

AREA CLASSIFICATION			
	Explosive atmospheres present continuously, long periods or frequently	Explosive atmospheres are likely to occur	Explosive atmospheres are unlikely to occur or present only infrequently and for a short period only
CENELEC / IEC	Zone 0 (Zone 20 - dust)	Zone 1 (Zone 21 - dust)	Zone 2 (Zone 22 - dust)
USA	Class I (gas) Class I (gas)	Zone 1*	Zone 2

* Equipment which is certified for Class I, Zone 1 can automatically be used in Class I, Division 2

AREA CLASSIFICATION			
		Explosive atmospheres can exist all of the time or some of the time under normal operating conditions	Explosive atmospheres are not likely to exist under normal operating conditions
USA	Class I (gas) Class II (dust) Class III (fibers)	Division 1	Division 2

NEC 500

Class I, Division 1, Groups A, B, C, D, T6

NEC 505

Class I, Zone 1, AEx

IEC

Ex

CENELEC

New marking according to ATEX



II 2 G

EEx

ed

IIC

T6

ed

IIC

T6

ed

IIC

T6

EXPLOSION GROUPS ACCORDING NEC 500

Typical Gas/Dust/Fiber	Group	
Acetylene	Class I	Group A
Hydrogen	Class I	Group B
Ethylene	Class I	Group C
Propane	Class I	Group D
Methane	Mining	
Metal dust	Class II	Group E
Coal dust	Class II	Group F
Grain dust	Class II	Group G
Fibers	Class III	

TEMPERATURE CLASSES

Maximum surface temperature	USA (NEC 500)
450°C	T1
300°C	T2
280°C	T2A
260°C	T2B
230°C	T2C
215°C	T2D
200°C	T3
180°C	T3A
165°C	T3B
160°C	T3C
135°C	T4
120°C	T4A
100°C	T5
85°C	T6

EQUIPMENT-GROUP I (Mining)

	Category M1 very high level of protection	Category M2 high level of protection
Sufficient Safety	by means of 2 protective measures / 2 faults	The equipment is intended to be de-energized in the event of an explosive atmosphere

EQUIPMENT-GROUP II (other explosive atmospheres)

	Category 1* very high level of protection		Category 2* high level of protection		Category 3* normal level of protection	
Sufficient Safety	by means of 2 protective measures / 2 faults		frequently occurring equipment faults / 1 fault		during normal operation	
Can be used in Atmosphere	Zone 0	Zone 20	Zone 1	Zone 21	Zone 2	Zone 22
G=Gas, D=Dust	G	D	G	D	G	D

* II (I) G = associated electrical apparatus – installation in the safe area

EXPLOSION GROUPS ACCORDING CENELEC, IEC, NEC 505

Explosion group	Typical gas
I	Methane
II A	Propane
II B	Ethylene
II C	Hydrogen

TEMPERATURE CLASSES

Maximum surface temperature	CENELEC IEC USA (NEC 505)
450°C	T1
300°C	T2
200°C	T3
135°C	T4
100°C	T5
85°C	T6

Classification of Gases and Vapours into EXPLOSION GROUPS and TEMPERATURE CLASSES

	T1	T2	T3	T4	T5	T6
I	Methane					
II A	Acetone Ethane Ammonia Benzol (pure) Acetic acid Methane (natural gas) Methanol Propane Toluene	Ethanol i- Amyl acetate n-Butane n-Butyl alcohol	Benzene Diesel fuel Aircraft fuel Heating oil n-Hexane	Acetylaldehyde Ethylether		
II B	Coal gas (lighting gas)	Ethylene				
II C	Hydrogen	Acetylene				Carbon disulphide

TYPES OF PROTECTION

Type of protection	Diagram	Main application	Standard
Increased safety		Terminal and connection boxes, control boxes for installing Ex-components (which have a different type of protection), squirrelcage motors, light fittings	EN 50 019 IEC 60 079-7 FM 3600 UL 2279
Flameproof enclosure		Switchgear and control gear and indicating equipment, control systems, motors, transformers, heating equipment, light fittings	EN 50 018 IEC 60 079-1 FM 3600 UL 2279
Pressurized apparatus		Switchgear and control cabinets, analysers, large motors	EN 50 016 IEC 60 079-2 FM 3620 NFPA 496
Intrinsic safety		Instrumentation technology, communication technology, sensors, actuators	EN 50 020 IEC 60 079-11 FM 3610 UL 2279
Oil immersion		Transformers, starting resistors	EN 50 015 IEC 60 079-6 FM 3600 UL 2279
Powder filling		Transformers, capacitors, terminal boxes for heating conductors	EN 50 017 IEC 60 079-5 FM 3600 UL 2279
Encapsulation		Switchgear for low power, control and signalling units, display units, sensors	EN 50 028 IEC 60 079-18 FM 3600 UL 2279
Type of protection n		All electrical apparatus for Zone 2, lighting equipment, less suitable for switchgear and control gear	EN 50 021 IEC 60 079-15

ia = use in Zone 0, 1, 2

ib = use in Zone 1, 2

[IEEx ib] = associated electrical apparatus – installation in the safe area

Ex plosive facts

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