Technical specifications for the establishment of a Cold Storage Rooms.

Technical specification for insulation panels

Design specification

Insulation thickness

Exterior and interior walls	≥80 mm
Ceiling	≥80 mm
Floor	≥50 mm

Insulation Type

Walls	Polyurethane Sandwich Panel
Roof	Polyurethane Sandwich Panel (5 Rib/lm min. 80 mm thickness)
Floor	Extruded polystyrene/ or Polyurethane

1. Insulated Sandwich Panels – Data Sheet

1.1. Walls Insulation

1.2. Roof Insulation

1.3. Ceiling Insulation

1.3.1. Basic information

Automatic foamed sandwich panels from isolated noise and shock absorbing polyurethane hard foam core with variable deck layers

General Information

PU Metal Sandwich panels, due to the transformed metal deck layers as against synthetic and polyester deck and glass reinforced layers are;

Age resistant,

Brittle less,

Spread resistant – even after years of use.

Weight Stable

Stroke Resistant – without fissure formation (high deformation)

Neutral to smells and bacteria resistant

1.3.2. Panel weight;

15 kg/m2 at 100 mm, panel strength and both sides 0.5 mm minimum steel deck layer

1.3.3. Vapor Tightness;

the sandwich panel are through the transformation of metal peck layers completely vapor spread tight. The insulation value of the original panel weight remains the same.

1.3.4. Rust Protection

Cathode protection through zinc coating at the steel deck layers the panels are resistant against chemicals, fungus and microorganisms. The panel also neutral to smells and very easy to clean.

1.3.5. Vibration strength;

due to the elastic cell structure and the foam process there appears no harm to the foam.

1.3.6. Temperature load bearing capacity;

durable resistant until 110C with steel deck layer and short time durable depending on deck layer until approximately 320 C.

Heat Strength; the thermal stretches become elastic at the panels and the joints, and are absorbed so that no deformation or delamination appears.

1.3.7. Insulation system

Polyurethane foam insulation are injected polyurethane foam compressed under a pressure of 300 tons hydraulic press with computer control. The process is one shot in site method. The results should be an excellent adhesion between foam and deck layers.

Appearance	Mobile yellow
Density	40 kg/m3
Thermal Conductivity	0.15 w/m2.k
Modules	>38 kg/m3
Metal to PU foam adhesion ASTM-D/623	>1.5 kg/m3
Flexural resistance ASTM-D/209	>2.8 kg/m3
Adhesive strength to metal	83 g/m2 24 hr

Water vapor transmission (ISO 1663 at 38 C 90 % RH)

1.3.8. Outer and Inner Deck Layers

Pre-painted regular polyester hot dipped galvanized steel sheets lock-forming quality according to ASTM A 527 with tolerance according to ASTM A525, Zinc coating G90-275 gms/m2.

Front side approximately 5-micron primer and approximately 20 microns regular polyester white approximately 120 microns thick.

Reverse side approximately 7-microns' primer in mill's finish suitable for polyurethane foam.

Modular insulated panels for walls and ceiling made for polyurethane insulation injected with a density of not less than 38 kg/m3 in between polyester pre-painted and hot dipped galvanized steel sheets, with a sheet thickness of not less than 0.6 mm.

K-Value Less than 0.23 w/m2. K for 100mm thick.

1.4. Floor Insulation

The floor insulation is made of one layer of 5cm Polyurethane insulation covered with 13cm concrete wear slab re-enforced with 10mm wire-mesh opening 200mm x 200 mm for leveling the floor.

2. Refrigeration Equipment, Cooling units' criteria's

2.1. General Design criteria's

- Independent refrigeration systems serving each room
- R22 refrigerant for all systems
- The control panel for each system will be installed at the entry of each room
- Power supply is considered 380 V, 3 Phases, 50 HZ.
- Ambient temperature is considered 35 C max.

2.2. General Equipment

Valves; All necessary valves and controls for proper operation, maintenance and safeties will be supplied and installed for evaporators and compressors rack.

Piping works; all pipe work will be Refrigeration Grade Copper pipe + insulation.

Drains; PVC Drain pipes from the room evaporators to outside) floor level 0 is included but not connected to drainage point.

2.3. Electric Control Panels

(Separate Panel for each system)

We have assumed that power available is 380 Volts/3 ph/50 Hz and that all electric motors can be started direct on line.
The control panels will be complete with;
A main voltmeter with voltmeter selector switch
Indication of faults
Voltage protection
Automatic direct on line starters for electric motors
Thermal overload relays for all the electric motors
The panel will be provided with a rail-system and a terminal strip with numbered and coded connecting terminals and is completely wired and connected.

3. Control Systems and Accessories

3.1. Temperature control system;

Temperature sensors for temperature control of cold rooms and all other necessary controls to ensure secure running and maintenance.
Six-temperature probe should be installed in the precooling room in order to control temperature inside goods of **each Pallet**.

3.2. Humidity Control System

Humidifier should be installed, 1 in the precooling room and 1 in the cooling room; in order to maintain humidity >92%

3.3. Cabling and wiring;

All the necessary electrical cables, wires cable trays, conduit and other auxiliary materials required from our control panels to the supplied refrigeration equipment and controls will be supplied according the high international standards.
The equipment control and protection are ensured by an electric, microcontroller based board.

3.4. Lighting;

Fluorescent water proof lights 2 x 40 W, with transparent PVC cover, delivered and installed for all rooms.

3.5. Round Corners

All junctions (wall to floor and wall to ceiling) must be covered by PVC round corners. The inner part consists of aluminum base, used for connecting the enclosure (wall to floor and wall to ceiling). The outer part consists of PVC corners, used to hermetically sealing and covering the inner aluminum part, preventing the ingress of bacteria and microbes.

4. Technical Specifications for insulated doors and plastic curtains

4.1. Sliding Doors

Door leaf with both side skin of not less than 0.6 mm thick white polyester pre painted galvanized sheet, poly-isocyanurate foam core and a channel flashing all around the door seal.
Each door is fit with an aluminum door frame (inside and outside with thermal barrier in between). Each door is also fitted with an ED PM rubber seal.
The lifting of the door leaf from its frame immediately precedes the sliding motion, with similar action when closing.
The rubber stop butts are incorporated at the end of the rail to avoid fixing on the panels.
Pleasing appearance and cleanliness are achieved by the rail concealing the mechanical components.
Easy mounting and minimum maintenance.

Smooth and noiseless operation.
External handle bar for easy opening and an internal handle incorporating an emergency release handle.

4.2. Plastic Curtains

Doors will be equipped with 2 mm thick stripes of Plastic Curtains with 20 % over lap hanging system. These air curtains, as they are called, can be a useful aid when the door is opened for short intervals.

4.3. Floor Epoxy Painting

Sanding of existing floor, cleaning and brushing the concrete residue (using acid and sanding machines), applying first coat of epoxy primer the adding 2 layers of epoxy coating (Tinopoxy S.F. Tar coating)

5. Technical Specifications for the support steel structure of the sandwich panels

5.1. Support Steel Structure for Hangar

Supply and install a steel structure hangar as per attached drawings and details, all black steel member shall be coated as per general notes (Attached Drawing SD-101 & SD-102), also bolts and steel member grades are per general notes (Attached Drawing SD-101 & SD-102). Steel structure to support the roof Covered with 5 Rib/lm min. 80 mm thickness sandwich panel (Attached Cross Section), and supported with galvanized G90 C channels in addition to galvanized draining gutters with all needed accessories and corner covers (Attached Drawing SD-102).

5.2. Support Steel Structure for Mezzanine

Supply and install a black steel structure. Stair to reach Mezzanine, supplied with Granulated black steel plate 3mm thickness & Black steel hand rail from both sides of stair. Internal mezzanine specifications, as per attached drawings SD-101 & SD-102 and details, all black steel member shall be coated as per general notes (Attached Drawing SD-101 & SD-102), bolts and steel member grades as per general notes (Attached Drawing SD-101 & SD-102).

Technical Offer

Per Attached excel file #DUWA1_TECHNICAL & FINANCIAL PROPOSAL _ Insulation Panels and Cooling Rooms - YOUR COMPANY NAME, Sheet Technical Offer

Financial Offer

Per Attached excel file RFQ #DUWA1_TECHNICAL & FINANCIAL PROPOSAL _ Insulation Panels and Cooling Rooms - YOUR COMPANY NAME, Sheet Financial Proposal