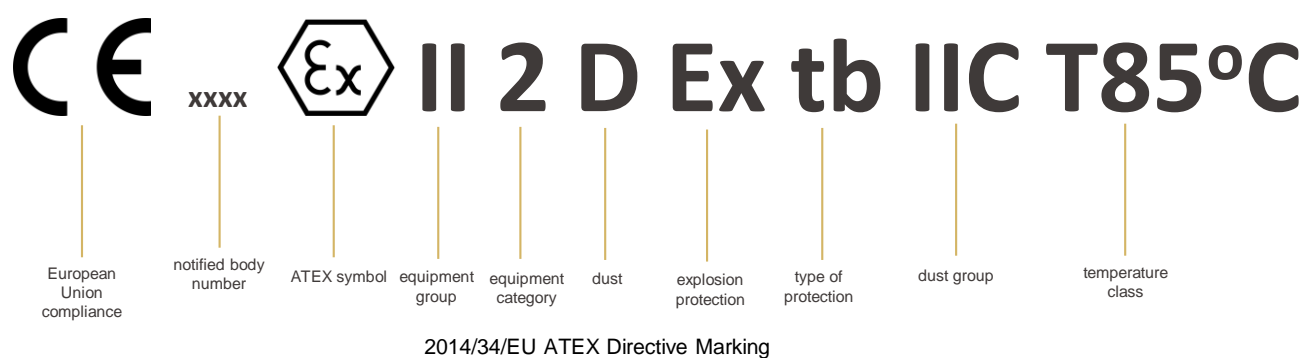


ATEX Marking (Europe)

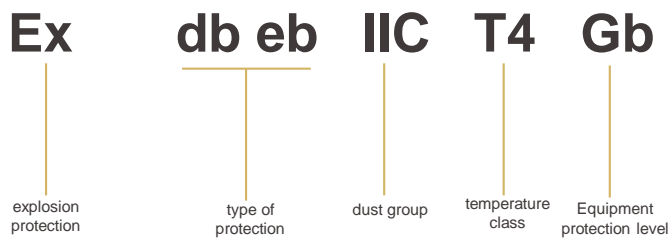
Typical Equipment Marking for Gas Atmospheres



Typical Equipment Marking for Dust Atmospheres



IECEx Marking (Global)



NEC/CEC Marking (North American)

Division System

Class I, Division 1, Group C & D, T4



Zone System

Class I, Zone 1, Aex, db IIC T4 Gb



Hazardous Area Zone System

ZONE 0	Explosive gas atmosphere present continuously or for long periods
ZONE 1	Explosive gas atmosphere likely to occur in normal operation
ZONE 2	Explosive gas atmosphere not likely to occur in normal operation but may be present for short periods
ZONE 20	Explosive dust atmosphere present continuously or for long periods
ZONE 21	Explosive dust atmosphere likely to occur in normal operation
ZONE 22	Explosive dust atmosphere not likely to occur in normal operation but may be present for short periods

Explosion Group

Explosive Atmosphere		Typical combustible material	Group
Gas, vapor or mist		Acetylene	IIC
		Hydrogen	IIC/IIB+H2
		Ethylene/Formaldehyde	IIB
		Methane/Octane	IIA
Dust	Conductive	Metal dust	IIIC
		Coal dust	IIIB
	Non-conductive	Grain dust	IIIB
	Fibers & Flyings	Wood, paper or cotton processing	IIIA

Division, Class, and Group Categories (NEC/CEC)

Class	Description	Group
Class I	Flammable gases or vapors may be present	Group A – Acetylene
		Group B – hydrogen, butadiene, ethylene oxide, propylene oxide and acrolein
		Group C – Ethylene, cyclopropane and ethyl ether
		Group D – Acetone, ammonia, benzene, butane, ethanol, gasoline, hexane, methane, methanol, methane, naphtha, natural gas, propane and toluene
Class II	Combustible dust may be present	E – Combustible metal dusts: aluminum, commercial alloys and magnesium
		F – Combustible carbonaceous dusts: carbon black, charcoal, coal and coke dusts
		G – Other combustible dusts: Chemicals, flour, grain, plastic and wood
Class III	Easily ignitable fibers or flyings may be present	Not Applicable
Division 1	Where ignitable concentrations of flammable gases, vapors, or liquids are frequently found.	
Division 2	Where ignitable concentrations of gases, vapors, or liquids are not frequently an issue.	

Equipment Group

Equipment Group	Definition
Group I	Electrical equipment intended for use in mines susceptible to fire damp
Group II	Electrical equipment intended for use in explosive gas atmospheres
Group III	Electrical equipment intended for use in explosive dust atmospheres

Equipment Protection Level

Equipment Protection Level (EPL) is defined by the international standard IEC/EN 60079. The assigned EPL of equipment indicates the risk level or ‘likelihood’ that the equipment can become a source of ignition. gas (G), dust (D) or mines (M)

Explosive Atmosphere Type	Protection Level	Description
Ga, Da, Ma	very high	the equipment remains safe in normal operation, even in rare fault situations (two faults at once)
Gb, Db, Mb	high	the equipment remains safe in normal operation, also when faults occur (single fault)
Gc, Dc	enhanced	the equipment remains safe in normal operation, and may have extra protection to minimize ignition risk in fault situations (fault may cause equipment to shut down)

Temperature Class

Maximum surface temperature	IEC/EN 60079-0
450°C	T1
300°C	T2
200°C	T3
135°C	T4
100°C	T5
85°C	T6

Protection Methods & Basic Concepts of Protection

Equipment Protection Level (EPL) is defined by the international standard IEC/EN 60079. The assigned EPL of equipment indicates the risk level or 'likelihood' that the equipment can become a source of ignition. gas (G), dust (D) or mines (M)

Type of Protection	Symbol	Zone	Standard	Concept
Flameproof	d	1 and 2	IEC BS EN 60079-1	Contains explosion and flame quenched
Increased safety	e	1 and 2	IEC BS EN 60079-7	No arcs, sparks or hot surfaces
Non-Sparking	nA	2	IEC BS EN 60079-15	No arcs, sparks or hot surfaces
Pressurised	p	1 and 2	IEC BS EN 60079-2	Keep flammable gas out
Oil immersed	o	1 and 2	IEC BS EN 60079-6	Keep flammable gas out
Restrictive breathing	nR	2	IEC BS EN 60079-15	Keep flammable gas out
Simple pressurised	nZ	2	IEC BS EN 60079-15	Keep flammable gas out
Quartz or sand filled	q	1 and 2	IEC BS EN 60079-5	Contains explosion and flame quenched
Encapsulation	ma	0,1 and 2	IEC BS EN 60079-18	Keep flammable gas out
Encapsulation	mb	1 and 2	IEC BS EN 60079-18	Keep flammable gas out
Enclosed break	nC	2	IEC BS EN 60079-15	Contains explosion and flame quenched
Energy limiting	nL	2	IEC BS EN 60079-15	Limit spark energy and surface temperatures
Intrinsic safety	ia	0,1 and 2	IEC BS EN 60079-11	Limit spark energy and surface temperatures
Intrinsic safety	ib	1 and 2	IEC BS EN 60079-11	Limit spark energy and surface temperatures
Intrinsic safety	ic	2	IEC BS EN 60079-11	Limit spark energy and surface temperatures

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