direct from the weld. Fume prevented from escaping from confined and enclosed spaces. Background levels of fume in the welding shop	
3b	What are the main <u>substances</u> of exposure?		
3c	What <u>modes</u> of exposure – inhaled, skin contact, skin uptake, ingested?		
	For each group exposed:		
4a	How can the number of sources be reduced?	Usually it will not be possible to reduce sources of welding fumes, but it may be possible to confine welding activities to designated areas	
4b	How can the size and/or rate of emission/release be reduced?	Choose a lower-emission technique – e.g., MIG in place of MMA. Adjusting the welding-set settings has an effect on the quantity of fume, but the relationships are not clear. Can only be challenged if the firm has settings approved for, e.g., quality.	
4c	How can duration of exposure be reduced?		
4d	Is segregation of large of diffuse sources possible? How?	Give additional consideration to welding and cutting processes which may give rise to excessive amounts of fume	
4e	Which sources need enclosure?	Automated welding and cutting. Submerged welding	
4f	Which sources need extraction (gas, fume, vapour, mist, dust)?	<ol style="list-style-type: none"> 1. Where possible, LEV should be designed to control fume from all parts of the workplace without adjustment e.g., a booth. Face velocity 0.5-1.0 m/s. 2. Adjustable, point-extraction hoods are generally only suitable for small welds performed one at a time. Face velocity 10-15 ms⁻¹. 3. Large hoods and very high flow rates are required for some cutting methods such as arc-air gouging. 	
4g	Is existing extraction <u>effective</u> – does it match the source?	<ol style="list-style-type: none"> 1. All workpieces should fit within any booth, down-flow bench, etc. 2. Point extraction hoods should be adjusted so that they are very close to the weld and take advantage of thermal lift. 	
4h	Is existing extraction applied and used properly?		
4i	How might controls fail?	<ol style="list-style-type: none"> 1. Workpiece is not within LEV capture zone. 2. LEV is not working correctly. 3. RPE is not fitted correctly or it is damaged, dirty or poorly maintained. 4. Work methods and practices are not followed. 	
4j	What emergency arrangements exist for such failure?		
5a	What is the existing work method?		
5b	Was this work process or method designed to minimise exposure?		
5c	How could the work method change to minimise exposure?	Work so that the welders face is not in the plume of fume.	
			Page 1

control measures	Principle (b)	Take into account all relevant routes of exposure – inhalation, skin and ingestion – when developing	
	Guidance points and checklist	Responses and action notes	Action
	Which routes of absorption are relevant to exposure: Which substances are relevant to exposure	0	
1a	How does the contaminant get into the air to cause exposure?	Exposure to welding fume is significant by inhalation only. Note also hazards from shield gases, ozone and Nox	
1b	How does contaminant spread through the air?	The highest exposure are from direct fume, especially if the welders face is in the visible fume. Fume in the atmosphere of the workshop will add to welders' exposure and cause other workers to be exposed.	
2a	How is the contaminant released to contaminate skin?		
2b	How does the contaminant spread beyond the area of use?		
3	How might ingestion occur?	Where dusts of toxic metals, such as lead, may be present there may also be a risk of ingestion.	
4a	Which are the main sources of exposure? List them.	<ol style="list-style-type: none"> 1. The welds or cuts cause the greatest volume of fume, especially MMA, FCA, arc-air gouging. 2. The welding or cutting of stainless or other special steels. 3. Confined or enclosed spaces and poor work positions which place the welders face in the fume. Other sources: Welding of mild steel using MIG	
4b	Which are the most important?	The welds or cuts cause the greatest volume of fume, especially MMA, FCA, arc-air gouging.	
			Page 2

Principle (c)		Control exposure by measures that are proportionate to the health risk	
	Guidance points and checklist	Response and action notes	Action
1	What are the potential health risks – <u>long-term</u> effects?	<ol style="list-style-type: none"> 1. Progressive long-term decrease in lung function and possible COPD. 2. Asthma from metal such as chromium and nickel, or irritating gases such as ozone and Nox. 3. Lung cancer, especially from recognised carcinogens such as nickel and chromium. 	
	Is there sufficient information to make decisions about:		
1a	Risks to health?	<ol style="list-style-type: none"> 1. Consumables suppliers provide analysis of welding <u>fume</u> constituents. 2. Control of fume containing known asthmagens or carcinogens should be as low as reasonably practicable. 	
1b	What exposure level will protect people's health?		
1c	Control measures likely to control the risk?		
2	What are the potential health risks – <u>short-term</u> effects?		
	Is there sufficient information to make decisions about:		
2a	Risks to health?		
2b	What exposure level will protect people's health?		
2c	Control measures likely to control the risk?		
	For the <u>contaminants or processes</u> , are there:		
3a	Workplace Exposure Limits (WELs)?	There are WELs for all common metal components of welding consumables	
3b	Other exposure standards?		
3c	Are these standards well-founded?	Note that the previous OES for welding fume was not well founded and has been withdrawn.	
3d	What fraction of this standard should exposure be kept below?	Control of fume containing known asthmagens or carcinogens should be as low as reasonably practicable. There are no known NOAELs.	
3e	Is there guidance on adequate control measures? What is it?	Welding Essentials is available on the HSE website at http://www.hse.gov.uk/welding/guidance/index.htm	
3f	Is health surveillance needed?	Health monitoring usually needed.	
4a	Are the controls sufficiently effective to give adequate control?	High hazard: E.g., Nickel >6%, Chromium >15%, Beryllium, Cobalt, cadmium. Is visible fume captured by LEV?	
4b	Will the proposed controls give adequate control?	High exposure tasks: Is the welding method chosen to minimise fume? MMA/FCA high; MIG/MAG medium, TIG low. Is the welding activity organised to minimise exposure to fume? Is LEV well-designed and well-positioned? Is RPE worn correctly?	
	<i>The control must meet the challenge. This depends on the size and number of sources, workplace layout, etc</i>		
5a	How often will control measures be reviewed? (at least annually)		
5b	By whom?		
5c	Next review?		
6	Have you considered productivity and/or quality gains alongside health and safety?		

Note: Suppliers, trade/industry associations, specialist advisors, and HSE's 'Chemicals' webpages are some of the information sources that may be useful

Principle (d) Choose the most effective and reliable control options that minimise the escape and spread of substances hazardous to health			
	<i>Key questions: When can a control option be applied? How much will it reduce exposure? How reliable will it be?</i>		
	Guidance points and checklist	Responses and action notes	Action
1	Can the process be modified or the material replaced so as to prevent exposure? (<i>Regulation 7.1</i>)		
2a	How did you select the people to develop the control measures?		
2b	Did they have the right knowledge, skill and experience?		
	Can you make modifications to reduce emission and/or spread:		
3a	Process modifications?		
3b	Material modifications?		
3c	Workplace modifications?		
4a	Can you enclose the process to limit emission or spread?	Important for automated processes. Is welding segregated from other activities?	
4b	Can you use extraction or suppression to limit emission or spread?	Applied controls (List): Consider whether the LEV available is suitable for the type of work being done: Adjustable hoods are often not suitable for long welds or where there are many small isolated welds. Welding on jigs often lends itself to both downflow tables. Welding in confined or restricted areas may require fan-assisted make up air.	
4c	List the controls. Include supervision.		
5	Confirm the criteria for PPE selection as a control solution	Is RPE being used in conjunction with other controls or alone?	
6	How do the work methods contribute to exposure control?	Define and describe the methods of working: Fabrication being carried out in a logical sequence. LEV booths large enough for largest workpieces. Workpiece or jig can be moved to avoid welder standing between the fume and the extraction.	
7	How do the controls integrate into an effective set of measures?	In most workplaces, control of fume requires general ventilation and LEV. RPE is needed for high fume or high hazard components. Constant need to move LEV trunking. Need time, training and encouragement to adapt to on-gun extraction. May not be suitable for all jobs.	
	Each of use, maintenance and repair		
8a	Is the control measure easy to use?	Does not require adjustment. LEV trunking in confined and restricted spaces.	
8b	Is the control measure easy to maintain?	Having many small LEV systems and large numbers of RPE sets will create a burden.	
8c	Is the control measure easy to repair?	Flexible trunking is easily damaged by heat and sparks.	

Note: There is a hierarchy of control reliability often linked to effectiveness. Address the most significant sources first – see Principle A

Principle (e)		Where adequate control of exposure cannot be achieved by other means, provide, in combination with other control measures, suitable personal protective equipment (PPE) including respiratory protective equipment (RPE)		
<i>Note: If needed, as an element in a set of control measures, PPE usage must be managed within a programme</i>				
Guidance points and checklist		Responses and action notes		Action
1a	Is PPE required, in addition to other control options?			
1b	List type(s) of RPE and the degree of protection required	In most situations, FFP1 will be sufficient, although there are difficulties with compatibility with welding faceshields		
1c	List type(s) of other PPE and the performance required	Eye protection and safety protection will also be needed		
2	Is PPE currently provided adequate to deal with the hazard?			
3	Is all PPE suitable for the wearer and work environment?	Specific RPE for welders is available, usually as a part of the welders' visor. Vision – Welding faceshields/RPE causes severe restriction. Moving outside the immediate work area should be with visor raised. Loss of communication is not often a factor in welding		
4a	Does RPE fit properly? Has fit-testing been done?			
4b	Does other PPE fit?			
5	Do wearers find it reasonably comfortable over the whole exposure period?			
6	Have supervisors and wearers been trained to use RPE and PPE			
7	Are the storage arrangements adequate?	Where is the RPE left during breaks? Is there a storage cupboard or similar?		
8a	Is the PPE checked? Are the checks frequent enough?	Include before-use checks and frequency of filter changes		
8b	Who does the checking?			
8c	Date of next check?			
9a	What are the arrangements for thorough examination and test of RPE another PPE?			
9b	Who does this examination and test?			
9c	Where are the records kept?			

Principle (f)

Check and review regularly all elements of control measures for their continuing effectiveness

Note I	<i>If you understand the characteristics and effectiveness of the control measures, focus on checking and maintaining them.</i>
Note II	<i>If the characteristics and effectiveness of the control measures are unclear, check that exposure is adequately controlled.</i>
Note III	<i>The frequency and thoroughness of checking should relate to the likelihood that a control will break down, and the consequences for health if it does break down.</i>

Guidance points and checklist		Responses and action notes	Action
	List all the elements in your set of control measures in (rough) order of importance:		
1a	'Hardware controls' such as process equipment, applied controls such as extraction, and PPE	Enclosure, LEV, General ventilation, RPE	
1b	'Software controls' such as instructions on methods of working, supervision and health surveillance	Fabrication sequence. Avoidance of enclosed and confined spaces. Correct use of all hardware	
2	Are you confident that the control measures will effectively, reliably and adequately control exposure?		
3a	How do you detect significant change? List the checks.	Hardware: LEV on and capturing fume. RPE clean and in good repair. Software: Surface contaminants removed. Welder avoids putting head in fume. LEV adjusted correctly. RPE worn correctly and filters changed regularly	
3b	How often should the checks be made?		
3c	Is there a programme of regular checks?	Weekly LEV flow rates or static pressure tests. 14 monthly LEV statutory examination and test. Pre- and post-use checks of RPE for damage. Observe process for escape of fume*. Observe capture of fume by LEV*. Observe removal of fume from workplace*. *= dust lamp may be used. Air-sampling for individual toxic metals may be necessary for high-alloy steels	
3d	What records are kept?		
4a	What basic checks will be done each day?	Welding settings – welder. LEV on – user. RPE clean and undamaged – wearer. LEV correctly used and adjusted – supervisor. RPE worn and used correctly – supervisor.	
4b	Who does these checks?	Welding settings – welder. LEV on- user. RPE clean and undamaged – wearer. LEV correctly used and adjusted – supervisor. RPE worn and used correctly – supervisor.	
4c	What records are kept?		
5a	Do <u>qualitative</u> checks show adequate control?		
5b	Do <u>quantitative</u> checks show adequate control?		
5c	Do you use the results of checks to change what checks you make or how often you make them?		

Qualitative tests – e.g. observation, settled dust, odour, dust lamp, smoke tests, dye tracking

Quantitative tests – e.g. air sampling, biological monitoring, surface or skin wipes, air speed measurements, process criteria

Principle (g)		Inform, train all employees on the hazards and risks from hazardous substances, and how to use the control measures to minimise those risks	
	<i>Note: People need knowledge and understanding to motivate action, and confidence that measures work to assure their use</i>		
	Guidance points and checklist	Responses and action notes	Action
	Training and instruction on health risks		
1a	Is this clear, concise, accessible and interesting?	Diseases – Progressive long-term decrease in lung function and possible COPD. Asthma from metal such as chromium and nickel, or irritating gases such as ozone and Nox. Lung cancer, especially from recognised carcinogens such as nickel and chromium. Causes – Inhaling welding fume. Outcomes – Severe debility because of breathing difficulties. Possible need to leave the welding industry. Instruction is delivered by: It is reinforced by:	
1b	How do you check that trainees understand what they are being told?		
	Training and instruction on how control measures work.		
2a	Is this clear, concise, accessible and interesting?	How they protect – Respirators will not protect against oxygen loss. How to use them correctly. Checks to be carried out and how to get repairs done. Training is delivered by: It is reinforced by: Refresher training is carried out	
2b	How do you check that trainees understand what they are being told?		
2c	How do you check that they put the training into practice?		
3a	Are the control measures designed so that workers can use them easily?		
3b	Were workers on the process involved in developing the control measures?		
3c	Do they have confidence in the control measures?		
3d	Do they continue to use the control measures properly?		

Note: Where control measures involve methods of working or affect the organisation of work, involve workers to make sure the proposed measures are workable

Principle (h)		Ensure that the introduction of measures to control exposure does not increase the overall risk to health and safety	
	Guidance points and checklist	Responses and action notes	
	How could the application of new control measures affect other risk elements:		
1a	What risks to health?	There are no additional MSD risks	
1b	How to minimise these risks?	Planning of large fabrications. Welding posture is acceptable	
2a	What risks to safety?	Explosion risks have been considered.	
2b	How to minimise these risks?	Oxygen and flammable gases in workplace. Cylinders should not be in confined spaces. Access for all tasks is without risk. Planning of large fabrications.	
3a	What risks to the environment?	Releases to the environment have been considered	
3b	How to minimise these risks?	High quantities of dust containing toxic metals	