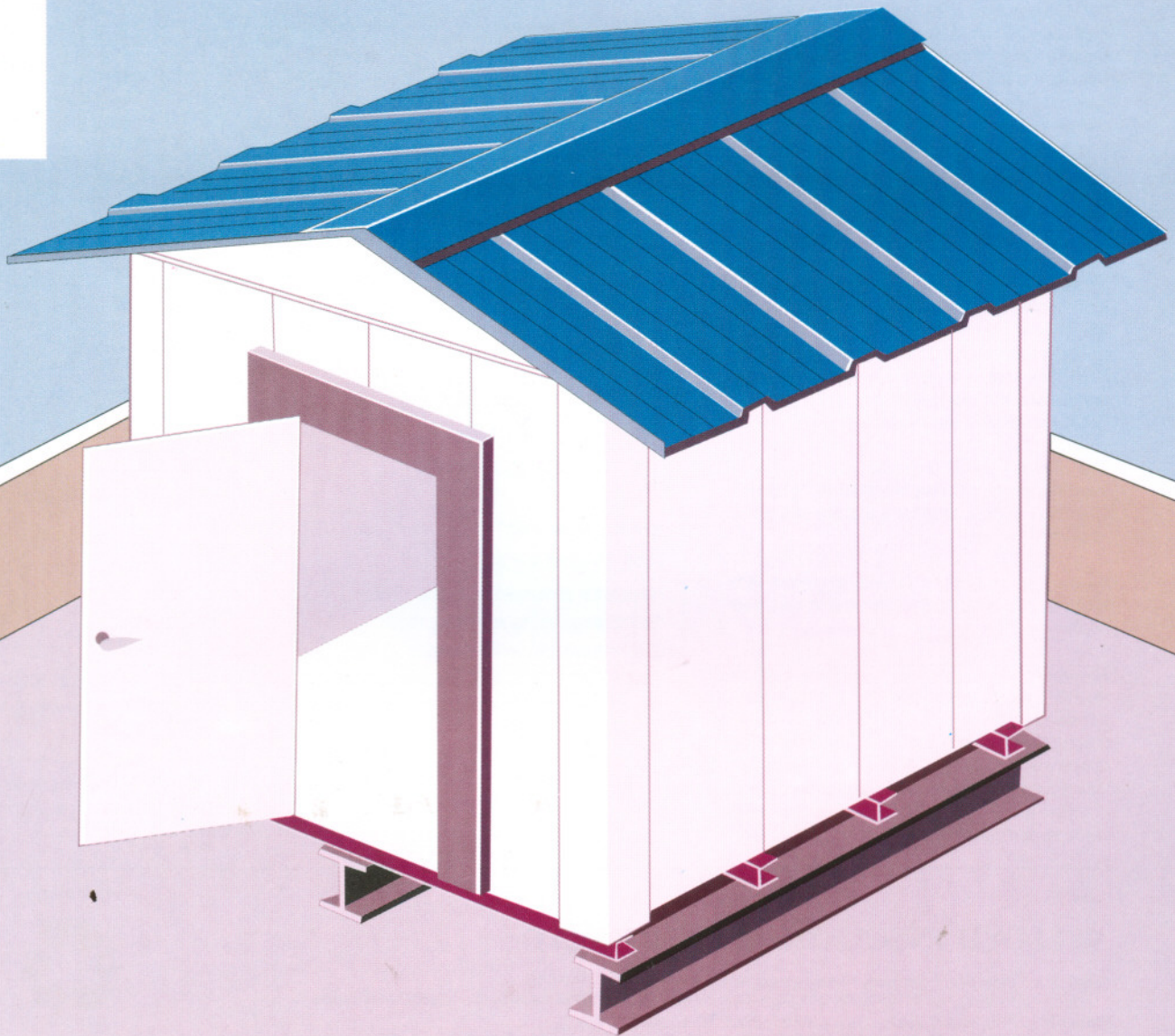




# LLOYDSHELTER

THE DUST PROOF, WATERPROOF, INSULATED ENCLOSURE FOR  
CONTROLLED ATMOSPHERE





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## THE DUSTPROOF, WATERPROOF, INSULATED ENCLOSURE FOR CONTROLLED ATMOSPHERE

LLOYDSHELTER is a custom designed concept for housing sensitive equipments such as electronic devices in Cellular Telephone & basic Telecom systems, Radar and Communication stations, Remote stations for Scientific and Defence applications, etc.

LLOYDSHELTER provides a one-step answer where a thermally insulated, Water-tight and Dustproof enclosure is needed for these and other applications.

LLOYDSHELTER is constructed out of the revolutionary "LLOYD PANEL SYSTEM", the concept which is the first choice for all critical applications including Frozen Cold Storages. LLOYD PANEL SYSTEM is manufactured to Scandinavian standards of excellence using State of the Art panel making Presses and PUF foaming equipment with capability to make architectural grade sandwich panels from 60 mm to 200 mm in thickness and up to 6 m in length without joints.

The LLOYD PANEL SYSTEM featured for LLOYDSHELTER comprises of specially designed corner panels which define the co-ordinates of the enclosure. These also act as the main structural elements for securement to the base frame system. Standard panels are used to fill the space between edges of the corner panels to complete the wall, ceiling and floor insulation in the required thickness. Doors, PVC Seals/ Flashings, Steel profiles for inner and outer corners, Silicon sealants and foam chemicals as required are the other elements of LLOYD PANEL SYSTEM.

These panels are faced by metallic sheets with light cutting grooves. These grooves improve the general appearance along with imparting considerable strength to the panel. The standard facing material is steel, 0.6 mm thick and the sheets are hot-dip galvanised (175 gm/m<sup>2</sup>). Other thicknesses are available on request.

The facing has Organic Coating and architectural or Silicone Modified POLYESTER COATING (25 microns) on the sides facing the exterior & interior.

As an option, other facing material like aluminium/ colour coated aluminium can also be offered.

The wall, ceilings, floor and corner panels of the insulated rooms are shipped as pre-fabricated sandwich panels insulated with rigid polyurethane foam. Specially selected PUF chemicals are injected between formed metal facings using high pressure equipment in a precise ratio to create an excellent rigid polyurethane foam matrix.

The density of foam is minimum 40 kg/m<sup>3</sup>, with thermal conductivity of 0.023 W/m-K (AGED), and tested continuously for the highest dimensional stability over the temperature range of -60 deg C to +100 deg C. The foam is fire retardant and self extinguishing conforming to IS 11239 - 1988, BS : 5608 and ASTM : C 591.

All tests for Thermal conductivity, Flexural and Compressive strengths and stability are carried out at the plant using State of the Art test equipment.

The floor insulation is made up of panels with marine quality plywood as the inner facing if desired.

The joining system of the panels is designed to ensure a quick and secure assembly of the building at the site. This is achieved through the use of specially designed camlocks placed inside the foam mass before casting. The panels are made perfectly vapour tight by the use of silicone sealants.

The LLOYDSHELTER SYSTEM is offered with complete accessories such as

- Shaped steel sections (L & U) for joint covers of corners and bottom of panels.
- Rivets, bolts and screws, etc. needed for fixing the flashings.

### Thermal and load characteristics

THICKNESS	mm	60	80	100	120	150	200
"U" VALUES	W/m <sup>2</sup> °C	0.36	0.26	0.21	0.19	0.14	0.11
PANEL WEIGHT	kg/m <sup>2</sup>	11.25	12.05	12.85	13.65	14.85	16.85

### Properties of polyurethane foam (CFC Free)

DENSITY	40 +/-2 kg/m <sup>3</sup>
COMPRESSIVE STRENGTH at 10% deformation	2.1 kg/cm <sup>2</sup>
TENSILE STRENGTH	3.7 kg/cm <sup>2</sup>
BENDING STRENGTH	4.0 kg/cm <sup>2</sup>
ADHESION STRENGTH (Foam to Steel)	2.9 kg/cm <sup>2</sup>
DIMENSIONAL STABILITY (48 hours)	
- 25 °C	0.1%
+ 38 °C & 90% RH	0.1%
+ 100 °C	0.4%
CLOSED CELL CONTENT	90-95%
TEMPERATURE RANGE	-180 °C to +95 °C
THERMAL CONDUCTIVITY at 0 °C (design value 0.020 k-cal/m-hr/°C or 0.023 W/m-K)	0.018 k-cal/m-hr/°C
FIRE RESISTANCE	
Horizontal Extent of Burn BS 4735	< 125 mm
Self Extinguishing ASTM D 1692 (fire retarded foam chemicals)	passes
WATER ABSORPTION	0.2% volume at 100% RH
VAPOUR PERMEABILITY (at 90% RH & 38 °C)	0.08 / 0.12 gms/hr m <sup>2</sup>

- Consult us for recommendation on thickness of Insulation and application to suit your end use condition.



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