

HazLoc Hand Chart

Protection Method	Ex Code	Standard IEC / EN / BS / ANSI/ISA	Gas			Dust		
			ATEX Category	IEC / EN (ATEX) / BS (UK) Zone	EPL	USA (NEC 505) Zone	EPL	ATEX Category
Intrinsic Safety	ia	60079-11	1G	Zone 0	Ga	Zone 20	Da	1D
	ib		2G	Zone 1	Gb	Zone 21	Db	2D
	ic		3G	Zone 2	Gc	Zone 22	Dc	3D
Flameproof	da	60079-1	1G	Zone 0 Not for USA	Ga			
	db		2G	Zone 1	Gb			
	dc		3G	Zone 2	Gc			
Protection by Enclosure	ta	60079-31				Zone 20	Da	1D
	tb					Zone 21	Db	2D
	tc					Zone 22	Dc	3D
Pressurisation	pxb	60079-2	2G	Zone 1	Gb	Zone 21	Db	2D
	pyb		2G	Zone 1	Gb	Zone 21	Db	2D
	pzc		3G	Zone 2	Gc	Zone 22	Dc	3D
Increased Safety	eb	60079-7	2G	Zone 1	Gb			
	ec		3G	Zone 2	Gc			
Encapsulation	ma	60079-18	1G	Zone 0	Ga	Zone 20	Da	1D
	mb		2G	Zone 1	Gb	Zone 21	Db	2D
	mc		3G	Zone 2	Gc	Zone 22	Dc	3D
Liquid Immersion	ob	60079-6	2G	Zone 1	Gb			
	oc		3G	Zone 2	Gc			
Powder Filling	q	60079-5	2G	Zone 1	Gb			2D
Hermetically Sealed / Non-Incendive Restricted Breathing	nC	60079-15	3G	Zone 2	Gc			
	nR		3G	Zone 2	Gc			
Pressurised Room	px	60079-13	2G	Zone 1	Gb	Zone 21	Db	2D
	py		2G	Zone 1	Gb			
	pz		3G	Zone 2	Gc	Zone 22	Dc	3D
	pv			Non-hazardous	Gb/GC			
Optical Radiation	op sh	60079-28	1G	Zone 0	Ga	Zone 20	Da	1D
	op is		1G	Zone 0	Ga	Zone 20	Da	1D
	op pr		2G	Zone 1	Gb	Zone 21	Db	2D
Special Protection	sa	60079-33	1G	Zone 0	Ga	Zone 20	Da	1D
	sb		2G	Zone 1	Gb	Zone 21	Db	2D
	sc		3G	Zone 2	Gc	Zone 22	Dc	3D
Non-electrical Equipment - Basic Method and Requirements	h	ISO 80079-36	1G	Zone 0	Ga	Zone 20	Da	1D
			2G	Zone 1	Gb	Zone 21	Db	2D
			3G	Zone 2	Gc	Zone 22	Dc	3D

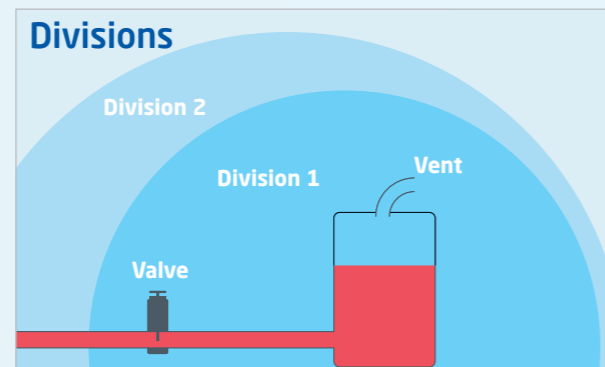
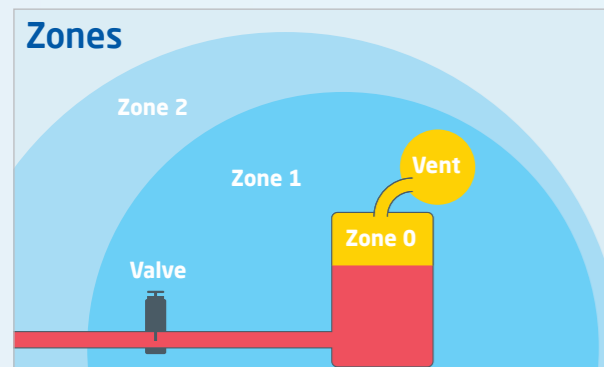
Reference Standards

Explosive Atmospheres, General Requirements	IEC / EN / BS / ANSI/ISA 60079-0
Classification of Hazardous Areas	IEC / EN / BS / ANSI/ISA 60079-10-1/2
Electrical Installations	IEC / EN / BS 60079-14, NEC 505 to 509, ANSI/UL 2225
Inspection & Maintenance	IEC / EN / BS 60079-17, NEC 505 to 509, ANSI/UL 2225

Protection Method	Code	USA (NEC 500) FM & UL	Canada (CEC) CSA	Gas	Dust
Intrinsic Safety	IS	FM3610/ UL913 UL698A	C22.2 No. 157	Class I, Div 1 Class I, Div 2	Class II, Div 1 Class II, Div 2 Class III, Div 1 Class III, Div 2
Explosion-proof Dust Ignition-proof	XP	ANSI/UL1203 FM3615 FM3616	C22.2 No. 30	Class I, Div 1 Class I, Div 2	Class II, Div 1 Class II, Div 2
Dust-tight			C22.2 No. 25		Class II, Div 2 Class III, Div 1 Class III, Div 2
Purged and Pressurised	Type X	NFPA 496 FM3620	C22.2 No. 60079-2	Class I, Div 1	Class II, Div 1
	Type Y			Class I, Div 1	Class II, Div 1
	Type Z			Class I, Div 2	Class II, Div 2
Oil Immersion				Class I, Div 2	
Non-incendive Hermetically Sealed	NI		C22.2 No. 213	Class I, Div 2	Class II, Div 2 Class III, Div 1 Class III, Div 2
Pressurised Room		FM3611 NFPA 496			Class I, Div 1 Class I, Div 2 Class II, Div 1 Class II, Div 2
Optical System	op sh			Class I, Div1 Class I, Div 2	Class II, Div1 Class II, Div 2
Optical Radiation	op is			Class I, Div1 Class I, Div 2	Class II, Div1 Class II, Div 2
Optical Radiation	op pr			Class I, Div 2	Class II, Div 2

Reference Standards

	NEC500	C22.2 No. 0		
	NEC500			
	NEC 501 to 504, ANSI/UL 2225	C22.2 No. 174		
	NEC 501 to 504			



Temperature Class

Maximum Surface Temperature	IEC, EU (Europe) USA (NEC 505)	USA (NEC 500) Canada
450°C (842°F)	T1	T1
300°C (572°F)	T2	T2
280°C (536°F)		T2A
260°C (500°F)		T2B
230°C (446°F)		T2C
215°C (419°F)		T2D
200°C (392°F)	T3	T3
180°C (356°F)		T3A
165°C (329°F)		T3B
160°C (320°F)		T3C
135°C (275°F)	T4	T4
120°C (248°F)		T4A
100°C (212°F)	T5	T5
85°C (185°F)	T6	T6

US NEMA / UL50 Ratings

NEMA / UL50	IP Rating Approximate	Abbreviated Description
1	IP20	General purpose indoors from contact with contents
3	IP55	Outdoors, rain, sleet & ice damage
3R	IP24	Outdoors, falling rain & ice damage
3S	IP54	Outdoors, dust tight, rain tight, sleet, windblown dust & ice damage
4	IP65	Indoors/Outdoors, windblown rain and dust, splashing & direct hose, icing
4X	IP66	NEMA 4 plus corrosive agents

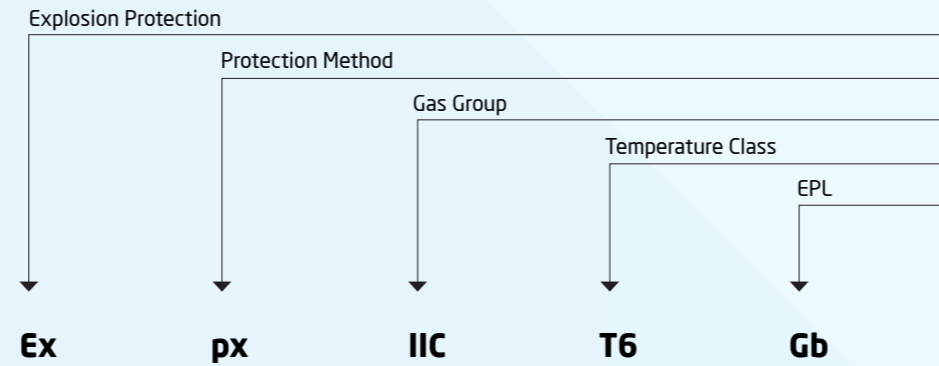
IP Ratings (IEC 60529)

First number Protection against solid bodies	Second number Protection against liquid
0 - No Protection	0 - No Protection
1 - Objects greater than 50 mm	1 - Vertically dripping water
2 - Objects greater than 12.5 mm	2 - Dripping water at 15°
3 - Objects greater than 2.5 mm	3 - Sprayed water at 60°
4 - Objects greater than 1.0 mm	4 - Splashed water, any direction
5 - Dust-Protected	5 - Water jets, any direction
6 - Dust-tight	6 - Powerful water jet, any direction
	7 - Temporary immersion, 0.15 m to 1 m
	8 - Continuous immersion, specific depth

Hazardous Area Equipment Mark

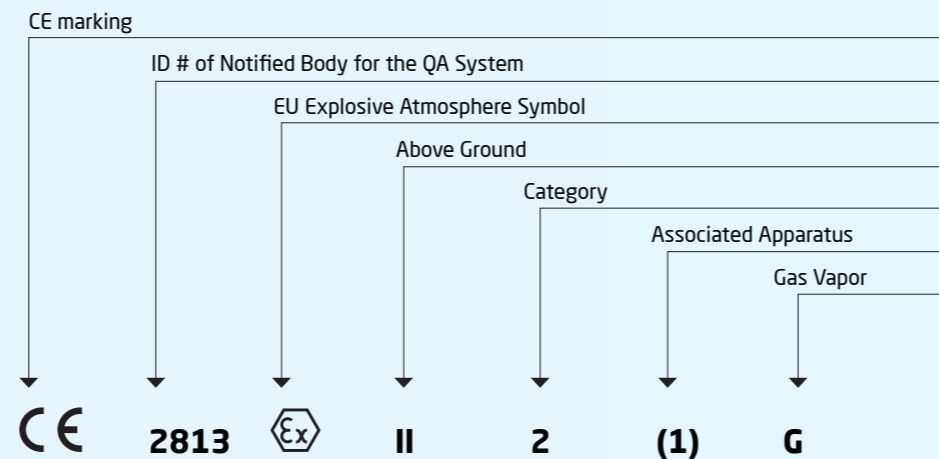
Markings for IEC / ATEX

IEC / ATEX



European (EU) ATEX Directive (94/9/EC)

(Mandatory end June 2003 not applicable to mobile plants)

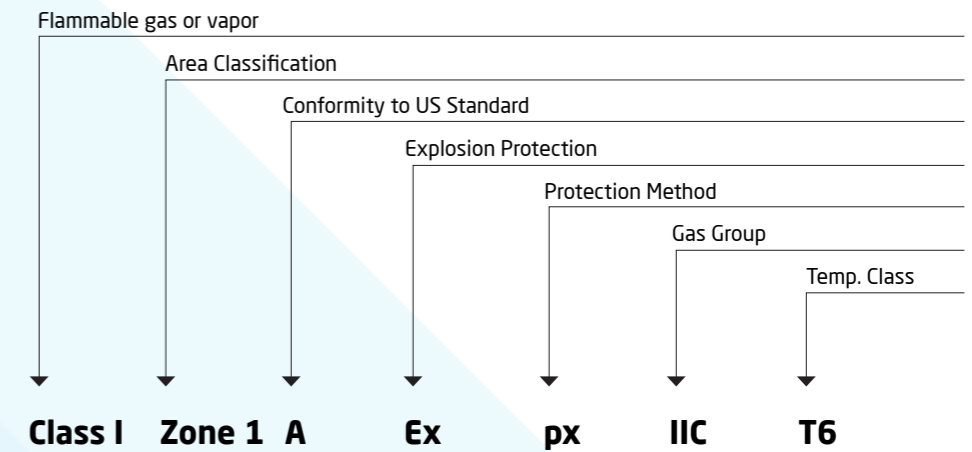


Markings for North America

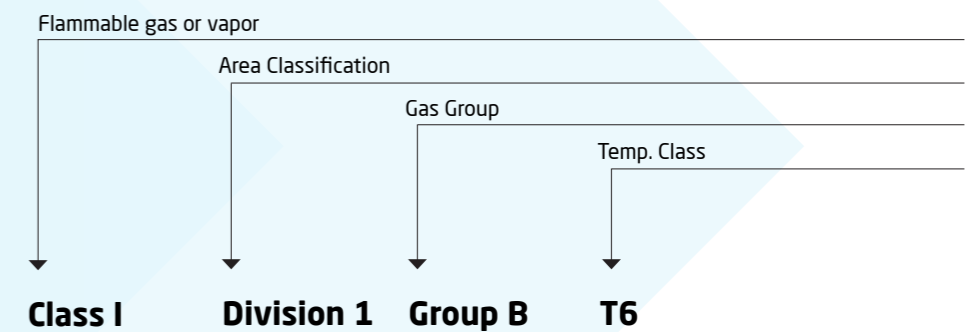
Canada (Zone System)

Ex p IIC T4

USA (NEC 505)



USA (NEC 500)



EPLs, Equipment Groups and Categories

IEC / EN / USA (NEC 505)			ATEX Directive 2014/34/EU		Atmosphere
EPL - Equipment Protection Level	Zones	Material Groups	Equipment Group	Equipment Category	
Ma	Not Applicable	I	I	M1	Mines susceptible to firedamp
Mb				M2	
Ga	0	IIA IIB IIC	II	1G	Gas, vapours or mists
Gb	1			2G	
Gc	2			3G	
Da	20	IIIA IIIB IIIC	II	1D	Dust
Db	21			2D	
Dc	22			3D	

Gas & Dust Groupings

Gas, Dust or Fibre	IEC / ATEX / USA (NEC 505) / Canada (CEC)	Canada (CEC) USA (NEC 500)
Acetylene	Group IIC	Class I, Group A
Hydrogen		Class I, Group B
Ethylene	Group IIB	Class I, Group C
Propane	Group IIA	Class I, Group D
Methane	Group I, IIA	Class I, Group D
Metal Dust	Group IIIC	Class II, Group E (Div 1 only)
Coal Dust	Group IIIB	Class II, Group F
Grain	Group IIIB	Class II, Group G
Fibres	Group IIIA	Class II, Group H