TERMINAL ENCLOSURE DESCRIPTIONS

M1—GENERAL PURPOSE (NEMA I)
Nonventilated enclosure to prevent accidental contact with enclosed apparatus, suitable for use indoors where not subjected to any unusual operating conditions, to provide protection against dirt, light and indirect splashing, but not dust tight.

M5—MOISTURE RESISTANT

M6— EXPLOSION RESISTANT

M7—COMBINATION MOISTURE TIGHT, EXPLOSION RESISTANT

Specifying an Explosion Resistant Electrical Enclosure

CLASSIFICATION OF HAZARDOUS ATMOSPHERES† (Based on National Electrical Code and UL)

Class	Division	Group	Typical atmosphere/ignition temps.	Devices Covered	Temperature Measured	Limiting Value
I Gases, vapors	1 Normally hazardous	A	acetylene (305C, 581F)	All electrical devices and wiring	Maximum external temperature in 40C ambient	See Sect. 500-2 of NEC
		B	butadiene (420C, 788F) ethylene oxide[1] (429C, 804F) hydrogen (408C, 752F) manufactured gases containing more than 30% hydrogen (by volume) propylene oxide[1] (449C, 840F)			
		C	acetaldehyde (175C, 347F) cyclopropane (500C, 932F) diethyl ether (160C, 320F) ethylene (490C, 914F) unsymmetrical dimethyl hydrazine (UDMH 1, 1-dimethyl hydrazine) (249C, 480F)		
		D	acetone (465C, 869F) acrylonitrile (481C, 898F) ammonia[3] (651C, 1204F) benzene (560C, 1040F) butane (405C, 761F) 1-butanol (butyl alcohol) (365C, 689F) 2-butanol (secondary butyl alcohol) (405C, 761F) n-butyl acetate (425C, 797F) isobutyl acetate (421C, 790F) ethane (515C, 959F) ethanol (ethyl alcohol) (356C, 689F) ethyl acetate (472C, 803F) ethylene dichloride (413C, 775F) gasoline (58–60 octane: 280C, 536F) (100 octane: 456C, 853F) heptanes (280C, 536F) hexanes (225C, 437F) isoprene (220C, 428F) methane (natural gas) 482 to 632C, 900 to 1170F) methanol (methyl alcohol) (385C, 725F) 3-methyl-1-butanol (isoamyl alcohol) (350C, 662F) methyl ethyl ketone (516C, 960F) methyl isobutyl ketone (460C, 860F) 2-methyl-1-propanol (isobutyl alcohol) (427C, 800F) 2-methyl-2-propanol (tertiary butyl alcohol) (480C, 896F) petroleum naphtha[4] (288C, 550F) octanes (220C, 428F) pentanes (260C, 500F) 1-pentanol (amyl alcohol) (300C, 572F) propane (450C, 842F) 1-propanol (propyl alcohol) (440C, 824F) 2-propanol (isopropyl alcohol) (399C, 750F) propylene (460C,860F) styrene (490C, 914F) toluene (480C, 896F) vinyl acetate (427C, 800F) vinyl chloride (472C, 882F) xylenes (530C, 986F)		

1) Group D equipment shall be permitted for this atmosphere if such equipment is isolated in accordance with Section 501-5(a) by sealing all conduit ½-inch size or larger.

2) Group C equipment shall be permitted for this atmosphere if such equipment is isolated in accordance with Section 501-5(a) by sealing all conduit ½-inch size or larger.

3) For Classification of areas involving ammonia atmosphere, see Safety Code for Mechanical Refrigeration (ANSI B9.1-1971) and Safety Requirements for the Storage and Handling of Anhydrous Ammonia (ANSI K61.1-1972).

4) A saturated hydrocarbon mixture boiling in the range 20–135°C (68–275°F). Also known by the synonyms benzene, ligroin, petroleum ether or naphtha.

†For a complete list noting properties of flammable liquids, gases and solids refer to the latest edition of NFPA No. 325M.

(Continued) Specifying an Explosion Resistant Electrical Enclosure

Class	Division	Group	Typical atmosphere/ignition temps.	Devices Covered	Temperature Measured	Limiting Value
I Gases Vapors	2 Not normally hazardous	A B C D	Same as Division 1 Same as Division 1 Same as Division 1 Same as Division 1 (Not normally hazardous means that the gases aren't normally present.)	Lamps, resistors, coil etc., other than arcing devices (see Div. 1)	Max. internal or external temp. not to exceed the ignition temperature in degrees Celsius (° C) of the gas or vapor involved	See Sect. 500-2 of NEC
II Combustible dusts	1 Normally hazardous	E	Metal dust, including aluminum, magnesium, and their commercial alloys, and other metals of similarly hazardous characteristics	Devices not subject to overloads (switches, meters).	Max. external temp. in 40C ambient with a dust blanket	No overload: E-200C (392F) F-200C (392F) G-165C (329F)
		F	Carbon black, coal, coke dust with more than 8% volatile material.	Devices subject to overload (motors, transformers)		Possible overload: E, F, G-120C (248F) but not to exceed no overload values at overload
		G	Flour, starch, grain dusts.			
	2 Not normally hazardous	G	Same as Division 1	Lighting fixtures	Max. external temp. under conditions of use	Group G-165C (329F)
III Easily ignitible fibers and flyings	1, 2			Lighting fixtures	Max. external temp. under conditions of use	165C (329F)

M6 and M7 Terminal Enclosures for Use in Hazardous Locations

CSA LR55274-24

NRTL/C - Certified to U.S. Standards
Class I, Groups B, C, and D
Class II, Groups E, F, and G
Class III

Special requirements for electric heaters and terminal enclosures in hazardous locations:

WIRING—The proper use of Type M6 and M7 terminal enclosures on electric heaters located in hazardous areas requires that all electrical wiring comply with National Electrical Code (NEC) requirements for hazardous locations

MAXIMUM TEMPERATURES— Safe operation in a hazardous location requires the maximum operating temperatures of all exposed surfaces of the heater including temperatures on the outside of the vessel, piping, flanges, pipe plugs, enclosures and other heat conduction parts be limited. The maximum surface temperature permitted in any hazardous location is determined by the flammable liquids, vapors or gases present. The end user or purchaser of the electric heating equipment is responsible for determining the proper classification of an area and for providing STS with hazardous area specifications and requirements for proper equipment design. (NEC Articles 500 and 501 provide guidelines for evaluating and classifying hazardous locations.)

SAFETY DEVICES—Approved pressure and/or temperature limiting controls must be used on electric heaters and heating elements to ensure safe operation in the event of system malfunctions.

Note 1: Class I Group B locations include Hydrogen gas. These areas require additional conduit seals and thread engagement. Contact STS for heaters and terminal enclosures suitable for Class I Group B hazardous locations.

Maximum Rating for Approval:

Pipe Plug Immersion Heaters — 225kw 600V
Flanged Immersion Heaters — 225kw 600V
Circulation Heaters — 70kw 600V

Round elements only. Contact STS for Mighty-Blades.