

Anaconda Flexible Conduit Solutions for Hazardous Environments

CERTIFICATION ACCORDING TO	DIRECTIVE	MEANING TYPE OF CERTIFICATION	AREA
ATEX	2014/34/EU Annex I	Atmosphères Explosibles	European explosion protection
IECEX	60079	International Electrotechnical Commission System for Certification to Standards Relating to Equipment for Use in Explosive atmospheres	Global explosion protection
CEC	18	Canadian Electrical Code	Canadian explosion protection
NEC	505-506	National Electrical Code	American (USA) explosion protection

DEFINITION OF A HAZARDOUS LOCATION / FREQUENCY / TYPE AND DESIGNATION

ACCORDING TO	LOCATION	FREQUENCY	TYPE ZONE DESIGNATION				
			GASES	VAPOURS	DUSTS	FIBERS	FLYINGS
ATEX IECEX	A hazardous location is a place/area in which an explosive atmosphere is:	<ul style="list-style-type: none"> Continually present. Likely to occur in normal operation occasionally. Not likely to occur in normal operation and only for a very short duration. 	Zone 0			Zone 20	
			Zone 1			Zone 21	
			Zone 2			Zone 22	
CEC	A hazardous location is an area in which an explosive:	<ul style="list-style-type: none"> Gas atmosphere is continuously present for a long period of time. Atmosphere is likely to occur in normal operation. Gas atmosphere does not normally exist. 	Zone 0			Zone 20	
			Zone 1			Zone 21	
			Zone 2			Zone 22	
NEC	A hazardous location is a location made hazardous by the presence of :	<ul style="list-style-type: none"> Flammable gases or vapours that may be present in the air in quantities sufficient to produce an explosive or ignitable mixture. Combustible or electrically conductive dust. Easily ignitable fibers or flyings in the air, but not likely to be in suspension in quantities sufficient to produce ignitable mixtures. 	Zone 0			Zone 20	
			Zone 1			Zone 21	
			Zone 2			Zone 22	

GROUPS (ACCORDING TO IEC AND NEC/CEC 505-506 / EQUIPMENT CATEGORY (ACCORDING TO ATEX) AND EQUIPMENT PROTECTION LEVEL (ACCORDING TO IEC)

ACCORDING TO	ENVIRONMENT	GROUP	EQUIPMENT CATEGORY	EQUIPMENT PROTECTION LEVEL	ZONE DESIGNATION	SUBDIVISION	TYPICAL GAS AND DUST EXAMPLES
ATEX	Mines susceptible for firedamp	I	M1	-	-	-	-
			M2	-	-	-	-
	Explosive gas atmosphere	II	1G	-	Zone 0	IIA	Propane
			2G	-	Zone 1	IIB	Ethylene
			3G	-	Zone 2	IIC	Hydrogen / Acetylene
	Explosive dust atmosphere	II	1D	-	Zone 20	IIIA	Combustible flyings
2D			-	Zone 21	IIIB	Non-conductive dust	
3D			-	Zone 22	IIIC	Conductive dust	
IECEX	Mines susceptible for firedamp	I	-	Ma	-	-	-
			-	Mb	-	-	-
	Explosive gas atmosphere	II	-	Ga	Zone 0	IIA	Propane
			-	Gb	Zone 1	IIB	Ethylene
			-	Gc	Zone 2	IIC	Hydrogen / Acetylene
	Explosive dust atmosphere	II	-	Da	Zone 20	IIIA	Combustible flyings
-			Db	Zone 21	IIIB	Non-conductive dust	
-			Dc	Zone 2	IIIC	Conductive dust	
CEC	Mines susceptible for firedamp	I	-	-	-	-	-
			-	-	-	-	-
	Explosive gas atmosphere	II	-	-	Zone 0	IIA	Propane
			-	-	Zone 1	IIB	Ethylene
			-	-	Zone 2	IIC	Hydrogen / Acetylene
	Explosive dust atmosphere	II	-	-	Zone 20	IIIA	Combustible flyings
-			-	Zone 21	IIIB	Non-conductive dust	
-			-	Zone 22	IIIC	Conductive dust	
NEC	Mines susceptible for firedamp	I	-	-	-	-	-
			-	-	-	-	-
	Explosive gas atmosphere	II	-	-	Zone 0	IIA	Propane
			-	-	Zone 1	IIB	Ethylene
			-	-	Zone 2	IIC	Hydrogen / Acetylene
	Explosive dust atmosphere	II	-	-	Zone 20	IIIA	Combustible flyings
-			-	Zone 21	IIIB	Non-conductive dust	
-			-	Zone 22	IIIC	Conductive dust	

TYPES OF PROTECTION FOR ELECTRICAL EQUIPMENT IN EXPLOSIVE ATMOSPHERES (MOST COMMON)

TYPE OF PROTECTION	SYMBOL	ZONE	ENVIRONMENT	IEC / EN / UL DIRECTIVE
General requirements	-	-	-	60079-0
Flameproof enclosures	Ex da	Zone 0	Mines	60079-1
	Ex db	Zone 1	Gas	
	Ex dc	Zone 2	Dust	
Increased safety	Ex eb	Zone 1	Gas	60079-7
	Ex ec	Zone 2	Dust	
Intrinsic safety	Ex ia	Zone 0	Mines	60079-7
	Ex ib	Zone 1	Gas	
	Ex ic	Zone 2	Dust	60079-11
		Zone 22	Dust	
Protection by enclosure	Ex ta	Intrinsically safe systems		60079-25
	Ex tb			
	Ex tc	Zone 20	Dust	

ALLOWABLE FLEXIBLE CONDUITS

ACCORDING TO	DESIGNATION	CLASSIFICATION	TYPE OF FLEXIBLE CONDUITS			REMARK
			LFMC	LFNC	FMC	
ATEX	Zone 0	Category 1G	No	No	No	In combination with IECEx / ATEX certified fittings only.
	Zone 1	Category 2G	Yes	Yes	Yes	
	Zone 2	Category 3G	Yes	Yes	Yes	
IECEX	Zone 20	Category 1D	No	No	No	In combination with IECEx / ATEX certified fittings only.
	Zone 21	Category 2D	Yes	Yes	Yes	
	Zone 22	Category 3D	Yes	Yes	Yes	
CEC	Zone 0	Class I - Division 1	No	No	No	LFMC and Fittings must be CSA certified and HD marked for Heavy Duty.
	Zone 1	Class I - Division 1	No	No	No	
	Zone 2	Class I - Division 2	Yes	No	No	
	Zone 20	Class II - Division 1	Yes	No	No	
		Class III - Division 1	Yes	No	No	
	Zone 22	Class III - Division 2	Yes	No	No	
NEC	Zone 0	Class I - Division 1	No	No	No	LFMC, LFNC and FMC conduits and fittings must be UL Listed.
	Zone 1	Class I - Division 1	No	No	No	
	Zone 2	Class I - Division 2	Yes	Yes	Yes	
	Zone 20	Class II - Division 1	Yes	Yes	No	
		Class III - Division 1	Yes	Yes	No	
	Zone 22	Class II - Division 2	Yes	Yes	No	
CLARIFICATION TYPE OF FLEXIBLE CONDUIT	LFMC	Liquid-tight Flexible Metal Conduit				Conduit contains a metal inner core with a plastic outer cover.
	LFNC	Liquid-tight Flexible Non-metallic Conduit				Conduit contains plastic only, no metal.
	FMC	Flexible Metal Conduit				Conduits contains metal only, no plastic.

RECOMMENDED FLEXIBLE CONDUITS

ACCORDING TO	LFMC - GALVANISED STEEL CORE ANACONDA SEALTITE TYPE		LFMC - STAINLESS STEEL CORE ANACONDA SEALTITE TYPE		LFNC ANACONDA ALL PLASTIC TYPE	FMC - GALVANISED STEEL ANACONDA MULTIFLEX TYPE	FMC - STAINLESS STEEL ANACONDA MULTIFLEX TYPE
	HTDL	ASUA-HD	HFI-316 Black	HFI-316 Blue			
ATEX	HFX Black	(1) & (2)	HCI-316	(1) & (2)	Not applicable	On Request (3)	On Request (3)
	HFX Blue		ASI-316				
IECEX	ZHUA		SS-HTUA				
			SS-ZHUA				
CEC	ASUA-HD		Not allowed		Not allowed	Not allowed	Not allowed
	HTUA-HD						
NEC	HTDL		SS-HTUA		CNP	On Request (3)	Not allowed
	UVUA		SS-ZHUA		NMUA		
	ZHUA						

- NOTES
- Anaconda IECEx / ATEX certified fittings type BXA with a 2 epoxy resin compound barrier (barrier glands) are only allowed to be used in combination with our LFMC (liquid-tight flexible metal conduit) Anaconda SEALTITE flexible conduits.
 - LFMC (liquid-tight flexible metal conduit) Anaconda SEALTITE flexible conduits with a blue coloured plastic cover are recommended for Ex I classified environments for identification purposes.
 - Because FMC (flexible metal conduit) can be a complex choice for use in potential explosive environments, we recommend to consult your Area Sales Manager or one of our experts.

TO CONNECT AND PROTECT



TRAINING and SUPPORT
Our experts provide comprehensive training and support for compliance with NEC and IECEx regulations

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