High Performance Insulated Precast Wall Panel

High performance insulated panels are designed to meet the most stringent energy conversation requirements in the construction industry. This superior wall system has a coefficient of heat transmission as low as U=0.22 W/m²K for 150mm (6”) insulation, exceeding any energy code requirement and contributing greatly towards the LEED and other Green building rating systems.

The System

At the heart of the wall system is a continuous fiber composite (FC) connector patented by THERMOMASS®, USA which is used to structurally tie two layers of concrete through pre-drilled, prefabricated insulation board. The non-conductive, chemically resistant FC connector allows the creation of an uninterrupted envelope of insulation throughout the exterior walls of the building thus providing a highly energy efficient building system that is virtually maintenance-free. The system represents a dramatic advancement in building technology for many types of temperature and atmosphere controlled buildings/facilities and offers unsurpassed advantages over conventional construction.

Connectors

The Fiber composite connectors are made from a resilient composite matrix. With incredible strength and durability they are far superior to steel because they are non-corrosive, chemically resistant and have low thermal conductivity with unsurpassed structural strength. FC connectors are available for 25mm (1”) to 250mm (10”) thick insulation boards.

Cost Comparison of Various Wall Systems - Wall size 4x3m²

Wall Systems Complying to SASO Thermal Requirements (U=0.290 W/m²K)

<table>
<thead>
<tr>
<th></th>
<th>High Performance Insulated Panel</th>
<th>Standard Wall</th>
<th>EIFS Insulated Wall</th>
</tr>
</thead>
<tbody>
<tr>
<td>outer layer</td>
<td>60 mm concrete wythe</td>
<td>100 mm concrete wythe</td>
<td>120 mm EIFS (15+105mm)</td>
</tr>
<tr>
<td>insulation</td>
<td>115 mm k**=0.035 W/mK</td>
<td>120 mm k***=0.035 W/mK</td>
<td>- K***=0.035 W/mK</td>
</tr>
<tr>
<td>inner layer</td>
<td>100 mm concrete wythe</td>
<td>200 mm hollow block</td>
<td>200 mm hollow block</td>
</tr>
<tr>
<td>plaster</td>
<td>-</td>
<td>15 mm spray plaster</td>
<td>15 mm spray plaster</td>
</tr>
<tr>
<td>total wall thickness</td>
<td>275 mm</td>
<td>435 mm</td>
<td>335 mm</td>
</tr>
<tr>
<td>fixing accessories</td>
<td>4 galvanized angles</td>
<td>4 galvanized angles</td>
<td>-</td>
</tr>
<tr>
<td>sealing of joints</td>
<td>included</td>
<td>included</td>
<td>-</td>
</tr>
<tr>
<td>construction stages</td>
<td>2 stages</td>
<td>5 stages</td>
<td>4 stages</td>
</tr>
<tr>
<td>construction time</td>
<td>5 man-hours</td>
<td>35-45 man-hours</td>
<td>40-45 man-hours</td>
</tr>
<tr>
<td>remarks</td>
<td>Cranes for erection excluded</td>
<td>Cranes for erection excluded</td>
<td>scaffolding not included*</td>
</tr>
<tr>
<td>cost/m²</td>
<td>330 AED</td>
<td>430-450 AED</td>
<td>330-350 AED</td>
</tr>
</tbody>
</table>

* external scaffolding for application of EIFS wall, ** wall can be thinner with better-quality insulation

Al Meraikhi, P.O. Box: 53023, Abu Dhabi, UAE
Mobile: (971) 50 4456913, office (971) 2 6729077, (966) 2 6985050
Email: miroslav@almgroup.ae, www.almgroup.ae
bnesset@thermomass.com, www.thermomass.com
Advantages:

Energy Efficiency

- consistent thermal control
- higher R-values due to Mass Effect
- reduces HVAC loads
- eliminates moisture condensations and frost build-up in freezers
- impedes mold growth
- interior space comfort – no cold spots.

Economic Advantages

- longer building life
- lowers building maintenance cost
- reduces HVAC system construction cost
- reduces energy bills by as much as 50%
- fire resistance lowers insurance cost

Construction Advantages

Precast concrete insulated panels can be load bearing or cladding panels.
- rapid construction, quickest dry-in possible
- off-site construction, production never on critical path
- fewer construction trades at the site
- panels produced in quality controlled environment

Technical Design Assistance

- determination of system compatibility with your project
- recommendation of design modifications to assure the integrity of the project
- isothermal analysis verifying R-value
- mass performance analysis showing the impact of mass on the building
- construction cost estimate and building life cycle payback analysis
- dewpoint analysis, moisture and WUFI
- thermographic analysis