

ATEX & HAZARDOUS AREAS

Compliance Guide for Electrical Installations in Potentially Explosive Atmospheres

Protecting people, plant and processes
Electrical equipment installed in a hazardous area must be appropriate for the identified zone and the characteristics of the hazardous substance. Correct zoning, equipment selection, installation, inspection and maintenance are key parts of controlling ignition risk.

1. Understanding ATEX and hazardous areas

ATEX is the commonly used term for UK/European requirements associated with equipment and protective systems intended for use in potentially explosive atmospheres. In Great Britain, product requirements are governed by the Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations 2016, as amended. Workplace risks from dangerous substances and explosive atmospheres are addressed through DSEAR.

Hazardous-area classification identifies locations where an explosive atmosphere may occur and supports the selection of suitable electrical and non-electrical equipment. The zone and its extent depend on the likelihood and persistence of the explosive atmosphere, together with site-specific factors.

2. Hazardous-area zoning

Gas Group / dust	Definition	Equipment approach
Zone 0	Explosive atmosphere present continuously, for long periods or frequently.	Equipment with the appropriate protection level for Zone 0.
Zone 1	Explosive atmosphere likely to occur occasionally during normal operation.	Equipment suitable for Zone 1, subject to the full marking and site conditions.
Zone 2	Explosive atmosphere not likely in normal operation, but if it occurs it will exist only for a short period.	Equipment suitable for Zone 2, subject to the full marking and site conditions.

Combustible dusts are classified separately as Zones 20, 21 and 22, using the same principle of increasing likelihood and duration of an explosive dust atmosphere.

3. Equipment selection

Selecting Ex equipment is not simply a matter of matching the word “ATEX” to a zone. The equipment marking, protection concept and certification must be appropriate for the hazardous atmosphere and installation conditions.

Key consideration	What it means
Zone / EPL / category	The equipment must provide the protection level required for the classified area.
Gas or dust group	The characteristics of the substance influence the required equipment suitability.
Temperature class / maximum surface temperature	Equipment surface temperatures must not create an ignition source for the atmosphere present.
Protection concept	Examples include flameproof enclosure, increased safety and intrinsic safety, depending on the application.
Cable entries and glands	Entries, glands, stopping plugs and terminations must be suitable for the equipment and protection concept.

New equipment supplied for use in potentially explosive atmospheres should carry the appropriate explosion-protection marking and conformity assessment marking. Equipment suitability must be verified against the actual hazardous-area classification and manufacturer documentation.

4. Electrical installation requirements

ATEX electrical work requires specialist installation practices because incorrect equipment, termination or maintenance can compromise the protection method. Installation should follow the applicable equipment certification, manufacturer instructions and relevant BS EN IEC 60079 requirements.

- Lighting and emergency lighting – use appropriately certified equipment and ensure mounting, glands and wiring arrangements are suitable for the zone.
- Distribution and isolation – Ex-rated switches, isolators and distribution equipment must be selected for the environment and protection concept.
- Cabling and containment – cable systems, glands, entries and terminations should be appropriate for the installation and hazardous-area requirements.
- Motors and process equipment – motors, actuators, instrumentation and associated equipment may require specific Ex protection and certification.
- Earthing and bonding – protective conductors, bonding and equipotential arrangements should be designed and maintained to prevent dangerous potential differences and ignition risks.
- Instrumentation and control – intrinsically safe circuits and associated apparatus require careful system design, segregation and verification.

5. Inspection, testing and maintenance

An Ex installation remains compliant only if its protective features are maintained throughout its service life. Inspection and maintenance should be appropriate to the equipment, installation and hazardous-area classification.

- Check Ex equipment for damage, corrosion, loose or missing components and deterioration.
- Verify cable glands, stopping plugs, covers, fasteners and enclosure interfaces are correctly installed and maintained.
- Check earthing and bonding arrangements where applicable.
- Confirm replacement equipment is compatible with the hazardous-area classification and original protection concept.
- Record defects and complete remedial works using suitably competent personnel.
- Reassess the installation where process changes, equipment changes or changes to hazardous-area classification occur.

6. Common ATEX electrical services

Service	Typical scope
ATEX lighting installations	Ex-rated luminaires, emergency lighting and associated wiring
Ex distribution & isolation	Switchgear, isolators and distribution equipment
Cable installation	Ex glands, entries, terminations and suitable cable systems
Inspection & remedials	Identification and correction of installation defects
Testing & certification	Electrical testing and appropriate documentation
Upgrades & replacement	Replacement of obsolete or unsuitable Ex equipment

7. Key legislation and standards

- DSEAR 2002 – requires employers to assess and control risks from dangerous substances and explosive atmospheres, including classification of hazardous areas where applicable.
- Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations 2016 – governs equipment and protective systems intended for use in potentially explosive atmospheres in Great Britain.
- BS EN IEC 60079 series – provides requirements covering explosive atmospheres, equipment, protection methods, hazardous-area classification and electrical installations.
- BS 7671 – electrical installation requirements apply alongside hazardous-area standards where relevant.

8. Competence and specialist knowledge

Work in hazardous areas should be undertaken by personnel with appropriate competence for the specific task. Competence should cover the relevant installation, inspection, testing, maintenance and Ex protection requirements.

QUEST Electrical has experience delivering specialist ATEX electrical works in industrial environments, supported by engineers with ATEX/CompEx-related competence appropriate to the work undertaken.

WHY QUEST?

- ATEX/CompEx-qualified engineers
- Industrial and commercial hazardous-area experience
- Installation, inspection and remedial works
- Electrical testing and certification
- Support from planned works through to maintenance
- Nationwide service capability

Typical environments

Paint shops • Manufacturing • Chemical processing • Fuel and solvent storage • Dust-producing environments • Food processing • Waste and recycling • Industrial process areas

Important note

This guide is intended as general technical information and should not be used as a substitute for a site-specific risk assessment, hazardous-area classification, design review or equipment certification. The applicable requirements depend on the substances, process, zone classification, equipment and installation conditions at the site.

Reference points

HSE guidance on ATEX and explosive atmospheres; UK Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations 2016; designated standards for equipment for explosive atmospheres; BS EN IEC 60079 series.

Need specialist ATEX electrical support?

Talk to QUEST Electrical about ATEX installations, inspection, testing, remedial works and hazardous-area electrical projects.