

Area Classification

Standard	Flammable Material	Present Continuously ⁽¹⁾	Present Intermittently	Present Abnormally	
IEC / CENELEC	IEC / EN 60079-10-1	Gas / Vapour	Zone 0	Zone 1	Zone 2
	IEC / EN 60079-10-2	Combustible Dust or Ignitable Fibers	Zone 20	Zone 21	Zone 22
ATEX	Directive 99/92/EC	Gas / Vapour	Zone 0	Zone 1	Zone 2
		Combustible Dust or Ignitable Fibers	Zone 20	Zone 21	Zone 22
NEC 501	ANSI/NFPA 70 National Electrical Code Article 501	Gas / Vapour	Class I, Division 1	Class I, Division 1	Class I, Division 2
NEC 505	ANSI/NFPA 70 National Electrical Code Article 505	Gas / Vapour	Class I, Zone 0	Class I, Zone 1	Class I, Zone 2
NEC 502	ANSI/NFPA 70 National Electrical Code Article 502	Combustible Dust or Ignitable Fibers	Class II, Division 1	Class II, Division 1	Class II, Division 2
NEC 506	ANSI/NFPA 70 National Electrical Code Article 506	Combustible Dust or Ignitable Fibers	Zone 20	Zone 21	Zone 22
CEC Sec. 18	CSA C22.1 Canadian Electrical Code Section 18	Gas / Vapour	Class I, Zone 0	Class I, Zone 1	Class I, Zone 2
	CSA C22.1 Canadian Electrical Code Section 18	Combustible Dust or Ignitable Fibers	Class II, Division 1	Class II, Division 1	Class II, Division 2

(1) Electric motors are not allowed in Zone 0/20 locations;

Atmosphere Groups

Substance	ATEX IECEx Group ⁽³⁾	North America		
		Class	NEC / CEC Division System	NEC / CEC Zone System ⁽³⁾
Methane (Fire damp)	I	-	Gaseous	Mines ⁽²⁾
Propane	IIA	I	Group D	IIA
Ethylene	IIB		Group C	IIB
Hydrogen	IIC		Group B	IIC
Acetylene	IIC		Group A	IIC
Fibers and Flyings	IIIA	III	-	IIIA
Grain Dust	IIIB	II	Group G	IIIB
Coal Dust	IIIB		Group F	IIIB
Metal Dust	IIIC		Group E	IIIC

(2) Not within scope of NEC or CEC. Mining applications under jurisdiction of MSHA (Mine Safety & Health Association).

(3) Equipment with Gas Group marking IIC, covers also the Groups IIA and IIB. Equipment with Dust Group marking IIIC, covers also the Groups IIIA and IIIB.

Temperature Classes

IEC / CENELEC NEC 505 / CEC SECTION 18	NEC 500 / CEC Annex J	Maximum Surface Temperature
T1	T1	450 °C (842 °F)
T2	T2	300 °C (572 °F)
T3	T2A	280 °C (536 °F)
	T2B	260 °C (500 °F)
	T2C	230 °C (446 °F)
	T2D	215 °C (419 °F)
T4	T3	200 °C (392 °F)
	T3A	180 °C (356 °F)
	T3B	165 °C (329 °F)
T5	T3C	160 °C (320 °F)
	T4	135 °C (275 °F)
	T4A	120 °C (248 °F)
T6	T5	100 °C (212 °F)
	T6	85 °C (185 °F)

Protection Concepts

Type of Protection	Code / Symbol	Division / Zone	Market	Standard	Concept of Protection
Electrical Equipment for Flammable Gas, Vapours and Mist					
Flameproof Level of Protection "db"	Ex db	Zone 1	IECEX / ATEX	IEC / EN 60079-1	Contain the explosion and prevent flame propagation
	AEx db	Class I, Zone 1	US	ANSI / UL 60079-1	
Explosion Proof	(XP)	Class I, Division 1	Canada	CSA-C22.2 No. 145 / No. 30	No arcs, sparks or hot surfaces
	(XP)	Class I, Division 1	US	UL 674 / UL 1203	
Increased Safety Level of Protection "eb"	Ex eb	Zone 1	IECEX / ATEX	IEC / EN 60079-7	No arcs, sparks or hot surfaces
	AEx eb	Class I, Zone 1	US	ANSI / UL 60079-7	
Increased Safety Level of Protection "ec"	Ex ec	Zone 2	IECEX / ATEX	IEC / EN 60079-7	No arcs, sparks or hot surfaces
	AEx ec	Class I, Zone 2	US	ANSI / UL 60079-7	
Non-sparking "nA"	Ex nA	Zone 2	Canada	CAN/CSA-C22.2 No. 60079-15	No arcs, sparks or hot surfaces
	AEx nA	Class I, Zone 2	US	ANSI / UL 60079-15	
Nonincendive (Div.2)	(NI)	Class I, Division 2	Canada	CSA-C22.2 No. 0 / No. 213	No arcs, sparks or hot surfaces
	(NI)	Class I, Division 2	US	UL 674 / ISA 12.12.01	
Pressurized Level of Protection "pxb"	Ex pxb	Zone 1	IECEX / ATEX	IEC / EN 60079-2	Keep flammable gas out
	AEx pxb	Class I, Zone 1	US	ANSI / UL 60079-2	
	Ex pyb	Zone 1	IECEX / ATEX	IEC / EN 60079-2	
Pressurized Level of Protection "pyb"	Ex pyb	Zone 1	Canada	CAN/CSA-C22.2 No. 60079-2	Keep flammable gas out
	AEx pyb	Class I, Zone 1	US	ANSI / UL 60079-2	
	Ex pzc	Zone 2	IECEX / ATEX	IEC / EN 60079-2	
Pressurized Level of Protection "pzc"	Ex pzc	Zone 2	Canada	CAN/CSA-C22.2 No. 60079-2	Keep flammable gas out
	AEx pzc	Class I, Zone 2	US	ANSI / UL 60079-2	
	Type X	Class I, Division 1	Canada / US	NFPA 496	
Pressurized	Type Y	Class I, Division 1	Canada / US	NFPA 496	Keep flammable gas out
	Type Z	Class I, Division 2	Canada / US	NFPA 496	
	Electrical Equipment for Combustible Dusts				
Protection by Enclosure Level of Protection "tb"	Ex tb	Zone 21	IECEX / ATEX	IEC / EN 60079-31	Keep combustible dust out
	AEx tb	Class I, Zone 21	US	ANSI/UL 60079-31	
	Ex tc	Zone 22	IECEX / ATEX	IEC / EN 60079-31	
Protection by Enclosure Level of Protection "tc"	Ex tc	Zone 22	Canada	CAN/CSA-C22.2 No. 60079-31	Keep combustible dust out
	AEx tc	Class I, Zone 22	US	ANSI/UL 60079-31	
	(DIP)	Class II, Division 1	Canada	CSA-C22.2 No. 25	
Dust Ignition Proof	(DIP)	Class II, Division 1	US	UL 1203	Keep combustible dust out
	(NI)	Class II, Division 2	Canada	CSA-C22.2 No. 25	
Dust Protected	(NI)	Class II, Division 2	US	ANSI/UL 1604	Keep combustible dust out
	(PX)	Class II, Division 1	Canada / US	NFPA 496	
Pressurized	(PY)	Class II, Division 1	Canada / US	NFPA 496	Keep combustible dust out
	(PZ)	Class II, Division 2	Canada / US	NFPA 496	

Equipment Group, Category, Zone and Protection Level (EPL)

Equipment Group	Equipment Category (acc. ATEX Directive 2014/34/EU)	Zone	Equipment Protection Level	Atmosphere	Protection Level	Use
I (Mines)	M1	-	Ma	Methane (Fire damp)	Very High	Operable in Ex atmosphere
	M2	-	Mb	Methane (Fire damp)	High	De-energised in Ex atmosphere
II (All other)	1	0	Ga	G - Gas, Vapours D - Dust	Very High	Zones 0, 1 and 2
		20	Da			Zones 20, 21 and 22
	2	1	Gb		High	Zones 1 and 2
		21	Db			Zones 21 and 22
	3	2	Gc		Enhanced	Zone 2
		22	Dc			Zone 22

ATEX Marking (European)

CE 0598 Ex II 2 G Ex db IIB T4 Gb

CE Marking: Identification of the Notified Body responsible for EX Quality System approval. e.g. 0598 is the identification number for SGS Fimko.

The European Commission mark for explosion protection.

Equipment group: II Surface Industry I Mines (underground industries)

Surrounding atmosphere: G - Gas D - Dust

Explosion Protected

Equipment Category: 1 for Zone 0 or 20 2 for Zone 1 or 21 3 for Zone 2 or 22

M1 - Mines: Required to remain functional in the presence of an explosive atmosphere
M2 - Mines: Must be de-energized in the presence of an explosive atmosphere

Type of Protection: "db" - Flameproof "db eb" - Flameproof with increased safety terminal box "eb" - Increased Safety - Zone 1 "ec" - Increased Safety - Zone 2 "nA" - Non-sparking "tb" - By Enclosure - Zone 21 "tc" - By Enclosure - Zone 22 "pxb" - Pressurized - Zone 1 "pyb" - Pressurized - Zone 1 "pzc" - Pressurized - Zone 2

Gas group: I: Mining IIA: Propane IIB: Ethylene IIC: Acetylene, Hydrogen

Dust group: - IIIA: combustible flyings - IIIB: non-conductive dust - IIIC: conductive dust

Equipment Protection Level

Gas group Temperature Class: T1, T2, T3, T4, T5 or T6

Dust group Maximum surface temperature: T125°C

Mines group maximum surface temperature is limited to 150°C.

IECEX Marking (Global)

Ex db eb IIC T4 Gb

Explosion Protected

Type of Protection: "db" - Flameproof "db eb" - Flameproof with increased safety terminal box "eb" - Increased Safety - Zone 1 "ec" - Increased Safety - Zone 2 "nA" - Non-sparking "tb" - By Enclosure - Zone 21 "tc" - By Enclosure - Zone 22 "pxb" - Pressurized - Zone 1 "pyb" - Pressurized - Zone 1 "pzc" - Pressurized - Zone 2

Gas group: I: Mining IIA: Propane IIB: Ethylene IIC: Acetylene, Hydrogen

Dust group: - IIIA: combustible flyings - IIIB: non-conductive dust - IIIC: conductive dust

Equipment Protection Level

Gas group Temperature Class: T1, T2, T3, T4, T5 or T6

Dust group Max. surface temperature: 125°C

Mines group maximum surface temperature is limited to 150 °C.

NEC/CEC Marking (North American)

Division System

Class I, Division 1, Group C & D, T4

Explosive atmosphere: - Class I (Gas or vapour) - Class II (Dust) - Class III (Flyings)

Area classification: - Division 1 - Division 2

Gas group: - A: Acetylene - B: Hydrogen - C: Ethylene - D: Propane - E: Metal dusts - F: Carbonaceous dusts - G: Combustible dusts

Temperature code: - T1, T2, T2A, T2B ... T4A, T5 or T6

Zone System ⁽⁶⁾

Class I, Zone 1, AEx db IIC T4 Gb

Explosive atmosphere: - Class I (Gas or vapour)⁽⁶⁾

Area classification: - Zone 1 (Gas or vapour) - Zone 2 (Gas or vapour) - Zone 21 (Dust) - Zone 22 (Dust)

Explosion Protected approved to U.S. Standards ⁽⁶⁾

Type of Protection: "db" - Flameproof "db eb" - Flameproof with increased safety terminal box "eb" - Increased Safety - Zone 1 "ec" - Increased Safety - Zone 2 "nA" - Non-sparking "tb" - By Enclosure - Zone 21 "tc" - By Enclosure - Zone 22 "pxb" - Pressurized - Zone 1 "pyb" - Pressurized - Zone 1 "pzc" - Pressurized - Zone 2

Gas group: - IIA: Propane - IIB: Ethylene - IIC: Acetylene, Hydrogen

Dust group: - IIIA: combustible flyings - IIIB: non-conductive dust - IIIC: conductive dust

Equipment Protection Level

Gas group Temp. Class: T1, T2, T3, T4, T5 or T6

Dust group maximum surface temperature: T125°C

(4) For Dust environments (Zone 21 or 22) the Class of the hazard (Class II) shall not be mentioned in the marking e.g. Zone 21, AEx tb IIC T125°C Db
(5) For Canadian Standards letter "A" shall not be mentioned in the marking e.g. Class I, Zone 1, Ex db IIC T4 Gb
(6) Zone System is recommended for new installations in Canada. For United States, the installation, Zone System is optional.

When it comes to **HAZARDOUS AREAS,**

WE MAKE IT SAFE!