

ATEX and explosive atmospheres

Explosive atmospheres in the workplace can be caused by flammable gases, mists or vapours or by combustible dusts. Explosions can cause loss of life and serious injuries as well as significant damage.

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Background

Explosive atmospheres can be caused by flammable gases, mists or vapours or by combustible dusts. If there is enough of the substance, mixed with air, then all it needs is a source of ignition to cause an explosion.

Explosions can cause loss of life and serious injuries as well as significant damage. Preventing releases of dangerous substances, which can create explosive atmospheres, and preventing sources of ignition are two widely used ways of reducing the risk. Using the correct equipment can help greatly in this.

The Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSEAR) place

duties on employers to eliminate or control the risks from explosive atmospheres in the workplace. A summary of those requirements can be found below.

This page does not deal with intentional explosives such as those used in demolition work or blasting in quarries.

Further information:

- [HSE Explosives website](#)^[4]

What is an explosive atmosphere?

In DSEAR, an explosive atmosphere is defined as a mixture of dangerous substances with air, under atmospheric conditions, in the form of gases, vapours, mist or dust in which, after ignition has occurred, combustion spreads to the entire unburned mixture.

Atmospheric conditions are commonly referred to as ambient temperatures and pressures. That is to say temperatures of -20°C to 40°C and pressures of 0.8 to 1.1 bar.

Where can explosive atmospheres be found?

Many workplaces may contain, or have activities that produce, explosive or potentially explosive atmospheres. Examples include places where work activities create or release flammable gases or vapours, such as vehicle paint spraying, or in workplaces handling fine organic dusts such as grain flour or wood.

What is ATEX?

ATEX is the name commonly given to the two European Directives for controlling explosive atmospheres:

1) Directive 99/92/EC (also known as 'ATEX 137' or the 'ATEX Workplace Directive') on minimum requirements for improving the health and safety protection of workers potentially at risk from explosive atmospheres. The text of the Directive and the supporting EU produced guidelines are available on the EU-website. For more information on how the requirements of the Directive have been put into effect in Great Britain see the information in the section on [Equipment and protective systems intended for use in explosive atmospheres](#).

2) Directive 94/9/EC (also known as 'ATEX 95' or 'the ATEX Equipment Directive') on the

approximation of the laws of Member States concerning equipment and protective systems intended for use in potentially explosive atmospheres. The text of the Directive and EU produced supporting guidelines are available on the EU website. For more information on how the requirements of the Directive have been put into effect in Great Britain see the section on [Selection of equipment and protective systems](#).

Further information:

- [ATEX Equipment Directive](#) ^[5]

Explosive atmospheres in the workplace

In Great Britain the requirements of Directive 99/92/EC were put into effect through regulations 7 and 11 of the Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSEAR).

The requirements in DSEAR apply to most workplaces where a potentially explosive atmosphere may occur. Some industry sectors and work activities are exempted because there is other legislation that fulfils the requirements. These exemptions are listed in regulation 3 of DSEAR.

What does DSEAR require?

DSEAR requires employers to eliminate or control the risks from dangerous substances – further information on these requirements can be found on the [DSEAR](#)^[6] page. In addition to the general requirements, the Regulations place the following specific duties on employers with workplaces where explosive atmospheres may occur.

Classification of areas where explosive atmospheres may occur

Employers must classify areas where hazardous explosive atmospheres may occur into zones. The classification given to a particular zone, and its size and location, depends on the likelihood of an explosive atmosphere occurring and its persistence if it does. Schedule 2 of DSEAR contains descriptions of the various classifications of zones for gases and vapours and for dusts.

Further information and guidance on the classification and zoning of areas where potentially explosive atmospheres may occur and the selection of equipment for use in those areas:

- [Explosive atmospheres - Classification of hazardous areas \(zoning\) and selection of equipment](#) ^[7]

Selection of equipment and protective systems

Areas classified into zones must be protected from sources of ignition. Equipment and protective systems intended to be used in zoned areas should be selected to meet the requirements of the Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations 1996. Equipment already in use before July 2003 can continue to be used indefinitely provided a risk assessment shows it is safe to do so.

Identifying areas where explosive atmospheres may occur

Where necessary, the entry points to areas classified into zones must be marked with a specified 'EX' sign.

Providing anti-static clothing

Employers must provide workers who work in zoned areas with appropriate clothing that does not create the risk of an electrostatic discharge igniting the explosive atmosphere, eg anti-static footwear. The clothing provided depends on the level of risk identified in the risk assessment.

Confirming (verifying) overall explosion safety

Before a workplace containing zoned areas comes into operation for the first time, the employer must ensure that the overall explosion safety measures are confirmed (verified) as being safe. This must be done by a person or organisation competent to consider the particular risks in the workplace, and the adequacy of the explosion control and other measures put in place.

Equipment and protective systems intended for use in explosive atmospheres

The aim of Directive 94/9/EC is to allow the free trade of 'ATEX' equipment and protective systems within the EU by removing the need for separate testing and documentation for each Member State.


In Great Britain, the requirements of the Directive were put into effect through BIS Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres

Regulations 1996 (SI 1996/192).

The Regulations apply to all equipment intended for use in explosive atmospheres, whether electrical or mechanical, and also to protective systems.

Manufacturers/suppliers (or importers, if the manufacturers are outside the EU) must ensure that their products meet essential health and safety requirements and undergo appropriate conformity procedures. This usually involves testing and certification by a 'third-party' certification body (known as a Notified Body) but manufacturers/suppliers can 'self-certify' equipment intended to be used in less hazardous explosive atmospheres. Once certified, the equipment is marked by the 'EX' symbol to identify it as such.

Certification ensures that the equipment or protective system is fit for its intended purpose and that adequate information is supplied with it to ensure that it can be used safely.

BIS has policy responsibility for the Regulations (although HSE enforces them). More information on the 1996 Regulations and the ATEX EU Directive 94/9/EC can be found on the [GOV.UK](#) ^[8] website.

Further information:

- [ATEX Equipment Directive](#) ^[9]

Link URLs in this page

1. Where can I find further information?
<http://www.hse.gov.uk/fireandexplosion/resources.htm>
2. Publications
<http://www.hse.gov.uk/fireandexplosion/resources.htm>
3. ATEX and DSEAR Frequently asked questions
<http://www.hse.gov.uk/electricity/atex/index.htm>
4. HSE Explosives website
<http://www.hse.gov.uk/explosives/index.htm>
5. ATEX Equipment Directive
<http://ec.europa.eu/enterprise/atex/direct/text94-9.htm>
6. DSEAR

<http://www.hse.gov.uk/fireandexplosion/dsear.htm>

7. Explosive atmospheres - Classification of hazardous areas (zoning) and selection of equipment

<http://www.hse.gov.uk/fireandexplosion/zoning.pdf>

8. GOV.UK

<https://www.gov.uk/atex-equipment-manufacturers-and-their-responsibilities>

9. ATEX Equipment Directive

<http://ec.europa.eu/enterprise/atex/direct/text94-9.htm>