

Explosion Protection - Markings

2014/34/EU (ATEX) Markings		Typical IEC/CENELEC Product Markings			
ATEX Required Markings		Gas		Dust	
Explosion Protection Marking	II	Ex	IIC	Ex	IIC
Equipment Group	2	Gb	tb	Db	tb
Equipment Category	D	T6	Ex	T80°C	Db
Explosive Atmosphere Suitability (G - Gas, vapor or mist)					IPXX
Explosive Atmosphere Suitability (D - Dust)					
Explosion Protection Marking					
Type of protection (Gas)					
Explosion Group (Gas)					
Temperature Class (Gas)					
Equipment Protection Level (EPL-Gas)					
Explosion Protection Marking					
Type of protection (Dust)					
Explosion Group (Dust)					
Max. Surface Temperature (Dust)					
Equipment Protection Level (EPL-Dust)					
IP Protection Level					

Zone Classification / Equipment Protection Level			
Hazardous mixture	Period of presence of the flammable substances	Zone Classification	Equipment Protection Level EPL
Gas Mist Vapor	Continuously for long periods or frequently	Zone 0	Ga
	Occasional occurrence	Zone 1	Gb
	Not likely, but if it does occur only rarely and for a short period	Zone 2	Gc
Dust	Continuously for long periods or frequently	Zone 20	Da
	Occasional occurrence	Zone 21	Db
	Not likely, but if it does occur only rarely and for a short period	Zone 22	Dc

Gas Groups		Ignition temperature / Temperature Class of gas	
Marking	Gas	Ignition temperature of gas	Explosion Group II
IIA	propane	630°C	
IIB	ethylene	595°C	
IIC	hydrogen	560°C	
		470°C	
		425°C	
		365°C	
		305°C	
		259°C	
		170°C	
		95°C	

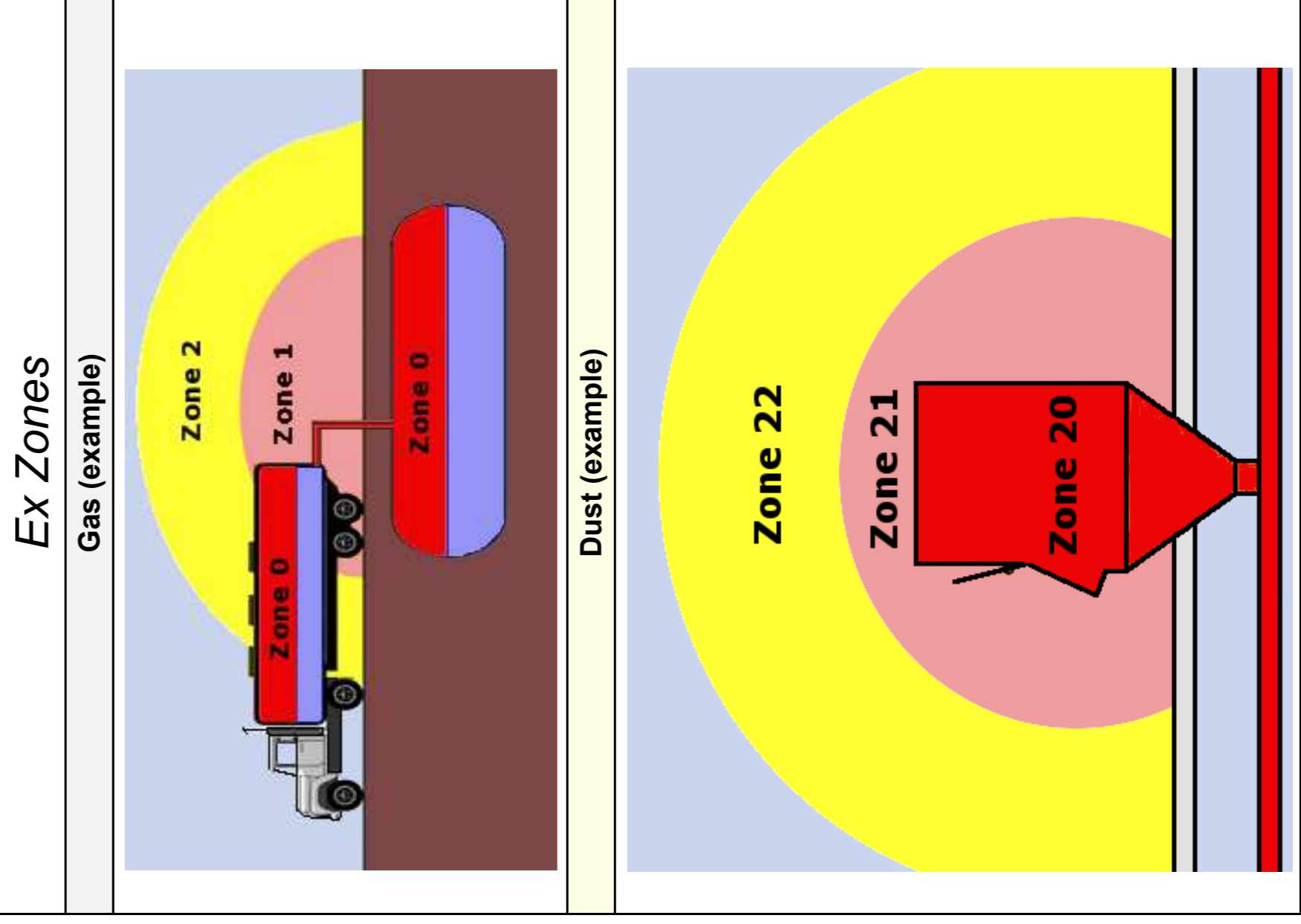
Dust Groups		Dust ingress protection	
Marking	Dusts	Protection Level	Geräte der Gruppe
IIIA	Combustible flyings	IIIC	IIIA
IIIB	Non-conductive dust	IP6X	IP6X
IIIC	Conductive dust	IP6X	IP6X
		IP6X	IP6X

Method of Explosion Protection									
Type of Protection / Description of Protection	in potentially explosive gas atmospheres	Protection Concept	Zone	Norm		Applications			
				EN	Category / EPL				
o	Oil Immersion	Exclusion of Ex-atmosphere and surface temperature limitation	1 or 2	EN 60079-6	2 G / Gb 3 G / Gc	Transformers, relays, control stations, magnetic contactors			
	Powder Filling	Prevent the flame propagation and surface temperature limitation	1 or 2	EN 60079-5	2 G / Gb 3 G / Gc	Capacitors, transformers, relays			
ma mb mc	Encapsulation	Exclusion of Ex-atmosphere and surface temperature limitation	0, 1, 2 1 or 2 2	EN 60079-18	1 G / Ga 2 G / Gb 3 G / Gc	Coils of motors or relays, solenoid valves, connection systems			
px py pz	Pressurized Enclosure	Exclusion of Ex-atmosphere and surface temperature limitation	1 or 2 1 or 2 2	EN 60079-2	2 G / Gb 2 G / Gb 3 G / Gc	Switch and control stations, motors, analyzers, computers			
d	Flameproof Enclosure	Contain the explosion, prevent the flame propagation and surface temperature limitation	1 or 2	EN 60079-1	2 G / Gb 3 G / Gc	Control stations, motors, fuses, switchgear, power electronics			
e	Increased Safety	No arcs, sparks or hot Surfaces	1 or 2	EN 60079-7	2 G / Gb 3 G / Gc	Junction and connection boxes, enclosures, motors, lights, terminals			
ia ib ic	Intrinsically Safety Intrinsically Safety	Limit the energy of the spark and surface temperature limitation	0, 1, 2 1 or 2 2	EN 60079-11 EN 60079-25*	1 G / Ga 2 G / Gb 3 G / Gc	Measurement and control technology, automation technology, sensors, actuators			
nA nC	Non-Sparking Enclosed Break	No arcs, sparks or hot surfaces Prevent the flame propagation	2	EN 60079-15	3 G / Gc	all applications for zone 2			
nR	Restricted Breathing	Protection by enclosure							
op is	Optical Radiation	Limit or prevent energy transmission from optical radiation	0, 1, 2	EN 60079-28	1 G, 2 G, 3 G / Ga, Gb, Gc	Opto-electronic devices			
op pr op sh	Optical Radiation		1 or 2	EN 60079-28	2 G, 3 G / Gb, Gc				
Type of Protection / Description of Protection									
in potentially explosive dust atmospheres									
ta tb tc	Protection by enclosure	Keep the combustible dust out and surface temperature limitation	20, 21, 22	EN 60079-31	1 D / Da 2 D / Db 3 D / Dc	Junction and connection boxes, enclosures, motors, lights, switch and control cabinets, plugs			
ia ib ic	Intrinsically Safety	Limit the energy of the spark and surface temperature limitation	20, 21, 21 or 22	EN 60079-11	1 D / Da 2 D / Db 3 D / Dc	Measurement and control technology, automation technology, sensors, actuators			
p	Pressurized	Exclusion of Ex-atmosphere and surface temperature limitation	22	EN 60079-2	2 D / Db 3 D / Dc	Switch and control stations, motors, analyzers, computers			
ma mb mc	Encapsulation	Exclusion of Ex-atmosphere and surface temperature limitation	20, 21, 22 22	EN 60079-18	1 D / Da 2 D / Db 3 D / Dc	Coils of motors or relays, solenoid valves, connection systems			

Additional marking

Marking	Conditions
without	device can be used without restriction
X	special conditions for safe use
U	ex component with partial certificate cannot be used alone

Localisation of Gas- and Dust- Ex Zones



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1) Standard marking - alternate marking possible e.g.: Ex db e IIC T6 / Ex tb IIC T80°C IPXX

* Intrinsically safe systems