

# CSA INTERNATIONAL

# HAZARDOUS LOCATIONS

## GLOBAL TESTING AND CERTIFICATION SERVICES

### Explosive Gas Atmospheres Protection Concepts

Type of Protection	Code	Market	Application	Standard	Protection Principle
<b>General Requirements</b>		US	Class I, Division 1 & 2	FM 3600	
		CA	Class I, Division 1 & 2	CSA C22.2 No. 0	
	AEx	US	Class I, Division 1 & 2	ISA 60079-0	
	Ex	CA	Class I, Division 1 & 2	CSA E60079-0	
	EX	EU	Category 1G, 2G, & 3G	EN 60079-0	
	Ex	IEC	EPL Ga, Gb, & Gc	IEC 60079-0	
<b>Increased Safety</b>	AEx e	US	Class I, Zone 1	ISA 60079-7	
	Ex e	CA	Class I, Zone 1	CSA E60079-7	
	Ex e (or Ex eb)	EU	Category 2G	EN E60079-7	
	Ex e (or Ex eb)	IEC	EPL Gb	IEC E60079-7	
<b>Non-Incendive</b>	(NI)	US	Class I, Division 2	ISA 12.12.01 / FM 3611	No arcs, sparks or hot surfaces
	(NI)	CA	Class I, Division 2	C22.2 No. 213	
<b>Non-Sparking</b>	AEx nA	US	Class I, Zone 2	ISA 60079-15	
	Ex nA	CA	Class I, Zone 2	CSA E60079-15	
	Ex nA (or Ex nAc)	EU	Category 3G	EN 60079-15	
	Ex nA (or Ex nAc)	IEC	EPL Gc	IEC 60079-15	
<b>Explosionproof</b>	(XP)	US	Class I, Division 1	FM 3615	Contain the explosion and extinguish the flame
	(XP)	CA	Class I, Division 1	C22.2 No. 30	
<b>Flameproof</b>	AEx d	US	Class I, Zone 1	ISA 60079-1	
	Ex d	CA	Class I, Zone 1	CSA E60079-1	
	Ex d (or Ex db)	EU	Category 2G	EN 60079-1	
	Ex d (or Ex db)	IEC	EPL Gb	IEC 60079-1	
<b>Power-Filled</b>	AEx q	US	Class I, Zone 1	ISA 60079-5	
	Ex q	CA	Class I, Zone 1	CSA E60079-5	
	Ex q (or Ex qb)	EU	Category 2G	EN 60079-5	
	Ex q (or Ex qb)	IEC	EPL Gb	IEC 60079-5	
<b>Enclosed Break</b>	AEx nC	US	Class I, Zone 2	ISA 60079-15	
	Ex nC	CA	Class I, Zone 2	CSA E60079-15	
	Ex nC (or Ex nCc)	EU	Category 3G	EN 60079-15	
	Ex nC (or Ex nCc)	IEC	EPL Gc	IEC 60079-15	
<b>Intrinsic Safety</b>	(IS)	US	Class I, Division 1	UL 913 / FM 3610	Limit energy of sparks and surface temperature
	(IS)	CA	Class I, Division 1	C22.2 No. 157	
	AEx ia	US	Class I, Zone 0	ISA 60079-11 / FM 3610	
	AEx ib	US	Class I, Zone 1	ISA 60079-11 / FM 3610	
	Ex ia	CA	Class I, Zone 0	CSA E60079-11	
	Ex ib	CA	Class I, Zone 1	CSA E60079-11	
		CA	Class I, Zone 1	CSA E60079-11	

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Type of Protection	Code	Market	Application	Standard	Protection Principle
	Ex ia	EU	Category 1G	EN E60079-11	Limit energy of sparks and surface temperature
	Ex ib	EU	Category 2G	EN E60079-11	
	Ex ic	EU	Category 3G	EN E60079-11	
	Ex ia	IEC	EPL Ga	IEC E60079-11	
	Ex ib	IEC	EPL Gb	IEC E60079-11	
	Ex ic	IEC	EPL Gc	IEC E60079-11	
<p><i>Note 1: For associated intrinsically safe apparatus suitable for installation in a hazardous location, the symbol for the type of protection "ia" or "ib" are enclosed within square brackets, e.g. AEx d [ia] IIC T4.</i></p> <p><i>Note 2: For associated intrinsically safe apparatus not suitable for installation in a hazardous location, both the symbol "Ex" or "AEx" and the symbol for the type of protection "ia" or "ib" are enclosed within the same square brackets, e.g. [AEx ia] IIC; in this case, a temperature class is not included.</i></p>					
<b>Limited Energy</b>	AEx nC	US	Class I, Zone 2	ISA 60079-15	Keep flammable gas out
	Ex nL	CA	Class I, Zone 2	CSA E60079-15	
	Ex nL (or Ex nLc)	EU	Category 3G	EN 60079-15	
	Ex nL (or Ex nLc)	IEC	EPL Gc	IEC 60079-15	
<b>Pressurized</b>	Type X	US	Class I, Division 1	FM 3620 (NFPA 496)	
	Type X	CA	Class I, Division 1	NFPA 496	
	Type Y	US	Class I, Division 1	FM 3620 (NFPA 496)	
	Type Y	CA	Class I, Division 1	NFPA 496	
	Type Z	US	Class I, Division 2	FM 3620 (NFPA 496)	
	Type Z	CA	Class I, Division 2	NFPA 496	
	AEx px	US	Class I, Zone 1	ISA 60079-2	
	Ex px	CA	Class I, Zone 1	CSA E60079-2	
	Ex px (or Ex pxb)	EU	Category 2G	EN 60079-2	
	Ex px (or Ex pxb)	IEC	EPL Gb	IEC 60079-2	
	AEx py	US	Class I, Zone 1	ISA 60079-2	
	Ex py	CA	Class I, Zone 1	CSA E60079-2	
	Ex py (or Ex pyb)	EU	Category 2G	EN 60079-2	
	Ex py (or Ex pyb)	IEC	EPL Gb	IEC 60079-2	
	AEx pz	US	Class I, Zone 2	ISA 60079-2	
	Ex pz	CA	Class I, Zone 2	CSA E60079-2	
	Ex pz (or Ex pzb)	EU	Category 3G	EN 60079-2	
	Ex pz (or Ex pzb)	IEC	EPL Gc	IEC 60079-2	
<b>Restricted Breathing</b>	AEx nR	US	Class I, Zone 2	ISA 60079-15	
	Ex nR	CA	Class I, Zone 2	CSA E60079-15	
	Ex nR (or Ex nRc)	EU	Category 3G	EN 60079-15	
	Ex nR (or Ex nRc)	IEC	EPL Gc	IEC 60079-15	
<b>Encapsulation</b>	AEx ma	US	Class I, Zone 0	ISA 60079-18	
	Ex ma	EU	Category 1G	EN 60079-18	
	Ex ma	IEC	EPL Ga	IEC 60079-18	
	AEx m	US	Class I, Zone 1	ISA 60079-18	
	Ex m	CA	Class I, Zone 1	CSA E60079-18	
	AEx mb	US	Class I, Zone 1	ISA 60079-18	
	Ex mb	EU	Category 2G	EN 60079-18	
	Ex mb	IEC	EPL Gb	IEC 60079-18	
<b>Oil Immersion</b>	AEx o	US	Class I, Zone 1	ISA 60079-6	
	Ex o	CA	Class I, Zone 1	CSA E60079-6	
	Ex o (or Ex ob)	EU	Category 2G	EN 60079-6	
	Ex o (or Ex ob)	IEC	EPL Gb	IEC 60079-6	



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