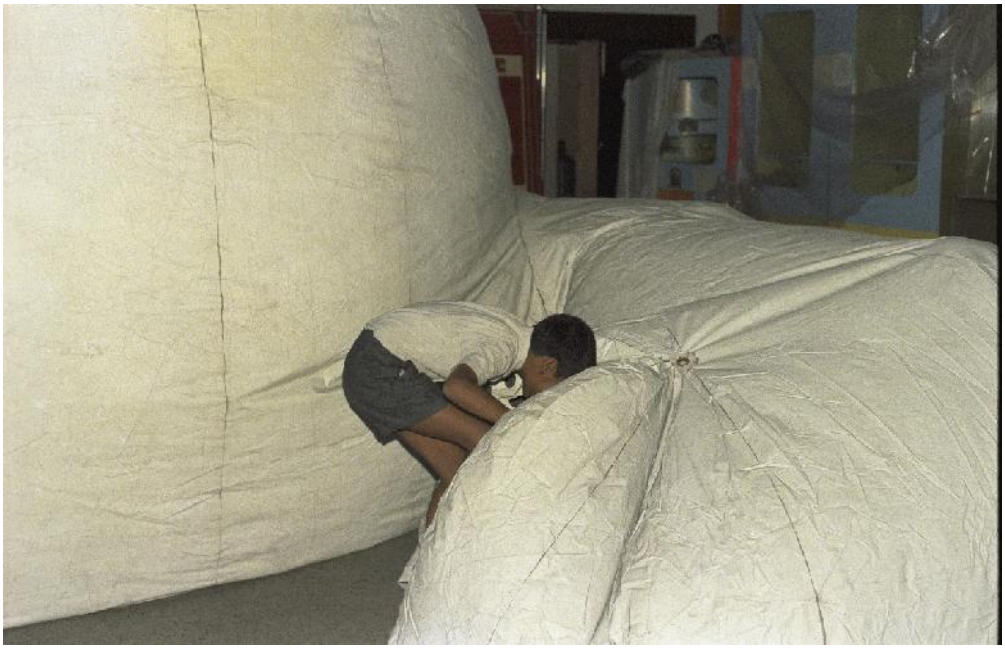
Ministry of Culture
Government of India

National Council of Science Museums

33 Block GN, Saltlake Sector V
Bidhannagar, Kolkata 700 091

TENDER NO. I-18012/2/22(42)

Technical Specification & Drawing



Pic 1: Visitor's entrance into Inflated Dome

Pic 2: Inside Inflated Dome

Pic 3: Deflated Dome

Pic 4: Air flow from Fan to Inflated Dome

Pic 1: Visitor's Exit fromInflated Dome

- **Manufacture & Supply of Customized 5 meter diameter InflatablePlanetarium (Taramandal) Dome**

National Council of Science Museums, an autonomous organization working directly under Ministry of Culture, Govt. of India, is mainly engaged in propagating science among masses in the country in a non-conventional way in indifferent capacities. Taramandal show is one such programme through which the council facilitates learning astronomy in different parts of our country. Dome is the essential part of this facility where a number of visitors would be inside it to watch astronomy programmes. Therefore, this dome has to be manufactured in a way so that it must be lightproof, fire/flame retardant & also waterproof.

Construction

The planetarium dome is of inflated type, which employs a self-supporting fabric structure that includes a hemispherical dome having its peripheral edge connected with an upright wall that serves to support the dome w.r.t. the ground or floor surface upon which the overall unit is placed. The unit thereupon inflated with air so as to be generally self-supporting. The air pressure being controlled by suitable means to maintain in a substantially constant contour to the inflated planetarium dome. The structure can be set up and dismantled, as needed and when used with suitable planetarium projector, in intended to provide a relatively accurate representation of a planetarium display.

The entrance tube shall be splitted vertically and shall be self-closing type in the middle so that visitors can enter into it.

SPECIFICATIONS OF INFLATABLE PLANETARIUM (TARAMANDAL) DOME

01. The inflated DOME is an air supported structure made up of rubberized nylon fabric, both side coated, which is waterproof, lightproof and fire/flame retardant. The coated fabric shall meet the fire/flame retardant requirements of Class A type of IS:1259-1984. It should be waterproof showing no sign of Wet patches/leakage when tested under 90 cm water head for 30 minutes. As per IS: 7016 (Pt-VII)-1973.

02. The DOME can be fully blown up within 7 minutes by means of an axial flow electric blower fan and will retain the hemispherical shape as long as the blower is in operation. The axial flow blower is of approx. 380 mm. sweep, 900 RPM, 1800 cubic meter of air flow per hour at 3 mm water column of equivalent operating at 220 Volts, 50 Cycles, 90 Watts. (Fan to be supplied along with DOME).

03. The size of the DOME is mentioned below:
Height: 3.20 meters. Dia: 5.00 meters.

04. The body of the DOME when fully blown up shall be free from wrinkles.1.5 feet of the dome should rest on the floor from its circular edgewhere the vertical structure starts from the floor.

05. The Volume of the DOME will be approx. 35 Cubic meters.

06. Total weight of the DOME should not exceed 35 Kgs.

07. The entrance tube shall be splitted vertically and shall be self-closing type in the middle so that people can enter into it.

08. Approx. 50 to 60 Nos. of holes of 38 mm. diameter shall be provided on the front side of the entrance tube for air circulation.

09. The opening of the inflation tube at the fan-end shall be such that it can easily accommodate the rim of the blower and shall not slip due to air pressure.

10. The colour of the DOME portion will be both side aluminized whereas the entrance portion of the blower and connecting tube shall be one side black and another side aluminized.

11. Repairing material made of the same material and same colour of the dome coated on one side with pressure sensitive adhesive of approx. size 30 cm. X 3.0 meters shall be supplied for minor repair.

SPECIFICATIONS OF COATED FABRIC USED FOR DOME

Sl. No.	Test Parameters	Specified Value	Specifications
1	Weight / sqmtr.(gm)	350 ± 10%	IS: 1964 – 1970
2	Breaking Strength in kgf, min. before ageing (5 x 20 cm grip)	Warp – 50 Weft – 40	IS: 7016 (part II) – 1981
3	Breaking Strength in kgf, min. after ageing (5 x 20 cm grip)	Warp – 45 Weft – 35	IS: 7016 (part II) – 1975, oven method @70 ± 1°C for 1 day
4	Tear Strength in kgf, min. before ageing (Torque Method)	Warp – 2.5 Weft – 2.0	IS: 7016 (part III) – 1981
5	Tear Strength in kgf, min. after ageing (Torque Method)	Warp – 2.0 Weft – 1.5	IS: 7016 (part VIII) – 1975, oven method @70 ± 1°C for 1 day
6	Water proofness at 90 cm water column for 30 min.	No leakage or wet patches should observe	IS: 7016 (part VII) – 1973
7	Flameproof test After Glow, sec Char Length, cm	 12 22	BS: 3119

Packing

Valise fitted with zip fastener and strap handle shall be provided in which the DOME can be accommodated.

Installation

Step-I Takeout the dome from the valise and place it loosely on collapsed/deflated form on asmooth surface free from any sharp object, gravels, etc. which may damage the body of the dome. Inflated tube end and the entrance/exit doorway should be left at opposite end.

Step-II Take out the fan from the box.

Step-III Fix up the inflated tube end with the projected rim of the axial blower fan by using nylon tape fitted with buckles.

Step-IV Connect the blower fan 220/230V 50 Hz single phase AC supply and switch on the fan. It takes approx. 5 to 6 minutes for the dome to take its own shape.

Step-V The self-closing type doorway is to be used for entrance & exit purposes.