

LEAFLET 56**DANGEROUS SUBSTANCES AND EXPLOSIVE ATMOSPHERES****CONTENTS**

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LEAFLET FOR LINE MANAGERS

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LEAFLET FOR LINE MANAGERS**REGULATIONS COVERED**

- 1 The Dangerous Substances and Explosive Atmospheres Regulations (DSEAR)

INTRODUCTION

2 These Regulations impose requirements for the purpose of eliminating or reducing risks to safety from fire, explosion or other events arising from the hazardous properties of a "dangerous substance" in connection with work. Further guidance is being developed, and will be incorporated as soon as possible.

3 Employers must carry out a suitable and sufficient assessment of the risks to their employees where a dangerous substance is or may be present at the workplace. "Risk" is defined as meaning "the likelihood of a person's safety being affected by harmful physical effects being caused to him from fire, explosion or other events arising from the hazardous properties of a dangerous substance in connection with work and also the extent of that harm". Under regulation 3 of the Management of Health and Safety at Work Regulations, an employer is already required to carry out a risk assessment, but where a dangerous substance is or may be present at the workplace, he will now additionally need to assess the risks in the light of the requirements for the assessment under regulation 5 of these Regulations.

4 Employers are required by these Regulations to eliminate or reduce risk so far as is reasonably practicable. Where risk is not eliminated, employers are required, so far as is reasonably practicable and consistent with the risk assessment, to apply measures to control risks and mitigate any detrimental effects.

5 Places at the workplace where explosive atmospheres may occur must be classified as hazardous or non-hazardous and hazardous places must be classified into zones on the basis of the frequency and duration of the occurrence of an explosive atmosphere. Equipment and protective systems in hazardous places must comply with the requirements of Schedule 3 to the Regulations and, where necessary, hazardous places must be marked with signs at their points of entry in accordance with Schedule 4.

6 Employers are required to make arrangements for dealing with accidents, incidents and emergencies and to provide employees with precautionary information, instruction and training where a dangerous substance is present at the workplace. Containers and pipes used at work for dangerous substances must, where not already marked in accordance with the requirements of the legislation listed in Schedule 5 to the Regulations.

7 Where two or more employers share a workplace where an explosive atmosphere may occur, the employer responsible for the workplace is to co-ordinate the implementation of the measures required by these Regulations.

DEFINITIONS

8 The following definitions apply:

Approved classification and labelling guide

9 The current edition of the Approved Guide to the Classification and Labelling of Dangerous Substances and Dangerous Preparations, as approved by the Health and Safety Commission;

Dangerous substance means

10 A substance or preparation which meets the criteria in the Approved Guide to the Classification and Labelling of Dangerous Substances and Dangerous Preparations for classification as a substance or preparation which is explosive, oxidising, extremely flammable, highly flammable or flammable, whether or not the substance or preparation is classified under the Chemicals (Hazard Information and Packaging for Supply) Regulations;

11 A substance or preparation which because of its physico-chemical or chemical properties and the way it is used or is present at the workplace creates a risk, not being a substance or preparation falling within paragraph 10 above; or

12 Any dust, whether in the form of solid particles or fibrous materials or otherwise, which can form an explosive mixture with air or an explosive atmosphere, not being a substance or preparation falling within paragraphs 10 or 11 above.

Explosive atmosphere

13 A mixture, under atmospheric conditions, of air and one or more dangerous substances in the form of gases, vapours, mists or dusts in which, after ignition has occurred, combustion spreads to the entire unburned mixture;

14 Hazard means the physico-chemical or chemical property of a dangerous substance which has the potential to give rise to fire, explosion, or other events which can result in harmful physical effects of a kind similar to those which can be caused by fire or explosion, affecting the safety of a person;

15 Personal protective equipment means all equipment which is intended to be worn or held by a person at work and which protects that person against one or more risks to his safety, and any addition or accessory designed to meet that objective;

16 Preparation means a mixture or solution of two or more substances;

17 Substance means any natural or artificial substance whether in solid or liquid form or in the form of a gas or vapour.

APPLICATION

18 These Regulations apply to all work places and to HM Ship and Submarines.

19 The duties to assess, eliminate or reduce the risk, have emergency plans and mark or label containers and pipework apply in all areas covered by the regulations. There are a small number of areas where the duty to classify, as discussed below, does not apply. The categories that are likely to found in MOD are limited to:

19.1 Areas used directly for and during medical treatment of patients;

19.2 The use of gas appliances for cooking, heating, hot water production, refrigeration, lighting or washing (where the fuel is a gas at 15°C and 1 Bar); and where applicable, the normal water temperature does not exceed 105°C; (including forced draught burners and heating bodies to be equipped with such burners but not including an appliance specifically designed for use in an industrial process carried out on industrial premises;

19.3 Gas fittings within the meaning of the Gas Safety (Installation and Use) Regulations 1998 located in domestic premises, not being gas appliances falling within subparagraph 192;

19.4 The manufacture, handling, use, storage and transport of explosives or chemically unstable substances;

EMPLOYERS DUTIES UNDER THESE REGULATIONS

20 A suitable and sufficient assessment of the risks to employees that arise from a dangerous substance, which is or is liable to be present at the workplace must be made. The assessment must consider:

20.1 The hazardous properties of the substance;

20.2 Information on safety provided by the supplier, including information contained in any relevant safety data sheet;

20.3 The circumstances of the work including:

20.3.1 The work processes and substances used and their possible interactions;

20.3.2 The amount of the substance involved;

20.3.3 Where the work will involve more than one dangerous substance, the risk presented by such substances in combination; and

20.3.4 The arrangements for the safe handling, storage and transport of dangerous substances and of waste containing dangerous substances;

20.4 Activities, such as maintenance, where there is the potential for a high level of risk;

20.5 The effect of measures which have been or will be taken pursuant to these Regulations;

20.6 The likelihood that an explosive atmosphere will occur and its persistence;

20.7 The likelihood that ignition sources, including electrostatic discharges, will be present and become active and effective;

20.8 The scale of the anticipated effects of a fire or an explosion;

20.9 Any places which are or can be connected via openings to places in which explosive atmospheres may occur; and

20.10 Any additional safety information that may be needed in order to complete the risk assessment.

21 The risk assessment must be reviewed regularly so as to keep it up to date and particularly if there is reason to suspect that it is no longer valid or there has been a significant change in the matters to which the risk assessment relates including when the workplace, work processes, or organisation of the work undergoes significant changes, extensions or conversions.

22 A record of the significant findings of the risk assessment must be made as soon as is practicable after that assessment is made, including in particular:

22.1 The measures which have been or will be taken;

22.2 Sufficient information to show that the workplace and work processes are designed, operated and maintained with due regard for safety and that, in accordance with the Provision and Use of Work Equipment Regulations, adequate arrangements have been made for the safe use of work equipment; and

22.3 Where an explosive atmosphere may occur at the workplace, sufficient information to show:

22.3.1 Those places which have been classified into zones

22.3.2 Equipment which is required for, or helps to ensure, the safe operation of equipment located in places classified as hazardous;

22.3.3 That any verification of overall explosion safety required has been carried out; and

22.3.4 The aim of any co-ordination required by regulation 11 and the measures and procedures for implementing it.

23 No new work activity involving a dangerous substance can commence unless an assessment has been made and the measures required by these Regulations have been implemented.

Elimination or reduction of risks from dangerous substances

24 The risk must either be eliminated or be reduced so far as is reasonably practicable. Dangerous substances must be avoided at the workplace, so far as is reasonably practicable, either by avoiding their use or by substitution. Where it is not reasonably practicable to eliminate risk, then the employer must, so far as is reasonably practicable, apply measures, consistent with the risk assessment and appropriate to the nature of the activity or operation to control risks, including the following in order of priority:

24.1 Reducing the quantity of dangerous substances to a minimum;

24.2 Avoiding or minimising the release of a dangerous substance;

24.3 Controlling the release of a dangerous substance at source;

24.4 Preventing the formation of an explosive atmosphere, including the application of appropriate ventilation;

24.5 Ensuring that any release of a dangerous substance which may give rise to risk is suitably collected, safely contained, removed to a safe place, or otherwise rendered safe, as appropriate;

24.6 Avoiding:

24.6.1 Ignition sources including electrostatic discharges; and

24.6.2 Adverse conditions which could cause dangerous substances to give rise to harmful physical effects; and

24.7 Segregating incompatible dangerous substances.

25 The detrimental effects of a fire or explosion or the other harmful physical effects arising from dangerous substances must be mitigated by applying the following:

25.1 Reducing to a minimum the number of employees exposed;

25.2 Avoiding propagating fires or explosions;

25.3 Providing explosion pressure relief arrangements;

25.4 Providing explosion suppression equipment;

25.5 Providing plant which is constructed so as to withstand the pressure likely to be produced by an explosion; and

25.6 Providing suitable personal protective equipment.

26 Arrangements must be made for the safe handling, storage and transport of dangerous substances and waste containing dangerous substances, and any conditions necessary to comply with these Regulations for ensuring the elimination or reduction of risk must be maintained.

27 The following general safety measures must be taken so far as is reasonably practicable, and subject to them being consistent with the risk assessment and appropriate to the nature of the activity or operation:

27.1 WORKPLACE AND WORK PROCESSES

27.1.1 Ensuring that the workplace is designed, constructed and maintained so as to reduce risk.

27.1.2 Designing, constructing, assembling, installing, providing and using suitable work processes so as to reduce risk.

27.1.3 Maintaining work processes in an efficient state, in efficient working order and in good repair.

27.1.4 Ensuring that equipment and protective systems meet the following requirements:

27.1.4.1 Where power failure can give rise to the spread of additional risk, equipment and protective systems must be able to be maintained in a safe state of operation independently of the rest of the plant in the event of power failure;

27.1.4.2 Means for manual override must be possible, operated by employees competent to do so, for shutting down equipment and protective systems incorporated within automatic processes which deviate from the intended operating conditions, provided that the provision or use of such means does not compromise safety;

27.1.4.3 On operation of emergency shutdown, accumulated energy must be dissipated as quickly and as safely as possible or isolated so that it no longer constitutes a hazard; and

27.1.4.4 Necessary measures must be taken to prevent confusion between connecting devices.

27.2 ORGANISATIONAL MEASURES

27.2.1 The application of appropriate systems of work including:

27.2.1.1 The issuing of written instructions for the carrying out of the work;
and

27.2.1.2 A system of permits to work with such permits being issued by a person with responsibility for this function prior to the commencement of the work concerned,

Where the work is carried out in hazardous places or involves hazardous activities.

Classification

28 From 30 June 2003, places at the workplace where an explosive atmosphere may occur must be classified into hazardous or non-hazardous places. A place where explosive atmospheres may occur is a place in which an explosive atmosphere may occur in such quantities as to require special precautions to protect the health and safety of the workers concerned is deemed to be hazardous within the meaning of the Regulations. A place in which an explosive atmosphere is not expected to occur in such quantities as to require special precautions is deemed to be non-hazardous within the meaning of these Regulations.

29 Hazardous places are classified in terms of zones on the basis of the frequency and duration of the occurrence of an explosive atmosphere.

29.1 Zone 0: A place in which an explosive atmosphere consisting of a mixture with air of dangerous substances in the form of gas, vapour or mist is present continuously or for long periods or frequently.

29.2 Zone 1: A place in which an explosive atmosphere consisting of a mixture with air of dangerous substances in the form of gas, vapour or mist is likely to occur in normal operation occasionally.

29.3 Zone 2: A place in which an explosive atmosphere consisting of a mixture with air of dangerous substances in the form of gas, vapour or mist is not likely to occur in normal operation but, if it does occur, will persist for a short period only.

29.4 Zone 20: A place in which an explosive atmosphere in the form of a cloud of combustible dust in air is present continuously, or for long periods or frequently.

29.5 Zone 21: A place in which an explosive atmosphere in the form of a cloud of combustible dust in air is likely to occur in normal operation occasionally.

29.6 Zone 22: A place in which an explosive atmosphere in the form of a cloud of combustible dust in air is not likely to occur in normal operation but, if it does occur, will persist for a short period only.

30 Note that layers, deposits and heaps of combustible dust must be considered as any other source which can form an explosive atmosphere, and "normal operation" means the situation when installations are used within their design parameters.

Equipment in hazardous areas

31 After 30 June 2003, equipment and protective systems for all places in which explosive atmospheres may occur will have to be selected on the basis of the requirements set out in the Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations 1996 unless the risk assessment finds otherwise. In particular, the following categories of equipment will have to be used in the zones indicated, provided they are suitable for gases, vapours, mists, dusts or mists and dusts, as appropriate:

- 31.1 In zone 0 or zone 20, category 1 equipment,
- 31.2 In zone 1 or zone 21, category 1 or 2 equipment,
- 31.3 In zone 2 or zone 22, category 1, 2 or 3 equipment.

32 In this context:

32.1 Equipment means machines, apparatus, fixed or mobile devices, control components and their instrumentation, and detection or prevention systems which, separately or jointly, are intended for the generation, transfer, storage, measurement, control and conversion of energy and the processing of material, as the case may be, and which are capable of causing an explosion through their own potential sources of ignition;

32.2 Protective systems means devices other than components of equipment which are intended to halt incipient explosions immediately or limit the effective range of an explosion or both;

32.3 Devices means safety devices, controlling devices and regulating devices intended for use outside potentially explosive atmospheres but required for or contributing to the safe functioning of equipment and protective systems with respect to the risks of explosion;

32.4 Component means any item essential to the safe functioning of equipment and protective systems but with no autonomous function; and

32.5 Potentially explosive atmosphere means an atmosphere, which could become explosive due to local and operational conditions.

33 These requirements do not apply to equipment and protective systems already in use in places where explosive atmospheres may occur, and which are or have been in use or made available at the workplace on or before 30th June 2003. But any modification, extension or restructuring undertaken after 30 June 2003 will have to comply.

34 Otherwise, any such workplace which was in use on or before 30th June 2003 must comply with the requirements of these regulations no later than 30th June 2006 and the employer's duties under those regulations in respect of such a workplace shall apply accordingly.

Marking

35 From 30 June 2003, where necessary, places classified as hazardous must be marked with signs at their points of entry to warn that an explosive atmosphere may occur. The sign is below.



Verification

36 From 30 June 2003, before a workplace containing places classified as hazardous is used for the first time, the overall explosion safety must be verified by a person who is competent in the field of explosion protection as a result of his experience or any professional training or both.

Work clothing

37 Appropriate work clothing which does not give rise to electrostatic discharges must be provided for use in places classified as hazardous.

ARRANGEMENTS TO DEAL WITH ACCIDENTS, INCIDENTS AND EMERGENCIES

38 Unless the results of the risk assessment show that, because of the quantity of each dangerous substance at the workplace, there is only a slight risk to employees, and that the measures taken are sufficient to control that risk, arrangements to protect the safety of employees from an accident, incident or emergency related to the presence of a dangerous substance at the workplace must be made.

39 Such arrangements include:

39.1 Procedures, including the provision of appropriate first-aid facilities and relevant safety drills (which shall be tested at regular intervals), have been prepared which can be put into effect when such an event occurs;

39.2 Information on emergency arrangements, including:

39.2.1 Details of relevant work hazards and hazard identification arrangements, and

39.2.2 Specific hazards likely to arise at the time of an accident, incident or emergency is available;

39.3 Suitable warning and other communication systems are established to enable an appropriate response, including remedial actions and rescue operations, to be made immediately when such an event occurs;

39.4 Where necessary, before any explosion conditions are reached, visual, or audible, warnings are given and employees withdrawn; and

39.5 Where the risk assessment indicates it is necessary, escape facilities are provided and maintained to ensure that, in the event of danger, employees can leave endangered places promptly and safely.

40 The information on emergency arrangements must be:

40.1 Made available to relevant accident and emergency services to enable those services, whether internal or external to the workplace, to prepare their own response procedures and precautionary measures; and

40.2 Displayed at the workplace, unless the results of the risk assessment make this unnecessary.

41 In the event of an accident, incident or emergency related to the presence of a dangerous substance at the workplace, immediate steps must be taken to mitigate the effects of the event; restore the situation to normal, and inform those of employees who may be affected.

42 Only those who are essential for the carrying out of repairs and other necessary work are permitted in the affected area and they must be provided with appropriate personal protective equipment and protective clothing, and any necessary specialised safety equipment and plant, which must be used until the situation is restored to normal.

INFORMATION, INSTRUCTION AND TRAINING

43 Where a dangerous substance is present at the workplace, employees must be provided with:

43.1 Suitable and sufficient information, instruction and training on the appropriate precautions and actions to be taken by them in order to safeguard themselves and other employees at the workplace;

43.2 The details of any such substance including:

43.2.1 The name of the substance and the risk which it presents;

43.2.2 Access to any relevant safety data sheet; and

43.2.3 Legislative provisions which concern the hazardous properties of the substance;

And,

43.3 The significant findings of the risk assessment.

IDENTIFICATION OF HAZARDOUS CONTENTS OF CONTAINERS AND PIPES

44 Where containers and pipes used at work for dangerous substances are not marked in accordance with relevant requirements of the legislation listed below, subject to any derogations provided for in that legislation, the contents of those containers and pipes, together with the nature of those contents and any associated hazards, must be clearly identifiable. The regulations are:

- The Classification and Labelling of Explosives Regulations 1983 (S.I. 1983/1140).
- The Chemicals (Hazard Information and Packaging for Supply) Regulations 2002 (S.I. 2002/1689).
- The Health and Safety (Safety Signs and Signals) Regulations 1996 (S.I. 1996/341).
- The Radioactive Material (Road Transport) (Great Britain) Regulations 1996 (S.I. 1996/1350).
- The Carriage of Dangerous Goods by Rail Regulations 1996 (S.I. 1996/2089).
- The Packaging, Labelling and Carriage of Radioactive Material by Rail Regulations 1996 (S.I. 1996/2090).
- The Carriage of Dangerous Goods (Classification, Packaging and Labelling) and Use of Transportable Pressure Receptacles Regulations 1996 (S.I. 1996/2092).
- The Carriage of Explosives by Road Regulations 1996 (S.I. 1996/2093).
- The Carriage of Dangerous Goods by Road Regulations 1996 (S.I. 1996/2095).
- The Good Laboratory Practice Regulations 1997 (S.I. 1997/654).