CONTINUOUS SANDWICH PANELS

With PUF / EPS/Mineral wool/Rock wool as insulation material
Sandwich panel.

- Sandwich panels are made of two color coated metal sheets with an insulation material sandwiched in between.
Our Products:

- **GREENPAN**: between two PPGI sheets PU foam is sandwiched.

- **ECONOPAN**: between two PPGI sheets EPS (Thermocole) is sandwiched.

- **SAFOPAN**: between two PPGI sheets Glass wool / Rockwool is sandwiched.
SINTEX PUF sandwich panel made of

**PPGI**
- Pre-painted Galvanizing Iron / Galvalume
- Total Coated Thickness: 0.35mm / 0.4mm / 0.45mm / 0.5mm

**PUF**
- Short form of Polyurethane Foam.
- Composition of 2 chemical: Polyol and Isocynate
- Density: 40kg/cu.m +/- 2 kg/cu.m
Unique features:

- Tongue and groove type joinery system.
- Hidden self tapping screws for aesthetic appeal.
- Great energy saver.
- Fast and easy installation.
- Light weight.
- Space Saving
- Various designs/vivid colours.
- Energy conservation as per ECBC code.
- Our roofing panels are having special crown type overlap design, so that the joints become 100% leak proof.
Application area:

- **Industrial Buildings**
  - Roof
  - Walls
  - Partitions – Semi Glazed
  - False Ceiling
  - Walk-on False Ceiling

- **Commercial Buildings**
  - Facades / Elevation
  - Side wall paneling
  - Partitions – Semi Glazed

- **Warehouses / Godown**
  - Roof
  - Walls
  - Partitions

- **Cold Stores / Blast Freezers**
  - Insulated Ceiling
  - Insulated Walls

- **Farm House**
  - Decorative Siding Panels

- **Pharmaceutical Manufacturing Units**
  - Clean Rooms
  - Walk-on False Ceiling
  - Return-Air Boxing

- **Air Handling Units**
  - Insulated Panels

- **Poultry Farm**
  - Ceiling
  - Walls

- **Dairy Industry**
  - Ceiling
  - Walls

- **Malls / Departmental Stores**
  - Facades
  - Partition
  - Walls
Climate zones of India

Indian climatic conditions:

The ambient temp. varying from 25 °C to 45 °C and in some places even 50 °C

Winter temp. varying from 20 to 100 °C and in some places even sub zero temperatures.

High humidity varying from 60 to 98 percent.
Effect of climate in built spaces:

- Increase in temperature inside the buildings.
- Inside temperature is likely to go above than the outside ambient.
- Higher air conditioning loads and increased running time of the compressors.
- Higher energy cost.

High ambient and humidity result in:

- Uncomfortable working conditions.
- Lower productivity.
Need for thermal insulation:

- Thermal insulation is an essential part of all buildings and performs many functions.
- Energy conservation – reduces the heating / cooling load.
- Human comfort – improves the efficiency of the workmen.

Solution

- The thermal performance of sandwich panels lies in the physical properties of the rigid polyurethane foam and in the tightness of the joint.
- Technique: Rigid polyurethane possesses the lowest heat transmission property.
‘Energy Conservation Building Code’

What is ECBC?

- **Energy Conversation Building Code** – prepared by Govt of India, any air-conditioned building having connected load of 500 KWs and more, (10000 Sq. Feet area) will have to go compulsory for insulation envelopes for Walls and Roof to keep U Value determination. So that, minimum energy is wasted / transmitted from inside conditions to outside.

- This code provides the U-factor and R-values of components to be used in a building.
The U-factor and R-value prescribed by the ECBC.-(for roof assemblies):

<table>
<thead>
<tr>
<th>Climate zone</th>
<th>24-hour use buildings</th>
<th>Daytime use buildings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Maximum U-factor of the overall assembly</td>
<td>Minimum R-value of the insulation alone</td>
</tr>
<tr>
<td>Composite</td>
<td>0.261</td>
<td>3.5</td>
</tr>
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<td>Hot and dry</td>
<td>0.261</td>
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</tr>
<tr>
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</tr>
<tr>
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<td>3.5</td>
</tr>
<tr>
<td>Moderate</td>
<td>0.409</td>
<td>2.1</td>
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Sintex sandwich panel recommended usage:

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<tr>
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<th>Day time buildings</th>
<th>24 hour buildings</th>
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<tr>
<td>For roofs</td>
<td>50 mm panels</td>
<td>75 mm panels</td>
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The U-factor and R-value prescribed by the ECBC.- (for wall assembly):

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<tbody>
<tr>
<td></td>
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<tr>
<td>Composite</td>
<td>0.440</td>
<td>2.1</td>
</tr>
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<td>2.1</td>
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<tr>
<td>Warm and Humid</td>
<td>0.440</td>
<td>2.10</td>
</tr>
<tr>
<td>Cold</td>
<td>0.369</td>
<td>2.20</td>
</tr>
<tr>
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Recommended usage of sandwich panels:

To satisfy the U-factor and R-values of ECBC code, the following panels can be used as per the requirement:

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<tr>
<th>Panel Thickness</th>
<th>U-factor</th>
<th>R-value</th>
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<tr>
<td>75 mm thick</td>
<td>0.24-0.28</td>
<td>3.95 to 3.41</td>
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<tr>
<td>Sintex panel</td>
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<td>50 mm thick</td>
<td>0.36-0.40</td>
<td>2.6 to 2.3</td>
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<td>Sintex panel</td>
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Evaluation of sandwich panels

- Experiments and evaluations were conducted by Prof. N.K. Bansal (Retd., IIT Delhi) and consultant, Ministry of new and renewable energy sources, Government of India.

- Evaluation shows that a 50 mm thick panel on walls and 75 mm panel on roofs can reduce load and annual electrical consumption by 50 to 60% depending on room size and climatic zone.

- Evaluations also prove that lesser tonnage (capacity) A/C will also yield in the same thermal comfort, therefore reducing initial fixed costs.
The heat transfer diagram of roofs:

- The roof is exposed maximum to sun and then the energy is utilised in 3 main forms:
  A.) Reflection.
  B.) Absorption.

- Our sandwich panels are of shiny material having more reflectance, reducing the heat energy absorbed.

- The insulation material in our sandwich panel does not allow the absorbed energy to penetrate inside.
Energy efficiency:

- With 80 mm thick sandwich panels with polyurethane rigid foam, the U value is 0.297 W/(m² K). In comparison, a solid wall with 24 cm thick masonry and 2 cm plaster walls has U value of 1.85 W/(m² K).

- 35 mm PUF is equal to: 50 mm EPS (Thermocol)
  55 mm Glass wool
  60 mm Mineral wool
  80 mm Fiber board
  175 mm Wood
  475 mm Concrete
  1075 mm Thick brick work
SINTEX Continuous sandwich panel

- Roof panels: SIP - 1001
Roof panel details:
SIP - 1001

- Standard Cover Width: 1 Mtr
- Length: Any transportable length, say upto 12 Mtr
- Thickness: 30 mm / 40 mm / 50 mm / 75 mm / 100 mm
Roof panel SIP-1001
Wall panel SIP – 2001
Two rib (SIP – 2001)
- Thickness: 30 mm / 40 mm / 50 mm / 75 mm / 100 mm
- Single ribbed upper skin.

Four rib (SIP – 2002)
- Thickness: 50 mm / 75 mm / 100 mm
- Triple Ribbed upper skin.
- Installation with concealed fasteners i.e. self tapping screws are not visible from outside.
Wall panels SIP - 2003
Light rib (SIP – 2003)
- Thickness: 30 mm / 40 mm / 50 mm / 60 mm / 75 mm / 100 mm / 150 mm
- Fasteners are visible from outside.
- To be installed vertically.

Siding panel (SIP – 2004)
- Thickness: 50 mm / 75 mm
- Gives like siding effect.
- To be installed horizontally.
Siding panels  SIP - 2004

An example of SIP – 2004 can be used
Accessories

Self drilling screw

1. External ridge

2. Internal ridge

3. Roof trapezoidal end cap
4. Wall internal L-angle

5. Roof side cap

6. Wall C-channel

7. Wall external L-angle
Roof & wall cladding
Roofing
Intas Pharma, Ahmedabad
United Breweries, Aurangabad
United Breweries, Aurangabad
L&T Barmer power project
Ground plus 1 building
Prefabricated structures
Prefabricated structures
Partitions
Most modern and state-of-the-art manufacturing facility at Kalol, North Gujarat.