

Atex markings

94/9 EC product markings							typical IEC/CENELEC product markings				
CE symbol	explosion protection marking	equipment group	equipment category	explosive atmosphere suitability G: gas, vapor or mist D: dust	protection method	surface temperature class	Ex	d e	gas IIC	T6	Gb
							explosion marking	type of protection	explosion group	temperature class	equipment protection level (EPL-gas)
							Ex	t	dust IIIC	T80°C	Db
							explosion marking	type of protection	explosion group	max surface temperature	equipment protection level (EPL-dust)

Protection method (94/9 EC)

II 2 GD c T4

Protection method IEC/CENELEC

type of protection	sym.	protection concept	type of protection	sym.	typical application
flow restricting enclosure	fr	the explosive atmosphere is prevented from reaching the ignition source by the tight seals of the enclosure	flame proof enclosure	d	power apparatus, switchgears motors (all devices able to ignite flammable mixtures in normal operations)
flameproof enclosure	d	an ignition inside the equipment does not propagate the external atmosphere	powder filling	q	capacitors, electronics
inherent safety	g	low potential energy	pressurised apparatus	p	power apparatus (requires special measures to maintain safety features)
constructional safety	c	Ignition hazards are eliminated by the specification of the equipment	oil immersion	o	transformers
control of ignition source	b	sources of ignition are only present in the event of a malfunction	encapsulation	m	measuring and control systems (avoiding hot spots on printed boards)
pressurisation	p	the enclosure is purged with a protective gas (air) and pressurised to ensure that an external atmosphere cannot re-enter the enclosure	increased safety	e	terminal and connection boxes, squirrel cage motors and lighting (no incendiary or hot surfaces in normal operations)
liquid immersion	k	The enclosure has a suitable liquid to prevent the explosive atmosphere reaching the ignition source or to cool a hot surface	intrinsic safety	i	terminal and connection boxes, data processing (small electric values)

Hazardous area equipment

method	symbol	type of protection
exclusion	Ex tD	dust-excluding ignition proof
	Exm	encapsulation
	Extn	non-sparking (hermetically sealed devices, sealed devices and restricted breathing)
	Exp	pressurised enclosure / Rooms
	Exq	Sand-filled (powder filling)
explosion containment	Exd	flameproof enclosure
energy limitation	Exi	intrinsic safety
dilution	Exv	ventilation
avoidance of ignition source	Exe	increased safety
	Exn	non-sparking (inherit non parking)

Explosion group			Temperature classification		II 2 GD c T4
explosive atmospheres	typical hazardous material	explosion group	maximum surface temperature		IEC
gases and vapors	acetylene hydrogen ethylene propane	IIC IIC/IIB+H2 IIB IIA	[°C]	[°F]	
			450	842	T1
			300	572	T2
			280	536	
			260	500	
dust	metal dust coal dust grain dust	IIIC IIIC IIIB	230	446	
			215	416	
			200	392	T3
			180	356	
			165	329	
fibres and flyings	wood, paper or cotton processing	IIIA	160	320	
			135	275	T4
			120	248	
			100	212	T5
			85	185	T6

Zone classification / Equipment protection level

hazardous mixtures	period of presence of the flammable substances	zone classification	94/9/EC		IEC 60079-0		protection level
			equipment group	category	protection group	equipment protection level	
gas, mist, vapor	continuous for long periods or frequently	zone 0	II	1G	II	Ga	very high
	occasional occurrence	zone 1	II	2G	II	Gb	high
	not likely, but if it does occur only rarely and for a short period	zone 2	II	3G	II	Gc	increased
dust	continuous for long periods or frequently	zone 20	III	1D	III	Da	very high
	occasional occurrence	zone 21	III	2D	III	Db	high
	not likely, but if it does occur only rarely and for a short period	zone 22	III	3D	III	Dc	increased
methane		mining	I	M1	I	Ma	very high
coal dust		mining	I	M2	I	Mb	high

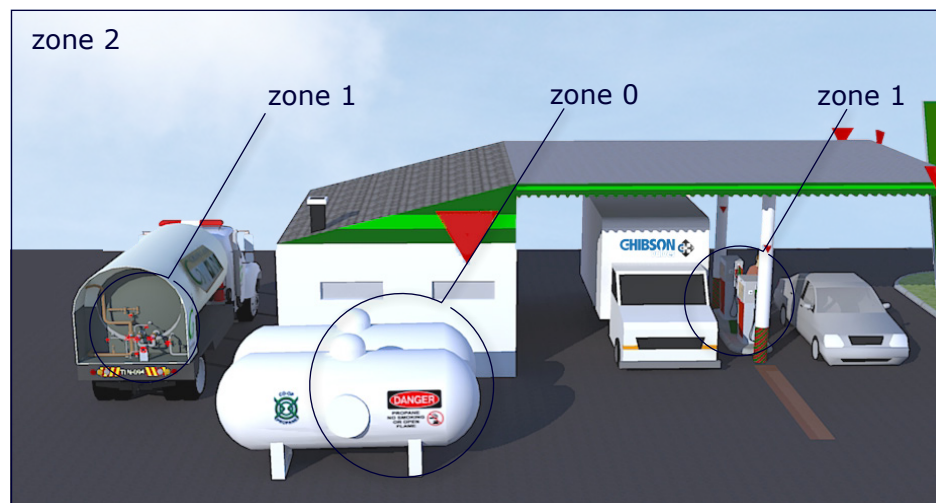
Group II - non mining areas

zone	type of atmosphere	presence of explosive atmosphere	category of devices
0 20	gas (G) dust (D)	continuous long period	1
1 21	gas (G) dust (D)	occasional	2
2 22	gas (G) dust (D)	seldom, short periods	3

Hazardous area equipment

The class of an entire assembled system is the one of the lowest classified item.

valve	coil	resulting category
II 2GD T4 T150°C	II 2GD T5	II 2GD T4 T150°C
II 2GD T4 T150°C	II 3GD T150°C	II 3GD T4 T150°C
II 2G T4	II 2GD T5	II 2G T4
II 2G T4	II 2Gd IIC T6	II 2GD IIC T4

Example area zones
**gas / vapour
area zones**

**dust area
zones**
