

CENELEC-IEC AND NEC COMPARISON

International electrotechnical Commission (www.iec.ch)

The IEC (International Electrotechnical Commission), created in 1904 in Geneva (Switzerland) establish the IEC regulations.

In 1947, with the creation of the International Standards Organisation (ISO) by the United Nations, the IEC became responsible for the organisation of the electrical division, while still remaining independant.

The IEC has defined three categories of hazardous zones (see page 18) :

- Zone 0 : the explosive atmosphere is continuously present.
- Zone 1 : the explosive atmosphere is often present.
- Zone 2 :the explosive atmosphere may accidentally be present.

Gas and vapour classification

Gases are divided into four groups by the CEC and the NEC (with some additional gases).

The IEC also defines different groups of gases and vapours.

The IEC and North American groups are viewed as fundamentally the same, apart from the

fact that there are three groups in the IEC and four for the NEC.

(See table as follows)

Temperature classification

IEC defined a temperature classification for materials used in hazardous areas.

Following this, CEC and NEC have also been modified to include a temperature classification.

(See table as follows).

GAS AND VAPOUR CLASSIFICATION

IEC	Group		Gas or vapour
	IEC	NEC (North America)	
II C	A		Acetylene
II C	B		Hydrogen
II B	C		Ethylene
II B	C		Ethyl ether
II B	C		Cyclopropane
II B	C		Butadene 1-3
II A	D		Propane
II A	D		Ethane
II A	D		Butane
II A	D		Benzène
II A	D		Pentane
II A	D		Heptane
II A	D		Acetone
II A	D		Methyl Ethyl
II A	D		Methyl Alcohol
II A	D		Ethyl Alcohol

TEMPERATURE CLASSIFICATION

Temperatures IN °C	Classification	
	IEC	NEC (North America)
450	T1	T1
300	T2	T2
280	T2	T2A
260	T2	T2B
230	T2	T2C
215	T2	T2D
200	T3	T3
180	T3	T3A
165	T3	T3B
160	T3	T3C
135	T4	T4
120	T4	T4A
100	T5	T5
85	T6	T6

Group 1 - underground workin mine

Group 2 - surface industry

CENELEC-IEC / NEC COMPARISON

Inflammable Material	CENELEC/IEC				NEC		
	Protection	Zone	Group	Subdivision	Class	Division	Group
Gases and vapours							
Acetylene	d - e	1,2	II	C	I	1 - 2	A
Hydrogen	d - e	1,2	II	C	I	1 - 2	B
Propylene Oxide	d - e	1,2	II	B	I	1 - 2	B
Ethyl ether	d - e	1,2	II	B	I	1 - 2	C
Ethylene	d - e	1,2	II	A	I	1 - 2	D
Acetone	d - e	1,2	II	A	I	1 - 2	D
Benzene	d - e	1,2	II	A	I	1 - 2	D
Butane	d - e	1,2	II	A	I	1 - 2	D
Propane	d - e	1,2	II	A	I	1 - 2	D
Hexane	d - e	1,2	II	A	I	1 - 2	D
Paint Solvents	d - e	1,2	II	A	I	1 - 2	D
Natural Gas	d - e	1,2	II	A	I	1 - 2	D
Combustible dusts	Protection		Zone				
Magnesium Aluminium or metallic dusts with $R \leq 10^5$ Ohms x cm	D/DIP		21-22		II	1	E
Coal	D/DIP		21-22		II	1	F
Floor Non metallic dusts with $R > 10^5$ Ohms x cm	D/DIP		21-22		II	2	G
Fibers and flyings							
Rayon Cotton Linen Wood Hemp Flax bast Tow Coconut fiber Oakum					III	1 - 2 ⁽¹⁾	

(1) Division 1 : manufacturing location
Division 2 : storage location

Continuation> CENELEC-IEC/NEC comparison

EQUIPMENT TYPES IEC, EN, UL CORRESPONDANCES

Equipment	IEC	CENELEC	UL (NEC)
Fixed luminaires for general use	<ul style="list-style-type: none"> • IEC 60079.0 • IEC 60079.1 and/or 60079.7 • IEC 60598.1 	<ul style="list-style-type: none"> • EN 50 014 • EN 50 018 and/or 50 019 • EN 60598.1 	<ul style="list-style-type: none"> • UL 844
Portable equipment			<ul style="list-style-type: none"> • UL 844 • UL 781
Floodlights and lamps			<ul style="list-style-type: none"> • UL 844 • UL 783
Luminaires with fluorescent lamps			<ul style="list-style-type: none"> • UL 844 • UL 1570
Luminaires with incandescent lamps			<ul style="list-style-type: none"> • UL 844 • UL 1571
Power outlets	<ul style="list-style-type: none"> • IEC 60079.0 • IEC 60079.1 and/or 60079.7 • IEC 60309.1 (IEC 60309.2) 	<ul style="list-style-type: none"> • EN 50 014 • EN 50 018 and/or 50 019 • EN 60 309.1 (EN 60 309.2) 	<ul style="list-style-type: none"> • UL 1010 • UL 1682
Switches	<ul style="list-style-type: none"> • IEC 60079.0 • IEC 60079.1 and/or 60079.7 • IEC 60947.1 • IEC 60947.3 	<ul style="list-style-type: none"> • EN 50 014 • EN 50 018 and/or 50 019 • EN 60 947.1 • EN 60 947.3 	<ul style="list-style-type: none"> • UL 508 • UL 98 • UL 1087 • UL 894