

THE CONTROL OF SUBSTANCES HAZARDOUS TO HEALTH (AMENDMENT)
REGULATIONS 2004

PROPOSED REVISED ACOP TEXT SUPPORTING REGULATION 7

Prevention of exposure

89 An employer's overriding duty and first priority is to consider how to prevent employees being exposed to substances hazardous to health by all routes (regulations 7(1) and (2)). Employers who do not first consider this are failing to comply with a fundamental requirement of the Regulations. The duty to prevent exposure should be achieved by measures other than the use of personal protective equipment. Employers can best comply with this requirement by eliminating completely the use or production of substances hazardous to health in the workplace. This might be achieved by:

- (a) changing the method of work so that the operation giving rise to the exposure is no longer necessary; or
- (b) modifying a process to eliminate the production of a hazardous by-product or waste product; or
- (c) substituting wherever reasonably practicable, a non-hazardous substance which presents no risk to health where a hazardous substance is used intentionally.

90 In many workplaces, it will not be possible or practicable to eliminate exposure to substances hazardous to health completely. Therefore, where it is necessary to use a hazardous substance, an employer should consider whether it is possible to significantly reduce exposure and risk to the health of employees significantly by using:

- (a) using an alternative less hazardous substance; or
- (b) a different form of the same substance; or
- (c) a different process,

~~which, in the circumstances of the work, presents less risk to the health of employees. This might be achieved~~ For example, by changing the form of the substance concerned so that exposure is negligible, e.g. using a substance in pellet rather than powder form.

91 ~~The~~ Among the factors an employer will need to take many factors into account when considering whether to use an alternative substance, including all are the harmful properties of any proposed replacement. The harmful properties of many potential replacement substances may not all be known. Care should be taken when there are gaps in the knowledge about the potential of the substance to cause harm. ~~The harmful properties of many potential replacement substances~~

~~may not all be known, and employers should be aware of this in considering alternatives. The ultimate decision should be based on a balance of any new risks they might present against the potential benefits. For example, in seeking a less toxic substitute chemical for a process, the an employer's choice of a replacement substance one with lower toxicity but higher flammability might increase the overall risk if the process has an intrinsic fire risk. Therefore, ~~i~~In considering potential substitutes, employers should be aware of the responsibilities they have under other regulations e.g. the Dangerous Substances and Explosives Atmospheres Regulations 2002.~~

92 More guidance on substitution is provided by HSE's publication *Seven steps to successful substitution of hazardous substances*.

~~Adequate control of exposure by all routes~~

93 Where prevention of exposure to substances hazardous to health is not reasonably practicable, employers must comply with the secondary duty in regulation 7(1) to adequately control exposure adequately by all routes. ~~Employers can achieve adequate control of exposure from all routes of exposure by complying with the provisions of regulation 7(7). These require employers to take the following measures To achieve this, employers must consider and apply, where appropriate for the circumstance of the work:~~

(a) the measures set out in Regulation 7 (3) in the priority order given;

(b) the specific measures in Regulation 7 (4);

~~(a)(c)~~ apply the principles of good practice for the control of exposure to substances hazardous to health as set out in Schedule 2A, as required by ~~Regulation 7(7)(a)~~; (see the guidance on the principles on page xx) and

~~(b)(d)~~ ensure that any workplace exposure limit (WEL) approved for a substance hazardous to health is not exceeded [regulation 7(7)(b)] (see Regulation 10); and where appropriate

(e) reduce exposure so far as is reasonably practicable for:

(i) a substance which carries the risk phrase R45, R46 or R49, or for a substance or process which is listed in Schedule 1; or

~~substances assigned the risk phrase R45 "May cause cancer"; or R46 "May cause heritable genetic damage"; or R49 "May cause cancer by inhalation" (carcinogens and mutagens, regulation 7(7)(c)); and~~

(ii) a substance which carries the risk phrase R42 or R42/43, or which is listed in section C of HSE publication 'Asthmagen? Critical

assessments of the evidence for agents implicated in occupational asthma', or any other substance which the risk assessment has shown to be a potential cause of occupational asthma (ii) substances or processes listed in Schedule 1 Other substances and processes to which the definition of "carcinogen" relates (regulation 7(7)(c)).

94 Where appropriate, employers should be able to comply with the requirements of sub-paragraphs (b) and (c) by applying the principles of good practice for the control of exposure to substances hazardous to health as required by sub-paragraph (a). Guidance on applying those principles is provided by HSE's publication [title].

95 In complying with regulation 7(7) to achieve adequate control of exposure, employers must also comply with the provisions of regulation 7(3) supported by those in regulation 7(4). Regulation 7(3) requires that employers apply protection measures appropriate to the activity and consistent with the risk assessment in an order of priority.

96 At the same time as considering how to apply the protection measures set out in regulation 7(3) and (4), employers must also consider how to implement the general principles of good practice for the control of exposure to substances hazardous to health required by regulation 7(7) and Schedule 2A. Some aspects of the requirements in regulation 7(3) duplicate or overlap the list of principles in the Schedule. Therefore, this reinforces the need for employers to consider the separate requirements concurrently in order to achieve adequate control of exposure by all routes. The employer's aim should be to apply the principles of good practice and to select the most appropriate controls that are proportionate to the risks arising from the work. So if the risks to employees' health are serious or uncertain, stringent control of exposure by all routes will be required.

97 The order of priority in applying protection measures required by regulation 7(3) means that employers must first consider the application of the measures set out in regulation 7(3)(a) in so far as they are appropriate for the circumstances of the work, before considering those in 7(3)(b) and finally those in 7(3)(c).

98 Where employers cannot achieve adequate control of exposure by a combination of the measures in regulation 7(3), (4), (7) and Schedule 2A, then they may supplement them by the use of suitable personal protective equipment (PPE). Wherever possible, however, PPE should only be used as a last resort and then in addition to other control measures. For example, in certain circumstances, e.g. maintenance and cleaning operations where there is the potential for a high level of exposure that may be particularly difficult to adequately control, employers may also need to provide personal protective equipment, including respiratory protective equipment.

~~9594~~ 99—The employer should apply the principles of good practice in all circumstances, but it will not always be necessary to apply all the controls described in regulations 7(3) and (4). However, ~~it will often be necessary to use a~~ A combination of them which in practice will work will often be necessary to best to protect the health of employees. The employer should give priority to those controls that contain or minimise the release of contaminants and the spread of hazardous substances into the workplace. Guidance on applying those principles is provided by HSE's publication [title].

~~95~~ The ~~A~~administrative and procedural options for controlling exposure are also important elements that the employer should consider, e.g. the arrangements for the safe handling, storage and transport of hazardous substances, of waste containing such substances, and suitable maintenance procedures etc. ~~Many examples of how to adequately control exposure are provided in COSHH Essentials: Easy steps to control hazardous substances.~~

~~96~~ 100—The specific standards that are needed to achieve adequate control of exposure by all each routes of exposure, i.e. inhalation, absorption through the skin and ingestion, are described in paragraphs ~~124-147~~120-141.

Specific control measures

~~97~~ 101—Regulation 7(4) supports regulation 7(3) by providing a list of typical control measures that employers should ~~consider~~apply if indicated as necessary in the risk assessment. ~~when applying the control measures set out in regulation 7(3).~~The objective is to use the findings of the risk assessment to select the control measure or the combination of control measures that are proportionate to the risk and which will achieve adequate control of exposure.

~~102~~ The requirement at regulation 7(4)(c)(iii)—“reducing to the minimum required for the work concerned the quantity of substances hazardous to health present at the workplace”—is not intended to prevent employers buying hazardous substances in bulk in order to reduce their costs, but to reduce the overall risk by minimising the amount potentially released into the working area.

~~98~~ 103—Appropriate application of the principles of good practice for the control of exposure to hazardous substances will enable ~~The control measures that employers~~ to select the optimum may have to use could be any combination of control measures of the following which may include:

- (a) totally enclosed process and handling systems;
- (b) plant or processes changes ~~or systems of work~~ which, for instance:

- (i) keep the production or generation of the hazardous dust, fume, vapour, biological agent etc. to a minimum, e.g. by modifying a process or changing its conditions such as temperature or pressure to reduce emissions; ~~or~~
- (ii) contain it hazardous substances within the plant;
- (iii) reduce or eliminate the need for maintenance staff to go into hazardous areas; and
- (iv) limit the area contaminated if spills and leaks occur;

- (c) ~~(e)~~ Changes to systems of work which, for instance:
- (i) Identify and define methods of work which minimize emission, generation or release of substances hazardous to health;
 - (ii) Reduce people's exposure time;
 - (iii) Minimise the number of people exposed.

(d) ventilation

- (i) partial enclosure, with local exhaust ventilation;
- (ii) local exhaust ventilation; and/or
- (iii) sufficient general ventilation;

Further guidance is available from the HSE publications HSG37 An introduction to local exhaust ventilation, and HSG202 General ventilation in the workplace. Guidance for employers...

(de) reducing to the minimum required for the work:

- (i) the number of employees exposed and excluding non-essential employees, e.g. by using "refuges";
- (ii) the level and duration of exposure; and
- (iii) the quantities of hazardous substances used or produced;

(ef) regular cleaning of contamination from walls, surfaces etc. or their disinfection;

(fg) providing safe handling, storage, transport and disposal of substances hazardous to health and waste containing such substances;

(h) hygiene measures:

- (i) adequate facilities for washing, changing and storage of clothing and PPE (see paragraph 185);

- (ii) including arrangements for laundering contaminated clothing;
- (iii) separate accommodation for clothing worn at work which may become contaminated by work clothing; and
- (iv) where appropriate, prohibiting employees from eating, drinking and smoking in contaminated areas which may result in the ingestion of hazardous substances.

99 104—Employers should ensure by appropriate supervision that employees follow good practice and defined methods of work at all times. Employers should also ensure they involve safety representatives. This can play a significant role in helping to secure and maintain adequate control of exposure to hazardous substances.

100 105—Employers must also ensure that whoever provides advice on the prevention or control of exposure is competent to do so in accordance with regulation 12(4). The people who carry out this work should A competent person will have adequate knowledge, training and expertise, e.g. in the design of processes, ventilation and personal protective equipment, the human and technical reasons why these control measures can fail, and the importance of following the principles of good practice. Such people will include qualified occupational hygienists and registered safety practitioners.

101 The requirement at regulation 7(4) (c) (iii) - "reducing to the minimum required for the work concerned...the quantity of substances hazardous to health present at the workplace" - is not intended to prevent employers buying hazardous substances in bulk in order to reduce their costs, but to reduce the overall risk by minimising the amount potentially released into the working area.

102 PPE must be used where it is not possible to achieve adequate control of exposure by other control measures alone, and then only in addition to them (regulation 7(3)(c) and schedule 2A, principle d)).

Control of exposure to hazardous substances not classified as carcinogens or mutagens

106 For these hazardous substances, the employer should make every effort to achieve adequate control of exposure by applying the principles of good practice in Schedule 2A and the protection measures in regulation 7(3) other than personal protective equipment (PPE). However, PPE must be used where it is not reasonably practicable to achieve adequate control of

~~exposure by other control measures alone, and then only in addition to them (regulation 7(3)(c)).~~

COSHH Essentials: Easy steps to control chemicals

103 ~~107~~ — Employers may use the advice available from step-by-step process described in COSHH Essentials for identifying the appropriate controls measures for a wide range of hazardous substances/task combinations. ~~Employers correctly using the~~ When properly applied and followed COSHH Essentials ~~should indicate the appropriate control measures required. If correctly applied, these control measures should provide adequate control of exposure.~~ ~~risk assessment scheme and following the control advice will be applying good practice and complying, in the vast majority of circumstances, with the control requirements of regulation 7(3). However, it remains the responsibility of employers to ensure that they:~~

- (a) have made a suitable and sufficient assessment in accordance with regulation 6;
- (b) are adequately ~~controlling~~ exposure adequately to substances hazardous to health in accordance with regulation 7(7). ~~and, where appropriate, complying with any relevant workplace or in-house exposure limits; and~~
- (c) are protecting employees' health.

104 ~~108~~ They Employers should seek specialist advice if they are in doubt about the suitability of control advice recommended by *COSHH Essentials*. The BOHS Faculty of Occupational Hygiene (www.bohs.org/) keeps lists of qualified hygienists who can help.

105 ~~109~~ — Employers who use the *COSHH Essentials* approach may use the completed checklist from the publication, or the printout from the web-based *COSHH Essentials*, as part of the significant findings of the assessment that the employer may need to record in accordance with regulation 6(4).

106 To achieve adequate control employers must apply the principles of good practice for the control of exposure to hazardous substances. But there is more than one route by which they can get advice on control measures. The flow-diagrams in Figure 1 (page xx) illustrate two such routes: one of these is most suitable for the non-expert and the other for health and safety professionals such as Occupational Hygienists.

Control of exposure to carcinogens and mutagens

~~107~~ ~~110~~ — If it is not reasonably practicable to prevent exposure to a ~~—~~ carcinogen or mutagen, ~~(substances assigned one of the risk phrases R45, R46 or R49 (see paragraph 93 (e)), or listed in Schedule 1~~ the employer must put into place the appropriate controls set out in regulation 7(3) and all the measures in regulation 7(5). This means that whether or not it is reasonably practicable to enclose totally the process and handling systems in accordance with regulation 7(5)(a), all the other measures in 7(5)(b)-(e) are still required.

~~111~~ For carcinogens and mutagens assigned one of the risk phrases R45, R46 or R49 (see paragraph 93(c)), or listed in Schedule 1, the employer's overriding aim must be to reduce exposure so far as is reasonably practicable.

~~108~~ ~~112~~ — Further guidance on the control of exposure to hazardous substances defined as carcinogens or mutagens for the purposes of COSHH carcinogens and mutagens is set out in Appendix 1.

Control of exposure to substances that cause occupational asthma

~~109~~ ~~113~~ — Further Additional ACoP duties on the control of substances that cause occupational asthma are set out in Appendix 3. A list of ~~the~~ substances that can cause occupational asthma is available on the HSE website at www.hse.gov.uk/asthma/causes.htm.

Further general guidance

~~110~~ ~~114~~ — The HSE publication EH40/2005 Workplace Exposure Limits 2005 ~~{title}~~:

- (a) provides a list of those hazardous substances for which HSC has approved a WEL;
- (b) gives details of the limit(s) concerned;
- (c) ~~provides a brief description of how exposure to the substance may affect health~~ lists the Risk phrases from the Chemicals (Hazard Information and Packaging for Supply) Regulations 2002 for the WELs;
- ~~(d)~~ lists the appropriate ~~COSHH Essentials~~ hazard group;
- (~~e~~d) identifies substances with WELs which, ~~for that~~ — the purposes of COSHH, are also defined as carcinogens, ~~—~~ or mutagens or substances that can cause occupational asthma for the purposes of COSHH, substances that may cause occupational asthma, and substances assigned a skin notation (see paragraph 143);
- (~~e~~f) lists the appropriate control approach under ~~COSHH Essentials~~, and
- (~~e~~f) provides further helpful guidance, e.g. work activities which may result in exposure to the substance concerned.

The publication is available on the HSE website at [www....](http://www.hse.gov.uk)

Control of exposure to biological agents

111 115—If employers cannot prevent exposure to a biological agent they should take steps to ensure that it is ~~adequately controlled~~ adequately and consider all the requirements set out in regulation 7(3), (4), (6) and (7). They should apply the principles of good practice and use each requirement where, and to the extent that:

- (a) it is applicable; and
- (b) the assessment carried out under regulation 6 shows that it will lead to a reduction in risk.

112 116—The selection of control measures for biological agents should take into account the fact that there are no exposure limits for them. Their ability to replicate and to infect at very small doses means that exposure may have to be reduced to levels that are at the limit of detection.

113 117—Not all the listed measures will be required in every case. The assessment may indicate for example that:

- (a) a specific method of transmission and route of infection is required;
- (b) a susceptible host is needed;
- (c) there is a low prevalence of the infection in that particular activity; and
- (d) illness is ~~easily treatable~~ easily leading to rapid and complete recovery.

114 118—In these cases, the risk would be relatively low and the control measures required less stringent.

115 119—Another factor that will determine which controls are to be applied may be the extent to which exposure to a biological agent is incidental to the main purpose of the work (see also paragraphs 48-49), or involves intentional work with a biological agent. The duties under COSHH apply in both circumstances. Schedule 3 applies for all work with biological agents that involves research, development, teaching or diagnosis.

116 120—Where human patients or animals infected with a biological agent in Group 2 are accommodated, e.g. patients on a hospital ward, the choice of controls and containment, as in other cases, should be on the basis of risk assessment and in particular the nature of

infection and the facility for mode of transmission of the agent. The controls selected should reflect the principles in regulation 7(3), (4), (6) and (7). For patients and animals infected with a Group 3 or 4 biological agent the control and containment measures should reflect the above principles with appropriate measures selected from Part II of Schedule 3. The level of risk should be the employer's main consideration, and even where the exposure is incidental to the activity, if the risk is sufficiently high and some of the listed measures can reduce it, then the employer should apply those measures.

117 ~~121~~—There are effective vaccines against some biological agents. In addition to other measures designed to prevent or control the risk of exposure to such agents under regulation 7(3), (4), (6) and (7), employers should make arrangements for vaccination, free of charge to employees who are considered vulnerable to the biological agents to which they are exposed or likely to be exposed at work. It is also recommended that employers keep a vaccination record.

118 ~~122~~—In addition, employers and employees have responsibilities to protect others who might be put at risk from a work activity, e.g. patients, visitors and members of the public. Vaccination of employees can help prevent the spread of infection to such individuals.

119 ~~123~~—Employees should be informed of the benefits and drawbacks of both vaccination and non-vaccination. Protection against serious illness is the most obvious benefit; protection against spread of infection to patients and other members of the public is also important. Drawbacks include the possibility of reactions to the vaccine, and any potential effects on health should be explained to the individual. Having considered the risks and benefits, employers should recommend vaccination to their employees.

Adequate control of exposure by inhalation

Workplace exposure limits (WELs)

~~121~~120 ~~124~~—The HSC has established WELs for a number of substances hazardous to health. These are intended to prevent excessive exposure to specified hazardous substances by containing exposure at or below a set limit. A WEL is the maximum concentration of an airborne substance averaged over a reference period, to which employees may be exposed by inhalation. WELs should not be considered a hard and fast line between

safe an unsafe. The principles require the degree to which exposure is reduced below the WEL to be proportionate to the health risk. If employers ~~correctly~~ apply the principles of good practice for the control of substances hazardous to health correctly, exposure should be below any relevant WEL.—The principles require the degree to which exposure is reduced below the WEL to be proportionate to the health risk.

121 WELs apply only to people at work and to conditions where the atmospheric pressure is normal, i.e. between 900 and 1100 millibars.

122 WELs refer to concentrations of hazardous substances in the air that people breathe, averaged over a specified period of time referred to as time weighted average (TWA). Two time periods are used: long term (8 hours); and short term (15 minutes). These limits cannot be adapted readily to evaluate or control non-occupational exposure.

123 Some substances for which WELs have been approved have been assigned short-term exposure limits (STELs) (15-minute reference period). These substances can cause acute effects and the purpose of the short-term limit is to protect against the adverse health effect occurring from brief exposures to the substance.

124 HSE's publication EH40/2005 Workplace Exposure Limits 2005 includes the list of substances assigned WELs (see paragraph 110). It also provides more detailed guidance on the use of WEL's. This includes the approved methods for averaging over the specified reference periods, an explanation of the terms 'respirable' and 'inhalable', and related material.

125 ~~125~~ A WEL is the maximum concentration of an airborne substance averaged over a reference period, to which employees may be exposed by inhalation under any circumstances. Substances which have been assigned a WEL fall into two broad groups, i.e.:

- (a) a substance which carries the risk phrase R42 or R42/43, or which is listed in section C of HSE publication 'Asthmagen? Critical assessments of the evidence for agents implicated in occupational asthma', or any other substance which the risk assessment has shown to be a potential cause of occupational asthma and those defined as a carcinogen or mutagen for the purposes of COSHH; including those assigned one of the risk phrases R45, R46 or R49 (see paragraph 93(e)), or included in the list of substances and processes in Schedule 1;
- (b) all other hazardous substances assigned a WEL.

~~126~~ ~~126~~ — For those substances included in (a) above, employers must ensure that the control measures are in place to reduce exposure so far as is reasonably practicable below the WEL as far below the WEL as is reasonably practicable (see paragraphs ~~110~~ ~~107~~ to ~~112~~ ~~108~~). For all other hazardous substances assigned WELs, (~~paragraph (b) above~~), employers should achieve adequate control of exposure by inhalation ~~will be achieved by applying the principles of good practice (see page xx) that are proportionate to the health risk and also by ensuring that the WEL is not exceeded (see paragraphs 102 to 106 to 109)~~. The principles require that measures to control exposure are proportionate to the health risk from the substance.

~~127~~ Regulation 7(4)(c)(ii) requires employers to reduce to the minimum for the work concerned the level and duration of exposure. For substances that have been assigned a WEL or in-house exposure limit that should not be exceeded (regulation 7(7)(b)), employers can comply with this requirement by ensuring that they apply the principles of good practice required by regulation 7(7)(c) and as set out in Schedule 2A. In so doing, they will ensure that exposure is adequately controlled and complies with any relevant exposure limit for the substance concerned.

~~128~~ WELs apply only to people at work and to conditions where the atmospheric pressure is normal, i.e. between 900 and 1100 millibars.

~~129~~ WELs refer to concentrations of hazardous substances in the air that people breathe, averaged over a specified period of time referred to as time weighted average (TWA). Two time periods are used: long term (8 hours); and short term (15 minutes). These limits cannot be readily adapted to evaluate or control non-occupational exposure.

~~127~~ preventFor this reason and in keeping with the principles of good practice for the control of substances hazardous to health, short term WELs should not ~~be~~ ~~exceed~~

~~130~~ HSE's publication [title] includes the list of substances assigned WELs (see paragraph 114). HSE's publication [title] includes the approved methods for averaging over the specified reference periods, an explanation of the terms 'respirable' and 'inhalable', and related material.

Substances defined as carcinogens, ~~or~~ mutagens or a cause of occupational asthma and assigned a workplace exposure limit (WEL)

128 ~~131~~—To comply with the requirements in regulation 7(7)(c) to reduce exposure so far as is reasonably practicable, for substances with an 8-hour long-term reference period, employers may have to carry out a programme of air monitoring in accordance with regulation 10. This will generally be necessary unless the risk assessment made under regulation 6 shows that the level of exposure is most unlikely ever to exceed the WEL. The extent to which employers can should reduce exposure below the WEL will depends on the type of risk presented by the substance, weighed against the cost and the effort involved in taking measures to reduce the risk (see paragraph 34 on reasonable practicability).

Other substances assigned a workplace exposure limit

129 ~~132~~—For a single substance assigned a WEL that is not classified under COSHH as a carcinogen, or mutagen, or a cause of occupational asthma adequate control of exposure will be achieved by applying the principles of good practice to the work involving exposure to the substance concerned and keeping the exposure below any WEL. In these circumstances, and particularly if *COSHH Essentials* is used to identify and apply the appropriate control measures, the employer is unlikely to need a programme of air monitoring to check whether exposure is being maintained at or below the WEL.

Short-term exposure limits

~~133~~ Some substances for which WELs have been approved have been assigned short term exposure limits (STELs) (15 minute reference period). These substances can cause acute health effects and the purpose of the short term limit is to prevent the adverse health effect occurring from brief exposures to the substance. For this reason, and in keeping with the principles of good practice for the control of substances hazardous to health, short term WELs should **not** be exceeded.

Inhaled substances not assigned WELs

130 ~~134~~—The absence of a substance from the lists of WELs does not mean that it is safe. Many substances in use do not have a WEL. For these substances, employers should apply the principles of good practice for the control of substances hazardous to health and to control exposure to a level to which nearly all the working population could be exposed, day after day at work, without adverse effects on health. As set out in paragraphs 107–109, employers may be able to use *COSHH Essentials* to help decide on suitable control measures. In addition, HSE has published good practice advice to help employers decide on suitable control measures. Available material includes the guidance on Schedule 2A (page xx), for a number of substances not covered by

~~COSHH Essentials (see paragraphs 103-106), e.g. gases and process specific guidance for a number of common processes - dusts and fumes. HSE has also produced and Chemical Hazard Alert Notices (CHANS). - for a number of substances and a A list of these CHANS and other HSE guidance currently available can be viewed on the HSE website at www.hse.gov.uk/pubns/chindex.htm. In addition, employers can obtain information about the substance concerned from a number of other sources, including:~~

- (a) manufacturers and suppliers of the substance;
- (b) industry associations ~~publications;~~ and
- (c) occupational medicine and occupational hygiene journals.

~~131 135 Employers may also have to set their own in-house exposure limit in situations where a substance they are using has an approved WEL, but it is not appropriate to apply it, e.g. it is being used in circumstances above normal atmospheric pressure. If it is not possible to identify suitable exposure control measures using, for instance, COSHH Essentials and no WEL exists it may be possible and useful to identify or develop an exposure standard. Suppliers, trade associations or specialist advisers may be able to help.~~

~~Action if a workplace exposure limit or in-house standard is exceeded~~

~~132 136 A Workplace Exposure Limit or other exposure standard should not normally be exceeded. If it is the employer should check the continuing effectiveness of the control measures. There may be something obviously wrong which can be corrected. If the reasons for the excessive exposure are not obvious a more detailed investigation may be needed. This could involve task-based and process-related measurements to identify when and why raised exposures are occurring.~~

~~The employer's first step should be to consider if there is a visible, obvious reason for the result(s) which exceed the limit., e.g. the person to whom the result(s) relates may be subject to higher than normally expected exposure in a job that only that person carries out. If it is an isolated result, or one or two results which marginally exceed an 8-hour time-weighted average limit, the employer should consider whether they have real significance and indicate a failure to maintain adequate control, or whether they reflect an error in the measurement method. However, a single result above a 15 minute short term exposure limit (STEL) may be cause for concern and require the employer to take immediate remedial action: e.g. where the substance concerned has been assigned a WEL and also an accompanying STEL, and particularly where the substance is a carcinogen,~~

~~mutagen or can cause occupational asthma. Employers who are unsure of the implications of results that exceed a WEL or in-house~~other exposure standard, ~~should~~ may want to obtain ~~consult appropriate expert advice, e.g. from an expert, such as an~~ occupational hygienist ~~or the laboratory which carried out the air monitoring.~~

133 ~~137~~—If the employer concludes that the air ~~exposure~~ monitoring results do not indicate adequate control of exposure, the further steps to take should include:

- (a) checking control measures to ensure that they are working as they should, ~~and for~~should. For instance that exhaust ventilation etc., ~~that it is performing to design specification or people are following the defined methods of working which are necessary to minimise their exposure;~~
- (b) liaising with managers, safety representatives and employees to check that all the principles of good practice are being ~~correctly~~ correctly, and to establish possible reasons for the rise in the measured exposure airborne concentration of the substance concerned;
- (c) considering whether it is necessary to provide the employees who may be exposed to the substance concerned with suitable RPEPEPE. This should be a temporary measure only until the situation is returned to normal and adequate control of exposure is re-established;
- (d) devising and implementing a programme of immediate action to reinforce the control measures where a WEL is exceeded and particularly so where the substance concerned is a carcinogen, ~~or~~ mutagen or a cause of occupational asthma; and
- (e) ~~taking further air samples to confirm the concentration of the substance in the air~~ Making further measurements of exposure in order to check that any remedial action to tighten control has been effective.

134 ~~138~~—If the further air ~~monitoring~~exposure measurements raises doubts as to whether adequate control is being achieved, the employer should review the assessment to decide whether additional and more stringent ~~effective~~ effective controls are needed.

135 ~~139~~—For detailed advice on the sampling strategies suitable for measuring exposure and practical guidance on interpreting the results in relation to occupational exposure limits see HSE's publication: *Monitoring strategies for toxic substances*.

Adequate control of exposure by routes other than inhalation

136 ~~140~~—COSHH requires that employers prevent or adequately control exposure adequately by all routes,

not just the inhalation route and deals with substances which can be hazardous to health by:

- (a) absorption through the skin or mucous membranes; or
- (b) contact with the skin or mucous membranes, e.g. dermatitis; chemical burns and microbial infection; or
- (c) ingestion.

~~137~~ ~~141~~—Some information about substances, that can be absorbed into the body, is contained in HSE's publication [EH 40 *Occupational Exposure Limits*]. HSE's publication [EH40/2005 Workplace Exposure Limits 2005](#) [title] (see paragraph 1104) lists those substances that have been assigned a WEL and which can be absorbed through the skin to a significant extent and identifies them with a skin (Sk) notation. Safety data sheets and hazard warning labels are other useful sources of information about substances that have the potential to affect and be absorbed through the skin.

~~142~~ Exposure to any substance hazardous to health that can be absorbed by any of the routes listed in paragraph 140 should be controlled to a standard where nearly all the population could be exposed repeatedly without adverse health effect. Employers will achieve adequate control when they apply the principles of good practice in Schedule 2A and exposure by these other routes does not result in adverse health effects. The following paragraphs provide some guidance on how employers can achieve adequate control of exposure by these other routes.

Absorption through the skin

~~138~~ ~~143~~—In handling any substance which has been assigned an "Sk" notation, the employers' application of good practice controls, work methods and other precautionary measures should prevent the substance coming into contact with the employee's skin. Employers should also prepare a contingency plan to deal with incidents where a substance makes contact with an employees' skin. The plan should draw on any information and advice provided by the supplier on the particular characteristics and properties of the substance and how to deal with spillages etc.

Contact with the skin and eyes

~~139~~ ~~144~~—Irritant and corrosive substances such as acids and alkalis can cause seriously damage to either the skin or the and eyes. Therefore, ~~w~~Where employers have to use these substances, therefore, they should design their systems of work and select their control equipment to minimise the possibility of skin and eyes being exposed. If this is not possible for a particular job, employers may have to provide suitable personal protective equipment and, in these circumstances, pay

special attention to how employees wear and use it and how it is maintained.

140 145—Some hazardous substances, e.g. solvents, remove the natural oils from the skin so that frequent or prolonged contact may cause dermatitis or more serious skin disorders. When such skin contact is likely to occur, employers should provide employees with suitable gloves and dispose of them when they become contaminated, i.e. before the solvent is likely to "break through" the glove material. HSE's publication *Health risk management. A guide to working with solvents* provides further guidance on selecting suitable glove materials for work with a number of the most commonly used solvents. Employers should also ensure that employees follow good personal hygiene practice, such as thoroughly washing their hands in warm (not hot) water whenever necessary, encouraging them to use moisturising creams after work, and introducing a regular programme of skin inspection.

Ingestion

141 146—If employees do not follow a high standard of personal hygiene, or do not handle substances with care, solid materials or powder may get trapped under fingernails or transferred from overalls and clothing onto food. Where substances which are potentially hazardous by ingestion are used, employers should ensure that employees remove any contaminated clothing in the area set aside for this activity, and thoroughly wash their hands and face (see paragraph 145139), and scrub their fingernails before eating, drinking or smoking. Employers should stress the importance of employees following good personal hygiene practices and of not eating food in the work area.

142 147—Employers should ensure that the information, instruction and training given to employees in accordance with regulation 12 covers all aspects of achieving and maintaining adequate control of exposure by all routes. In particular, employers should stress the importance of how the combination of good practice under regulation 7(7) and the protection measures the employer applies under regulation 7(3) are designed to protect employees' health from exposure to hazardous substances.

Biological monitoring

143 148—Biological monitoring can also make a valuable contribution to measuring levels of exposure in those situations where air sampling alone may not give a reliable indication of exposure. For example, e.g. when personal protective equipment is used or where there is liable to be significant dermal exposure to a substance that can permeate the skin-, biological monitoring may be the only reliable way of measuring

exposure. HSE's publication *Biological monitoring in the workplace: A guide to its practical application to chemical exposure* provides further guidance.

When personal protective equipment might be necessary

144 149—Regulation 7(3)(c) and principle (e) in Schedule 2A requires the employer to provide employees with suitable personal protective equipment, e.g. RPE, protective clothing, protective gloves, footwear; and equipment to protect the eyes, *in addition to* all other control measures if the combination of all control measures fails to achieve adequate control of exposure. The guidance on Schedule 2A (page xx) provides further information on the steps the employer needs to take.

145 150—The situations where PPE will normally be necessary include:

- (a) where adequate control of exposure cannot be achieved solely by good practice and the application of operational or engineering measures, appropriate to the activity and consistent with the risk assessment then, in addition, suitable PPE should be used to secure adequate control;
- (b) where a new or revised assessment shows that PPE is necessary until adequate control is achieved by other measures;
- (c) where there is temporary failure to achieve adequate control of the process, e.g. because of plant failure, and the only practicable solution to reimpose adequate control in the time available may be the provision and use of suitable PPE; and
- (d) where maintenance operations have to be carried out. The risk of exposure during these operations should be assessed and appropriate control, such as prior decontamination of equipment and areas, should be identified and carried out. Although exposure may occur regularly during such work, the infrequency and small number of people involved and the difficulties of applying process and engineering controls often makes the use of PPE necessary.

145 151—In assessing whether the use of PPE is the appropriate option, employers should consider:

- (a) the limitations of PPE;
- (b) the costs;
- (c) the practical difficulties of ensuring its continued correct use;
- (d) its effectiveness in the actual work situation; and

- (e) the type and level of exposure to the hazardous substance concerned.

Suitable personal protective equipment

146 ~~152~~ PPE should ~~adequately~~ control exposure adequately to the hazardous substances to which the wearer is exposed, or is liable to be exposed, throughout the time it is used. When selecting PPE, it is important for employers to take into account:

- (a) the circumstances in which it will be used, e.g. the substances to which it will be exposed and for how long, and the degree of protection necessary;
- (b) whether it can resist penetration and permeation by the substance concerned ~~indefinitely or~~ for a specified or recommended period;
- (c) whether the design is adequate and suitable, i.e. the equipment fits the wearer does not dislodge, deform, melt or otherwise fail to perform in the conditions in which it is used and is compatible with other PPE worn;
- (d) the environment in which it will be worn; and
- (e) in dusty environments, whether the materials selected reduce the tendency for dust to collect on the PPE and be re-released.

147 ~~153~~ Manufacturers of PPE must ensure that their products comply with the Personal Protective Equipment Regulations 2002.

Suitable respiratory protective equipment (RPE)

148 ~~154~~ For each work activity for which it is foreseen that employees will need to wear respiratory protective equipment (RPE), the employer should specify the suitable equipment to be worn to make sure that employees are given adequate protection. To be suitable, RPE must be capable of adequately controlling the inhalation exposure using as a guide the equipment's assigned protection factor as listed in HSE publication *The selection, use and maintenance of respiratory protective equipment: A practical guide*. The selection and provision of suitable RPE should be based on a range of considerations:

- (a) the level of protection claimed by manufacturers for different types of RPE, and identification of those types that will provide a greater degree of protection than that required for likely or known exposure;
- (b) the type of work to be done; the physical effort required to do it; the length of time the equipment will have to be worn; the requirements for visibility, comfort and the

need for employees to communicate with each other; its compatibility with any other PPE that may be needed (for example, safety glasses);

- (c) the different facial characteristics of the RPE wearers, to ensure that the equipment fits correctly, and is matched to the wearer. In addition the equipment must be matched to the job and the environment in which it is to be used. The selection of suitable equipment should be undertaken in full consultation with the wearers. This will help to ensure that the wearers have the most comfortable equipment best suited for them and which, as a consequence, is likely to be the most effective in use;
- (d) it must be "CE" marked if it was manufactured on or after 1 July 1995 to show that it is manufactured to meet minimum legal requirements. However, where RPE was manufactured before 1 July 1995 then it must either be "CE" marked or HSE approved;
- (~~f~~e) employees should be ~~properly~~-trained properly in its use and supervised;
- (~~g~~f) it should be ~~regularly~~-cleaned and checked regularly to ensure that it remains effective.

Fit testing of facepieces

149 ~~155~~—The performance of RPE with a tight-fitting facepiece (filtering facepieces, half and full-face masks) depends on a good contact between the wearer's skin and the face seal of the mask. A good face seal can only be achieved if the wearer is clean shaven in the region of the seal and the facepiece is of the correct size and shape to fit the wearer's face. If spectacles with side arms and other PPE are also worn, they should not interfere with the correct fitting of the facepiece or the face seal. The performance of RPE with a loose fitting facepiece, e.g. visors, helmets, hoods, etc. is less dependent on a tight fit on the face, but nevertheless requires the correct size to ensure the wearer achieves an adequate fit and protection.

150 ~~156~~—Employers should ensure that the selected facepiece (tight and loose fitting types) is of the right size and can correctly fit each wearer. For a tight-fitting facepiece (filtering facepieces usually known as disposable masks, half and full face masks) the initial selection should include fit testing to ensure the wearer has the correct device. The test will assess the fit by determining the degree of face-seal leakage of a test agent while the RPE user is wearing the facepiece under test. For full-face masks, a suitable quantitative fit test should be used and

the pass level fit factor is 2000. For devices such as filtering facepieces and half masks, the pass level fit factor is 100. For these lower performance facepieces, a suitable and validated qualitative method (often called a semi-quantitative test) can be carried out instead. Employers must ensure that whoever carries out the fit testing is competent to do so in accordance with regulations 12(4).

151 ~~157~~—Repeat fit testing will be needed when changing to a different model of RPE or a different sized facepiece or if there have been significant changes to the facial characteristics of the individual wearer, e.g. as a result of significant weight gain or weight loss or due to dentistry. Repeat fit testing will not be required following a change of employer, provided that the same model of RPE continues to be used by the employee.

152 ~~158~~—The quantitative fit testing may be carried out using:

- (a) a test chamber which uses a salt aerosol or sulphur hexafluoride gas to assess the face-seal leakage; or
- (b) a portable device at the workplace which measures particulates in air to assess the face-seal leakage; or
- (c) a portable device at the workplace which measures pressure variations inside the facepiece to assess face seal-leakage.

153 ~~159~~—Qualitative test methods use bitter or sweet-tasting aerosols. When the tests are carried out the facepiece wearer will perform simple exercises as indicated by the competent person carrying out the test. More information on the selection, including information on assigned protection factors, use and fit testing of RPE is contained in the HSE publications - *The selection, use and maintenance of respiratory protective equipment: A practical guide*, and *Fit testing of respiratory protective equipment facepieces*.

Facilities for washing, changing, eating and drinking

154 ~~160~~—Employers should provide certain facilities to:

- (a) ensure that employees meet and maintain a standard of personal hygiene that is consistent with adequate control of exposure;
- (b) avoid the spread of substances hazardous to health; and

- (c) reduce the risk of ingestion of substances hazardous to health.

155 ~~161~~—The facilities include:

- (a) *adequate washing facilities*. These should be sited in a convenient position but situated so that they do not themselves become contaminated. The facilities provided should relate to the type and level of exposure;
- (b) *changing facilities*. These should be provided when PPE is used or where outdoor clothing could be contaminated by substances hazardous to health. They should be located and designed to prevent the spread of contamination from protective clothing to personal clothing and from one facility to another, and to prevent contamination from getting on to the RPE from other equipment or protective clothing;
- (c) *facilities for eating, drinking etc.* Employees should not eat, chew, drink or smoke in places that are contaminated by substances hazardous to health. This will help reduce the risk of employees ingesting hazardous substances. If employers have to prohibit eating, drinking etc. in certain areas, they should set aside an uncontaminated area or areas where these activities can be carried out. The eating and/or smoking area should be ~~conveniently~~ conveniently accessible to the working area and to washing facilities.

156 ~~162~~—Employers should ensure that not only are the hygiene measures provided but also that employees are made aware, through information, instruction and training of why, how and when they must be used. Employers should also ensure through appropriate supervision, that employees use the facilities in accordance with agreed procedures.

157 ~~163~~—Employers may also have duties under the Workplace (Health, Safety and Welfare) Regulations 1992 to provide the facilities described above.

PROPOSED REVISED ACOP TEXT SUPPORTING REGULATION 10

Another method of evaluation

201 In many workplace situations, employers are likely to have to rely on a body of evidence rather than a single measure in making a judgement that adequate control of exposure is being achieved. For that evidence, employers will need to include measures drawn from the principles of good practice for the control of exposure to hazardous substances (page xx) and the list in the ACoP on regulation 7 (paragraph 10397). In particular by:

- (a) ensuring that all routes of exposure, including skin contact and ingestion, have been considered in the regulation 6 assessment;
- (a) using totally enclosed processing and handling systems which are ~~demonstrably~~can be shown to be working efficiently without leaking a hazardous substance into the work area;
- (b) ensuring that engineering controls and ventilation systems, including LEV, are ~~demonstrably~~can be shown to be working to specification;
- (d) ensuring that the work system is well-defined, predictable, properly supervised and consistent at all times with the assessment.

202 By demonstrating the effective implementation of these and other pertinent measures (for example by correctly applying such as good practice and, where appropriate, COSHH Essentials guidance), an employer can show sufficient evidence that he does not require specific exposure monitoring to demonstrate adequate control of exposure.

PROPOSED REVISED TEXT FOR APPENDIX 3 - CONTROL OF SUBSTANCES THAT CAUSE OCCUPATIONAL ASTHMA

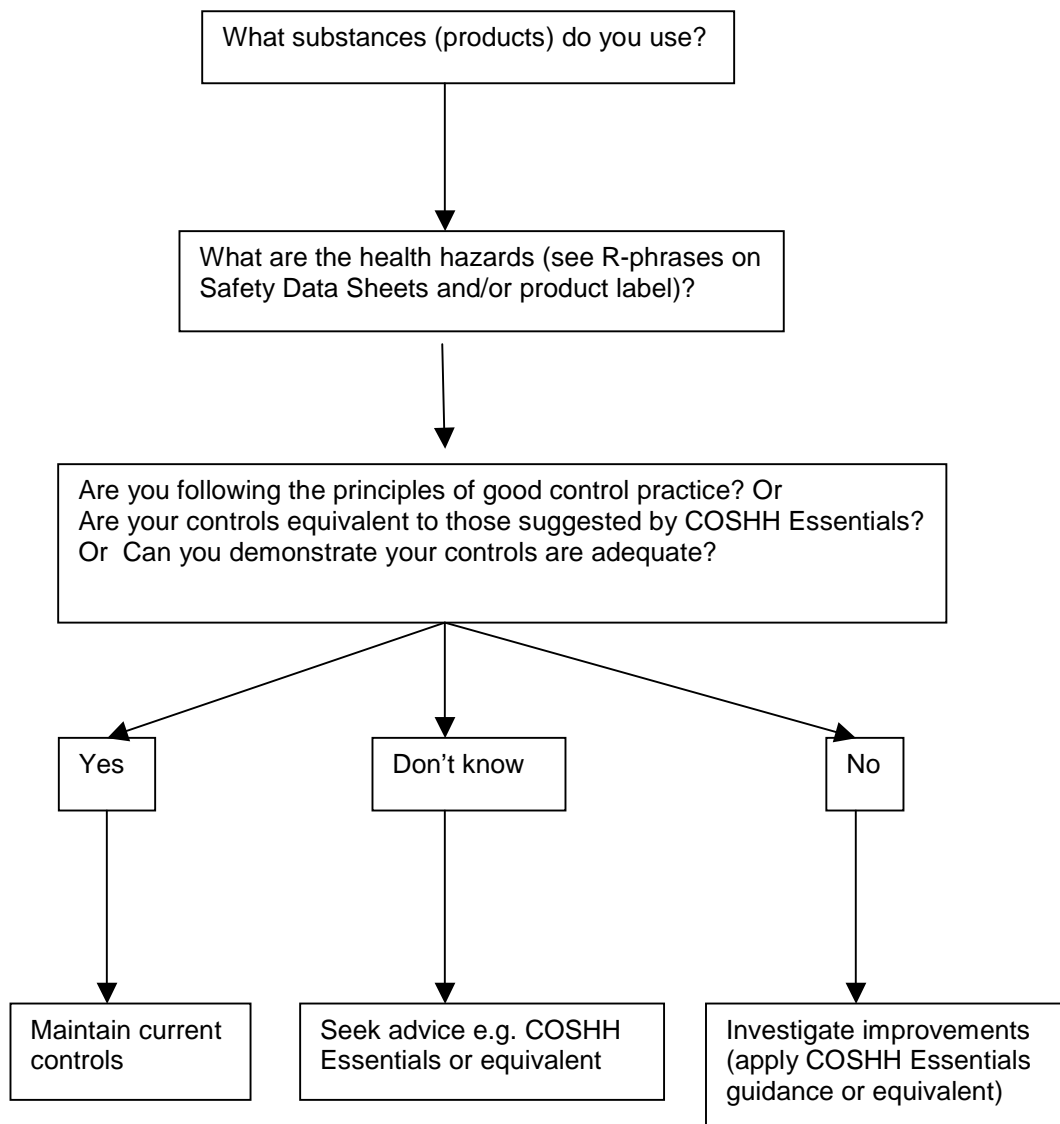
Prevention or control of exposure to substances hazardous to health (regulation 7)

12 Exposure to substances with the potential to cause occupational asthma should be prevented. If that is not reasonably practicable, the objective should be to control exposure so as to prevent employees and others who may be exposed from developing occupational asthma as a result of exposure to those substances. Limited scientific knowledge on levels below which substances will not cause asthma means that it will ~~normally~~ be necessary to reduce exposure so far as is reasonably practicable. This will involve considering the potential for short-term peaks of exposure as well as longer-term time-weighted averages.

Figure 1

The law requires exposure to hazardous substances encountered in the workplace to be controlled adequately. To achieve adequate control involves applying what is called "good control practice", which is a consensus view of the hardware, systems of work and other measures that need to be put in place to control the risk. There is more than one route by which advice on good control practice can be obtained. The flow-diagrams that follow illustrate two such routes: one of these is most suitable for the non-expert and the other for health and safety professionals such as occupational hygienists.

Route Map for Adequate Control for SMEs/Non-Experts



Route map for adequate control for health and safety professionals such as occupational hygienists

