

ADALET

A SCOTT FETZER COMPANY

Overview Guide to Hazardous Location Information

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Enclosure Types



Classifications

Enclosure Types

Enclosure Type	Intended Use	Approx. IP Code Rating
1	Indoor use, limited amounts of falling dirt	20
3	Outdoor use, rain, sleet, wind blown dust, external formation of ice	54
3R	Outdoor use, rain, sleet, external formation of ice	24
4	Indoor or outdoor use, wind blown dust and rain, splashing water, hose directed water, external formation of ice	66
4X	Indoor or outdoor use, wind blown dust and rain, splashing water, hose directed water, corrosion, external formation of ice	66
6	Indoor or outdoor use, hose directed water, temporary submersion, external formation of ice	67
6P	Indoor or outdoor use, hose directed water, prolonged submersion, external formation of ice	67
12	Indoor use, circulating dust, falling dirt, dripping noncorrosive liquids	52
13	Indoor use, lint, dust, spraying of water, oil, and noncorrosive liquid	54

Zone Definitions

Gas: EN 60079-10 IEC 60079-10	Dust: EN 61241-10 IEC 61241-10	Definition	ATEX Category:	IECEX EPL:	Typical Zone Suitability:
0	20	A place in which an explosive atmosphere is continually present	1 G	Ga	Zones 0,1,2
1	21	A place in which an explosive atmosphere is likely to occur in normal operation occasionally	1 D	Da	Zones 20,21,22
2	22	A place in which an explosive atmosphere is not likely to occur in normal operation, but if it does only occurs for short periods	2 G	Gb	Zones 1,2
			2 D	Db	Zones 21,22
			3 G	Gc	Zone 2
			3 D	Dc	Zone 22

Protection Categories

Gas Group (Explosive)

Substance	US Hazard Class:	IECEX ATEX:	NEC 500:	NEC 505 NEC 506	Lower Explosive Limit:	Upper Explosive Limit:
Any Gas	Class I	II		II		
Acetylene		IIC	Group A	IIC	2.3 %	100 %
Hydrogen		IIB+H ₂	Group B	IIB+H ₂	4 %	77 %
Ethylene		IIB	Group C	IIB	2.3 %	36 %
Propane / Methane		IIA	Group D	IIA	1.7 % / 4.4 %	11 % / 17 %
Firedamp (Methane)		I	N/A	N/A		
Metal (Conductive) Dust	Class II	IIIC	Group E	N/A		
Coal (Carbonaceous) Dust		IIIB	Group F	D		
Grain Dust		IIIB	Group G	D		
Flyings / Fibers	Class III	IIIA		D		

Protection Concepts [North America]

Type of Protection	USA		Canada		Basic Concepts of Protection	
	NEC 500	NEC 505	Existing	New		
	Area Classification	Code	Area Classification	Code		
Increased Safety Non-Incendive	N/A Division 2	Zone 1, 2 Zone 2	AEx e AEx n	N/A Division 2 Zone 1, 2 Zone 2	Ex e EX n	No arcs, sparks or hot surfaces
Flameproof Explosionproof Powder Filled	N/A Division 1,2 N/A	Zone 1, 2 N/A Zone 1, 2	AEx d N/A AEx q	N/A Division 1,2 N/A Zone 1, 2	Ex d N/A Ex q	Contains the explosion, prevent flame propagation
Intrinsic Safety	Division 1,2 N/A	Zone 0,1, 2 Zone 1, 2	AEx ia AEx ib	Division 1,2 N/A Zone 0,1, 2 Zone 1, 2	Ex ia Ex ib	Limit the spark energy and temperatures
Pressurized (Purged) Encapsulation Oil Immersion	Division 1,2 N/A Division 2	Zone 1, 2 Zone 1, 2 Zone 1, 2	AEx p AEx m AEx o	Division 1,2 N/A Division 2 Zone 1, 2 Zone 1, 2	Ex p Ex m Ex o	Exclude gas from ignition sources

Markings

Typical NEC® Marking

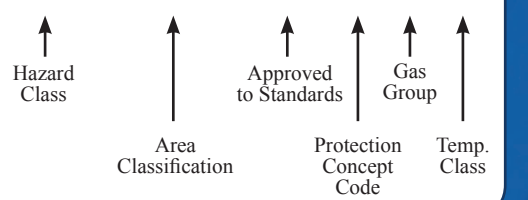
NEC® 500

Class I, Division 2, Groups AB T6



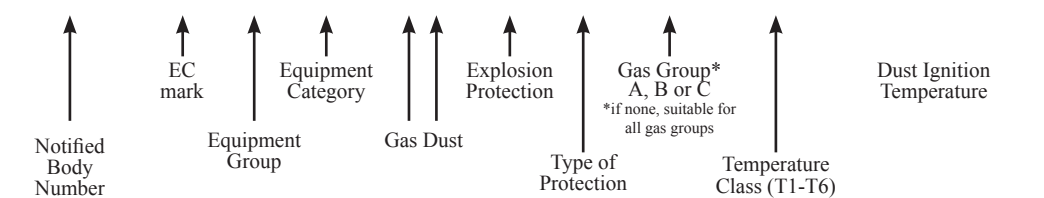
NEC® 505

Class I, Zone 1, AEx d IIC T6



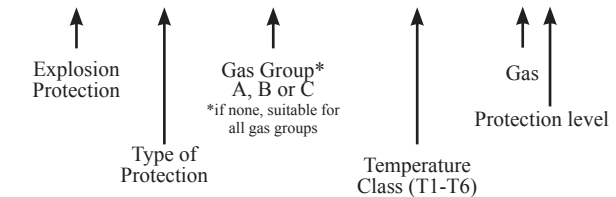
Typical [ATEX (94/9/EC)] Marking

0539 Ex II 2 GD Ex d IIC T4 (T125°C)



Typical IECEx Marking (Gas)

Ex d IIC T5 Gb



Equipment Group [ATEX (94/9/EC) / IECEx]

Equipment Group:	Equipment Category:	Atmosphere	Protection Level:	Required Protection Performance & Operation:
I (Mines)	M1	Methane & Dust	Very High	• Two Faults, Remain energized and functioning
I (Mines)	M2	Methane & Dust	High	• Severe normal operation, De-energize in exp. atm.
II (Above Ground)	1	Gas, Vapor, Mist, Dust	Very High	• Two Faults
II (Above Ground)	2	Gas, Vapor, Mist, Dust	High	• One Fault
II (Above Ground)	3	Gas, Vapor, Mist, Dust	Low	• Normal Operation

Protection Concepts [Europe/ International]

Electrical equipment for gases, vapors and mists (G)

Types of Protection	Symbol	Category	CENELEC ATEX	Basic concepts of protection
Increased Safety Non-Sparking	Ex e Ex nA	M2 & 2 3	EN 60079-7	No arcs, sparks or hot surfaces
Flameproof Enclosure Break Quartz / Sand Filled	Ex d Ex nC Ex q	M2 & 2 3 2	EN 60079-1 EN 60079-15 EN 60079-5	Contain the explosion, prevent flame propagation
Intrinsic Safety Intrinsic Safety Intrinsically Safe Systems Energy Limitation	Ex ia Ex ib Ex nL	M1 & 1 M2 & 2 3	EN 60079-11 EN 60079-11 EN 60079-25 EN 60079-15	Limit the energy of the spark and the surface temperature
Pressurized Restricted Breathing Encapsulated Encapsulated (Cat 1) Oil Immersion	Ex p Ex nR Ex mb Ex ma Ex o	2 3 2 1 2	EN 60079-2 EN 60079-15 EN 60079-18 EN 60079-18 EN 60079-6	Keep the flammable gas out
Special Protection	Ex s	1	EN 60079-33	Alternate techniques
Category 1G		1	EN 60079-26	
Category M1		M1	EN 50303	

Electrical equipment for combustible dusts (D)

Protection by enclosure		1, 2, or 3	EN 60079-31	Keep the combustible dust out and avoid hot surfaces
Non-electrical equipment and machinery			IEC 80079 (pending)	General requirements

* Information is accurate to the best of our knowledge at the time of print. As always, please consult the appropriate agency for the latest approval & standards information.