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## COMPLYING WITH ATEX AND DSEAR

ATEX is the name commonly given to the two European Directives for controlling explosive atmospheres. Directive 99/92/EC (ATEX 153) is concerned with the minimum requirements for improving the health and safety protection of workers potentially at risk from explosive atmospheres and is implemented in the UK through the Dangerous Substances and Explosive Atmosphere Regulations (DSEAR).

UK companies storing or handling substances that can burst into flames or explode must comply with DSEAR. This includes not only dangerous substances but combustible dusts (e.g., flour, wood dust, etc.), gases under pressure in cylinders and corrosives.

DSEAR requires an understanding of the properties of the materials being handled, what can go wrong, and the equipment, systems and procedures needed to maintain safe operation.

The Regulations also require knowledge of where releases may occur on plant in normal operation and determination of the extent of any flammable atmosphere i.e., through Hazardous Area Classification or Zoning. Precautions must be in place to reduce the likelihood of ignition of these releases, and to mitigate the effects of ignition or explosion (e.g., through explosion relief, explosion suppression equipment, etc.).

Directive 94/9/EU (now 2014/34/EU ATEX 114) is concerned with the supply of equipment, protective systems, components etc., for use in potentially explosive atmospheres. In the UK it is implemented through The Equipment and Protective Systems Intended for use in Potentially Explosive Atmospheres Regulations (EPS). Electrical and non-electrical equipment intended for use within a flammable atmosphere must comply with the Directive by being constructed in a way that reduces the likelihood of ignition – such special equipment is commonly termed ‘ATEX’ equipment.

Whether it is a new design or a review of existing processes, systems or procedures that is required, consideration must be given to the following:

- Understanding the properties of materials
- Use of materials on the basis of their properties
- Gases under pressure
- Reactive chemistry and key controls
- Risk Assessment
- Basis of safety
- Hazardous Area Classification (HAC)
- Specification of equipment versus the HAC and compliance with BS EN 60079-17
- Assessment of non-electrical ignition sources
- Technical and organisational measures in place

### DSEAR Risk Assessment

DSEAR requires employers to assess the risks before commencing any new work activity involving dangerous substances. The regulations state that the risk assessment shall include consideration of:

- The hazardous properties of the substance
- Information on safety provided by the supplier
- The circumstances of the work
- The effect of risk reduction measures
- Activities such as maintenance, where there is the potential for a high level of risk
- Likelihood and persistence of a flammable atmospheres
- Likelihood of an ignition source becoming active and effective
- The scale of the anticipated effects of a fire or an explosion
- Places that are or can be connected via openings
- Such additional safety information as the employer may need in order to complete the risk assessment

The risk assessment should include information to show that the workplace and work equipment will remain safe during normal operation and reasonably foreseeable abnormal operation, including during shutdowns and maintenance.

### **Hazardous Area Classification**

Hazardous Area Classification (HAC) drawings are used to depict the extent of flammable atmospheres. Any electrical or mechanical equipment that is installed within them must be certified as meeting the appropriate requirements of ATEX 114, to reduce the likelihood of it becoming an ignition source.

Hazardous areas are classified based on an assessment of the frequency of occurrence and duration, as follows for an explosive gas atmosphere:

- Zone 0: An explosive atmosphere is present continuously or for long periods.
- Zone 1: An explosive atmosphere is likely to occur in normal operation.
- Zone 2: An explosive atmosphere is not likely to occur in normal operation and, if it occurs, will only exist for a short time.

Combustible dusts are treated similarly and classified as Zone 20, 21, 22, based on an explosive atmosphere in the form of a cloud of combustible dust in air being present.

Determining the Zone and extent requires an understanding of the:

- Flammable materials
- Physical properties and characteristics of the materials
- Potential sources of release
- Operating temperatures and pressures
- Degree and availability of ventilation (forced and natural)
- Probability of releases

Where the properties of the materials being handled are not fully understood, they should be characterised using appropriate test methods. Characterisation is also necessary to determine the basis of safety e.g., in relation to explosion prevention and explosion protection.

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## Hazardous Area Equipment

Electrical and mechanical equipment present within a flammable atmosphere must comply with the relevant requirements of ATEX 114 and must be inspected and maintained accordingly. Such equipment will be CE marked and have a Declaration of Conformity. This is being replaced with the UKCA (UK Conformity Assessed) marking. It is a new UK product marking that is used for goods being placed on the market in Great Britain (England, Wales and Scotland). It covers most goods which previously required the CE marking, known as 'new approach' goods. The UKCA marking came into effect on 1 January 2021. However, to allow businesses time to adjust to the new requirements the CE marking can still be used until 1 January 2023, in most cases.

This means that essential process safety documentation and records must be in place for new and existing plant, including information relating to:

- Hazardous area classification and drawings
- Specification of electrical and mechanical equipment according to the Equipment and Protective Systems Intended for use in Potentially Explosive Atmospheres Regulations 1996 (EPS)
- Mechanical Equipment Ignition Risk Assessment (MEIRA) studies for legacy equipment pre-dating the Regulations
- Design and implementation of explosion prevention and protection systems
- Systems and procedures for ongoing inspection, testing, maintenance and corrective action management
- Competence management and training

Our consultants and engineers are fully conversant with the requirements of ATEX and DSEAR and can provide advice and support in relation to specification, inspection, testing and maintenance of electrical and mechanical equipment for use in potentially explosive atmospheres (powders, dusts, flammable liquids and vapours).