IECEx ATEX LINE

Product line “ATEX”

In todays’ manufacturing, each processing stage can be a source of risks susceptible to explosions which, unless kept under control, can result in extensive injury to persons as well as in damage to the environment and the machinery.
This risk exists in many companies in the chemical, petrochemical and pharmaceutical sector, where the production of potentially harmful gas-originated atmospheres can become extremely actual.

Not to be disregarded are also certain manufacturing conditions where the presence of fine organic powders from wood processing, light metal machining, in feed-stuff factories and in mills producing meals for the food industry can in turn produce the build-up of easily inflammable powders.
A strong sense of responsibility is required from all those who manufacture machinery or provide components engineered to operate on plants being classified as dangerous, in order to minimize the risks for human life.

To this effect, the regulations and directives in force at European and international level take into consideration the increased need for commitment to safety.

Directive 2014/34/UE “ATEX” (ATMOSPHERES EXPLOSIBLES)

The Directive is MANDATORY since 1st July 2003.
The Directive applies to protection Equipment or Systems designed to operate in areas exposed to the risk of explosion.
“Equipment, means the machines, materials, fixed or mobile devices, controls, instruments and detection and prevention systems which, on their own or when combined, are intended for the production, transport, storage, measuring, adjustment, conversion of energy and for the transformation of materials that, due to their own specific potential priming sources, are at risk of causing explosion.”

In order to be potentially explosive, there must be in the atmosphere the simultaneous presence of the three conditions of the so-called flame triangle.

PRIMING (flame, electric arc, hot body, impact, friction among surfaces)
COMBURENT (air, oxygen)
FUEL (gas, vapours, dusts, mists)

The priming conditions takes place when a specific mix occurs between comburent and fuel.
It is very important for the person in charge with the equipment operation to classify the area of installation, to make sure the materials used comply with the intended use.
The explosion-proofing requirements are quite demanding.
Ilinox containers meet these standards. Relentless research and development, pooled with a continuously expanding program, guarantee the connector blocks and the s/s boxes for areas Ex 1 and 2 with explosive gases and for areas EX 21 and 22 with explosive dusts.

The relevant conformity certificate compliant with Directive 2014/34/UE is available for all containers.
With long-lasting skill and utmost professional accuracy, Ilinox manufactures its enclosures exclusively from stainless steel, for complex and hazardous applications.

Great attention is paid mainly to Directives, laws and regulations having international validity and it is exactly within this frame that a key role is played by the close contact with engineering certifying Bodies.



GROUPS OF EQUIPMENT

GROUP	
I	Equipment intended for use in underground jobs in mines or in the relevant surface plants, exposed to the risk of firedamp burst and/or flammable powders.
II	Appliances intended for use in other environments where the presence of explosive atmospheres is possible.

GROUP II		
SUBSTANCE	AREA	DESCRIPTION
GAS "G"	0	Place where an explosive atmosphere formed by a mixture of air and flammable substances in the form of gas, vapour or mist is present either continuously of for long periods, or often (1.000 h/year at least).
	1	Place where an explosive atmosphere formed by a mixture of air and flammable substances in the form of gas, vapour or mist is present occasionally during routine operation (More than 10 , up to 1.000 h/year)
	2	Place where an explosive atmosphere formed by a mixture of air and flammable substances in the form of gas, vapour or mist is unlikely to occur during routine operation but, when present, only lasts shortly (NEVER longer than 10 h/year)
DUST "D"	20	Place where an explosive atmosphere in the form of a fog of a combustible dust is present in the air, either continuously, for long periods, or often.
	21	Place where an explosive atmosphere in the form of a fog of combustible dust is likely to occur occasionally during routine operation.
	22	Place where an explosive atmosphere in the form of a fog of combustible dusts in the air is unlikely to occur during routine operation but, when present, only lasts shortly. (NOT longer than 10 h/year)

CLASS OF THE EQUIPMENT	AREA	PROTECTION LEVEL	PROTECTION METHOD SERVICEABLE
1G	0	Very high	ia ÷ ma
2G	1	High	d ÷ e ÷ ib ÷ m ÷ o ÷ q ÷ p
3G	2	Standard	N
1D	20	Very high	IP6X
2D	21	High	IP6X
3D	22	Standard	IP6X (Conductor powders) IP5X (Non-conductor powders)

The protection method applied to higher classes can be applied to lower classes, too.

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Protection methods

- Containment
- Prevention
- Insulation

Containment
The limitation of the explosion must permit to confine the explosion in a clearly defined place without propagation to the surrounding atmosphere. (d)

Prevention
The specificity of this method is to increase reliability of the electric components which, in routine operation, cannot make sparks nor reach surface temperatures capable of priming the explosive mixture. (ia ÷ ib ÷ e ÷ n)

Insulation
The specificity of this method is to physically separate or isolate the live electric components or hot surfaces from the explosive mixture, to prevent contact with the priming source. (p ÷ ma ÷ m ÷ o ÷ q)

Description of protection methods

ia ÷ ma	Inherent safety: use of components that cannot produce arcs or sparks.
ma ÷ m	Capping: closing the components into small tight caps.
d	Explosion-proofing: Closing the dangerous parts into strong cases thus limiting the explosion.
e	Increased safety: Take measures to avoid the formation of hot spots. Only for NON sparkling equipment.
o	Immersion into oil: protection of the hazardous areas by dipping them into dielectric oil.
q	Under sand: filling static components with sand to isolate the hot spots from the atmosphere.
p	Inner overpressure: filling the cases with overpressurized inhert gas to prevent hazardous atmosphere from entering.
n	Simplified protection: Type A for NON sparkling equipment, it consists in the application of the following increased safety criteria: Case protection degree IP54 or IP44 Unlosable gaskets, if any. Impact strength 1÷ 3,5 J Protection grid for fragile parts, mesh NOT more than 50x50 Monitoring of surface temperature Type B for SPARKLING equipment, it consists of the application of the increased safety criteria indicated for class A, limited venting with suitable gaskets and cable glands.

For protection methods “d ” ÷ “i ” and, sometimes, “n ” three classifications exist as follows:
II GA ÷ II GB ÷ II GC, the difference consisting in the type of gas present in the installation area.

The protection degree required for an higher class can apply also to lower ones.

Temperature Classes

The temperature class is related with the maximum temperature, which MUST NOT be overcome in the casings or the exposed hot spots, in case of any failure.

TEMPERATURE CLASS	T1	T2	T3	T4	T5	T6
Max Surface Temp. (°C)	450	300	200	135	100	85

ILINOX

has achieved the ATEX and “IECEx” certification for the connector blocks type DS and the Cabinets type QL - QLP with single and solid door.
The types mentioned above can be used in the electric protection type “eb” , “tb” (only for QL-EX and QLP-EX), “eb” , “ta” (only for DS-EX), or whenever the IP protection degree is the only tightness degree required.

The choice of the type of protection is always the Fitter’s responsibility.

Marking: enclosures are considered components, hence they DO NOT bear the CE MARK. Example of marking:

Marking for small cabinets QL and QLP

ilinox
San Polo di Torrile (PR) Italy
Strada Prov. Asolana 4/6

II 2 GD IP66
IECEx EUT 18.0016 U
Ex eb IIC Gb
Ex tb IIIC Db
EPT 18 ATEX 3029 U
NB: 0477

Marking for connector blocks DS

ilinox
San Polo di Torrile (PR) Italy
Strada Prov. Asolana 4/6

II 1D 2G IP66
IECEx EUT 18.0016 U
Ex eb IIC Gb
Ex ta IIIC Da
EPT 18 ATEX 3029 U
NB: 0477

Our enclosures are fit for:
- Class 1D (area 20) for connector blocks Series DS-EX
- Class 2G (area 1) and 2D (area 21)

An higher approval covers the lower classes, as well, hence they are also fit for:
- Class 3G (area 2) and 3D (area 22)

For class 1G (area 0) the enclosure can be delivered with only the declaration of the IP degree and, possibly, a declaration for the materials employed, the validation procedure being at the charge of the Fitter of the equipment.

MARKING LEGEND

II	-	Equipment Group
1- 2 - 3	-	Equipment Class
G	-	Fit for environments with presence of Gas
D	-	Suitable for environments with presence of Dust (Explosive dusts)
U	-	Identification of component status
EPT 18 ATEX 3029U	-	Number of CE exam Certificate as issued by EUROFIN PRODUCT TESTING
IECEx EUT 18.0016 U	-	Number of IECEx TR Certificate

Deliverables:

a - Declaration of Conformity
b - Use and Maintenance Manual
c - Declaration of IP tightness (NOT mandatory)
d - Declaration of materials employed in manufacturing (NOT mandatory)