

4. INSTALLATION AND OPERATION OF ELECTRICAL EQUIPMENT IN HAZARDOUS AREAS

4.2 AREA CLASSIFICATION AND SELECTION OF EQUIPMENT

Potential explosion hazards are addressed at an early stage in the planning of new systems. When classifying hazardous areas both the strength of potential sources of ignition for combustible substances and the influence of natural or artificial ventilation must be taken into account. The explosion safety characteristics of the combustible substances used must be determined (Appendix 5.1). Only then can a decision be reached on the classification of explosive areas into zones and the selection of suitable equipment.

Equipment may only be used in the ambient temperature range specified in its marking. If the marking does not contain any information, the standard range of -20 °C to +40 °C applies. Electrical equipment must comply with the subgroup IIA, IIB or IIC. It must be selected and installed so that it is protected from external influences that may compromise explosion protection.

4.3 INSTALLATION TECHNIQUES

In the main, three installation systems are used for electrical systems in hazardous areas:

- Cable system with indirect entry.
- Cable system with direct entry.
- Conduit system.

The technical design of the electrical equipment implemented in the individual types of installation varies accordingly.

In the USA only the conduit system or mineral insulated cables (MI) are permitted for all Class 1, Division 1 applications to NEC 501-4, whereby mineral-insulated cables are mainly used as heating lines and fire-resistant signal and control lines. Type MC-HL or ITC-HL cables may also be used in specific conditions. Certain types of cable and line are also permitted in Division 2.

Cable systems

In Europe cable systems are most common, with high-quality cables and lines laid uncovered. It is only in areas in which mechanical damage is likely that they are laid in conduits, which are open at both ends.