EXPLOSIVES ATMOSPHERES

DIRECTIVES 2014/34/EU (manufacturers) & 1999/92/CE (users)

EUROPEAN CERTIFICATE NUMBER				
INERIS	16	ATEX	0044	X
Notified Body	Year	in accordance with Directive 2014/34/EU	Certificate number assigned by Notified Body	Additional conditions of use

INTERNATIONAL CERTIFICATE NUMBER				
IECEx	INE	16.	0053	X
in accordance with the international sheme of certification	Certification Body	Year	Certificate number assigned by the Certification Body	Additional conditions of use

Additional conditions of installation	
The equipment can be used without particular restrictions	-
Particular conditions of use are specified in the certificate and must be respected for ensure safe use ◆	X
The equipment is an ATEX or IECEx component (Examples : terminal blocks, plugs, empty boxes, ...)	U

◆ **Note :**
The equipment must always be used in respect of its instruction sheet and its ATEX or IECEx instruction sheet.

MARKING FOR EQUIPMENT INSTALLED IN ATEX ZONES

(e.g. : increased safety equipement)

CE 0081 ⬡ | II 2 G/D | Ex db eb / Ex tb | IIC / IIIC | T6 / T80°C | Gb / Db | IP66

MARKING FOR ASSOCIATED EQUIPMENT

(e.g. intrinsic safety interfaces)

CE 0081 ⬡ | II (1) G/D | [Ex ia Ga] / [Ex ia Da] | IIC / IIIC

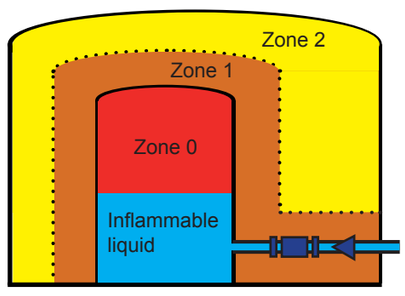
● Number of Notified Body (0081=LCIE) for evaluation of the quality system

EQUIPMENT - GROUP I (MINES)	
Category M1	Category M2
Very high level of protection using two protection concepts. Safe after two consecutive malfunctions.	High level of protection. Equipment should be de-energized in an explosive atmosphere.

EQUIPMENT - GROUP II (SURFACE INDUSTRIES)					
Category 1		Category 2		Category 3	
Very high level of protection using two protection concepts. Safe after two consecutive malfunctions.		High level of protection. Safe in the event of frequently occurring malfunctions and normally expected faults.		Normal level of protection. Safe under normal operating condition.	
Zone 0	Zone 20	Zone 1	Zone 21	Zone 2	Zone 22
G (gas)	D (dust)	G (gas)	D (dust)	G (gas)	D (dust)

EQUIPMENT PROTECTION LEVEL (EPL)							
Groupe II - Gas Zone			Groupe II - Dust Zone			Groupe I (Mining)	
Category	Zone	EPL	Category	Zone	EPL	Category	EPL
II 1 G II 2 G II 3 G	0 1 2	Ga Gb Gc	II 1 D II 2 D II 3 D	20 21 22	Da Db Dc	I M1 I M2	Ma Mb

CLASSIFICATION IN GAS AREAS, VAPOURS AND FOGS



Zone 0 : A place in which an explosive atmosphere consisting of a mixture with air and dangerous substances in the form of gas, vapour or dust present continuously or for long periods or frequently.

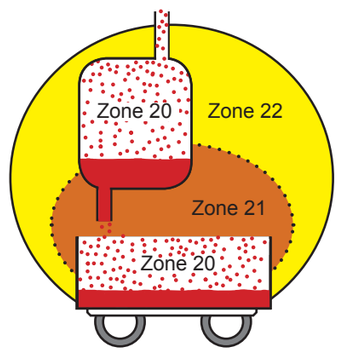
Zone 1 : A place in which an explosive atmosphere consisting of a mixture with air and dangerous substances in the form of gas, vapour or dust likely to occur in normal operation.

Zone 2 : A place in which an explosive atmosphere consisting of a mixture with air and dangerous substances in the form of gas, vapour or dust is not likely to occur in normal operation but, if it does occur, will persist for a short period only.

ENCLOSURES DEGREES OF PROTECTION (IEC 60529)			
The first digit indicates the protection against access to hazardous parts and the ingress of solid foreign objects.	Rating IP		The second digit indicates the protection against harmful ingress of water.
[No protection	0	0	No protection
[Back of hand Objects ≥ 50 mm	1	1	Vertical dripping water
[Finger Objects ≥ 12.5 mm	2	2	Dripping water at a 15° tilt
[Tool Objects ≥ 2.5 mm	3	3	Sprayed water up to 60° from vertical
[1 mm wire Objects ≥ 1 mm	4	4	Splashed water from any direction
[1 mm wires Dust-protected (minor ingress)	5	5	Water-jets from any direction
[1 mm wires Dust tight (no ingress)	6	6	Heavy water-jets from any direction
		7 ▲	Temporary immersion
		8 ▲	Immersion to specified depth
		9k ▲	Cleaning high pressure / jet of vapor

▲ IPx9k, IPx8 and IPx7 do not validate IPx6

CLASSIFICATION IN DUST AREAS



Zone 20 : A place in which an explosive atmosphere in the form of a cloud of combustible dust in air is present continuously, or for long periods or frequently.

Zone 21 : A place in which an explosive atmosphere in the form of a cloud of combustible dust in air is likely to occur in normal operation.

Zone 22 : A place in which an explosive atmosphere in the form or a cloud of combustible dust in air is not likely to occur in normal operation but, if it does occur, will persist for a short period only.

METHOD OF PROTECTION FOR ELECTRICAL EQUIPMENT - GAS AREAS

General rules for Electrical Equipment in Gas Areas					EN/IEC 60079-0
Installation	Category	Method of protection	Principe	Standard EN/IEC	Examples
Zone 0	II 1 G	ia ma op is / op sh da	Intrinsic safety Encapsulation Optical radiation Explosion-proof enclosure	60079-11 60079-18 60079-28 60079-1	Intrinsic safety
Zone 1	II 2 G	ib m / mb op is /op sh /op pr d / db px / pxb / py / pyb q / qb o / ob e / eb	Intrinsic safety Encapsulation Optical radiation Explosion-proof enclosure Pressurised enclosure Powder-filled Oil immersion Increased safety	60079-11 60079-18 60079-28 60079-1 60079-2 60079-5 60079-6 60079-7	Explosion-proof enclosure
Zone 2	II 3 G	ic m / mc dc pz / pzc nA / nC / nR op is /op sh/ op pr o / oc ec	Intrinsic safety Encapsulation Explosion-proof enclosure Pressurised enclosure «n» protection Optical radiation Oil immersion Increased safety	60079-11 60079-18 60079-1 60079-2 60079-15 60079-28 60079-6 60079-7	Increased safety

METHOD OF PROTECTION FOR NON-ELECTRICAL EQUIPMENT

General rules Equipment in Gas / Dust area	EN 13463-1		EN/IEC 80079-36	
Method of protection ■	Principe	Standard EN	Principe	Standard EN/IEC
Constructional safety Control of ignition source Liquid immersion	c b k	13463-5 13463-6 13463-8	h	80079-37

■ Some method of protection from the EN/IEC 60079-1 or EN/IEC 60076-2 can be taken into account in the certification of non electrical equipment.

METHOD OF PROTECTION FOR ELECTRICAL EQUIPMENT - DUST AREAS

General rules - Electrical Equipment in Dust Areas					EN/IEC 60079-0
Installation	Category	Method of protection	Principe	Standard EN/IEC	Examples
Zone 20	II 1 D	ia ● ma ta	Intrinsic safety Encapsulation Protective enclosure	60079-11 60079-18 60079-31	Protective enclosure
Zone 21	II 2 D	ib ● m / mb pb tb ●	Intrinsic safety Encapsulation Pressurised enclosure Protective enclosure	60079-11 60079-18 60079-2 60079-31	Encapsulation
Zone 22	II 3 D	ic ● m / mc pc tc ●	Intrinsic safety Encapsulation Pressurised enclosure Protective enclosure	60079-11 60079-18 60079-2 60079-31	Pressurised enclosure

METHOD OF PROTECTION FOR NON-ELECTRICAL EQUIPMENT

General rules Equipment in Gas / Dust areas	EN 13463-1		EN/IEC 80079-36	
Method of protection ■	Principe	Standard EN	Principe	Standard EN/IEC
Constructional safety Control of ignition source Liquid immersion	c b k	13463-5 13463-6 13463-8	h	80079-37

● The method of protection iaD, ibD, icD, tD et pD from the standards EN 61241 (old versions) have evolved to the method of protection ia, ib, ic, ta, tb, tc, pb and pc, under the standard EN/IEC 60079.
■ The method of protection t from EN/IEC 60079-31 can be taken into account in the certification of non electrical equipment.

CLASSIFICATION OF GASES AND VAPOURS - TEMPERATURE CLASSES ◆

	T1 450°C	T2 300°C	T3 200°C	T4 135°C	T5 100°C	T6 85°C
I	Methane					
IIA	Methane Acetone Ethane Ethyl acetate Ammonia Benzol (pure) Acetic acid Carbon monoxide Methanol Propane Toluene	Ethanol Isoamyl acetate n-Butane Butyl alcohol	Benzine Gasoil Volatile petrol Heated oils n-Hexane	Acetaldehyde		
IIB	Coal gas	Ethylene		Ethyl ether		
IIC	Hydrogen	Acethylene				Carbon disulphide

◆ The T(X) marking can be applied on an equipment : it indicates that the temperature classification is dependent on particular conditions of use - Refer to the associated manual.

DUST EXPLOSION TEMPERATURES

Materials	Granule size (µm)	Cloud (°C)	Layer of 5 mm (°C)
Paper fibre	16	570	335
Corn	1450	530	460
Wheat	37	510	300
Aluminium	<10	560	430
Polyethylene	72	440	Fusion
Sugar	30	490	480

The surface temperatures must be lower than or equal to the lowest of the two following criteria :
- 2/3 of the temperature of self-ignition of the air/dust cloud
- self-ignition temperature of a 5 mm layer of the dust in question reduced by 75°C.

DUST GROUPS

Group	Type of dust	Size	Resistivity
IIIA	Combustible flyings	> 500 µm	-
IIIB	Non-conductives flammable dust	< 500 µm	> 10^3 Ohm.m
IIIC	Conductive flammable dust	< 500 µm	< 10^3 Ohm.m

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