

SECTION 21 2000 - FIRE EXTINGUISHERS

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. Work under this section shall consist of furnishing all labour, materials, appliances and equipment necessary and required to install fire extinguishing hand appliances as per relevant specification of various authorities.
- B. Without restricting to the generality of the foregoing, the work shall consist of the following:
- Installation of fully charged and tested fire extinguishing hand appliances of A B C powder type, water Type and Mechanical Foam type as required and specified in the drawings and schedule of rates.

1.2 REFERENCE STANDARDS

Serial No.	Code No.	Code
1	NBC Part – IV	National Building Code of India; Part IV Fire & Life Safety
2	TAC	Tariff Advisory Committee fire protection manual Part-I.
3	IS 2190-1992	Selection, installation and maintenance of first-aid fire extinguishers code of practice
4	Is 4308: Part II	Dry Chemical Powder for Fighting B and C Class Fires
5	IS 14609	Dry Chemical Powder for Fighting A,B,C, Class Fires
6	IS: 2878	Fire Extinguisher, Carbon Dioxide Type (Portable and Trolley Mounted) -Specification
7	IS 7285	Seamless Steel Cylinders for Permanent and High Pressure Liquefiable Gases
8	IS 3224	Valve Fittings for Compressed Gas Cylinders Excluding Liquefied Petroleum Gas (LPG) Cylinders
9	IS 2825	Code for unfired pressure vessels
10	IS 7285	Seamless Steel Cylinders for Permanent and High Pressure Liquefiable Gases
11	IS 307	Carbon Dioxide
12	IS 940	Portable Fire Extinguisher, Water Type (Gas Cartridge

1.3 SUBMITTALS

- A. Product Data: Provide manufacturers catalogue information. Indicate valve data and ratings.
- B. Shop Drawings: Indicate extinguisher type, layout, weights, mounting.

- C. Project Record Documents: See Vol I SCC/GCC Record actual locations of components and tag numbering.
- D. Operation and Maintenance Data: Include installation instructions and spare parts lists.
- E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. Extra Valve Stem Packings: Two for each type and size of valve.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store extinguishers in shipping containers, with labeling in place.
- B. Provide temporary protective coating on extinguishers.

1.6 WARRANTY

- A. Provide installer's warranty that the installation is free from defects and will remain so for 1 year after date of Substantial Completion.

PART 2 - PRODUCTS

2.1 ABC TYPE DRY POWDER EXTINGUISHER

- A. The Extinguisher shall be filled with ABC grade 40, Mono Ammonium Phosphate 40% from any approved manufacturer.
- B. The capacity of the extinguisher when filled with Dry Chemical Powder (First filling) as per IS 4308, Part II, shall be 5 Kg +/-2% or 10 Kg +/- 3%.
- C. The distribution of fire extinguishers to be as per IS 2190 – 1992. It shall be operated upright, with a squeeze grip valve to control discharge.
- D. The plunger neck shall have a safety clip, fitted with a pin, to prevent accidental discharge. It shall be pressurized with Dry Nitrogen, as expellant.
- E. The Nitrogen to be charged at a pressure of 15 Kg/cm². Body shall be of mild steel conforming to relevant IS Standards.
- F. The neck ring shall be also mild steel and welded to the body. The discharge valve body shall be forged brass or leaded bronze, while the spindle, spring and siphon tube shall be of brass.
- G. The nozzle shall be of brass, while the hose shall be braided nylon. The body shall be cylindrical in shape, with the dish and dome welded to it.

- H. Sufficient space for Nitrogen gas shall be provided inside the body, above the powder filling.
- I. The Neck Ring shall be externally threaded - the threading portion being 1.6 cm. The filler opening in the neck ring shall not less than 50 mm.
- J. Discharge nozzles shall be screwed to the hose. The design of the nozzle shall meet the performance requirement, so as to discharge at least 85% of contents upto a throw of 4 mtr, continuously, at least for 15 seconds.
- K. The hose, forming part of discharge nozzle, shall be 500 mm long, with 10 mm dia internally for 5 Kg capacity and 12 mm for 10 Kg capacity.
- L. It shall have a pressure gauge fitted to the valve assembly or the cylinder to indicate pressure available inside.
- M. The extinguisher shall be treated with anti-corrosive paint, and it shall be labeled with words ABC 2.5 cm long, within a triangle of 5 cm on each face.
- N. The extinguisher body and valve assembly shall withstand internal pressure of 30 Kg/cm² for a minimum period of 2 minutes.
- O. The pressure gauge shall be imported and suited for the purpose.

2.2 WATER TYPE EXTINGUISHER (GAS PRESSURE TYPE)

- A. The Extinguishing medium shall be primarily water stored under normal pressure, the discharge being affected by release of Carbon Dioxide Gas from a 120 gms cylinder.
- B. The capacity of Extinguisher, when filled upto the indicated level, shall be 9ltr +/- 5%
- C. The skin thickness of the Cylinder shall be minimum 4.0 mm, fabricated from Mild Steel sheet, welded as required, with dish and dome, being of same thickness, and of size not exceeding the diameter of body.
- D. The diameter of body to be not less than 150 mm and not exceeding 200 mm. The neck shall be externally threaded upto a minimum depth of 16 mm, and leaded tin bronze.
- E. The cap shall be of leaded tin bronze, and screwed on the body up to a minimum of 1.6 cm depth, with parallel screw thread to match the neck ring.
- F. The siphon tube to be of brass or G.I. and the strainer of Brass. The cartridge holder, knob, discharge fittings and plunger to be of Brass/Leaded tin bronze, and plunger of stainless steel, spring of stainless steel. The cap to have handle fixed to it.
- G. The discharge hose shall be braided nylon, of 10 mm dia. and 600 mm long, with a nozzle of brass fitted at end.
- H. The extinguisher shall be treated for anti-corrosion internally and externally, and externally painted with Fire Red paint.
- I. The paint shall be stove enameled/powder coated. The cartridge shall be as per IS, and have 60 gm net carbon dioxide gas for expelling.

- J. The extinguisher, body and cap shall be treated to an internal hydraulic pressure of 25 Kg/cm².
- K. It shall have external marking with letter A, of 2.5 cm height, in block letters within a triangle of 5 cm each side.
- L. The extinguisher shall be upright in operation, with the body placed on ground and discharge tube with nozzle held in one hand to give a throw of not less than 6 mtr, and continue so for at least 60 secs.
- M. The extinguisher body shall be clearly marked with ISI stamp (IS 940).

2.3 CARBON DIOXIDE EXTINGUISHER

- A. The Carbon Dioxide Extinguisher shall be as per IS: 2878
- B. The body shall be constructed of seamless tube conforming to IS: 7285 and having a convex dome and flat base. Its dia shall be maximum 140 mm, and the overall height shall not exceed 720 mm.
- C. The discharge mechanism shall be through a control valve conforming to IS:3224. The internal siphon tube shall be of copper aluminum conforming to relevant specifications.
- D. Hose Pipe shall be high pressure braided Rubber hose with a minimum burst pressure of 140 Kg/cm² and shall be approximately 1.0 meter in length having internal dia of 10
- E. The discharge horn shall be of high quality unbreakable plastic with gradually expanding shape, to convert liquid carbon dioxide into gas form.
- F. The handgrip of Discharge horn shall be insulated with Rubber of appropriate thickness.
- G. The gas shall be conforming to IS: 307 and shall be stored at about 85 Kg/cm². The expansion ratio between stored liquid carbon dioxide to expanded gas shall be 1:9 times, the total discharge time (effective) shall be minimum 10 secs, and maximum 25-secs.
- H. The extinguisher shall fulfill the following test pressures:
 - 1. Cylinder: 236 Kg/cm²
 - 2. Control Valve: 125 Kg/cm²
 - 3. Burst Pressure of Hose: 140 Kg/cm² minimum
- I. It shall be an Upright type. The cylinder, including the control valve and high pressure Discharge Hose must comply with relevant Statutory Regulations, and be approved by Chief Controller of Explosives, Nagpur and also bear ISI marking. The Extinguisher including components shall be ISI marked.

2.4 MECHANICAL FOAM TYPE EXTINGUISHER

- A. The construction of body shall be welded and the requirement of thickness of sheet and details of the construction shall be as per IS-2825-1960 code for pressure vessels. CO₂ gas cylinder used for propelling foam solution shall have necessary statutory approvals. The extinguisher shall have furnished with all accessories as needed such as filling orifice with removable S.S strainer, S.S drain plug, pressure vacuum vent, (breather valve) pressure reducer, safety valve, level indicator etc.

- B. The charge shall be of mechanical foam compound as per IS-4989-1974 (part-11
- C. AFFF) for producing foam for fire fighting. The fire extinguisher shall be painted ' FIRE RED ' conforming to shade No 536 of IS- 5-1961. Each fire extinguisher shall be clearly marked with necessary information in English.

Technical Details

1. Tank capacity-50LTR
2. Gas (co2)- 2 kg in gas cylinder with control valve
3. Charge-AFFF (4) Foam expansion 6-8 times
4. Discharge jet length-8 to 10 mtr
5. Hose length-5 mtr
6. Tank shall be epoxy coated in side and outside the tank
7. Trolley wheel- 300mm dia solid rubber
8. Discharge Nozzle (specially designed self-aspirating branch pipe)- S.S-304.
9. Syphon tube-S.S-304.

2.5 Stored Pressure Mechanical Foam (AFFF)

a. Capacity	9 liters
b. Code	BIS: 15397
c. Jet range	< 6 meters
d. Discharge Time	25-60 Seconds
e. Minimum discharge	90%
f. Test Pressure	30 Kg/cm ²

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Hand appliances shall be installed in easily accessible locations with the brackets fixed to the wall by suitable anchor fasteners.
- B. Each appliance shall be provided with an inspection card indicating the date of inspection, testing, change of charge and other relevant data.
- C. All appliances shall be fixed in a true workmanlike manner truly vertical and at correct locations.
- D. Distribution / installation of fire extinguisher to be in accordance to IS:2190.

END OF SECTION 21 2000