UL SOLUTIONS HAZARDOUS LOCATIONS SERVICES

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Protecting facilities that present fire or explosion hazards is serious business. From oil refineries to grain mills, preventing the combustion or explosion of airborne vapors and particulates is essential to protecting people and property. HazLoc equipment safety standards vary according to site conditions and by regional regulation and enforcement differences. Continual revision of standards and regulations makes compliance even more challenging.

This UL Solutions Hazardous Locations Services eBook provides a structured approach for identifying standards according to key hazardous location characteristics, including:

- Explosive gas and dust atmosphere area class and zone definitions
- Temperature classifications for HazLoc divisions and zones
- Division system electrical equipment protection techniques
- Zone system electrical and non-electrical equipment protection techniques

From intrinsic safety to optical radiation, this eBook guides users to the correct testing standard for regulated hazards. The following sections also illustrate the resulting equipment markings that verify compliance and provides a tabulated key to IEC Ingress Protection Codes.

EXPLOSIVE GAS ATMOSPHERES (e.g. Class I Division System)

Includes flammable gases, flammable liquid-produced vapors, and combustible liquid-produced vapors

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Area classifications

Division 1:
Where ignitible concentrations of flammable gases, flammable liquid-produced vapors or combustible liquid-produced vapors **can exist** under normal operating conditions

Zone 0:
Where ignitible concentrations of flammable gases, flammable liquid-produced vapors or combustible liquid-produced vapors **are present continuously or for long periods of time** under normal operating conditions

Zone 1:
Where ignitible concentrations of flammable gases, flammable liquid-produced vapors or combustible liquid-produced vapors **are likely to exist** under normal operating conditions

Division 2:
Where ignitible concentrations of flammable gases, flammable liquid-produced vapors or combustible liquid-produced vapors **are not likely to exist** under normal operating conditions

Zone 2:
Where ignitible concentrations of flammable gases, flammable liquid-produced vapors or combustible liquid-produced vapors **are not likely to exist** under normal operating conditions

Groups

Divisions 1 and 2:		Zones 0, 1 and 2:	
A	Acetylene	**IIC**	Acetylene and hydrogen
B	Hydrogen	**IIB+H2**	Hydrogen
C	Ethylene	**IIB**	Ethylene
D	Propane	**IIA**	Propane

Temperature classifications

Divisions 1 and 2:		Zones 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

EXPLOSIVE GAS ATMOSPHERES (e.g. Class I Division System)

Includes flammable gases, flammable liquid-produced vapors, and combustible liquid-produced vapors

Division system electrical equipment protection techniques

		Applicable certification documents	
Area	**Protection techniques**	**UL Mark**	**C-UL Mark**
Div. 1	• Intrinsic safety	ANSI/UL 913	CSA 157 or CSA 60079-11
	• Explosion-proof	ANSI/UL 1203	CSA 30
	• Purged/pressurized, Type X or Y	ANSI/NFPA 496	ANSI/NFPA 496
	• Optical radiation	ANSI/UL 60079-28	CSA 60079-28
	• Special protection	ANSI/UL 60079-33	—
	• Any Class I, Zone 0 technique	See Zone 0 techniques	See Zone 0 techniques
Div. 2	• Enclosed break	ANSI/UL 121201	CSA 213
	• Hermetically sealed	ANSI/UL 121201	CSA 213
	• Nonincendive	ANSI/UL 121201	CSA 213
	• Non-sparking	ANSI/UL 121201	CSA 213
	• Oil-immersed	ANSI/UL 121201	CSA 213
	• Purged/pressurized, Type Z	ANSI/NFPA 496	ANSI/NFPA 496
	• Sealed	ANSI/UL 121201	CSA 213
	• Optical radiation	ANSI/UL 60079-28	CSA 60079-28
	• Special protection	ANSI/UL 60079-33	—
	• Any Class I, Division 1 technique	See above	See above
	• Any Class I, Zone 0, 1 or 2 technique	See zone techniques	See zone techniques

Note: References in one area to any protection techniques from another area require those other area techniques to be for the same gas atmosphere and with a suitable emperature class.

EXPLOSIVE GAS ATMOSPHERES (e.g. Class I Division System)

Includes flammable gases, flammable liquid-produced vapors, and combustible liquid-produced vapors

Zone System Electrical Equipment Protection Techniques (Equipment Protection Levels)

Area	Protection techniques (equipment protection levels)	Applicable certification documents UL Mark	C-UL Mark	IECEx	ATEX/UKEx
Zone 0	• Flame-proof, “da” (Ga)	ANSI/UL 60079-1	CSA 60079-1	IEC 60079-1	EN 60079-1
	• Intrinsic safety, “ia” (Ga)	ANSI/UL 60079-11	CSA 60079-11	IEC 60079-11	EN 60079-11
	• Encapsulation, “ma” (Ga)	ANSI/UL 60079-18	CSA 60079-18	IEC 60079-18	EN 60079-18
	• Optical radiation, “op” (Ga)	ANSI/UL 60079-28	CSA 60079-28	IEC 60079-28	EN 60079-28
	• Special protection, “s” (Ga)	ANSI/UL 60079-33	—	IEC 60079-33	—
	• Class I, Div 1 intrinsic safety	ANSI/UL 913	CSA 157	—	—
Zone 1	• Flame-proof, “db” (Gb)	ANSI/UL 60079-1	CSA 60079-1	IEC 60079-1	EN 60079-1
	• Pressurization, “pxb”/“pyb” (Gb)	ANSI/UL 60079-2	CSA 60079-2	IEC 60079-2	EN 60079-2
	• Powder filling, “q” (Gb)	ANSI/UL 60079-5	CSA 60079-5	IEC 60079-5	EN 60079-5
	• Liquid immersion, “ob” (Gb)	ANSI/UL 60079-6	CSA 60079-6	IEC 60079-6	EN 60079-6
	• Increased safety, “eb” (Gb)	ANSI/UL 60079-7	CSA 60079-7	IEC 60079-7	EN 60079-7
	• Intrinsic safety, “ib” (Gb)	ANSI/UL 60079-11	CSA 60079-11	IEC 60079-11	EN 60079-11
	• Encapsulation, “mb” (Gb)	ANSI/UL 60079-18	CSA 60079-18	IEC 60079-18	EN 60079-18
	• Optical radiation, “op” (Gb)	ANSI/UL 60079-28	CSA 60079-28	IEC 60079-28	EN 60079-28
	• Special protection, “s” (Gb)	ANSI/UL 60079-33	—	IEC 60079-33	—
	• Any Zone 0 technique	See above	See above	See above	See above
	• Any Class I, Div 1 technique	See CID1 techniques	See CID1 techniques	—	—

EXPLOSIVE GAS ATMOSPHERES (e.g. Class I Division System)

Includes flammable gases, flammable liquid-produced vapors, and combustible liquid-produced vapors

Zone System Electrical Equipment Protection Techniques (Equipment Protection Levels) CONTINUED

Zone 2	• Flame-proof, “dc” (Gc)	ANSI/UL 60079-1	CSA 60079-1	IEC 60079-1	EN 60079-1
	• Pressurization, “pzc” (Gc)	ANSI/UL 60079-2	CSA 60079-2	IEC 60079-2	EN 60079-2
	• Liquid immersion, “oc” (Gc)	ANSI/UL 60079-6	CSA 60079-6	IEC 60079-6	EN 60079-6
	• Increased safety, “ec” (Gc)	ANSI/UL 60079-7	CSA 60079-7	IEC 60079-7	EN 60079-7
	• Intrinsic safety, “ic” (Gc)	ANSI/UL 60079-11	CSA 60079-11	IEC 60079-11	EN 60079-11
	• Enclosed break, “nC” (Gc)	ANSI/UL 60079-15	CSA 60079-15	IEC 60079-15	EN 60079-15
	• Hermetically sealed, “nC” (Gc)	ANSI/UL 60079-15	CSA 60079-15	IEC 60079-15	EN 60079-15
	• Nonincendive, “nC” (Gc)	ANSI/UL 60079-15	CSA 60079-15	IEC 60079-15	EN 60079-15
	• Non-sparking, “nA” (Gc)	ANSI/UL 60079-15	CSA 60079-15	IEC 60079-15	EN 60079-15
	• Restricted breathing, “nR” (Gc)	ANSI/UL 60079-15	CSA 60079-15	IEC 60079-15	EN 60079-15
	• Sealed, “nC” (Gc)	ANSI/UL 60079-15	CSA 60079-15	IEC 60079-15	EN 60079-15
	• Encapsulation, “mc” (Gc)	ANSI/UL 60079-18	CSA 60079-18	IEC 60079-18	EN 60079-18
	• Optical radiation, “op” (Gc)	ANSI/UL 60079-28	CSA 60079-28	IEC 60079-28	EN 60079-28
	• Special protection, “s” (Gc)	ANSI/UL 60079-33	—	IEC 60079-33	—
	• Any Zone 0 or 1 technique	See above	See above	See above	See above
	• Any Class I, Div 1 or 2 technique	See Class I techniques	See Class I techniques	—	—

Note 1: Zone 0, 1 and 2 general requirements are contained in ANSI/UL 60079-0 (UL Mark), CSA 60079-0 (C-UL Mark), IEC 60079-0 (IECEx) and EN 60079-0 (ATEX/UKEx).

Note 2: INMETRO certification requirements in support of the UL-BR INMETRO Mark are determined by Portaria 115 dated March 23, 2022, with the associated Brazilian NBR Ex standards harmonized with the comparable IECEx standards noted above.

Note 3: References in one area to any protection techniques from another area require these other area techniques to be for the same gas atmosphere and with a suitable temperature class.

EXPLOSIVE GAS ATMOSPHERES (e.g. Class I Division System)

Includes flammable gases, flammable liquid-produced vapors, and combustible liquid-produced vapors

Zone system non-electrical equipment protection techniques (equipment protection levels)

		Applicable Certification Documents			
Area	**Protection Techniques**	**UL Mark**	**C-UL Mark**	**IECEx**	**ATEX/UKEx**
Zone 0	• Constructional safety, “c” (Ga)	ANSI/UL 80079-37	ISO 80079-37	ISO 80079-37	EN ISO 80079-37
	• Control of ignition source, “b” (Ga)	ANSI/UL 80079-37	ISO 80079-37	ISO 80079-37	EN ISO 80079-37
	• Liquid immersion, “k” (Ga)	ANSI/UL 80079-37	ISO 80079-37	ISO 80079-37	EN ISO 80079-37
	• Flame-proof, “da” (Ga)	ANSI/UL 60079-1	CSA 60079-1	IEC 60079-1	EN 60079-1
Zone 1	• Constructional safety, “c” (Gb)	ANSI/UL 80079-37	ISO 80079-37	ISO 80079-37	EN ISO 80079-37
	• Control of ignition source, “b” (Gb)	ANSI/UL 80079-37	ISO 80079-37	ISO 80079-37	EN ISO 80079-37
	• Liquid immersion, “k” (Gb)	ANSI/UL 80079-37	ISO 80079-37	ISO 80079-37	EN ISO 80079-37
	• Flame-proof, “db” (Gb)	ANSI/UL 60079-1	CSA 60079-1	IEC 60079-1	EN 60079-1
	• Pressurization, “pxb”/“pyb”(Gb)	ANSI/UL 60079-2	CSA 60079-2	IEC 60079-2	EN 60079-2
	• Any Zone 0 technique	See above	See above	See above	See above
Zone 2	• Flow-restricting enclosure, “fr”	—	—	—	EN 13463-2
	• Constructional safety, “c” (Gc)	ANSI/UL 80079-37	ISO 80079-37	ISO 80079-37	EN ISO 80079-37
	• Control of ignition source, “b” (Gc)	ANSI/UL 80079-37	ISO 80079-37	ISO 80079-37	EN ISO 80079-37
	• Liquid immersion, “k” (Gc)	ANSI/UL 80079-37	ISO 80079-37	ISO 80079-37	EN ISO 80079-37
	• Flame-proof, “dc” (Gc)	ANSI/UL 60079-1	CSA 60079-1	IEC 60079-1	EN 60079-1
	• Pressurization, “pzc” (Gc)	ANSI/UL 60079-2	CSA 60079-2	IEC 60079-2	EN 60079-2
	• Any Zone 0 or 1 technique	See above	See above	See above	See above

Note 1: Zone 0, 1 and 2 general requirements are contained in ANSI/UL 80079-36 (UL Mark), ISO 80079-36 (C-UL Mark & IECEx) and EN ISO 80079-36 (ATEX/UKEx).

Note 2: References in one area to any protection techniques from another area require those other area techniques to be for the same gas atmosphere and with a suitable temperature class.

EXPLOSIVE DUST ATMOSPHERES (e.g. Class II & III Division Systems)

Includes combustible dust, combustible fibers/flyings and ignitible fibers/flyings

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Includes combustible dust, combustible fibers/flyings and ignitible fibers/flyings

Area classifications

Class II, Division 1:
Where ignitible concentrations of combustible dust **are present** under normal operating conditions

Note: Locations where metal combustible fibers/flyings are present shall be classified as Class II, Division 1, Group E.

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

Zone 21:
Where ignitible concentrations of combustible dust, combustible fibers/flyings or ignitible fibers/flyings **are likely to exist occasionally** under normal operating conditions

Class II, Division 2:
Where ignitible concentrations of combustible dust **are not present** under normal operating conditions

Zone 22:
Where ignitible concentrations of combustible dust, combustible fibers/flyings or ignitible fibers/flyings **are not likely to occur** under normal operating conditions

Class III, Division 1:
Where explosible mixtures of nonmetal combustible fibers/flyings **are present** under normal operating conditions or where ignitible fibers/flyings **are handled manufactured or used**

Class III, Division 2:
Where explosible mixtures of nonmetal combustible fibers/flyings **are not present** under normal operating conditions or where ignitible fibers/flyings **are stored or handled other than in the process of manufacture**

EXPLOSIVE DUST ATMOSPHERES (e.g. Class II & III Division Systems)

Includes combustible dust, combustible fibers/flyings and ignitible fibers/flyings

Groups

Class II, Divisions 1 and 2		Zones 20, 21 and 22:	
E	Metal combustible dusts — Div. 1 only	**IIIC**	Metal combustible dusts/fibers/ flyings — Zones 20 and 21 only
F	Carbonaceous combustible dusts	**IIIB**	Other than metal combustible dusts
G	Combustible dusts not in Group E or Group F	**IIIB**	Other than metal combustible dusts

Class III, Divisions 1 and 2:

- Nonmetal combustible fibers/ flyings
- Ignitible fibers/flyings

Zones 20, 21 and 22:

IIIA Other than metal combustible fibers/flyings

Temperature classifications

Class II, Divisions 1 and 2:

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

Zones 20, 21 and 22: None

Note: For Zones 20, 21 and 22, equipment shall be marked to show the maximum surface temperature.

Class III, Division 1 and 2: None.

Note: Article 503 of the NEC limits the maximum surface temperature so as not to cause excessive dehydration or gradual carbonization. Appendix J of the CE Code limits the maximum surface temperature for Class III to 165°C for equipment not subject to overloading and to 120°C for equipment that may be overloaded.

EXPLOSIVE DUST ATMOSPHERES (e.g. Class II & III Division Systems)

Includes combustible dust, combustible fibers/flyings and ignitible fibers/flyings

Division system electrical equipment protection techniques

		Applicable certification documents	
Area	**Protection techniques**	**UL Mark**	**C-UL Mark**
Div. 1	• Intrinsic safety (Classes II and III)	ANSI/UL 913	CSA 157 or CSA 60079-11
	• Dust ignition-proof (Class II)	ANSI/UL 1203	CSA 25
	• Pressurized, Type X or Y (Class II)	ANSI/NFPA 496	ANSI/NFPA 496
	• Dust-tight (Class III)	ANSI/UL 121201	CSA 213
	• Hermetically sealed (Class III)	ANSI/UL 121201	CSA 213
	• Nonincendive (Class III)	ANSI/UL 121201	CSA 213
	• Sealed (Class III)	ANSI/UL 121201	CSA 213
	• Optical radiation	ANSI/UL 60079-28	CSA 60079-28
	• Special protection	ANSI/UL 60079-33	—
	• Any Zone 20 technique (Classes II and III)	See Zone 20 techniques	See Zone 20 techniques
Div. 2	• Dust-tight (Class II)	ANSI/UL 121201	CSA 213
	• Hermetically sealed (Class II)	ANSI/UL 121201	CSA 213
	• Nonincendive (Class II)	ANSI/UL 121201	CSA 213
	• Sealed (Class II)	ANSI/UL 121201	CSA 213
	• Pressurized, Type Z (Class II)	ANSI/NFPA 496	ANSI/NFPA 496
	• Optical radiation (Class II)	ANSI/UL 60079-28	CSA 60079-28
	• Special protection (Class II & III)	ANSI/UL 60079-33	—
	• Any CIID1 or CIIID1 technique	See above	See above
	• Any Zone 20, 21, 22 technique (Class II and III)	See zone techniques	See zone techniques

EXPLOSIVE DUST ATMOSPHERES (e.g. Class II & III Division Systems)

Includes combustible dust, combustible fibers/flyings and ignitible fibers/flyings

Zone system electrical equipment protection techniques (equipment protection levels)

Area	Protection techniques (equipment protection levels)	Applicable certification documents UL Mark	C-UL Mark	IECEx	ATEX/UKEx
Zone 20	• Enclosure, “ta” (Da)	ANSI/UL 60079-31	CSA 60079-31	IEC 60079-31	EN 60079-31
	• Intrinsic safety, “ia” (Da)	ANSI/UL 60079-11	CSA 60079-11	IEC 60079-11	EN 60079-11
	• Encapsulation, “ma” (Da)	ANSI/UL 60079-18	CSA 60079-18	IEC 60079-18	EN 60079-18
	• Optical radiation, “op” (Da)	ANSI/UL 60079-28	CSA 60079-28	IEC 60079-28	EN 60079-28
	• Special protection, “s” (Da)	ANSI/UL 60079-33	—	IEC 60079-33	—
	• Any CIID1 technique	See CIID1 techniques	See CIID1 techniques	—	—
Zone 21	• Enclosure, “tb” (Db)	ANSI/UL 60079-31	CSA 60079-31	IEC 60079-31	EN 60079-31
	• Pressurization, “pxb”/“pyb” (Db)	ANSI/UL 60079-2	CSA 60079-2	IEC 60079-2	EN 60079-2
	• Intrinsic safety, “ib” (Db)	ANSI/UL 60079-11	CSA 60079-11	IEC 60079-11	EN 60079-11
	• Encapsulation, “mb” (Db)	ANSI/UL 60079-18	CSA 60079-18	IEC 60079-18	EN 60079-18
	• Optical radiation, “op” (Db)	ANSI/UL 60079-28	CSA 60079-28	IEC 60079-28	EN 60079-28
	• Special protection, “s” (Db)	ANSI/UL 60079-33	—	IEC 60079-33	—
	• Any Zone 20 technique	See above	See above	See above	See above
	• Any CIID1 technique	See CIID1 techniques	See CIID1 techniques	—	—
Zone 22	• Enclosure, “tc” (Dc)	ANSI/UL 60079-31	CSA 60079-31	IEC 60079-31	EN 60079-31
	• Pressurization, “pzc” (Dc)	ANSI/UL 60079-2	CSA 60079-2	IEC 60079-2	EN 60079-2
	• Intrinsic safety, “ic” (Dc)	ANSI/UL 60079-11	CSA 60079-11	IEC 60079-11	EN 60079-11
	• Encapsulation, “mc” (Dc)	ANSI/UL 60079-18	CSA 60079-18	IEC 60079-18	EN 60079-18
	• Optical radiation, “op” (Dc)	ANSI/UL 60079-28	CSA 60079-28	IEC 60079-28	EN 60079-28
	• Special protection, “s” (Dc)	ANSI/UL 60079-33	—	IEC 60079-33	—
	• Any Zone 20, 21 technique	See above	See above	See above	See above
	• Any CIID1, CIID2 technique	See Class II techniques	See Class II techniques	—	—

Note 1: Zone 20, 21 and 22 general requirements are contained in ANSI/UL 60079-0 (UL Mark), CSA 60079-0 (C-UL Mark), IEC 60079-0 (IECEx) and EN 60079-0 (ATEX/UKEx).

Note 2: INMETRO certification requirements in support of the UL-BR INMETRO Mark are determined by Portaria 115 dated March 23, 2022, with the associated Brazilian NBR Ex standards harmonized with the comparable IECEx standards noted above.

Note 3: References in one area to any protection techniques from another area require those other area techniques to be for the same dust atmosphere and with a suitable temperature class.

EXPLOSIVE DUST ATMOSPHERES (e.g. Class II & III Division Systems)

Includes combustible dust, combustible fibers/flyings and ignitible fibers/flyings

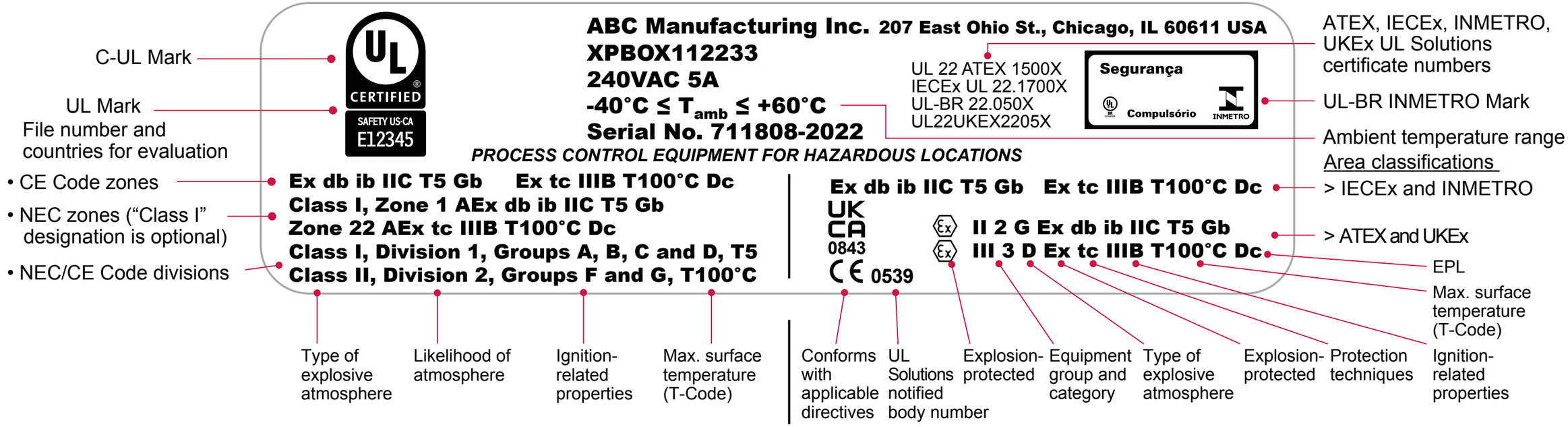
Zone system non-electrical equipment protection techniques (equipment protection levels)

		Applicable Certification Documents			
Area	**Protection Techniques**	**UL Mark**	**C-UL Mark**	**IECEx**	**ATEX/UKEx**
Zone 20	• Constructional safety, “c” (Da)	ANSI/UL 80079-37	ISO 80079-37	ISO 80079-37	EN ISO 80079-37
	• Control of ignition source, “b” (Da)	ANSI/UL 80079-37	ISO 80079-37	ISO 80079-37	EN ISO 80079-37
	• Liquid immersion, “k” (Da)	ANSI/UL 80079-37	ISO 80079-37	ISO 80079-37	EN ISO 80079-37
	• Enclosure, “ta” (Da)	ANSI/UL 60079-31	CSA 60079-31	IEC 60079-31	EN 60079-31
Zone 21	• Constructional safety, “c” (Db)	ANSI/UL 80079-37	ISO 80079-37	ISO 80079-37	EN ISO 80079-37
	• Control of ignition source, “b” (Db)	ANSI/UL 80079-37	ISO 80079-37	ISO 80079-37	EN ISO 80079-37
	• Liquid immersion, “k” (Db)	ANSI/UL 80079-37	ISO 80079-37	ISO 80079-37	EN ISO 80079-37
	• Pressurization, “pxb”/“pyb” (Db)	ANSI/UL 60079-2	CSA 60079-2	IEC 60079-2	EN 60079-2
	• Enclosure, “tb” (Db)	ANSI/UL 60079-31	CSA 60079-31	IEC 60079-31	EN 60079-31
	• Any Zone 20 technique	See above	See above	See above	See above
Zone 22	• Flow-restricting enclosure, “fr”	—	—	—	EN 13463-2
	• Constructional safety, “c” (Dc)	ANSI/UL 80079-37	ISO 80079-37	ISO 80079-37	EN ISO 80079-37
	• Control of ignition source, “b” (Dc)	ANSI/UL 80079-37	ISO 80079-37	ISO 80079-37	EN ISO 80079-37
	• Liquid immersion, “k” (Dc)	ANSI/UL 80079-37	ISO 80079-37	ISO 80079-37	EN ISO 80079-37
	• Pressurization, “pzc” (Dc)	ANSI/UL 60079-2	CSA 60079-2	IEC 60079-2	EN 60079-2
	• Enclosure, “tc” (Dc)	ANSI/UL 60079-31	CSA 60079-31	IEC 60079-31	EN 60079-31
	• Any Zone 20 or 21 technique	See above	See above	See above	See above

Note 1: Zone 20, 21 and 22 general requirements are contained in ANSI/UL 80079-36 (UL Mark), ISO 80079-36 (C-UL Mark & IECEx) and EN ISO 80079-36 (ATEX/UKEx).

Note 2: References in one area to any protection techniques from another area require those other area techniques to be for the same dust atmosphere and with a suitable temperature class.

Markings



Note 1: 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 2: Under the ATEX Directive (2014/34/EU) and the UKEx Regulation (SI 2016 No. 1107), equipment categories are similar to EPLs in function and designation as follows: Equipment Category 1G, 2G, 3G, 1D, 2D, 3D, M1, M2 = EPL Ga, Gb, Gc, Da, Db, Dc, Ma, Mb, respectively.

Ingress Protection (IP) Codes

Comparison of IP Codes

First numeral	Protection against access to hazardous parts by:	Protection against entry of solid objects:	Second numeral	Protection against entry of water:
0	No protection	No protection	0	No protection
1	The back of a hand	Objects greater than 50 mm	1	Vertically falling water drops
2	A finger	Objects greater than 12.5 mm	2	Vertically falling water drops when enclosure tilted up to 15°
3	A tool	Objects greater than 2.5 mm	3	Spraying water
4	A wire	Objects greater than 1.0 mm	4	Splashing water
5	Dust	Dust-protected	5	Water jets
6	Dust	Dust-tight	6	Powerful water jets
			7	Temporary immersion in water
			8	Continous immersion in water
			9	High pressure and temperature water jets

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