



<b>Health and Safety Executive</b>		<b>Operational Circular</b>	
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Target Audience:  
All HSE Inspectors

## [ENFORCEMENT MANAGEMENT MODEL \(EMM\)](#)

### APPLICATION TO CHEMICAL RISKS

This document gives guidance to inspectors on applying the EMM to health risks from chemicals. General guidance on applying EMM principles to health risks, including occupational health descriptors is in [OC 130/5](#).

#### Introduction

1 Application of the EMM to the health risks from exposure to chemicals covers a wide topic and touches upon a range of issues concerning a variety of hazards, the existence of established arrangements for setting exposure limits and the hierarchy of controls as applied through legislation. It is not possible to provide for all eventualities and therefore this guidance is intended to be used as an outline or a set of principles to be followed when considering the appropriate level of enforcement action.

#### Risk matrix

2 The matrix (see [Appendix](#)) provides information to assist in the selection of the appropriate EMM terms to feed into the model to deal with health risks from chemicals. It starts by listing the 'topics' by health effect and these are based on the descriptions used in CHIP to enable the descriptions to be used consistently (column 1). Some of the CHIP categories have been combined where enforcement options seem to be similar and the final row deals with chemical substances which do not give rise to the other specific health outcomes.

3 For most risks arising from the use of chemicals the nature of the health outcome will be known and will be identified in labelling requirements (eg risk phrases) and in data sheets.

4 For some chemicals it will be necessary to obtain basic information about the toxicology and potential health effects from exposure to the chemicals before using the model. See [OC 130/5](#) for general guidance on applying EMM to health risks, and on determining the most credible health outcome.

5 Column 2 of the matrix sets out the consequence descriptor (as described in [OC 130/5](#) Table 1 - Consequences) which is coupled with its 'Application/Interpretation' (column 3) to indicate the seriousness of the outcome and the health effect being considered.

6 Where reference is made to 'exposure' a judgement of the potential extent of exposure needs to be made by taking into account all the factors in the benchmark standard. This will include such elements as the condition and maintenance arrangements for ventilation equipment or PPE, the effect of inadequate provision of information and training, and the consequences of limited health surveillance. The judgement is not necessarily dependent on measured exposures against limits.

7 The matrix uses some qualifying terms such as 'repeated', 'prolonged', etc which are not defined. It is not possible to provide definitions that fit all circumstances but in some cases there is further guidance given in the 'Notes' column. Inspectors need to apply professional judgement in these matters and seek specialist advice if necessary in particular cases.

### **The benchmark**

8 The BENCHMARK has usually been identified as 'NIL or negligible'. This is based on an assumption that all the relevant controls are in place including such issues as assessment, control measures, monitoring, training, health surveillance etc. In such circumstances the aim of the law is to eliminate, or control to a negligible level, the likelihood of injury.

### **The EMM, MELs and ALARP**

9 The COSHH Regulations include occupational exposure limits described as MELs and OESs and many chemicals are assigned exposure limits within this legal framework. The formal establishment of a limit for a chemical by the ACTS would have taken into account its toxicity. For a MEL this process involves consideration of a balance between toxicity, uncertainty and the practicability of control. The exposure to substances with a MEL is required to be reduced so far as is reasonably practicable or the equivalent to as low as reasonably practicable (ALARP) which may be below the relevant MEL.

10 The risk matrix places exposure at or below the MEL in the nil/negligible category. Therefore, there is no benchmark comparator available to reflect an enforcement response where reducing exposure further is reasonably practicable. To get over this and for the purposes of the EMM 'the actual risk' may be defined as 'remote' in these circumstances. The benchmark of 'NIL or negligible' is only achieved when control has been reduced so far as is reasonably practicable. This interpretation leads to the outcome that formal enforcement can be applied below the numerical limit of the MEL.

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Appendix  
(para 2)

RISK MATRIX : CHEMICAL AGENTS

1 Topic	2 Descriptor	3 Application/ Interpretation	4 Likelihood				Notes
			Probable	Possible	Remote	Nil/Negligible	
Carcinogens, (EH40 Appendix 5), mutagens and substances toxic to reproduction.	SERIOUS HEALTH EFFECT	Potentially fatal, progressive etc.	Where the risk of cancer is so high that the majority of people will be affected. This is very unlikely in the occupational context.	Repeated or prolonged exposure. In some cases occasional exposure. (This is dependent on potency.)	Single or very occasional exposure.  Exposure above the exposure limit or above the reasonably practicable level for a substance with an MEL.	Exposure at or below the OEL including the MEL requirements of ALARP.  <b>BENCHMARK</b>	Exposure in this context means actual or potential exposure at any exposure limit that may be set.  The application was selected on the basis of <b>potential</b> outcome and lesser possibilities can be discounted.

1 Topic	2 Descriptor	3 Application/ Interpretation	4 Likelihood				Notes
			Probable	Possible	Remote	Nil/Negligible	
Acute lethal agents	SERIOUS HEALTH EFFECT	By definition the outcome can be fatal.	Gross exposure, for example, gases in confined spaces or large spills from a major incident, or extensive skin contact with phenol.	Gross exposure.  (As for 'probable'. It is not possible to generally distinguish these.)	Single exposure above the exposure limit.	No exposure or exposure to or below any exposure limit.  <b>BENCHMARK</b>	Exposure in this context means actual or potential exposure at a set exposure limit.  Gross exposure means many times over the exposure limit,

							or gross skin contamination .  It would be necessary to consider the toxicity of individual substances to define this closer but likely to be in the order of 10x the limit.
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1 Topic	2 Descriptor	3 Application/ Interpretation	4 Likelihood				Notes
			Probable	Possible	Remote	Nil/Negligible	
Respiratory sensitisers	SERIOUS HEALTH EFFECT	Leading to a person being sensitised to a substance and suffering occupational asthma.	Repeated and prolonged exposure to highly potent sensitisers such as some platinum salts, MDI and TDI.	Repeated and prolonged exposure to other asthmagens.	Single or very occasional exposures above exposure limits.	Exposure at, or below, any exposure limit including any MEL requirement.  <b>BENCHMARK</b>	This is not applicable to sensitised persons when a single exposure, even to very small levels, can lead to a probability of harm. It is likely then that the only remedy is removal of the individual from the risk of any exposure.

1 Topic	2 Descriptor	3 Application/	4 Likelihood				Notes
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		Interpretation					
			Probable	Possible	Remote	Nil/Negligible	
Corrosives	SERIOUS HEALTH EFFECT	Likely to cause permanent damage, eg exposure to the eyes. Or there is a progressive effect, eg HF.	Actual contact with corrosive substance.	Risk of contact but the duration limited by readily available remedial measures.	Not likely to be applicable as the risk of injury is considered to be either 'possible' or if no exposure potential 'NIL'.	<b>BENCHMARK</b>	There may be more severe or less severe outcomes than described dependent on extent of contact ranging from a minor splash to immersion.
	SIGNIFICANT HEALTH EFFECT	Non-progressive but with a temporary or cosmetic disability	Actual contact with 'severe burns' corrosive substance.	Extended exposure to a substance causing 'burns'.	Short-term exposure to substances causing 'burns'.	<b>BENCHMARK</b>	

1 Topic	2 Descriptor	3 Application/ Interpretation	4 Likelihood				Notes
			Probable	Possible	Remote	Nil/Negligible	
Substances causing dermatitis	SERIOUS HEALTH EFFECT	Allergic contact dermatitis involving sensitisation.		Continuous or frequently repeated skin contact with a dermatitic agent, eg R43 substance.	Occasional contact.	Single contact <b>BENCHMARK</b>	
	SIGNIFICANT HEALTH EFFECT	Occupational dermatitis.  Non-progressive and usually temporary disability.	Continuous or frequently repeated skin contact with a dermatitic agent, eg R43 substance.	Occasional but substantial contact.	Occasional contact.	Single contact <b>BENCHMARK</b>	Occasional contact ranges from intermittent tasks to potential failings in protective clothing. Single contact is

							unlikely to result in the condition and tolerance of this is implicit in the benchmark.
Irritants	SIGNIFICANT HEALTH EFFECT	Non-permanent disability.	Repeated & prolonged gross exposure.	Repeated & prolonged exposure.	Single exposure.		<b>BENCHMARK</b>

1 Topic	2 Descriptor	3 Application/ Interpretation	4 Likelihood				Notes
			Probable	Possible	Remote	Nil/Negligible	
General view of chemicals that do not lead to the above outcomes.	SERIOUS HEALTH EFFECT	For chemicals where the toxicology shows a serious end health effect. Examples in OC130/5 Appendix 1	Gross exposure.	Exposure to multiples of the exposure limit.	Exposure above the exposure limit. (See reference to MELs in 'Notes' column).	Below exposure limits. <b>BENCHMARK</b>	Exposure limits means OEL including short-term limits and mixed exposures. It includes exposure as far as is reasonably practicable below the MEL. The term 'multiple' means several times (2-3) and 'Gross' means greater than this. <b>This is a generalisation and the health effects from the specific substance must be considered</b>

							<b>before making enforcement decisions.</b>
	SIGNIFICANT HEALTH EFFECT	For chemicals where there is a less serious outcome. Examples in OC130/5 Appendix 2	As above	As above	As above	As above	<b>BENCHMARK</b>

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