Dangerous substances and explosive atmospheres Regulations 2002 (DSEAR)

Technical Bulletin

Allianz Engineering Inspection Services Ltd

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These Regulations are concerned with protection against risks from fire, explosion and similar events arising from dangerous substances used or present in the workplace. They came into effect for new installations on 1st July 2003 and from 1st July 2006 for all existing installations.

The Regulations require duty holders to assess and control the risks from dangerous substances.

A dangerous substance is defined as:

- A substance or preparation which is explosive, oxidising or flammable
- 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
- 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
- Examples of dangerous substances include: petrol, liquefied petroleum gas (LPG), paints, varnishes and certain types of dust produced in, for example, machining and sanding operations e.g. coal, wood, grain, flour, sugar, etc

Where a dangerous substance is, or is liable to be, present at the workplace, the duty holder shall make a suitable and sufficient assessment of the risks taking consideration of:

- The hazardous properties of the substance
- Information on safety provided by the supplier
- The circumstances of the work including the interaction between the process and substances used, the amount of the substance involved, the use of substances in combination and the safe handling, storage and transport of the substances
- Activities where there is a potential for a high level of risk
- The likelihood that an explosive atmosphere will occur and its persistence
- The likelihood that ignition sources will be present and become active
- The scale of the anticipated effects of a fire or explosion

The duty holder shall then ensure that the identified risks are either eliminated or reduced so far as is reasonably practicable. The manner in which this can be achieved is set out using a hierarchical approach:

- Replacement of the dangerous substance with a substance or process that eliminates or reduces the risk
- Reduce the quantity of dangerous substance to a minimum
- Avoid or minimise the release of a dangerous substance
- The control of the release of a dangerous substance at source
- Prevent the formation of an explosive atmosphere
- Ensure that any release is suitably contained or rendered safe
- Avoid ignition sources
- Segregate incompatible dangerous substances
- Provide suitable personal protective equipment

The duty holder shall also ensure that all places where an explosive atmosphere may occur are classified into zones:

Zone 0 (Zone 20 for combustible dust) - A place in which an explosive atmosphere consisting of a gas, vapour or mist is present continuously or for long periods or frequently.

Zone 1 (Zone 21 for combustible dust) - A place in which an explosive atmosphere consisting of a gas, vapour or mist is likely to occur in normal operation occasionally.

Zone 2 (Zone 22 for combustible dust) - A place in which an explosive atmosphere consisting of a gas, vapour or mist is not likely to occur in normal operation but, if it does, will persist for short period only.

Following the completion of the risk assessment and classification of areas, the duty holder shall then ensure that all equipment for use in the identified zones is suitable and safe and that all identified zones are suitably marked.

The BS EN 60079 series of standards have been developed to set out the essential criteria against which the following aspects can be determined:

- Area classification
- Selection of appropriate electrical apparatus
- The requirement for initial and regular periodic inspections to ensure that the installations are being maintained in a satisfactory condition

The grade and interval of periodic inspection shall be determined by a risk assessment, carried out by the duty holder, taking in account:

- Type of equipment
- Manufacturers guidance
- The level of deterioration expected
- The zone of use
- Results of previous inspections

The grade of periodic inspection carried out can be:

- Visual - An inspection which identifies, without the use of access equipment or tools, those defects, such as missing bolts, which will be apparent to the eye.
- Close - An inspection which encompasses those aspects covered by a visual inspection, and, in addition, those defects, such as loose bolts, which will be apparent only by the use of access equipment, for example steps and tools.
- Detailed - An inspection which encompasses those aspects covered by a close inspection and, in addition, identifies those defects, such as loose terminations, which will only be apparent by opening the enclosure, and/or using, where necessary, tools and test equipment.

The visual and close inspections can be performed with the apparatus energised. The detailed inspection will generally require the apparatus to be isolated.

The interval between periodic inspections shall not exceed three years without seeking expert advice.

Allianz Engineering are able to carryout all grades of electrical inspection, as described above.

For further information on this subject please contact Engineering Standards 01428 726121.