



WORKS FOR NATURE.

WORKS FOR YOU.



ECO-FRIENDLY GREEN PANELS WITH
CYCLOPENTANE **PUF INSULATION**

Blue Star is India's largest central air conditioning and commercial refrigeration company, with over 8 decades of experience in providing commercial refrigeration solutions of every kind. With products designed, developed and manufactured at seven state-of-the-art plants across India, and supported in every corner of the country through 30 offices and over 4040 dealerships.

The Company is known for its innovation and technological leadership and has introduced many cutting-edge products and solutions into the international marketplace which offer higher efficiency, better performance and more reliability—factors that matter most to the customer.

Blue Star also ensures that every new solution it brings to the marketplace is eco-friendly and green, and contributes to a sustainable future of reduced global warming and zero ozone depletion. The introduction of the eco-friendly R410a refrigerant in most of its air conditioning solutions, for example, goes a long way in helping the country meet its obligations to reduce the use of HFCs under the Montreal Protocol.

The Company now introduces eco-friendly pre-fabricated insulation panel systems in a range of profiles, thicknesses and finishes. The speciality of these panels is that, they are perfect for the speedy creation of cold stores of any size at the site due to their precise interlocking design and great insulation properties and are also eco-friendly both in their material and in their manufacturing process itself.

These new eco-friendly panel solutions from Blue Star can be used to create cold storages of any size, from small walk-ins to very large cold rooms.





The Perfect Cold Room

A cold storage is a critical piece of infrastructure for any industry. The quality of stored produce and raw materials depend upon the reliable and precise functioning of the cold storage.

Blue Star's experience in creating cold storages that offer different storage conditions in terms of temperature, humidity, fresh air, air flow, etc., to suit different industry requirements has made them the leaders in this domain too.

The Company's engineers plan and design cold rooms based on advanced heat load calculations using internationally acclaimed softwares thus building your desired cold room with precision.

Blue Star's Cold Storage Division extends across a wide spectrum of industries that includes:

Agro Industry

Cold Chain

Dairy

Floriculture

Food Processing

Healthcare

Horticulture

Hotels & Restaurants

Ice Cream

Industrial Canteens

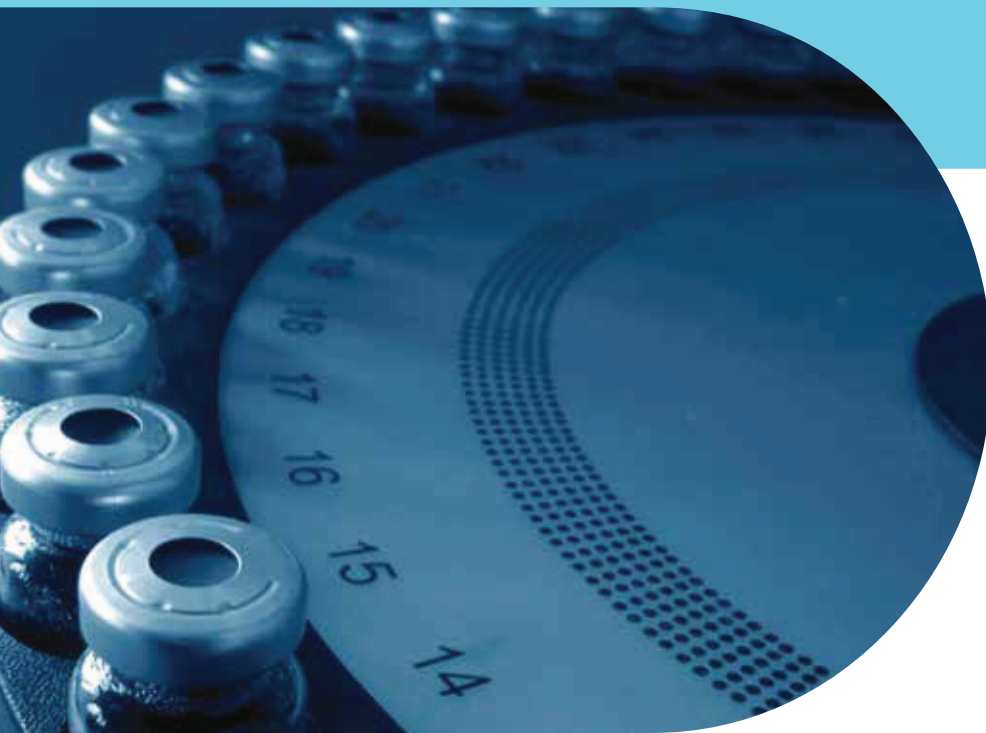
Meat Processing

Pharmaceuticals

Ripening Chambers

R & D Labs

Sea Food



Pre-fabricated from Blue Star

Panels

Blue Star's new range of pre-fabricated insulation panel systems are easy-to-use interlocking panels that can be used to create cold rooms of any size at the site.

Since the insulation material in these panels is foamed between two metal skins, they offer highly effective insulation for cold rooms.

What's more, these panels are designed to ensure precision interlocking and hence they form leak-free walls ideal for cold rooms.

Manufactured in a wide range of profiles, thicknesses and finishes, these systems can be used to create cold stores at the site and of any size – from small walk-ins to very large cold rooms.

Doors

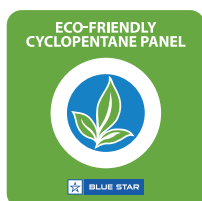
Blue Star offers a complete range of insulated doors to complement its world-class environment-friendly PUF panels.

The polyurethane foam insulation sandwiched between GI sheets makes the doors perfect for high-performance cold rooms.

- Self-closing: Ensures that the door remains closed without any human interaction
- Safety release: Doors can be opened from inside
- View port: Helps view products stored inside without opening the door, which is not just for convenience but for power saving too

- Posi-Seal: Provides perfect alignment of frames and ensures perfect closing movement
- Sweep gasket: Air-tight heavy-duty sealing gasket below the door remains flexible at any temperature
- Thermal break: Eliminates thermal conductivity which otherwise leads to condensation and ice formation

An Eco-friendly DNA



Panel Systems

Blue Star's new range of pre-fabricated insulation panels are eco-friendly from the ground-up since even the manufacturing process is green.

Cyclopentane: The eco-friendly blowing agent

Cyclopentane is increasingly becoming an industry standard, the world over, as an eco-friendly blowing agent. Blue Star has also invested in using cyclopentane as the blowing agent in the manufacture of its new series of insulation panels. This makes the panels 'green' even in their manufacturing process, and further underlines Blue Star's commitment to a greener tomorrow.

This ensures zero Ozone Depleting Potential (ODP) and reduces Global Warming Potential (GWP) as compared to HCFC-141b which is not environment-friendly.



Why cyclopentane

- ODP (Ozone Depletion Potential): 0
- GWP (Global Warming Potential): Negligible (11)
- Complies with TUV standards, CCOE certification

Blue Star's commitment to a healthy environment is thus further reinforced by this investment in a cyclopentane process, which not only ensures superior yet environmentally-friendly products, but also supports the obligations under the Montreal Protocol on 'Substances that Deplete the Ozone Layer'.

Cyclopentane vs Conventional HCFC-141b :

| S.N. | Particulars | HCFC 141b | Cyclopentane |
|------|---------------------------------|--------------------|--------------------|
| 1 | GWP (Global Warming Potential) | 630 | 11 |
| 2 | ODP (Ozone Depletion Potential) | 0.11 | 0 |
| 3 | Fire retardant property | Self-extinguishing | Self-extinguishing |

CFC and HCFC-free polyurethane

The insulation material used within Blue Star's new range of pre-fab panel systems is also eco-friendly, being made of CFC/HCFC-free polyurethane.

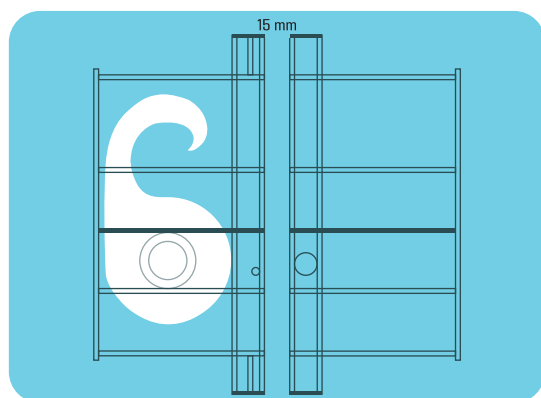
This is in accordance with the obligations under the Montreal Protocol on 'Substances that Deplete the Ozone Layer', which the 'Ozone Cell' (specially created within the Ministry of Environment, Govt. of India) is driving under the 'HCFC Phase Out Management Plan (HPMP) Stage 1B'.

Facilities aiming to become green buildings will find these panels ideal for their LEED certification process.

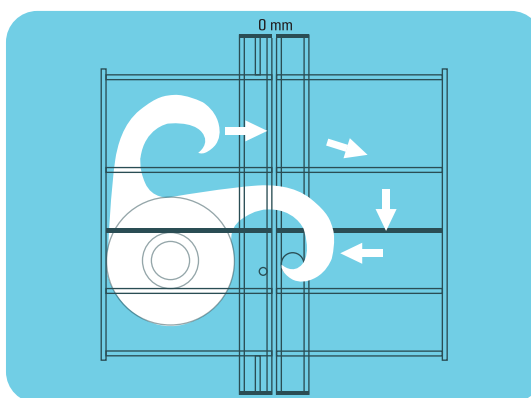
Precision Locking Mechanism

Each Blue Star pre-fab insulation panel has cam-action locking devices precisely positioned and firmly anchored within. All cam-locks have integral rear flanges to permanently anchor their position during the manufacture of the PUF panels. Cam-locks are also placed at exact matching locations on the tongue and groove side to ensure perfect locking.

All cam-locks are accessible from the inside by means of a hex wrench furnished with the panels. Access ports for cam-locks are covered with snap-in cap plugs that must be snapped out before accessing the cam-locks, thus making them tamper-proof.



BEFORE LOCKING THE PANELS



AFTER LOCKING THE PANELS

Technical Specification

| Sl.No. | Description | General Specifications |
|--------|------------------------|--|
| 1 | PUF Panel Thickness | 60/80/100/127/152mm |
| 2 | PUF Panel Cover | PP or SS |
| 3 | Sheet Metal Thickness | 0.4/0.5mm |
| 4 | Temperature Range | -40°C to 80°C |
| 5 | PUF Blowing Agent | Cyclopentane (C5) – (CFC & HCFC free) |
| 6 | Lock Arrangement | Cam-Lock with metal plunger |
| 7 | PUF Density | 40Kg/m ³ ±2Kg/m ³ |
| 8 | K Value (w/m °K) | 0.021 – 0.023 |
| 9 | Panel Length | Up to 11.5 m |
| 10 | Panel Width | 11.5 / 23 / 34.5 / 46 inches |
| 11 | Panel Joint | Tongue & Groove joint |
| 12 | Panel to Panel Fitment | The gap between two fitted panels < 3 mm |

Features & Benefits



PUF insulation core ensures excellent K factor



High density polyurethane offers better strength



Perfect joints eliminate air leakages



Effective thermal insulation results in negligible thermal conductivity



Suitable for a wide temperature range of -40°C to $+80^{\circ}\text{C}$



In case of fire, stops burning when source of fire is removed



Occupies less space due to efficient insulation



Eco-friendly blowing agent cyclopentane used



Modular construction resulting in faster installation



Easily expandable to larger sizes



Available in stainless steel and pre-painted GI



Thickness range from 60 to 152mm



90° corner panels to ensure stability

Wide Range of Refrigeration Units

Blue Star offers a wide range of both evaporating and condensing units. It includes both air-cooled and water-cooled condensers, with technology from the world leaders.

Depending on the application, different temperature zones need to be maintained:

Low (-23°C to -5°C), Medium (-5°C to $+2^{\circ}\text{C}$), High ($+2^{\circ}\text{C}$ to $+15^{\circ}\text{C}$)

Evaporating units

Blue Star's evaporating units are compact, slim and sleek, so they occupy minimum space ensuring maximum storage space. Other features include:



Stainless steel body and excellent corrosion resistance



Inner grooved copper tubes for superior heat transfer



In-built defrost heaters for medium and low-temperature units



External rotor driven fans with low noise levels



Removable side panels for easy service



Condensing Units

These units are characterised by high-efficiency heat transfer and low power consumption. Other features include:



Energy-efficient scroll and reciprocating compressors



UV and corrosion resistance



Filter drier for moisture and dirt protection



Pre-charged unit with service valves



In-built safety and control devices



Weather-proof polyster powder coated canopy



Microprocessor Controller and Power Panel

Blue Star's Refrigeration Units come with intelligent microprocessor-powered controllers and ready-to-use power panels that make electrical connections simple, fast and long-lasting.

Features:

- Embedded switchgear in the Positive Temperature Condensing Unit
- Power Panel with necessary accessories and defrost controls is available for Medium and Low Temperature Units

Perfect Installations

Without carefully executed installations, the efficiency and reliability of a cold room can be compromised. Hence Blue Star's engineers are equipped with latest technology and knowledge thus carrying out precise installations. Some of the checks considered by them include:

- The location of the evaporator within the cold room for uniform cooling and air distribution
- Level Flooring (0–0 level) to avoid misalignment of walls
- Proper selection of copper parts and pipe sizes
- Minimising bends and unduly long runs

After Sales Support

Blue Star is well known for its excellent service support in the entire industry. With a team of specially trained technicians placed at 30 destinations across India, you can expect absolutely smooth service support. Cold room dealers based in different locations will help you with perfect installations and Blue Star will ensure after sales support and availability of genuine parts at all times to avoid down time of your project.





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