Cold Stores
TSSC Insulated Panels

TSSC has been the frontrunner of manufacturing insulated panels for over 48 years in the Gulf region. Our insulated panel systems are ideal for use within temperature controlled and hygiene safe environments such as cold storage freezers and coolers, refrigerated vehicles, food processing facilities and clean rooms for pharmaceutical industries.

Panels in lengths up to 17m are produced in our state-of-the-art production facilities and are available in a range of profiles and thicknesses. The panels are washable, preventing bacteria and mold growth and the panel joints offer excellent air tightness, preventing thermal bridging and condensation.

Our FM approved insulated panels systems are suitable for internal and external walls and ceilings and TSSC is the only company in the GCC region which provides FM certified camlock panels.

TSSC offers its customers a diverse product line for temperature extremes; from blast freezers as cold as -40°C to pharmaceutical stability rooms up to 82°C. We manufacture insulated walls, ceilings, floor panels and insulated doors to specified sizes to be used in cold rooms of any capacity. Hygienic flooring methods such as polyurea coating complement the solutions we offer:

- Walk - In Commercial Cold Rooms
- Warehouse Cold Storages
- Portable Skid Mounted Cold Rooms
- Offshore Refrigerated Containers
- Refrigerated Vehicle Bodies

The TSSC Green Engineering

To meet EHS regulations and international standards, TSSC initiates green products with zero ozone emission, using environment friendly pentane as the blowing agent. Sandwich panels from pentane-blown rigid PU and PIR foam are of high quality, economical and offer higher compressive strength. With an ODP (and a low GWP ozone depleting potential) of zero and a GWP (global warming potential) these panels are environment friendly.
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Cold Rooms

Depending on the size and use cold rooms can be broadly classified as walk-in cold rooms and warehouse cold stores.

Walk-in cold rooms are smaller in size compared to the large warehouse cold stores and are used primarily by the retail industry to store goods with fast shelf replenishment rate. Due to the small size of the rooms, the insulated floors are built strong enough only to allow the use of handcarts and are not suitable for large power equipment such as forklifts. Walk-in cold rooms are used in the supermarkets, hotels, restaurants, etc.

Unlike walk-in cold rooms, warehouse cold stores are very large sized stores used to store goods at very low temperatures for a longer period. These are built with strong reinforced insulated flooring that allows the use of power equipment for loading and unloading goods. To achieve working temperature requirements of 15°C to –40°C, these large cold stores are in most cases fitted with more than one refrigeration unit.

Rack power system is the advanced power system used by TSSC in which the refrigeration units are connected in a racking arrangement. This system provides high-energy efficiency compared to the use of ordinary split units. TSSC is the only specialized company in the region capable of installing this system.

For quick freezing and chilling applications, blast-freezers and blast-chillers are used where the temperature in the cold room drops to as low as -40°C from the room temperature in just a few hours. TSSC is a pioneer in the design, manufacture, supply and installation of these modules, which are ideal for the instant freezing of medium sized fish and chicken.

Portable Skid Mounted Refrigerators & Off-shore Refrigerated Containers

The portable skid mounted refrigerators are cold rooms built on a mobile units to be used as a mobile refrigeration system. Cold rooms of different types are used as portable units and are always built on a strong steel base in order to provide the unit the necessary strength. These cold rooms find its use in applications that include high mobility including offshore applications.

The complete unit is built to the size of a container trailer so that it could be lifted using a crane or a large forklift and moved from one place to another on a trailer or a container. Cold rooms designed with partition walls and doors for different uses can also be built upon the same steel base.
Applications Of TSSC Cold Rooms

- Super markets
- Food services
- Catering
- Restaurants
- Butchery
- Hospitals
- Beverage rooms
- Processing areas

Quality

With over 5 decades of experience in manufacturing products to international standards, state of the art manufacturing facilities and the largest production capacity in the Middle East, the Quality Management System followed by TSSC ensures it caters to customer demands by ensuring timely delivery and providing exceptional service.

Continuous and constant improvement is the unique characteristic of our ISO system. As a leading manufacturer, TSSC has always stayed focused on finding new ways to design, produce, sell and deliver quality products at economical prices.

TSSC’s state-of-the-art QC laboratories ensure that the products meet the various international standards to which they are designed and produced. The QA/QC team monitors operational processes and inspect product quality at each stage of production.

Third party certifying agencies approve most of TSSC products. We are ISO 9001: 2008 certified by VINCOTTE INTERNATIONAL MIDDLE EAST and our Insulated Composite Panels for Cold Stores, Internal Partitions and Ceiling systems are certified FM Approved for Internal Applications per FM Approvals Standard 4880. The FM Approved panels system can be supplied with either Rockwool or PIR insulation. The systems are available in different options and offers based on excellent characteristics. Please contact sales department for FM approved system or special options. In addition to this, our thermal insulation (B2 & PIR) is approved by the Dubai Central Laboratories (DCL).

Guarantee:
TSSC offers a project based guarantee on the coating system considering the type of application the panels are used for.
FM Global Accreditation

TSSC Insulated Composite Panels system for Cold Stores, Internal Partitions and Ceilings are certified FM Approved for Internal Applications per FM approval standard 4880. The FM Approved panels system can be supplied with PIR insulation.

FM Global is world’s leading commercial and industrial property insurer with a unique focus on Loss Prevention through engineering. FM Approvals is known worldwide for its focus on testing and certifying only those products, which promote property loss prevention. A Class 1 rating from FM Approvals per approval standard #4880 means that TSSC’s insulated composite panels exhibit limited fire spread and fuel contribution and may not require special protection such as sprinklers, when the building walls do not exceed listed heights. Years of research and engineering on Insulated Sandwich panels at TSSC followed by a series of rigorous large-scale tests at FM Approvals for performance evaluation in case of Fire and Natural Hazards have resulted in TSSC obtaining the prestigious FM Approval mark.

FIRE RATED PANELS

Advantages of using FM 4880 Approved Panels system from TSSC

- TSSC FM Approved panels are highly fire-resistant and contribute to a reduction of the overall fire load
- TSSC FM approved panels exhibit limited or no flame spread in case of fire
- TSSC FM approved panels are self-extinguishing with limited smoke generation
- TSSC FM approved panels safeguard commercial/industrial properties from fire-related incidents thereby protecting the building envelope
- Risk reduction translates into fewer losses and reduced premiums with insurance companies
- Government regulatory bodies look more favorably on FM approved product

TSSC PIR panels system have up to 90 minutes fire integrity rating for 100mm and up to 2 hours 47 minutes fire rating for 200mm panels. System specification are available on request from TSSC sales dept.
Product Specification

A wide range of cladding materials is used by TSSC to manufacture insulated panels. These include:

1. Polyester pre-painted galvanized steel
2. PVC (Plastisol) coated galvanized steel
3. Stainless Steel
4. Aluminum (Stucco-embossed or pre-painted)

Depending on customer requirements, TSSC also supplies panels manufactured using other cladding materials. The surface profiles of the insulated panels are smooth or ribbed depending on the requirement.

The manufacturing process of the insulated panels involves injection of polyurethane foam at high pressure between the claddings using a high-pressure mixer. The panels are of standard sizes or are custom made to required sizes.

The different kinds of panels used in the construction of a cold room are wall, ceiling and floor panels. The ceiling and floor panels are manufactured with the same width as the wall panels. Corner panels are used with wall panels for partitioning in applications where multiple compartments need to be built.

The claddings are formed at the edges in "U" shape to guarantee superior adhesion between the sheet and polyurethane and are shallow ribbed to provide additional strength and dimensional stability. The floor panels are made strong to withstand uniformly distributed load of up to 2.5 tons per square meter.

Assembly

Insulated panels are joined together to assemble cold room walls, ceilings and floors in required lengths. The panels are tightly secured by the slip joint system for good structural stability.

The slip joint is a unique, interlocking, tongue-and-groove joint technology that has been adopted across the world for its unsurpassed sealing and waterproofing. It is a well-organized sandwich panel system that utilizes a male-female action on the longitudinal joint to achieve superior tightness and insulation.

Panels slip into place allowing for easy and rapid installation, whilst improving structural strength and thermal efficiency, offering a clean aesthetical appeal.

Insulated panels connected to assemble cold room walls, ceilings and floor are tightly secured by a tongue-and-groove system into a monolithic assembly. For joining the panels, camlocks with steel hooks are used to lock securely. The camlocks are moulded and permanently anchored in the injected rigid polyurethane foam core during the manufacture of the sandwich panel.

The use of camlocks in connecting the panels makes TSSC cold rooms easily expandable as well as dismountable, thus allowing easy reassembling at various locations.

TSSC also provides an All-Camlock system to connect ceiling to wall and floor to wall panels. This provides an easy to assemble connection system, which has a high aesthetic appearance.
PVC Panels

TSSC employs the highest standards of manufacturing non-ribbed PVC sandwich panels for non-toxic walls and ceiling cladding, primarily for use in cold stores, chiller rooms and refrigerated truck bodies, where hygiene is a priority.

From small to large buildings, mid-temperature to deep-frozen cold stores.

Bathrooms to food production areas, TSSC can provide insulated PVC panels to suit your various requirements.

These smooth, non-toxic PVC sheet panels require low maintenance for the walls and do not rust. The panels are simple and fast to install and provides an aesthetic look to the walls.

The PVC panels are also available with a low-cost all-purpose PVC - GI layer. These panels are UV & humidity resistant, offers enhanced impact resistance and are suitable for a multitude of applications. This combination of GI – PVC composite panel presents an interesting variation for objects, with the external facing available in various colors.

Flooring, Ceiling & Dimensions

TSSC panels with PIR core are recommended for applications where improved fire performance is required. The panels are lightweight sandwich panels with good cold-retention qualities and a PIR fire retardant core suitable for all insulated applications such as industrial and commercial premises including cold stores.

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>APPLICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSSC panels with PIR core</td>
<td>Cold store internal/external walls. Offers superior thermal performance, required for fire rated approvals</td>
</tr>
</tbody>
</table>

Flooring

TSSC recommends polyurethane slabs to be used for floor insulation to achieve maximum cold room insulation. In the case of small cold rooms, TSSC advises the PU slabs to be reinforced with plywood so that the load is uniformly distributed and the slab is protected against any impact damage. Depending on the customer requirement, either marine plywood or the standard water boiled plywood could be used.

For large refrigerated warehouses that require the use of power equipment such as forklifts, concrete reinforcement is required over the TSSC PU slabs for additional strength. For best results, TSSC recommends the laying of vapor proof barriers such as polyethylene sheets below and above the PU boards.

For cold rooms TSSC provides checkered aluminum finish or Polyurea coating. Flooring for larger refrigerated warehouses can be provided as per the client’s contractor.

Ceiling

To achieve maximum cold room insulation, it is important that the same insulated panels that are used for the walls and floor be used for the ceiling as well.

In applications where ceiling panels are long, the panels are to be suspended from the main structure. The ceiling also is used to conceal the plumbing, electrical and other utilities above the ceiling panels. The panels are built strong for it to hold the weight of the personnel walking over the ceiling for the maintenance of these units.

Dimensions

The standard width of the panels are 1200mm (47.24”) and are available in the following thickness ranges: 50mm (1.97”), 60mm (2.36”), 80mm(3.15”), 100mm(3.94”),120mm (4.72”), 150mm(5.91”),170mm(6.69”)and 200mm (7.87”). TSSCTM can manufacture panels up to 17 meters (55.77 ft) long. The density of insulation can be varied according to the project needs.
Polyurea Flooring

If you’re using traditional flooring methods such as checker plates, you have probably found that your flooring simply does not perform well over time. After just a few years the floor becomes completely wet, creating the perfect environment in which bacteria and bad odors can grow.

TSSC, the GCC region’s leading building products manufacturer, has the solution: Apply a Polyurea coating to your flooring.

Polyurea is the latest advancement in coating technology. Its extreme durability makes it several times stronger than epoxy. It’s chemically resistant to salt, oil, gas and other harsh chemicals — Polyurea won’t crack or peel. Polyurea has been utilized for over 25 years in industrial applications such as pipeline coatings, tank linings and water treatment plants. Fast cure times, flexibility and abrasion-resistance are all inherent properties of Polyurea, making it a natural choice for the high demands on any floor.

There are types of Polyurea, such as “Hybrid”, “Aromatic” and “Pure.” All can do an excellent job of reducing the ill effects of moisture and humidity on your flooring. In addition “Aliphatic” type can be used for roofs and any other area that is directly exposed to the sunlight.

Polyurea coatings from TSSC are...

1. Waterproof
2. Easy to clean
3. Food safe
4. Corrosion Resistant
5. Fast Curing
6. Completely VOC-free (and therefore do not outgas or produce an odor)
7. Extremely durable compared to other materials
8. Able to handle forklift traffic when applied at a thickness of 3 to 4 mm
9. Resistant to UV rays, abrasions and many of today’s harshest chemicals
10. Environmentally-friendly
11. Seamless
12. Able to provide reliable performance in a wide range of climate conditions

At TSSC, we know what it takes to have a successful project from the design phase to the release to the client. We have installed Polyurea floor coatings in a number of cold stores sites across the region and offer a wide range of options for the Food Processing industries, commercial kitchens and even Warehouse Facilities.

- Cold Rooms
- Abattoirs
- Freezer Areas
- Commercial & Industrial Kitchens
- Food Production Areas
- Dairies/Pasteurizing plants
- Chemical Plants

Polyurea flooring & roofing solutions from TSSC are of the highest quality in the industry and provide you with superior durability, great looks, low maintenance, and incredible value.
Insulated Doors

TSSC supplies a choice of CFC free polyurethane insulated doors in different thickness for various applications. These include:

1. Sliding doors from ITALY and DENMARK
2. Hinged doors from USA and France
3. Traffic swing type doors with glass porthole from MIV (Italy)
4. Hydraulic self-closing doors
5. Controlled atmosphere doors
6. Display thermal glass doors
7. Insulated sectional doors
8. High Speed Curtain Doors
9. Controlled Atmosphere Entrance

Hinged doors are of different types such as single leaf or double leaf, overlapping or flush. These doors are always open in the outward direction towards the left or the right. For applications that require flexibility in the location of the door, TSSC supplies retrofit reach-in doors. If the location of the door were on a single panel, it could be factory installed. However, if the door space needs to be shared between two panels, the hole would need to be size cut at the site.

The size of standard doors are 90cm (2.95ft) x 190cm (6.23ft) and are insulated with CFC free polyurethane of density 42 kg / cubic meter (2.62 lb/ft³).

The sliding doors are usually used for applications, which require larger door openings. It opens and closes with minimal effort and is available with both left and right hand sliding option. TSSC also supplies electric sliding doors that are available in either bi-parting or single door models. Doors up to a height of 5m can be fitted for cold rooms of any size ranging from standard modules to large sized warehouses.

Other features of TSSC™ doors include:

1. Durable hardware and attractive hinges and handles built for years of trouble-free usage.
2. Safety release handles that glows in the dark to prevent entrapment inside cold storage.
3. Door heater wire.
4. Aluminum or stainless steel railings for
5. Highly durable.
6. PVC Curtains

TSSC also supplies a range of door accessories that include:

1. Interior or exterior ramps manufactured according to client requirements
2. Display thermal glass
3. Hydraulic door closers (self-closing doors)
4. SS & Chequered Aluminum Kick Plates
Accessories

Cold rooms that require high sanitation standards require the joint of bolts to be concealed to avoid the corrosive parts from being exposed to the cold room.

TSSC supplies curving or rounded corner profiles for such applications. Some other accessories supplied by TSSC include bumpers, internal or external ramps, fire rated silicone and hydraulic ramps for small cold rooms. TSSC also supplies ceiling suspension for large span cold stores.
Electromechanical Services

With extensive experience in carrying out major projects in the GCC, TSSC provides the full range of services in the construction of cold rooms including the design, supply, installation and commissioning of a complete refrigeration plant. TSSC also installs branded refrigeration systems in its cold rooms that are chosen for their proven consistency and efficiency.

The highly qualified and experienced technical staffs ensure that the final product delivered to customers confines to the highest manufacturing and installation quality standards set by the company. TSSC could also install a monitoring system for projects that involve more than one cold room.

As part of the company’s efforts to satisfy the needs of all its customers, TSSC offers 24-hour service to guarantee that all systems installed by the company operate without fail, at all times. The large volume of returning customers is evidence to TSSC’s commitment towards customer satisfaction. TSSC also actively involves in the development of new products that meet the diverse needs of our valuable customers.

Refrigeration

Walk-in cold rooms are normally equipped with monoblock, split system or individual units. For large warehouse cold stores, TSSC recommends the use of rack power system. TSSC is one of the very few companies in the region capable of providing the customer with a rack power system. This power system involves a special compressor arrangement in a rack style. This system helps in reducing power consumption considerably compared to the use of other refrigeration systems such as split units. TSSC uses branded compressors for its rack system to ensure proven quality record.
Frost Heave Protection

In large sized low-temperature cold store applications, it is very likely that frost formed due to refrigeration gets deposited under the floor and eventually lead to the cracking of the insulated floor. This hampers the effectiveness of refrigeration and spoils the goods refrigerated.

TSSC recommends the use of frost heave protection for such cold stores. There are different types of protection available like underground pipe ventilation system and electric floor mat heater.

TSSC provides assistance in the design of the underground pipe ventilation system and also supplies electric floor mat heater.

Underground pipe ventilation system involves the laying of pipes / ducts under the insulated floor of the refrigerated room. The pipes with both ends left open are laid at an inclination to allow the flow of water formed due to precipitation. Air circulates through these pipes and prevents the formation of frost that could otherwise accumulate on the floor of the cold store.

In situations where underground pipes could not be laid, electric floor mat heater could be used as an additional accessory. These mats when laid under the cold store floor provide heating and thus prevent the formation of frost.
### Height & Ceiling Span Details

Insulated panel with 0.5 mm thick polyester pre-painted galvanized steel cladding

<table>
<thead>
<tr>
<th>Nominal Panel Thickness (mm)</th>
<th>U-Value (W/ m²°C)</th>
<th>Panel Weight (Kg/ m²)</th>
<th>Max. Wall Height (m)</th>
<th>Max. Ceiling Span (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>0.46</td>
<td>10.40</td>
<td>4.0</td>
<td>3.0</td>
</tr>
<tr>
<td>80</td>
<td>0.288</td>
<td>11.66</td>
<td>6.0</td>
<td>4.0</td>
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<tr>
<td>100</td>
<td>0.23</td>
<td>12.50</td>
<td>8.0</td>
<td>5.0</td>
</tr>
<tr>
<td>120</td>
<td>0.192</td>
<td>13.34</td>
<td>10.0</td>
<td>6.0</td>
</tr>
<tr>
<td>150</td>
<td>0.17</td>
<td>14.60</td>
<td>12.0</td>
<td>7.0</td>
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<tr>
<td>200</td>
<td>0.115</td>
<td>16.70</td>
<td>15.0</td>
<td>8.5</td>
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</table>

<table>
<thead>
<tr>
<th>Thickness in mm</th>
<th>U/ Value W/(m²K)</th>
<th>Q = Heat Transmission in W/m²</th>
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</thead>
<tbody>
<tr>
<td>50</td>
<td>0.460</td>
<td>2.88</td>
</tr>
<tr>
<td>80</td>
<td>0.288</td>
<td>2.30</td>
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<tr>
<td>100</td>
<td>0.23</td>
<td>1.92</td>
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<tr>
<td>120</td>
<td>0.192</td>
<td>1.53</td>
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<tr>
<td>200</td>
<td>0.115</td>
<td>1.15</td>
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</table>

System Details

Implementation Of Panel Steel Construction

- Allowable Heat transmission 10 to 12 W/m²
Cladding Specifications

Galvanised Polyester coated sheets

Hot Dip Galvanized coated coil - ASTM 755

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>MEASUREMENT</th>
<th>UNIT</th>
<th>STANDARD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yield strength</td>
<td>(170 - 310)</td>
<td>Mpa</td>
<td>ASTM 653</td>
</tr>
<tr>
<td>Elongation %</td>
<td>≥ 26</td>
<td>%</td>
<td>ASTM 653</td>
</tr>
<tr>
<td>Zinc coating</td>
<td>G60</td>
<td>180gms/sq mt</td>
<td></td>
</tr>
<tr>
<td>Total coating thickness Top side</td>
<td>22-25</td>
<td>Microns</td>
<td></td>
</tr>
<tr>
<td>Primer Thickness</td>
<td>5 to 7</td>
<td>Microns</td>
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</tbody>
</table>

Plastisol Coated Sheets – ASTM 755

<table>
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<tr>
<td>Primer Thickness</td>
<td>5 to 7</td>
<td>Microns</td>
<td></td>
</tr>
</tbody>
</table>

Polyisocyanurate Foam Properties

a. Mechanical Characteristic of the Polyisocyanurate Foam

Overall Density (40 - 45 Kg/m³ upon request)
- Tensile Strength: > 100 Kpa
- Compression Strength: > 100 Kpa
- Shear Strength: > 100 Kpa
- Fire Property Classification of PIR panel: Class 1 or A Best class with less Fire spread and smoke development as per ASTM E84

b. Insulation Capacity

Thermal Conductivity: 0.022 W/mK - 0.023 W/m K

<table>
<thead>
<tr>
<th>Polyisocyanurate Core Thickness (mm)</th>
<th>35</th>
<th>40</th>
<th>50</th>
<th>60</th>
<th>75</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Heat Transfer Coefficient U Value (W/m²K)</td>
<td>0.68</td>
<td>0.60</td>
<td>0.48</td>
<td>0.40</td>
<td>0.32</td>
<td>0.24</td>
</tr>
</tbody>
</table>

c. Water Absorption of the foam - 1% of Volume

d. Fire Properties of PIR panel as per ASTM E84:

- Flame spread: 20
- Smoke Development: 350

Classified as best class, class 1 or class A with less fire spread & smoke development

Our PIR foam is approved by DCL (Dubai Central Laboratory) as per EN: 13165

e. Dimensional Stability %:

- Length & Width < 2%
- Thickness < 6%

Insulation Foam Properties

<table>
<thead>
<tr>
<th>TEST</th>
<th>MEASURED VALUE</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density Core</td>
<td>40 - 42</td>
<td>Kg/m³</td>
</tr>
<tr>
<td>Compressive Strength</td>
<td>&gt;100 Kpa</td>
<td></td>
</tr>
<tr>
<td>Tensile Strength</td>
<td>&gt;100 Kpa</td>
<td></td>
</tr>
<tr>
<td>Shear Strength</td>
<td>&gt;100 Kpa</td>
<td></td>
</tr>
<tr>
<td>Thermal Conductivity (K Value)</td>
<td>0.022 - 0.023</td>
<td>w/(mK)</td>
</tr>
<tr>
<td>Closed Cell Content %</td>
<td>&gt;93 %</td>
<td></td>
</tr>
<tr>
<td>Water Absorption By Volume (After 24 hours)</td>
<td>1.0</td>
<td>%</td>
</tr>
<tr>
<td>Fire Classification</td>
<td>83 as per DIN 4102 (B2 &amp; PIR upon request)</td>
<td></td>
</tr>
</tbody>
</table>

Disclaimer

"Due to a process of continual improvement, the information herein is subject to change without notice"
### Packing

#### Standard Packing

1. Insulated panels of standard dimensions are stacked together in one bundle.
2. Panels of different sizes could be stacked together for easy transportation.
3. To avoid damage the insulated panels are placed on top of a 15mm polystyrene sheet, which is further supported by 80mm polystyrene placed as spacers at a distance of 80mm. The panels are also covered on top with an additional 15mm polystyrene sheet.
4. The stack is wrapped with a thick polyethylene sheet covering all sides of the stack. The packing then passes through an automated packing machine which further covers the entire stack with shrink wrap to ensure that the insulated panels reach the customer without any tampering.
5. When panels are transported by container, insulated panels can be stacked both horizontally and vertically to achieve optimum container space usage.

#### Special Packing

1. Special crating – For special transportation needs, insulated panels are packed in crates (semi or full) as per the requirement. This provides additional safety for the panels in all modes of transportation such as air, sea and land.
2. Corners of the insulated panels are protected using special corner protection angles for break bulk consignments and consignments that involve both air and land transportation.
3. When long and heavy insulated panels are packed, a thick PU/PIR foam panel is placed on top of the wooden pallet to give more protection on the top.

### Storage

#### Unloading at site

Extreme care and attention need to be given while unloading the panels at the site. It has to be done not only for the protection of the panels but also for the safety of the handling personnel.

Panels should never be dropped onto hard or uneven surfaces or thrown from vehicles.

#### Storage

Panels supplied in bundles should be stored on flat even ground able to withstand the weight of both the panels and the lifting equipment. The Polyethylene sheet wrap could remain on the bundle when the panels are stored for short periods provided they are not exposed to sunlight and humidity.

For long storage periods, TSSC advises its customers to remove the Polyethylene sheet wrap and store the panels indoors.

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*Using forklift with panels - under “6” meters Spreader bar with slings Using Lifting beam with panels over “6” Meters Long.*

*Protective film*

Both sides of TSSC insulated panels are covered with nylon protective film to protect the panels from scratches. The protective film should be removed only after the panels are installed in order to ensure maximum protection.

The protective film could remain on the insulated panel for any storage period. However, for long periods of storage the panels should be stored indoors.*
Refrigerated Truck Bodies & Trailers

TSSC has long been a pioneer in the manufacture of isothermal bodyworks. With over 50 years of proven expertise in the field of insulated panels, the company employs the latest construction techniques to manufacture insulated vehicle bodies to the highest standards. These techniques guarantee thermal efficiency and durability – offering you the most cost-effective solutions in the long term.

From small to large, mid-temperature to deep-frozen, TSSC can build refrigerated vehicle bodies for pickups, trucks, vans and trailers to specific requirements. These vehicle bodies are ideal for transporting dry goods as well as food products such as dairy, poultry, meat, fruits and juices. Insulated bodies can be constructed to maintain temperatures as low as -40°C.

TSSC is one of the few companies in the region to build truck bodies using only 6 panels – one for each side of the body. Along with contributing to the aesthetic look of the finished body, this has the advantage of minimizing leakage and ensures that desired temperatures are maintained in the most cost-effective way.

TSSC offers truck bed flooring in various finishes such as Polyurea (eco-friendly), Aluminum T-Profiles, fiber glass and stainless steel. The Truck’s side panels are capable of accommodating up to 4 doors on each side to allow easy loading and unloading of goods. There are a wide range of accessories that can be used in the body depending on client requirement.

With over five decades of experience, TSSC caters to your long term needs by providing exceptional after sales service. Our technical team can be contacted for assistance on a dedicated toll-free number seven days a week at any time, day or night, for technical or service issues relating to refrigeration units or vehicle bodies.

TSSC offers its customers a wide variety of high quality accessories to choose from.

- Eutectic Plates
- Wind Deflectors
- Meat Hanging Systems
- Steel Steps
- Roll Up Doors
- Tail Lifts
- Temperature Partitions
- Refrigeration Units

Wind Deflectors

TSSC’s Wind Deflector improves wind flow over the truck body by enhancing the vehicle’s aerodynamics. It is used to protect the refrigeration unit and vehicle against strong winds that blow against the vehicle at high speeds. The aerodynamic structure of the Wind Deflector reduces drag and decreases air pressure from top and bottom, resulting in smoother air flow. This increases vehicle handling and stability and improves performance and fuel economy.

Eutectic Plates

TSSC is one of the very few companies in the region to build refrigerated vehicle bodies using Eutectic Plates. These are used to maintain a certain temperature inside the insulated body for long periods even after the unit is disconnected from a power supply.

Eutectic plates are the preferred choice where temperatures need to be reduced down to -30°C. They find their ideal use where very low temperatures must be maintained and frequent stops are not required.

Doors

Depending on the nature of cargo and handling requirements, TSSC bodies can be equipped with sturdy and long life doors of various sizes, orientation and types. These doors are built and installed with the best-in-class hardware, locks, hinges, and handles.

Meat Hanging Systems

Made with an appropriate grade of stainless steel suitable for food areas as per international standards, the state of the art hardware allows for safe, hygienic, and efficient transportation of meat. The sturdy hooks are designed to take up to 30kgs of weight each.

Steel Steps

TSSC truck bodies can be equipped with either fixed or foldable steps with slip-safe treads.

Tail Lifts

TSSC can install hydraulically controlled tail lifts, which can bear loads of up to 1700 kg.

Temperature Partitions

Each truck can be fitted with a temperature partition which allows two temperature levels to be maintained within the same truck.

Alternatively, if the truck is half-full, energy can be saved by partitioning the loaded and unloaded sections of the truck and switching off refrigeration in the empty section.

Refrigeration Units

Refrigerated Vehicle Bodies manufactured by TSSC are available in different sizes. To meet temperature requirements each vehicle is fitted with a refrigeration unit which can be selected from a wide range of brands.
Projects
Since inception in 1961, TSSC, a primary member of Harwal Group has been setting manufacturing benchmarks with its engineering excellence. The ISO 9001:2008 certified company manufactures a diverse range of products and offers an array of services from its facilities spread across Sharjah, Dubai and Abu Dhabi. TSSC is the largest manufacturer of insulated panels for roofing and cladding in the Middle East. The building materials manufactured by TSSC are fire rated and carry individual product certifications.

With nearly five decades of experience, state-of-the-art manufacturing facilities and the largest production capacity in the Middle East, TSSC manufactures products of international quality and cater to customer demands by ensuring timely delivery and providing exceptional service.

Some of our Clients.....

AL RAWABI
NTDE, ETC
DUBAI MUNICIPALITY
DUBAI AIRPORTS AUTHORITY
DEIRA FISH MARKET
AL AWEER VEG. MARKET
LIFCO - DIC
BARAKAT QUALITY PLUS
TRANSMED OVERSEAS INC - DUBAI
DELMONTE FOODS - DUBAI
BRAZIL FOOD KIZAD
Abu Dhabi Municipality
AL KABEER
MC DONALDS OUTLETS - GCC

BURGER KING RESTAURANTS
CARREFOUR HYPER MARKET - GCC
SPINNEYS HYPERMARKET
PANDA HYPERMARKET
AL MAWALLEH VEG. MARKET - OMAN
DESSERT COLDSTORE - OMAN
AL MARAI - KSA
HALWANI BROS - KSA
LEHA AGRICULTURE
TABUK AGRICULTURE DEV. CO
AL WATANIA POULTRY
AGILITY - PAKISTAN
ANGRO FOODS – PAKISTAN
ITC Bangalore - 5 Star Hotel - India

Range of Products
Manufactured by TSSC

Cold Storage & Transportation
- Cold Rooms
- Freezer Rooms
- Refrigerated Vehicles

Building Materials
- Composite Panels
- Profiled Cladding Sheets
- Seamless Roofing System
- Glass & Aluminum Systems
- Doors & Windows

Housing Systems
- Affordable Houses
- Modular Houses
- Portacabins
- Prefab Houses
- Telecom Shelters
- Container Converted Units

Refrigerators & Coolers
- Visi coolers & Freezers
- Water Coolers
- Stainless Steel Refrigerators & freezers

Metal Storage Solutions
- Racking System
- Metal Sheds

Stainless Steel Equipment
- Laundry & Kitchen
- Hospitals

Services
- Galvanizing
Cold Stores

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