

ATEX Certificate Number			
SIRA	13	ATEX	1234
			Serial Number
			Year of Certification
			Reference to ATEX 95 Directive
Name of Notified Body performing EC-type examination			
Suffixes: U – component certification X – special conditions for safe use apply			

IECEx Certificate Number			
IECEx	CSA	13.	1234
			Serial Number
			Year of Certification
			Name of body Performing IECEx Certification
Reference to IECEx Scheme			
Suffixes: U – component certification X – special conditions for safe use apply			

Classification Of Divisions and Zones			
Type of Area	NEC & CEC*	ATEX & IEC	Definitions
Continuous hazard	Division 1	Zone 0 / Zone 20 Cat1	A place in which an explosive atmosphere is continuously present
Intermittent hazard	Division 1	Zone 1 / Zone 21 Cat 2	A place in which an explosive atmosphere is likely to occur in normal operation
Hazard under abnormal conditions	Division 2	Zone 2 / Zone 22 Cat 3	A place in which an explosive atmosphere is not likely to occur in normal operation, but may occur for short periods

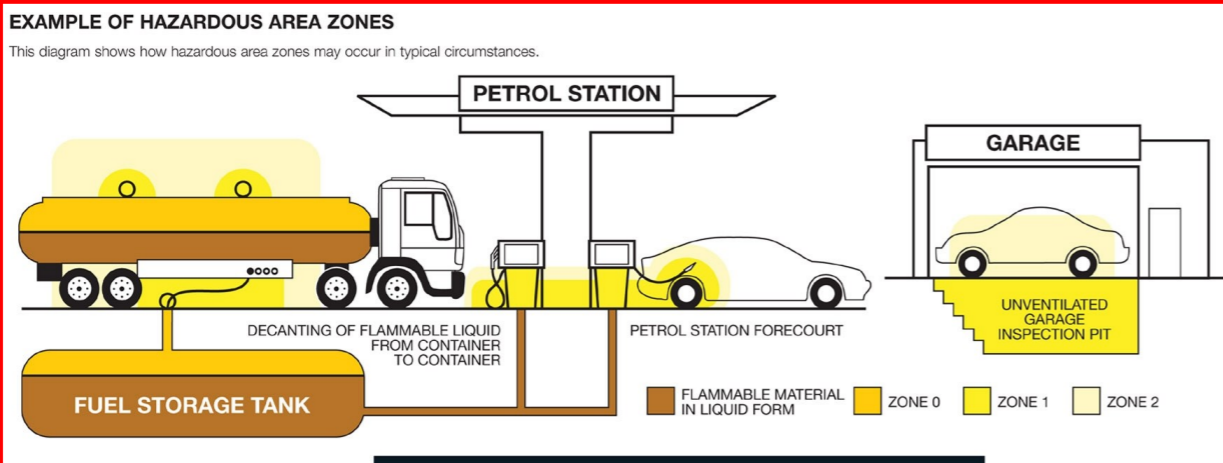
* On occasion the ATEX and IEC Zones may be used in the corresponding NEC an CEC system

Equipment Groups (ATEX and IECEx)					
Equipment Group	Equipment Category	Equipment Protection Level	Atmosphere	Protection Level	Required Protection Performance & Operation
I - Mines with firedamp	M1	Ma	Methane & Dust	Very High	Two Faults. Remain energised & functioning
	M2	Mb		High	Severe normal operation. De-energise in explosive atmosphere
II - All other areas	1	Ga / Da	Gas, Vapour, Mist, Dust	Very High	Two Faults
	2	Gb / Db		High	One Fault
	3	Gc / Dc		Low	Normal Operation

Enclosure Type Ratings (NEMA / CSA / UL)		
Type	Area	Brief Definition
1	Indoor	General purpose
2	Indoor	Protection against angled dripping water
3, 3R, 3S	Indoor / Outdoor	Protection against rain, snow
4, 4X	Indoor / Outdoor	Protection against rain, snow, hose directed water
5	Indoor	Protection against angled dripping water, dust, fibers, flyings
6	Indoor / Outdoor	Protection against temporary submersion
6P	Indoor / Outdoor	Protection against prolonged submersion
12, 12K	Indoor	Protection against circulating dust, fibers, flying
12	Indoor	Protection against circulating dust, fibers, flyings, seepage

Apparatus Groups (ATEX and IECEx)			
Group	Environment	Location	Typical Substance
I		Coal Mining	Methane (Fire damp)
IIA	Gases, Vapours	Surface and other Locations	Acetic acid, Acetone, Ammonia, Butane, Cyclohexane, Gasoline (petrol), Kerosene, Methane (natural gas) (non-mining), Methanol (methyl alcohol), Propane, Propan-2-ol (iso-propyl alcohol), Toluene, Xylene
IIB			Di-ethyl ether, Ethylene, Methyl ethyl ketone (MEK), Propan-1-ol (n-propyl alcohol), Ethanol (ethyl alcohol)
IIC			Acetylene, Hydrogen, Carbon disulphide
IIIA	Combustible Dusts	Surface and other locations	Combustible flyings
IIIB			Non-conductive
IIIC			Conductive

Temperature Classification			
Classification of maximum surface temperatures for Group II Electronic Equipment (T Class).			
Gas / Vapour	Apparatus Group	Temperature Class	Temperature
Ammonia	IIA	T1	630°
Hydrogen	IIC	T1	560°
Methane	IIA	T1	537°
Propane	IIA	T1	470°
Ethylene	IIB	T2	425°
Butane	IIA	T2	372°
Acetylene	IIC	T2	305°
Cyclohexane	IIA	T3	259°
Kerosene	IIA	T3	210°
Di-ethyl Ether	IIB	T4	160°
Carbon Disulphide	IIC	T6	95°



Protection Concepts (ATEX and IECEx)					
Type of Protection	Symbol	Typical IEC EPL	Typical Zones(s)	IEC Standard	Basic Concept of Protection
Electrical equipment for Gases, Vapours and Mists (G)					
General Requirements	-	-	-	IEC 60079-0	-
Optical Radiation	Op pr Op sh Op is	Gb Ga Ga	1,2 0, 1,2 0, 1,2	IEC 60079-28	Protection against ignitions from optical radiation
Increased Safety Type 'n' (non-sparking)	e nA	Gb Gc	1,2 2	IEC 60079-7 IEC 60079-15	No areas sparks or hot surfaces. Enclosure IP54 or better
Flameproof	d	Gb	1,2	IEC 60079-1	Contain the explosion, quench the flame
Type 'n' (enclosed break)	nC	Gc	2	IEC 60079-15	
Quartz / Sand Filled	q	Gb	1,2	IEC 60079-5	Quench the flame
Intrinsic Safety	la lb lc	Ga Gb Gc	0, 1,2 1,2 2	IEC60079-11	Limit the energy of sparks and surface temperatures
Pressurised	px py pz	Gb Gb Gc	1,2 1,2 2	IEC60079-2	
Type 'n' (sealing & hermetic sealing) Type 'n' (restricted breathing)	nC nR	Gc Gc	2 2	IEC 60079-15	Keep the flammable gas out
Encapsulation	ma mb mc	Ga Gb Gc	0 1,2 1,2 2	IEC 60079-18	
Oil Immersion	o	Gb	1,2	IEC 60079-6	

Electrical equipment for Combustible Dusts (D)					
Type of Protection	Symbol	Typical IEC EPL	Typical Zones(s)	IEC Standard	Basic Concept of Protection
General Requirements	-	-	-	IEC 60079-0	-
Enclosure	ta tb tc	Da Db Dc	20 21 22	IEC 60079-31	Standard protection for dusts, rugged tight enclosure
Intrinsic Safety	ia ib ic	Da Db Dc	20 21 22	IEC 60079-11	Limit the energy of sparks and surface temperatures.
Encapsulation	ma mb mc	Da Db Dc	20 21 22	IEC 60079-18	Protection by encapsulation of incendive parts
Pressurised	pD	Db Dc	21,22 22	IEC 61241-4	Protection by pressurisation of enclosure

Non-Electrical Equipment					
Type of Protection	Symbol	Typical IEC EPL	Typical Zones(s)	IEC Standard	Basic Concept of Protection
General Requirements	-	-	-	EN 13463-1	Low potential energy
Flow Restricted Enclosure Flameproof Enclosure	fr d	- -	2,22 1,2,21,22	EN 13463-2 EN 13463-3	Relies on tight seals, closely matched joints and tough enclosures to restrict the breathing of the enclosure
Constructional Safety	c	-	All See EPL	EN 13463-5	Ignition hazards eliminated by good engineering methods
Control of ignition Sources	b	-	All See EPI	EN 13463-6	Control equipment fitted to detect malfunctions
Pressurisation	p	-	1,2 21,22	EN 60079-2 EN 61241-4	Enclosure is purged and pressurised to prevent ignition sources from arising
Liquid immersion	k	-	All See EPL	EN 13463-8	Enclosure uses liquid to prevent contact with explosive atmosphere

Typical ATEX 7 IECEx Marking (*ATEX only)

CE 0051 Ex II 2 GD

- CE: Complies with European Directives
- 0051: Notified Body Number
- Ex: Explosion Protection
- II: Gas Group
- 2: Type of Protection
- GD: Dust type

*Environment
*Equipment Category
*Equipment Group
*Specific Marking for Explosion Protection

Dusts Typical Ignition Temperatures (°C)		
Dusts	Cloud	Layer
Aluminium	590°C	>450°C
Coal dust (lignite)	380°C	225°C
Flour	490°C	340°C
Grain Dust	510°C	300°C
Methyl cellulose	420°C	320°C
Phenolic resin	530°C	>450°C
Polythene	420°C	(melts) °C
PVC	700°C	>450°C
Soot	810°C	570°C
Starch	460°C	435°C
Sugar	490°C	460°C

Ingress Protection Codes (IP)			
First Number (protect from solid bodies)	Second Number (protect from water)	First Number	Second Number
0	No protection	0	No protection
1	Objects > 50mm	1	Vertical drip
2	Objects > 12.5mm	2	Angled drip
3	Objects > 2.5mm	3	Spraying
4	Objects > 1.0mm	4	Splashing
5	Dust-protected	5	Jetting
6	Dust-tight	6	Powerful jetting
		7	Temporary immersion
		8	Continuous immersion

*This wall chart is to be used as an introduction to the classification of hazardous locations and for basic information only. Further information can be found at the following websites: www.csagroupuk.org / www.iecex.com / www.iecee.org

