

Atex directive

In 2003 the Atex Directive becomes a mandatory requirement for all hazardous area equipment sold in the European Union and equipment must have applicable Atex certificates.

In addition to the technical requirements demanded by the appropriate standards for each type of protection concept, the Atex Directive imposes additional requirements on the certificate holder in terms of quality system, product documentation, installation information, possible limitations of use in the relation to its intended environment, labelling information etc.

The technical details of gas Grouping and Temperature Classification are unaltered but zoning references are amended and gas, vapour, mist and dust categories are combined under a single classification as shown opposite.

Zones	Equipment
Zone 0 & 20	Category 1
Zone 1 & 21	Category 2
Zone 2 & 22	Category 3

The marking of the equipment shall include the following typical data:

Ex II 2 G

Where II is the gas group;

2 is the category for use (prev. zone)

G (or D) is the type of explosive atmosphere - G = gas, vapour or mist; and D = Dust

IIC T4 Ta = -20°C to + 55°C

Where the T class will vary against ambient

IIC T5 Ta = -20°C to + 25°C

The T class marking for dust may also be shown if different to gas



Ingress protection

In addition to protection against the risk of explosion or ignition luminaires for use in hazardous areas will also need to provide adequate protection against the ingress of solids or liquids. The degree of classification is denoted by the IP classification system.

A two digit number is used to identify the degree of protection.

The first digit of the code denotes protection against dust and solid objects

The second digit denotes protection against moisture

INGRESS PROTECTION (IP) CODE BS EN 60529 (IEC 60529)

IP0X	No special protection	IPX0	No special protection
IP1X	Objects ≥ 50mm diameter (e.g part of a hand)	IPX1	Vertically dripping water
IP2X	Objects ≥ 12.5mm diameter (e.g finger)	IPX2	Vertically dripping water when enclosure tilted by 15°
IP3X	Objects ≥ 2.5mm diameter (e.g tool)	IPX3	Sprayed water up to 60° from vertical
IP4X	Objects ≥ 1.00mm diameter (e.g wire)	IPX4	Sprayed water from all directions
IP5X	Dust protection	IPX5	Water jets
IP6X	Dust tight	IPX6	Powerful water jets
		IPX7	Temporary submersion to a depth of 1m (for half an hour)
		IPX8	Extended submersion to a depth ≥ 1m

There are established engineering concepts recognised by the IEC for the design of electrical equipment for hazardous area applications. These engineering concepts are the basis of protection against the risk of fire or explosion. Each concept is identified by a protection symbol.

If a design relies on more than one concept all symbols are normally shown.

Symbol & EN ref	Concept	Summary	Zone use	Atex Category
Ex ia EN/IEC 60079-II	Intrinsic safety	Limits energy of sparks & surface temperatures (using electronics c/w 2 failure protection devices)	0	1
Ex ib EN/IEC 60079-II	Intrinsic safety	Limits energy of sparks & surface temperatures (using electronics c/w 1 failure protection devices)	1 & 2	2 & 3
Ex d EN/IEC 60079-I	Flameproof	Contains explosion quenches flame	1 & 2	2 & 3
Ex e EN/IEC 60079-7	Increased safety	No arcs, sparks or hot surfaces	1 & 2 2 & 3	
Ex p EN/IEC 60079-2	Pressurised	Keeps flammable gas out	1 & 2	2 & 3
Ex m EN/IEC 60079-18	Encapsulated	Keeps flammable gas out	1 & 2	2 & 3
Ex q EN/IEC 60079-5	Powder filled	Keeps flammable gas out	1 & 2	2 & 3
Ex o EN/IEC 60079-6	Oil filled	Keeps hazard away from ignition source using inert oil	1 & 2	2 & 3
Ex N EN/IEC 60079-15	Non-sparking	No arcs, sparks or hot surfaces	2	3

Emergency products

EN-60 598 2.22

This harmonised European product standard sets out the requirements for materials, design, manufacture, testing and operation of emergency lighting luminaires and equipment.

All emergency luminaires comply with EN 60 598 2.22 when used in an ambient temperature range of between 0 and +25°C. For any deviations please contact your local Technical Department.



Petrel Guide to Hazardous Areas

Temperature classification

The temperature classification of a given gas is the temperature above which an appropriate mixture of that gas with air will ignite. It is critical that the maximum surface temperature of any part of the equipment which may come into contact with the gas/air mixture, does not exceed the ignition temperature of the mixture.

The temperature class or 'T rating' is normally based on an ambient temperature of -20°C to +40°C

Class T Rating	Surface Temperature °C Max permitted	Ignition Temperature °C Gas/air mixture
T1	450	>450
T2	300	>300
T3	200	>200
T4	135	>135
T5	100	>100
T6	85	>85

Gas Groups

The explosive gases, vapours, and mists present in the atmosphere are grouped into temperature classes and gas groups according to various properties such as ignition temperature, the energy required to ignite the mixture, the energy produced by an explosion, flame transmission capability etc.

Group I Electrical equipment for use underground in mines susceptible to the hazard of firedamp (methane)

Group II Electrical equipment for use in all other hazardous areas. This group is then subdivided into the following 3 further groups according to the maximum experimental safety gap for non-transmission of an internal ignition plus the minimum ignition current of the mixture.



