

# ColdStorage

COOLSWAY as single window solution for cold storage



## COOLSWAY Benefits

- Single Window solution for: Layout Planning, Design & Drawing, Supply and Services
- Cost effective solutions
- Competent and professional service
- Own manufacturing of PUF Panels
- Emphasis on energy saving solutions
- Fast implementation

Broadly cold storage plant project activities may be divided into 7 major heads as shown below. COOLSWAY can contribute significantly for commissioning any new plant starting from initial layout planning till commissioning.

- 1
  - Initial layout planning based on proposed plant capacity
  - Land Acquisition based on initial layout plan
- 2
  - Heat and energy calculations
  - Finalization of Vendors
- 3
  - Final Layout Diagram
  - Structure Planning and design
  - Architectural Planning and Drawing
- 4
  - Civil and Foundations, Flooring etc.
  - PEB Structure supply and complete housing services
  - Electrical and Earthing supply and installations
- 5
  - PUF Panel Supply and Services
  - Doors Swing and Sliding Supply and Installation
- 6
  - Refrigeration System Installation
- 7
  - Checks and rectifications if any
  - Commissioning of plant and Operation



COOLSWAY Products & Services



COOLSWAY Products & Services



ISO 9001:2008, ISO 14001:2004 and OHSAS 18001:2007 certified company

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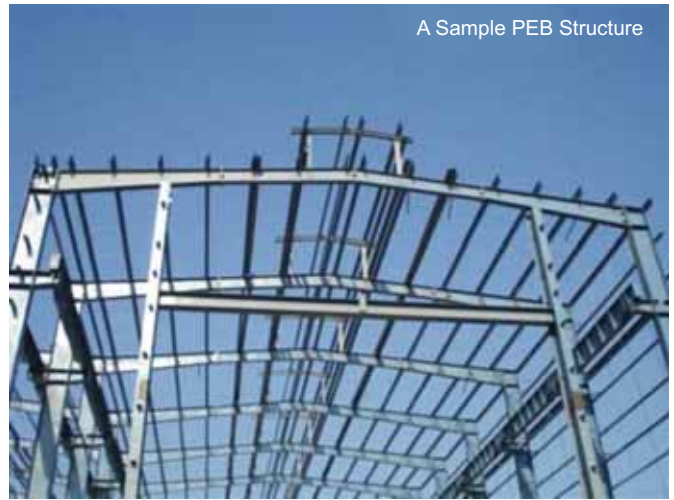
## COOLSWAY PEB Solutions

COOLSWAY recommends PEB because of underlined advantages:

### Why PEB Solutions for Cold Storage?

- Such buildings are detailed and designed in advance and manufactured in a quality controlled environment.
- Every manufacturing operation is carried out through advanced technologies such as sophisticated welding techniques, standardization of components, etc.
- Pre engineered construction system also facilitates mass production.
- The construction is faster than the conventional method.

### Comparison PEB V/S Conventional



A Sample PEB Structure

#### PEB Buildings

#### Conventional Building

Aesthetically appealing appearance	Special aesthetic design required
Reduced time because of international design standards & codes using standard sections and connections	Increased design time due to scratch and availability of less design aids
Higher resistance to seismic forces due to low weight flexible frames	Rigid heavy weight structures not suitable for seismic zones
30% less PEB steel structures weight through efficient use of steel	High weight due to excessive safety factor and heavy RCC work.
Factory controlled quality	Every project to be fabricated at site
Lower initial cost of PEB steel buildings (cost per square meter about 30% less than the conventional) and faster delivery	Special design and features developed for each project at higher costs
Simple Foundation, easy to construct and light weight of PEB structures	Extensive heavy foundation
Span size may be designed up to 40m	Span size with limitation of beam width may be limited to 10-15m
Average delivery time 6-8 weeks	Average delivery time 22-28 weeks



COOLSWAY Structure Plant and proposed PEB Plant at Sikandrabad, UP

#### Applicable Codes:

The 1996 Edition of Low Rise Building System Manual. Metal Building Manufacturers Association (MBMA).

Hot rolled and Built Up sections are designed in accordance with: Manual of Steel Construction, 9<sup>th</sup> Edition. American Institute of Steel Construction (AISC).

Cold-Formed members are designed in accordance with: 1996 Edition of Cold formed Steel Design Manual American Iron and Steel Institute (AISI).

Welding is applied in accordance with: American Welding Society (AWS D1.1.98) Structural Welding Code Steel.

All RCC structures are designed as per IS-456



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## COOLSWAY Insulation Solutions

COOLSWAY recommends use of PUF for cold storage because of following advantages:

- High thermal efficiency ensures low heat transfer means low refrigeration load
- Reduces operational cost. Major cost for any cold chain operation is electricity. Lower the refrigeration load, lower the electricity consumption.
- The sandwiched panel has significant mechanical strength, which makes it possible to go for larger spans as well as large partition walls.
- It gives aesthetic appearance, easy housekeeping.
- Panels are joined with CAMLOCK and also additionally joint with tongue and groove configuration.
- It is easy to erect or dismantle the panels.

The thermal efficiency of panel does not deteriorate over a period of time, making it long lasting insulation solution.

Thermal Conductivity (K) of the material decides the insulation property of the material. Lower the K value, better the insulation property. K value of some of the insulation materials are given below:

Mineral Wool:	0.028 W / mK	[Open Cell]
EPS:	0.036 W / mK	[Open Cell]
PUF:	0.023 W / mK	[Close Cell]

PUF is better insulating material than rest of the two. More over it is close cell. The open cell allows moisture ingress and deposition causing poor insulation. Since K value for PUF is lower than rest, so for the same insulation effect, the thickness required by PUF will be lesser than rest two, means more space in cold storage [See table below](#). Major advantage of better insulation is energy saving as well as lesser cost on maintenance of refrigeration compressors.

## Insulation Selection

Name of Material	Insulation thickness in mm, Temp in °C			
	-30 to -20	-20 to -15	-15 to -4	-4 to +2
Mineral Wool 24- 48 Kg/m <sup>3</sup>	175	150	125	100
EPS 18Kg/m <sup>3</sup>	175	150	125	100
PUF 40 Kg/m <sup>3</sup>	120	100	80	60

\*An energy calculation with certain assumption just to understand saving in terms of money:  
Storage capacity 6000 MT. Size 32m (L) x 32m (W) x 18m (H)

Conventional System	Modern PUF Panel System
<p>WALL - Brick wall 225mm (9"), Cement 12mm both side, EPS 100mm, Aluminium foil 0.05mm</p> <p>CEILING- EPS 100mm, RCC slab at roof.</p> <p>FLOOR- EPS 60mm, after tar felting and finish with concrete PCC (75mm).</p> <p>Thermal conductivity of EPS 0.036 W / mK. For ambient temperature of 40 °C and operation at 6 °C, thermal transmission values:</p> <p>Q wall and Ceiling = 12.24 W/m<sup>2</sup></p> <p>Q Floor = 9.06W/m<sup>2</sup></p> <p>For total area of wall, ceiling and floor are 1152m<sup>2</sup>, 1024m<sup>2</sup>, 1024m<sup>2</sup> respectively,</p> <p><b>Q (Total) = 35.91 KW</b></p>	<p>WALL PUF Panel 80mm</p> <p>CEILING PUF Panel 100mm</p> <p>FLOOR As in case of conventional system</p> <p>Thermal conductivity of PUF 0.023 W / mK. For ambient temperature of 40 °C and operation at 6 °C, thermal transmission values:</p> <p>Q wall and Ceiling = 9.78 W/m<sup>2</sup></p> <p>Q Floor = 7.82 W/m<sup>2</sup></p> <p>For total area of wall, ceiling and floor are 1152m<sup>2</sup>, 1024m<sup>2</sup>, 1024m<sup>2</sup> respectively,</p> <p><b>Q (Total) = 29.28 KW</b></p>

Saving by putting modern PUF technology is 35.91-29.28 = 6.63 KW at 100% efficiency. If plant runs for 24 hours, units saved will be 6.63x24=159 Units. Cost of a unit of electricity is Rs 6.00, saving per day = 159x6=Rs 954, saving in month = 954\*30= Rs 28641. **Saving in a year = 28641\*12 = Rs 343699**

## Opt PUF Panels →

**Energy Saving**  
**Fast deployment**  
**Maintenance free**  
**Easy housekeeping**

**Mechanical Strength**  
**Early Revenue Earning**  
**Less load on refrigeration unit**

**Better profitability**  
**Long Life**  
**Aesthetic look**



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\*All calculations above are indicative only.

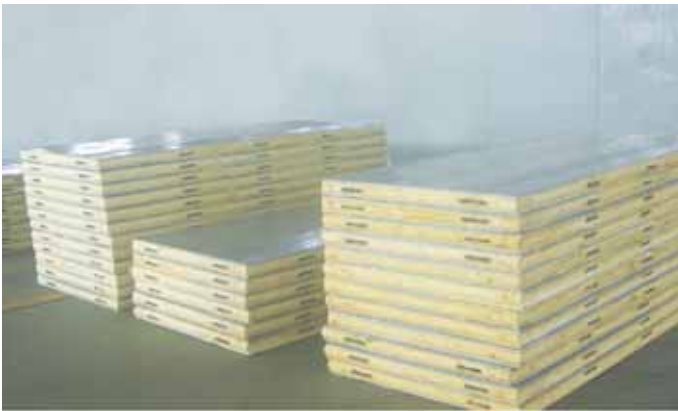
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Panels of various thicknesses and lengths are manufactured at COOLSWAY plant. Some common dimensions:

Up to 3m: 60mm, 80mm, 100mm, 120mm  
Up to 5m: 60mm, 80mm, 100mm, 120mm  
Up to 7m: 60mm, 80mm, 100mm, 120mm

Option for corners: instead of flushing, corner panel is preferred. Up to 7m of corner panel can be manufactured in the plant.

All panels are thoroughly tested for CAM LOCK setting, PUF quality and filling, sheet wavering and finally dimension and thickness. COOLSWAY product is time tested and proven

**COOLSWAY PUF Panel Manufacturing Plant at Ghaziabad**

COOLSWAY trademark for its doors is CoolGate. It has its own R&D division to develop doors. Keeping in mind Indian requirements, environmental conditions and cost effectiveness, doors are designed. Continual R&D is carried out based on various feedbacks.

- Very Low Heat Leakage
- Robust Design
- Low Maintenance cost
- Suitable For Chiller, Freezer and Blast Freezer Application
- Suitable for Food Industry, Medical Industry and for clean Rooms
- Rust and Maintenance free. S.S. 304 parts on exposed and moving areas

Sliding Doors

Swing Doors

Sliding Doors

Swing Doors

Sliding Doors

Swing Doors



CoolGate

Single window solution for cold chain by providing:

- Pre Fab structure and RCC structure engineering
- Design and drawing of cold rooms
- Assistance in Heat and Energy calculations
- Supply and services of Pre Fab structure from COOLSWAY Structure Unit
- Supply and services of PUF based panels from COOLSWAY PUF Panel Unit
- Experienced project management team
- ERP based project monitoring
- In house manufacturing of PEB, PUF Panels and Doors
- Team of structure, civil and electrical engineers
- Experienced supervisors for site supervision and installations
- More than 30 civil, electrical and installation vendors registered with company and actively working

For any enquiry, please contact:

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\*All data, design, specifications and calculations are indicative and for reference only. This may be changed.

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