TEP Ex

GUIDE FOR EXPLOSION PROTECTION

Explosive atmospheres occur when flammable gases, mist, vapors or dust are mixed with air. This creates a risk of explosion. The amount of a substance needed to create an explosive atmosphere depends on the substance in question. The area where this possibility exists is defined as a potentially explosive atmosphere.

These atmospheres can be found throughout industries, from chemical, pharmaceutical, food, to power, and wood processing. The areas may also be known as "*hazardous areas*" or "*hazardous locations*."

TYPE OF PROTECTION

Type of protection	Standard	Concept	Symbol	Category (CENELEC)	EPL (IEC)
Types of protection of electrical equipment for explosive atmosphere of flammable gases, vapours, mists or dusts (EN/IEC 60079-0)					
Flameproof	EN/IEC 60079-1		d	M2, 2G M1, 1G, 3G	Mb, Gb Ma, Ga, Gc
Pressurized	EN/IEC 60079-2		px, py, pz	M2, 2G, 3G 2D, 3D	Mb, Gb, Gc Db, Dc
Powder filling	EN/IEC 60079-5		q	M2, 2G	Mb, Gb
Oil-immersion	EN/IEC 60079-6		o	M2, 2G	Mb, Gb
Increased safety	EN/IEC 60079-7		e	M2, 2G 3G	Mb, Gb Gc
Intrinsic safety	EN/IEC 60079-11		i	M1, M2, 1G, 2G, 3G 1D, 2D, 3D	Ma, Mb, Ga, Gb, Gc Da, Db, Dc
Type of protection 'n'	EN/IEC 60079-15		nA	3G	Gc
			nC		
			nR		
Encapsulation	EN/IEC 60079-18		m	M1, M2, 1G, 2G, 3G 1D, 2D, 3D	Ma, Mb, Ga, Gb, Gc Da, Db, Dc
Protection by enclosures	EN/IEC 60079-31		t	1D, 2D, 3D	Da, Db, Dc
Special protection	IEC 60079-33		s	M1, M2, 1G, 2G, 3G 1D, 2D, 3D	Ma, Mb, Ga, Gb, Gc Da, Db, Dc

TYPE OF PROTECTION - nonelectrical equipment

Type of protection	Standard	Concept	Symbol	Category (CEN)	EPL (IEC)
Types of protection of non-electrical equipment for explosive atmosphere of flammable gases, vapours, mists or dusts (EN 13463-1/ IEC 80079-36)					
Flow restricting	EN 13463-2		fr	3G, 3D	/
Flameproof	EN 13463-3		d	M2, 2G	/
Constructional safety	EN 13463-5 IEC 80079-37		c	M2,1G, 2G, 3G 1D, 2D, 3D	Mb, Ga, Gb, Gc Da, Db, Dc
Control of ignition sources	EN 13463-6 IEC 80079-37		b	M2, 1G, 2G, 3G 1D, 2D, 3D	Mb, Ga, Gb, Gc Da, Db, Dc
Liquid immersion	EN 13463-8 IEC 80079-37		k	M1, M2, 1G, 2G, 3G 1D, 2D, 3D	Ma, Mb, Ga, Gb, Gc Da, Db, Dc
Pressurized	EN/IEC 60079-2		p	M2, 2G, 2D 3G, 3D	/

CATEGORIES / ZONES / EPL (protection levels)

Areas	Categories (ATEX)	EPL (IEC)	Zones	Explosive atmosphere
Mining - I	M1	Ma	/	/
	M2	Mb		
Other than mines - II	1G, 1D	Ga, Da	0, 20	Continuosly, long periods or frequently
	2G, 2D	Gb, Db	1, 21	Likely to occur, occasionally
	3G, 3D	Gc, Dc	2, 22	Not likely to occur, short period only
EPL – EquipmentProtectionLevel				

TEMPERATURE CLASS

Temperature Class	Maximum Surface Temperature
T1	450 °C
T2	300 °C
T3	200 °C
T4	135 °C
T5	100 °C
T6	85 °C

GROUP - dust/gas

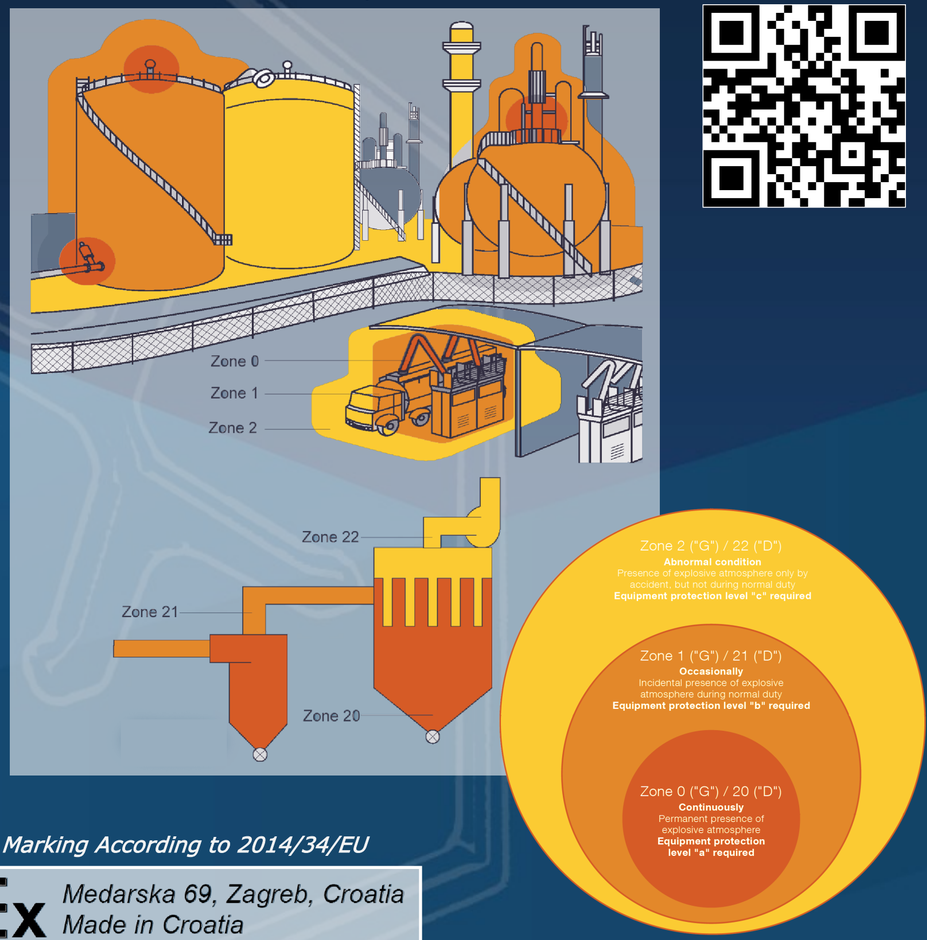
Dust Group	
IIIA	Combustible flyings
IIIB	Non-conductive dust
IIIC	Conductive dust

Gas Group	Representative Gas
I	Methane
IIA	Propane
IIB	Ethylene
IIC	Hydrogen, Acetylene

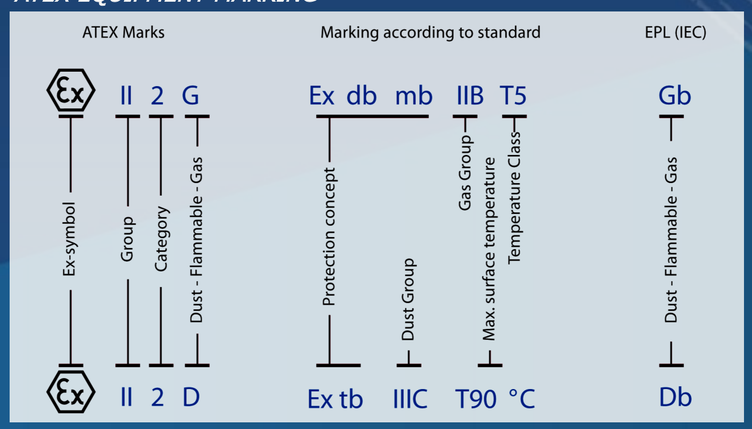
IP- MECHANICAL PROTECTION

Degrees of protection IP-code		
First numeral	Second numeral	Description of protection
1	-	Protection against solid objects >50 mm (hand protection)
2	-	Protection against solid objects >12,5 mm (finger protection)
3	-	Protection against solid objects >2,5 mm
4	-	Protection against solid objects >1 mm
5	-	Dust protected
6	-	Dust tight
-	1	Protection against vertically dripping water
-	2	Protection against dripping water (15° tilted)
-	3	Protection against spraying water (angle up to 60°)
-	4	Protection against splashing water from any direction
-	5	Protection against water jets
-	6	Protection against powerful water jets
-	7	Temporary immersion (0,15m/1m; 30 min)
-	8	Continuous immersion depth >1 m
-	9	High pressure water test

ZONES CLASSIFICATION / examples



ATEX EQUIPMENT MARKING



Typical Electrical Equipment Marking According to 2014/34/EU

MAKE YOUR WORK SURROUNDINGS SAFER