UL HAZARDOUS LOCATIONS SERVICES

CLASS I Flammable Gases, Vapors or Liquids

Area Classification

Division 1:
Where ignitable concentrations of flammable gases, vapors or liquids can exist all of the time or some of the time under normal operating conditions.

Zone 0:
Where ignitable concentrations of flammable gases, vapors or liquids are present continuously or for long periods of time under normal operating conditions.

Zone 1:
Where ignitable concentrations of flammable gases, vapors or liquids are likely to exist under normal operating conditions.

Division 2:
Where ignitable concentrations of flammable gases, vapors or liquids are not likely to exist under normal operating conditions.

Zone 2:
Where ignitable concentrations of flammable gases, vapors or liquids are not likely to exist under normal operating conditions.

Groups

Division 1 and 2:		Zone 0, 1 and 2:	
A	(acetylene)	IIC	(acetylene & hydrogen)
B	(hydrogen)	IIC	(acetylene & hydrogen)
C	(ethylene)	IIB	(ethylene)
D	(propane)	IIA	(propane)

Temperature Classes

Division 1 and 2:		Zone 0, 1 and 2:	
T1	(≤450°C)	**T1**	(≤450°C)
T2	(≤300°C)	**T2**	(≤300°C)
T2A	(≤280°C)	—	
T2B	(≤260°C)	—	
T2C	(≤230°C)	—	
T2D	(≤215°C)	—	
T3	(≤200°C)	**T3**	(≤200°C)
T3A	(≤180°C)	—	
T3B	(≤165°C)	—	
T3C	(≤160°C)	—	
T4	(≤135°C)	**T4**	(≤135°C)
T4A	(≤120°C)	—	
T5	(≤100°C)	**T5**	(≤100°C)
T6	(≤85°C)	**T6**	(≤85°C)

North American Protection Techniques

		Applicable Certification Documents	
Area	**Protection Techniques**	**USA**	**Canada**
Div. 1	• Intrinsic safety	UL 913	CSA 157
	• Explosionproof	UL 1203	CSA 30
	• Purged/pressurized (Type X or Y)	NFPA 496	NFPA 496
	• Class I, Zone 0 intrinsic safety, "ia"	UL 60079-11	CSA E60079-11
Div. 2	• Hermetically-sealed	ISA 12.12.01 or UL 1604	CSA 213
	• Nonincendive	ISA 12.12.01 or UL 1604	CSA 213
	• Non-sparking	ISA 12.12.01 or UL 1604	CSA 213
	• Purged/pressurized (Type Z)	NFPA 496	NFPA 496
	• Any Class I, Division 1 technique	See above	See above
	• Any Class I, Zone 0, 1 or 2 technique	See USA Zone 0, 1 or 2 tech.	See Canada Zone 0, 1 or 2 tech.

Note: Class I, Division 1 intrinsically safe system requirements are contained in UL 913 (USA) and CSA 157 (Canada).

International Protection Techniques (Equipment Protection Levels)

Area	Protection Techniques (Equipment Protection Levels)	Applicable Certification Documents: USA	Canada	IECEx System	Europe
Zone 0	• Intrinsic safety, "ia" (Ga)	UL 60079-11	CSA E60079-11	IEC 60079-11	EN 60079-11
	• Encapsulation, "ma" (Ga)	UL 60079-18	—	IEC 60079-18	EN 60079-18
	• Class I, Div 1 intrinsic safety	UL 913	CSA 157	—	—
Zone 1	• Flameproof, "d" (Gb)	UL 60079-1	CSA 60079-1	IEC 60079-1	EN 60079-1
	• Pressurization, "px" or "py" (Gb)	ISA 60079-2	CSA E60079-2	IEC 60079-2	EN 60079-2
	• Powder filling, "q" (Gb)	UL 60079-5	CSA E60079-5	IEC 60079-5	EN 60079-5
	• Oil immersion, "o" (Gb)	UL 60079-6	CSA E60079-6	IEC 60079-6	EN 60079-6
	• Increased safety, "e" (Gb)	UL 60079-7	CSA E60079-7	IEC 60079-7	EN 60079-7
	• Intrinsic safety, "ib" (Gb)	UL 60079-11	CSA E60079-11	IEC 60079-11	EN 60079-11
	• Encapsulation, "mb" (Gb) or "m" for CAN	UL 60079-18	CSA E79-18	IEC 60079-18	EN 60079-18
	• Any Zone 0 technique	See above	See above	See above	See above
	• Any Class I, Div 1 technique	See USA CID1 tech.	See CAN CID1 tech.	—	—
Zone 2	• Pressurization, "pz" (Gc)	ISA 60079-2	CSA E60079-2	IEC 60079-2	EN 60079-2
	• Intrinsic safety, "ic" (Gc)	UL 60079-11	—	IEC 60079-11	EN 60079-11
	• Encapsulated, "nC" (Gc)	UL 60079-15	CSA E60079-15	—	—
	• Enclosed-break, "nC" (Gc)	UL 60079-15	CSA E60079-15	IEC 60079-15	EN 60079-15
	• Energy-limited, "nL" (Gc)	UL 60079-15	CSA E60079-15	—	—
	• Hermetically-sealed, "nC" (Gc)	UL 60079-15	CSA E60079-15	IEC 60079-15	EN 60079-15
	• Nonincendive, "nC" (Gc)	UL 60079-15	CSA E60079-15	IEC 60079-15	EN 60079-15
	• Non-sparking, "nA" (Gc)	UL 60079-15	CSA E60079-15	IEC 60079-15	EN 60079-15
	• Pressurization, "nZ"	—	CSA E60079-15	—	—
	• Restricted breathing, "nR" (Gc)	UL 60079-15	CSA E60079-15	IEC 60079-15	EN 60079-15
	• Sealed, "nC" (Gc)	UL 60079-15	CSA E60079-15	IEC 60079-15	EN 60079-15
	• Encapsulation, "mc" (Gc)	—	—	IEC 60079-18	EN 60079-18
	• Any Zone 0 or 1 technique	See above	See above	See above	See above
	• Any Class I, Div 1 or 2 technique	See USA CID1 or CID2 tech.	See CAN CID1 or CID2 tech.	—	—

Note 1: Zone 0, 1 and 2 general requirements are contained in UL 60079-0 (USA), CSA 60079-0 (Canada) and IEC/EN 60079-0 (IECEx System & Europe).

Note 2: Zone 0, 1 and 2 intrinsically safe system requirements are contained UL 60079-11(USA & Canada) and IEC/EN 60079-25 (IECEx System & Europe).

Note 3: Special requirements for equipment installed in Zone 0 (Ga) areas are contained in ISA 60079-26 (USA) and IEC/EN 60079-26 (IECEx System & Europe).

Note 4: Zone 0, 1 and 2 FISCO requirements are contained in ISA 60079-27(USA) and IEC/EN 60079-27 (IECEx System & Europe).

Note 5: Equipment Protection Levels (EPLs) are used to provide additional details regarding the level of protection against ignition in explosive atmospheres. EPLs are designated by a letter "G" for Gas, "D" for Dust or "M" for Mining, followed by a letter "a" for "very high", "b" for "high" or "c" for "enhanced" level of protection.

Note 6: Under the ATEX Directive (94/9/EC), the marking of Categories is additionally required. ATEX Categories are similar to EPLs in function and designation as follows, ATEX Category 1G, 2G, 3G, 1D, 2D, 3D, 1M, 2M = EPL Ga, Gb, Gc, Da, Db, Dc, Ma, Mb respectively.

CLASS II Combustible Dusts

Area Classification

Division 1:
Where ignitable concentrations of combustible dust can exist all of the time or some of the time under normal operating conditions.

Zone 20:
Where ignitable concentrations of combustible dust or ignitable fibers/flyings are present continuously or for long periods of time under normal operating conditions.

Zone 21:
Where ignitable concentrations of combustible dust or ignitable fibers/flyings are likely to exist under normal operating conditions.

Division 2:
Where ignitable concentrations of combustible dust are not likely to exist under normal operating conditions.

Zone 22:
Where ignitable concentrations of combustible dust or ignitable fibers/flyings are not likely to exist under normal operating conditions.

Groups

Division 1 and 2:
E (metal dust — Div. 1 only)
F (coal dust)
G (grain dust)
—

Zone 20, 21 and 22:
IIIC (conductive dust)
IIIB (non-conductive dust)
IIIB (non-conductive dust)
IIIA (combustible flyings)

Temperature Classes

Division 1 and 2:

T1	(≤450°C)	**T3B**	(≤165°C)
T2	(≤300°C)	**T3C**	(≤160°C)
T2A	(≤280°C)	**T4**	(≤135°C)
T2B	(≤260°C)	**T4A**	(≤120°C)
T2C	(≤230°C)	**T5**	(≤100°C)
T2D	(≤215°C)	**T6**	(≤85°C)
T3	(≤200°C)		
T3A	(≤180°C)		

Zone 20, 21 and 22:
None.

Note: For Zone 20, 21 and 22, equipment shall be marked to show the operating temperature

North American Protection Techniques

Area	Protection Techniques	Applicable Certification Documents: USA	Applicable Certification Documents: Canada
Div. 1	• Intrinsic safety	UL 913	CSA 157
	• Dust-ignitionproof	UL 1203	CSA 25 or CSA E61241-1-1
	• Pressurized	NFPA 496	NFPA 496
	• Any Zone 20 technique	See USA Zone 20 tech.	—
Div. 2	• Dusttight	ISA 12.12.01 or UL 1604	CSA 157 or CSA E61241-1-1
	• Hermetically-sealed	ISA 12.12.01 or UL 1604	—
	• Nonincendive	ISA 12.12.01 or UL 1604	—
	• Pressurized	NFPA 496	NFPA 496
	• Any Class II, Division 1 technique	See above	See above
	• Any Zone 20, 21 or 22 technique	See USA Zone 20, 21 or 22 tech.	—

Note: Class II, Division 1 intrinsically safe system requirements are contained in UL 913 (USA) and CSA 157 (Canada).

International Protection Techniques (Equipment Protection Levels)

Area	Protection Techniques (Equipment Protection Levels)	Applicable Certification Documents: USA	Canada	IECEx System	Europe
Zone 20	• Enclosure, "ta" (Da)	ISA 60079-31	—	IEC 60079-31	EN 60079-31
	• Intrinsic safety, "ia" (Da)	ISA 61241-11	—	IEC 61241-11	EN 61241-11
	• Encapsulation, "ma" (Da)	ISA 61241-18	—	IEC 60079-18	EN 60079-18
	• Class II, Div 1 intrinsic safety technique	UL 913	—	—	—
	• Class II, Div 1 dust-ignitionproof technique	UL 1203	—	—	—
Zone 21	• Enclosure, "tb" (Db) or "t" for USA	ISA 60079-31	—	IEC 60079-31	EN 60079-31
	• Pressurization, "p" (Db)	ISA 61241-2	—	IEC 61241-4	EN 61241-4
	• Intrinsic safety, "ib" (Db)	ISA 61241-11	—	IEC 61241-11	EN 61241-11
	• Encapsulation, "mb" (Db)	ISA 61241-18	—	IEC 60079-18	EN 60079-18
	• Any Zone 20 technique	See above	—	See above	See above
	• Any Class II, Div 1 technique	See USA CIID1 tech.	—	—	—
Zone 22	• Enclosure, "tc" (Dc)	ISA 60079-31	—	IEC 60079-31	EN 60079-31
	• Pressurization, "p" (Dc)	ISA 61241-2	—	IEC 61241-4	EN 61241-4
	• Any Zone 20 or 21 technique	See above	—	See above	See above
	• Any Class II, Div 1 or 2 technique	See USA CIID1 or CIID2 tech.	—	—	—

Note 1: Zone 20, 21 and 22 general requirements are contained in UL 60079-0 or ISA 61241-0 (USA), and IEC/EN 60079-0 or IEC/EN 61241-0 (IECEx System & Europe).

Note 2: Equipment Protection Levels (EPLs) are used to provide additional details regarding the level of protection against ignition in explosive atmospheres. EPLs are designated by a letter "G" for Gas, "D" for Dust or "M" for Mining, followed by a letter "a" for "very high", "b" for "high" or "c" for "enhanced" level of protection.

Note 3: Under the ATEX Directive (94/9/EC), the marking of Categories is additionally required. ATEX Categories are similar to EPLs in function and designation as follows, ATEX Category 1G, 2G, 3G, 1D, 2D, 3D, 1M, 2M = EPL Ga, Gb, Gc, Da, Db, Dc, Ma, Mb respectively.

CLASS III Ignitable Fibers and Flyings

Area Classification

Division 1:

Where easily ignitable fibers or materials producing combustible flyings are handled, manufactured or used.

Division 2:

Where easily ignitable fibers are stored or handled.

Groups

Division 1 and 2:

None.

Temperature Classes

Division 1 and 2:

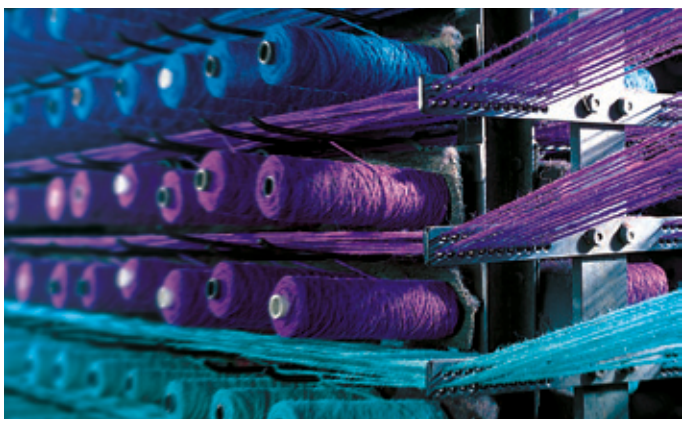
None.

Note: Article 503 of the NEC limits the maximum temperature for Class III equipment to 165°C for equipment not subject to overloading and to 120°C for equipment that may be overloaded.

North American Protection Techniques

		Applicable Certification Documents	
Area	**Protection Techniques**	**USA**	**Canada**
Div. 1	• Intrinsic safety	UL 913	CSA 157
	• Dusttight	ISA 12.12.01 or UL 1604	CSA 157 or CSA E61241-1-1
	• Hermetically-sealed	ISA 12.12.01 or UL 1604	—
	• Any Zone 20 technique	See USA Zone 20 tech.	—
Div. 2	• Nonincendive	ISA 12.12.01 or UL 1604	—
	• Any Class III, Division 1 technique	See above	See above
	• Any Zone 20, 21 or 22 technique	See USA Zone 20, 21 or 22 tech.	—

Note: Class III, Division 1 intrinsically safe system requirements are contained in UL 913 (USA) and CSA 157 (Canada).



See Markings Table on back cover

MARKINGS

Class I, II, and III, Division 1 & 2 (USA & Canada)

This marking would include:

Class(es), Division(s), Gas/Dust Group(s), Temperature Class (T-Code)
Example: Class I, Division 1, Groups C & D; Class II, Division 1, Groups E, F and G; Class III, Division 1,T4A

Class I, Zone 0, 1, & 2 (USA)

The marking would include:

For Zone Listings based on UL 60079 series standards:
Class, Zone, AEx, Protection Technique(s), Gas Group, Temperature Class (T-Code)
Example: Class I, Zone 1, AEx de IIB T4

For Zone Listings based on USA/UL Division standards:
Class, Zone, Gas Group, Temperature Class (T-Code)
Example: Class I, Zone 1, Group IIB T4

Zone 20, 21, & 22 (USA)

The marking would include:

For Zone Listings based on ISA 60079 or ISA 61241 series standards:
Zone, AEx, Protection Technique (s), Dust Group, Temperature Class (T-Code), Degree of Protection
Example: Zone 21, AEx tD IIIB T135°C IP66

For Zone Listings based on USA/UL Division Standards:
Zone, Temperature Class (T-Code)
Example: Zone 21, T4

Class I, Zone 0, 1 & 2 (Canada)

This marking would include:

For Zone Listings based on CAN/CSA-C22.2 No. E60079 Series Standards:
Ex, Protection Technique(s), Gas Group, Temperature Class (T-Code)
Example: Ex de IIB T4

For Zone Listing based on Canadian Division Standards:
Class, Zone, Gas Group, Temperature Class (T-Code)
Example: Class I, Zone 1, Group IIB T4

Zone 0, 1, & 2 (Europe)

This marking would include:

Ex, Protection Technique(s), Gas Group, Temperature Class, Equipment Protection Level (EPL)
Example: Ex de IIB T4 Gb

Zone 20, 21, & 22 (Europe)

This marking would include:

Ex, Protection Technique(s), Dust Group, Temperature Class, Equipment Protection Level (EPL), Degree of Protection
Example: Ex tb IIIB T135°C Db IP66

ATEX Directive (Europe)

In addition to the European Ex marking string noted above, this marking would include:

Non-mining: CE, NB Identifier, Ex, Equipment Group & Category, G (gas)/D (dust), Date Code
Example (for DEMKO):
CE 0539 Ex II 2 G 2011

Mining: CE, NB Identifier Ex, Equipment Group & Category, Date Code
Example (for DEMKO):
CE 0539 Ex I M2 2011

Zone 0, 1, & 2 (IECEx System)

This marking would include:

Ex, Protection Technique(s), Gas Group, Temperature Class, Equipment Protection Level (EPL)
Example: Ex de IIB T4 Gb

Zone 20, 21, & 22 (IECEx System)

This marking would include:

Ex, Protection Technique(s), Dust Group, Temperature Class, Equipment Protection Level (EPL), Degree of Protection
Example: Ex tb IIIB T135°C Db IP66

INMETRO Legislation (Brazil)

This marking would include:

INMETRO Mark, BR-Ex, Protection Technique(s), Gas Group, Temperature Class, Equipment Protection Level (EPL)
Example: BR-Ex de IIB T4 Gb

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UL's Global Hazardous Locations Engineering Offices

ul.com/hazloc

Corporate Headquarters
United States of America
333 Pfingsten Road
Northbrook, IL 60062-2096
USA
T: +1.847.664.2326
F: +1.847.313.2326
E: hazloc@ul.com

Germany
Frankfurter Strasse 229
D – 63263 Neu-Isenburg
Germany
T: +49(0).6102.369.0
F: +49(0).6102.369.161
E: info.de@de.ul.com

Brazil
Rua Fidêncio Ramos,
195 2° Andar Vila Olímpia
04551-010, São Paulo SP
Brasil
T: +55.11.3049.8300
F: +55.11.3049.8252
E: customerservice.br@br.ul.com

India
Kalyani Platina, 3rd Floor
Block I, No. 24, EPIP Zone, Phase II
Whitefield, Bangalore – 560 066
India
T: +91.80.4138.4400
F: +91.80.2841.3759
E: customerservice.in@in.ul.com

Denmark
Lyskaer 8
DK – 2730 Herlev
Denmark
T: +45.4485.6565
F: +45.4485.6500
E: info.dk@dk.ul.com

United Kingdom
Dallam Court, Dallam Lane
Warrington, WA2 7LT
United Kingdom
T: +44.(0).1483.302.130
F: +44.(0).1483.302.230
E: info.uk@uk.ul.com