



MAURIA UDYOG LIMITED

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Date:02/10/2024

To
The Director
Bureau of Indian Standards
Sco-21, Sec-12,
Faridabad.

Ref- **Application No. 95003236**

Subject: - **Approval of design Drawing for steel cylinder of 1 ltr water capacity bearing no.**

MUL/REFRIGERANT/1.0L/2258 & MUL/REFRIGERANT/1.0L/2259 conforming to IS 7142: 1995 for storage of R 32 refrigerant gas.

Dear Sir/Madam,

With reference to our above application for grant of license and subsequent scurrility of the submitted design drawing of steel cylinder of 1 ltr water capacity bearing no **MUL/REFRIGERANT/1.0L/2258 & MUL/REFRIGERANT/1.0L/2259** conforming to **IS 7142: 1995** for storage of R 32 Refrigerant gas and subsequent to your suggestion to declare R32 as low pressure and flammable gas and color scheme as per IS 4379:2021 I wish to explain as below.

1.With reference to **Page no. 63 & 64** of Gas cylinder rule 2016 the copy of GCR page no 63 and 64 are attached here with.

According GCR

"**Low pressure liquefiable gas**" means a liquefiable gas having critical temperature higher than +70°C.

"**High pressure liquefiable gas**" means a liquefiable gas having a critical temperature between - 10⁰ C and + 70°C.

The Critical Temperature of R 32 gas is 78.1⁰C. As the critical temperature of R 32 is more than 70°C so **R32** is following under the category of **low pressure liquefiable flammable gas**.

2.With refence to clause 19 of IS 7142 mentioning the cylinder shall be painted externally in accordance with colour scheme specified in IS 4379:2021.

Referring to table No 3 of IS 4379:2021 it is clearly mentioned R32 is as low-pressure Flammable Refrigerant Gases whereas referring to table 10 for colour identification of refrigerant Gases for category of low-pressure Flammable gases R32 is not mentioned in table 10 rather for colour R32 is mentioned in table 9 under category of High Pressure - non-flammable gas.

Now I request your good self to consider R32 as a low-Pressure Flammable gas and the colour scheme to be followed as recommended in table 10 of IS 4379:2021 i.e French grey (630) and mean while I request to approve the submitted drawings enabling us to submit the design drawings to CCOE, PESO for their review and further proceedings.

Thanking you.

Yours Faithfully,

FOR MAURIA UDYOG LIMITED



S.K. PALA(AGM)

- (xvi) "cryogenic container " means a double walled insulated closed metal container having volume exceeding 500 ml but not exceeding 1000 liters intended for filling, storage and transport of cryogenic liquid fabricated as per codes approved by the Chief Controller;
- (xvii) "cryogenic liquid" means liquid form of permanent gas having normal boiling point below minus 150 ° C;
- (xviii) "cylinder testing station" means facilities and infrastructure for periodical testing and examination of cylinder;
- (xix) "dissolved acetylene cylinder" means a cylinder having a valve and with or without safety devices, containing porous mass, a solvent for the storage of dissolved acetylene and at least sufficient quantity of acetylene to saturate acetone as solvent at atmospheric pressure and at a temperature of +15 ° C;
- Explanation.- For the purpose of this clause, acetone or any other solvent used shall not be capable of chemical reaction with the acetylene gas or with the porous mass or with the metal of the cylinder or valve;
- (xx) "dissolved gas" means a gas which is dissolved under pressure in a fluid solvent appropriate to the particular gas;
- (xxi) "district authority" means-
- (a) a Commissioner of Police or Deputy Commissioner of Police in any town having a Commissioner of Police; and
- (b) in any other place, the District Magistrate;
- (xxii) "District Magistrate" includes an Additional District Magistrate, and in the States of Punjab and Haryana and in the Karaikal, Mahe and Yanam areas of the Union territory of Pondicherry, also includes a Sub-Divisional Magistrate;
- (xxiii) "fee" means the fee specified in Schedule V;
- (xxiv) "filling pressure" means the maximum permissible gauge pressure, converted to + 15 ° C, at which a gas cylinder for permanent gas or gas dissolved under pressure can be filled;
- (xxv) "filling ratio" means the ratio of the weight of a liquefiable gas introduced in the cylinder to the weight of the water that the cylinders will hold at 15 ° C;
- (xxvi) "flammable gas" means any gas which, if either a mixture of 13 percent or less (by volume) with air forms a flammable mixture or the flammability range with air is greater than 12 percent regardless of the lower limit and these limits shall be determined at atmospheric temperature and pressure;
- Explanation.- For the purpose of this clause: "flammability range" means the difference between the minimum and maximum percentages by volume of the gas in mixture with air that forms a flammable mixture;
- (xxvii) "Form" means a Form set forth in Schedule V;
- (xxviii) "gas cylinder" or "cylinder" means any closed metal container having a volume exceeding 500 ml but not exceeding 1000 liters intended for the storage and transport of compressed gas, including any liquefied petroleum gas (LPG) container or compressed natural gas (CNG) cylinder fitted to a motor vehicle as its fuel tank but not including any other such container fitted to a special transport or under-carriage and includes a composite cylinder and cryogenic container, however, the water capacity of cylinder used for storage of CNG, nitrogen, compressed air, etc., may exceed 1000 liters up to 3000 liters provided the diameter of such cylinder does not exceed 60 cm;
- (xxix) "gas cylinders cascade " means a battery of cylinders connected with each other, a tube trailer, multiple element gas containers and bundle of cylinders, conforming to the specifications BS EN-13769, BS EN-13807, ISO-10961 or any other specification accepted by the Chief Controller;
- (xxx) "high pressure liquefiable gas" means a liquefiable gas having a critical temperature between - 10 ° C and + 70 ° C;
- (xxxi) "hot repair or reconditioning of the LPG cylinders or other welded cylinders "means repair or replacement of valve protection ring, foot ring , other protective fitments and removal of permissible dents of LPG cylinders or other welded cylinder followed by heat treatment as per the standards or codes accepted by the Chief Controller;
- (xxxii) "hydrostatic stretch test" means subjecting the cylinder to a hydrostatic pressure equal to the test pressure of the cylinder and recording the permanent stretch undergone by the cylinder;

- (xxxiii) "hydrostatic test" means the test to which a cylinder is subjected to a hydrostatic pressure equal to the test pressure of the cylinder;
- (xxxiv) "import" means bringing into India by land, sea or air;
- (xxxv) "inert gas" means a gas which is resistant to chemical action under normally encountered conditions;
- (xxxvi) "inspecting authority" means a person having qualifications and experience in the field of design, manufacture and testing of gas cylinders, valves and LPG regulators and recognised by the Chief Controller as authority for inspection and certification of gas cylinder, valves and LPG regulators.;
- (xxxvii) "installation" means premises wherein a place has been specially prepared for the manufacture or filling or storage of compressed gas cylinders;
- (xxxviii) "liquefiable gas" means a gas that may be liquefied by pressure at -10°C but will be completely vaporised when in equilibrium with normal atmospheric pressure (760 mm. Hg) at 17.5°C which value shall be increased to 30°C for toxic gases;
- (xxxix) "liquefied petroleum gas" means any material, which comprises predominantly of any of the following hydrocarbons or mixture of them with vapour pressure not exceeding 16.87 kg/cm² (gauge) at 65°C ; Propane (C₃H₈), propylene (C₃H₆), butane ((C₄H₁₀), (n-butane and iso-butane) and butylene (C₄H₈);
- (xl) "low pressure liquefiable gas" means a liquefiable gas having critical temperature higher than $+70^{\circ}\text{C}$;
- (xli) "manufacture of gas" means filling of a cylinder with any compressed gas and also includes transfer of compressed gas from one cylinder to any other cylinder;
- (xlii) "oxidising gas" means a gas which gives up oxygen readily or removes hydrogen from a compound or attracts negative electrons;
- (xlili) "permanent gas" means a gas whose critical temperature is below -10°C that is to say a gas which cannot be liquefied under any pressure at a temperature above -10°C ;
- (xliv) "pneumatic test" means the test to which a gas cylinder is subjected to a pneumatic pressure equal to the pneumatic test pressure or working pressure, as specified in the manufacturing code;
- (xlv) "poisonous or toxic gas" means a gas which has a maximum allowable concentration in air for human respiration not exceeding 100 mg/m³ at 15°C and 1 kgf/cm² absolute pressure;
- (xlvi) "porous mass" means single or multi-component substance introduced into, or formed in the cylinder shell, in order to fill it and due to its porosity allow the absorption of the solvent and the acetylene gas conforming to EN 13807 : 2003 - B.2.7;
- (xlvii) "Schedule" means the Schedule annexed to these rules;
- (xlviii) "tare weight" in relation to
- acetylene cylinder, means the weight of the cylinder together with any fittings, permanently attached and includes the weight of valve any safety device, porous mass, requisite quantity of solvent for dissolving acetylene, and the weight of acetylene gas saturating the solvent at atmospheric pressure and temperature of 15°C ;
 - liquefiable gas cylinder, means the weight of the cylinder together with any fittings permanently attached thereto and includes the weight of valve;
 - permanent gas cylinder, means the weight of the cylinder together with any fittings permanently attached thereto and excludes the weight of valve;
 - cryogenic container, means the weight of the container together with any fittings permanently attached thereto along with the weight of insulating material including the weight of the valves;
- (xlix) "test pressure" means the internal pressure required for the hydrostatic test or hydrostatic stretch test or pneumatic test of the cylinder as specified in the cylinder manufacturing codes;
- "transport" means the moving of a cylinder filled with any compressed gas from one place to another;
 - "water capacity" means the volume of water in litres, a cylinder will hold at 15°C ;
 - "working pressure for low pressure liquefiable gas" means the saturated vapour pressure at 65°C ;
Explanation - For the purposes of this clause, it is clarified that the values of saturated vapour pressure of different gases are specified in IS: 3710;
 - "working pressure for permanent gas" means the internal pressure of the gas in the cylinder at a temperature of 15°C ;
 - "yield strength" means the stress corresponding to a permanent strain of 0.2 percent of the original gauge length in a tensile test.