

Introduction

2014/34/EU ATEX Directive

The Directive

The 2014/34/EU Directive was adopted by the European Union to regulate the market for products suitable for use in potentially explosive atmospheres, harmonizing their technical characteristics and application standards.

The 2014/34/EU Directive came into force on the 30th of March 2014 and repeals Directive 94/9/EC with effect from 20th of April 2016; it imposes ATEX certification on all products marketed in the European Union, no matter of manufacture place and regulations in force there, if installed in potentially explosive environments.

Criteria for classifying equipment groups into categories

Group **I** includes equipment intended for underground work in mines and their surface installations (category **M1** and **M2**).

Group **II** includes equipment intended for use in other locations liable to be endangered by explosive atmospheres (categories **1, 2, 3**).

Products classified in the two groups may have different modes of explosion protection depending on the area in which the equipment is to be used.

For further information on Group II and its classification, please see the table on page III.4

Equipment Protection Level (EPL)

The EN 60079-14 standard introduced a method for risk assessment that takes into account equipment protection levels, called EPL, which indicates the ignition risk inherent within the equipment, regardless the protection mode adopted.

The ATEX Category letters "**G**" and "**D**" define whether the equipment can be used in areas containing hazardous gas (**G**) or dust (**D**). In the EPL classification, categories 1, 2 and 3 were replaced by the letters **a, b** and **c**.

The meaning of the markings is as follows:

- For Gases:

Ga identifies equipment for use in explosive atmospheres due to the presence of gas, with a "very high" level of protection that is not a source of ignition during normal operation or when subject to expected failure or when subject to rare failure;

Gb identifies equipment for use in explosive gas atmospheres, with a "high" level of protection, which is not a source of ignition during normal operation or when subject to anticipated malfunction, although not on a regular basis;

Gc identifies equipment for use in explosive gas atmospheres, with an "increased" level of protection, which is not a source of ignition during normal operation and which has some additional protective measures to ensure that it remains an inactive ignition source when subject to regularly expected events (e.g. lamp failure).

- For Dusts:

Da identifies equipment for explosive atmospheres due to the presence of combustible dusts, with a "very high" level of protection and which is not a source of ignition in normal operation or when subject to rare failures;

Db identifies equipment for explosive atmospheres due to the presence of combustible dusts, with a "high" level of protection and which is not a source of ignition in normal operation or when subject to expected, but not frequent, failures;

Dc identifies equipment for explosive atmospheres due to the presence of dust, with an "increased" level of protection, which is not a source of ignition in normal operation and which may have additional protections to ensure that it remains inactive as an ignition source in the event of regular and expected failures.

Gas and Dust groups

The ATEX regulation proposes a classification of explosion-hazardous gases and dusts against which the user can protect himself by using a product with an appropriate protection system.

For Group **II** materials, the hazardousness of gases and dust covered by the product increases from subdivision **IIA-IIIA**, the least hazardous, to subdivision **IIC-IIIC**, the most hazardous.

To determine the gases and dust potentially present and their subdivisions, please refer to the subdivision table for Group II on page III.4

Temperature classes for gases and dusts

The housing of the appliance must not have any flash points on its outer surface which could cause spontaneous combustion.

Different substances can ignite at different temperatures. The lower the flash point temperature, the more dangerous the substance. Consequently, any equipment used in an explosive atmosphere is classified according to the maximum surface temperature it generates.

The maximum surface temperature of the material must always be well below the auto-ignition temperature of the dusts and gases present.

For more information on the corresponding temperature classes and maximum surface temperatures, see the relevant table on page III.4

Classification and labeling of areas at risk of explosion

Flammable subjects	Hazardous environments (Presence of Potentially Explosive Atmospheres)	Explosion risk areas (Partition)	Device classification		Equipment Protection Level (EPL)
			Group	Category	
Gases Stems Mists	Continuously, for long periods or frequently	Zone 0	II		
	Occasionally	Zone 1	II	1G	Ga
	Rarely or for very short periods	Zone 2	II	2G	Gb Gc
Dusts	Continuously, for long periods or frequently	Zone 20	II		
	Occasionally	Zone 21	II	1D	Da
	Rarely or for very short periods	Zone 22	II	2D	Db Dc

Subdivision and differentiation of gases, mists and steams

Explosion group	Most common gases in reference to explosion group and temperature classes					
	Ammonia Methane Ethane Propane	Ethanol Cyclohex. n-Butane	Gasoline Diesel n-Hexane	Acetaldehyd.		
IIA						
IIB						
IIC	Smog Acrylic Nitrile	Ethylene Ethylene oxide	Ethylene glycol Hydrogen sulphide	Ethyl ether		
	Coal hydrogen	Acetylene				Disulfide

Marking

Community mark of conformity to safety requirements

Specific marking for protection from explosions

CE Ex II 2G Ex ia IIC T6 Gb
II 2D Ex tb IIIC T80°C Db X IP65

Device	Protection principle	Protection type	Marking	Use zone	Symbol	Standard
Electric	Containment	Explosion proof	Ex d	- b 1 c 2		EN60079-1
	Prevention	Increased Safety	Ex e	- b 1 c 2		EN60079-7
	Prevention	Intrinsic Safety	Ex i	a 0, 20 b 1, 21 c 2, 22		EN60079-11
	Segregation	Pressurization	Ex p	y 1, 21 z 2, 22		EN60079-2
	Segregation	Encapsulation	Ex m	a 0, 20 b 1, 21 c 2, 22		EN60079-18
	Segregation	Oil immersion	Ex o	- b 1 c 2		EN60079-6
	Segregation	Sand filling	Ex q	- b 2		EN60079-5
	Prevention Containment Segregation	Ignition proof	Ex n	A C R 2		EN60079-15
	Segregation	Dustproof	Ex t	a 20 b 21 c 22		EN60079-31
	Mechanical	Prevention Containment	Control of ignition sources	Ex h	c 0, 20 1, 21 2, 22	
Prevention Containment		Constructive safety	b 0, 20 1, 21 2, 22			
Prevention Containment Segregation		Liquid immersion	k 0, 20 1, 21 2, 22			

Group	Classification
IIIA	Volatile combustible substances (fibers)
IIB	Non-conductive powders
IIC	Conductive powders

Dust classification

IP class protection	Solid and dust protection	Liquids protections
0	not protected	0 not protected
1	solids > 50 mm	1 vertical rain
2	solids > 12,5 mm	2 cross rain (up to 15°)
3	solids > 2,5 mm	3 cross rain (fino a 60°)
4	solids > 1 mm	4 splashing water from every direction
5	dusts (limited access)	5 water sprays from all direction
6	dusts (full protection)	6 high pressure water sprays from all directions
7	-	7 temporary immersion (max.1 m for 30')
8	-	8 continuous immersion (>1 m for 60')

Additional information	Suffix
No limitations	-
Some conditions must be met	X
To be used only in a complete system	U

Principle and type of protection

Additional information