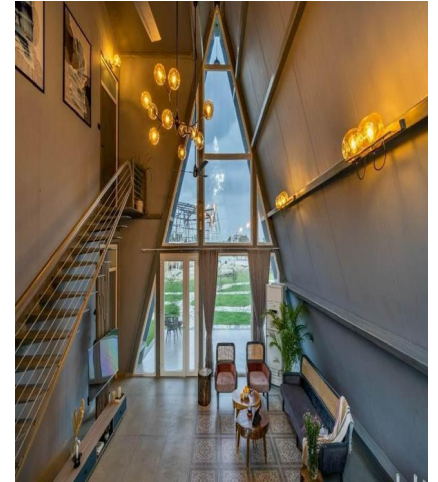


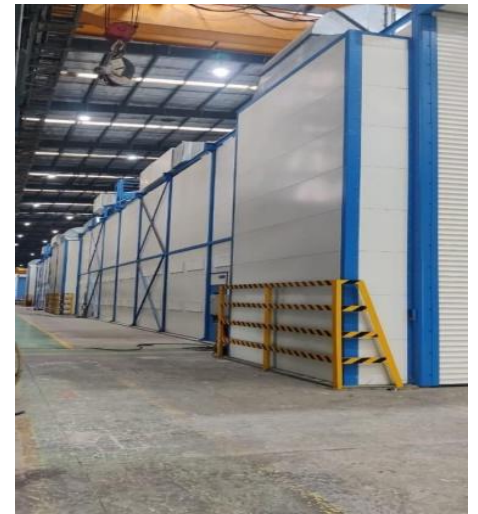


Name and Address of Certificate Holder:
M/s SUCHI FOAMS PRIVATE LIMITED
Survey No. 1972, Sonvad Road,
Village; Khavad, Taluka: Kadi,
Dist. Mehsana Gujarat-382165
Tel: 7948989571
Website: www.suchifoams.com

Performance Appraisal
Certificate
PAC No.: **1073-P/2025**
Issue No.: **01**
Date of issue: **03/06/2025**



**INSULATED
SANDWICH PANEL
(RIGID
POLYURETHANE /
POLYISOCYANURATE
CORE)**



**User should check the
validity of the Certificate**
by contacting Member
Secretary, BMBA at
BMTPC or the Holder of
this Certificate

Building Materials & Technology Promotion Council
Ministry of Housing & Urban Affairs
Government of India
Core 5A, First Floor, India Habitat Centre, Lodhi Road,
New Delhi – 110 003

Tel: +91-11-2463 6705, 2463 8097; Fax: +91-11-2464 2849
E-mail: info@bmtpc.org Web Site: <http://www.bmtpc.org>

PERFORMANCE APPRAISAL CERTIFICATE

FOR

**INSULATED SANDWICH PANEL (RIGID POLYURETHANE/
POLYISOCYANURATE CORE)**

ISSUED TO

M/S SUCHI FOAMS PRIVATE LIMITED

STATUS OF PAC NO: 1073-P/2025

S. No	Issue No.	Date of Issue	Date of renewal	Amendment		Valid up to (Date)	Remarks	Signature of authorized signatory
				No.	Date			
1	2	3	4	5	6	7	8	9
1	1	03/06/2025				02/06/2026		

PAC No. 1073-P/2025

Issue No. 01

Date of Issue: 03/06/2025

CONTENTS

PART 1 CERTIFICATION	3
1.1 Certificate Holder	3
1.2 Description of the Product.....	3
1.3 Size and Profiles of Panels.....	3
1.4 Uses of the Product.....	6
1.5 Assessment	6
1.6 Conditions of Certification	8
1.7 Certification	8
PART 2 CERTIFICATE HOLDER’S TECHNICAL SPECIFICATIONS	9
2.1 General	9
2.2 Specifications for the Product	9
2.3 Inspection & Testing at Plant	10
2.4 Manufacturing Machinery & Equipment	10
2.5 Manufacturing Process & Flow Chart	11
2.6 Method of erection of Wall panel, ceiling panel system & jointing detail of panels.....	12
2.7 Skills requirements	15
2.8 Guarantees/ Warranties provided by the PAC Holder to the customer	15
2.9 Services provided by the PAC holder to the customer.....	15
2.10 Manuals.....	15
2.11 Responsibility	15
PART 3 BASIS OF ASSESSMENT & BRIEF DESCRIPTION OF ASSESSMENT PROCEDURE	16
3.1 Scope of Assessment	16
3.2 Various Tests performed for the Assessment	16
3.3 Site Inspection.....	21
3.4 Projects Executed	21
PART 4 STANDARD CONDITIONS	22
PART 5 LIST OF APPLICABLE STANDARDS AND CODES	24
CERTIFICATION	25
PART 6 LIST OF ABBREVIATIONS	26
PERFORMANCE APPRAISAL CERTIFICATION SCHEME – A BRIEF	27
ANNEX 1 Quality Assurance Plan	28
ANNEX 2 Process Flow Chart.....	30
ANNEX 3 Standard Flashing.....	31
ANNEX 4 Photographs of the Projects.....	32

PART 1: CERTIFICATION

1.1 Certificate Holder: **M/s Suchi Foams Pvt. Ltd.**
Survey No. 1972, Sonvad Road, Village: Khavad,
Taluka: Kadi, Dist. Mehsana,
Gujarat – 382165
Website: www.suchifoams.com
Email: kamin@suchifoams.com

1.2 Description of the Product

1.2.1 Name of the Product: Insulated Sandwich Panel (Rigid Polyurethane/
Polyisocyanurate Core)

1.2.2 Brand Name: SUCHI FOAMS

1.2.3 Brief Description

The panels are manufactured as composite panels with an insulating layer of rigid core sandwiched between two outer metal sheets. These are modular building components, manufactured with varying facings, panel thicknesses and profiles. The outer layers of metal sheet facings are available with various surface coatings/finishing options including Pre-Painted Galvanized Steel (PPGL/PPGL), Stainless Steel (SS) sheets, which offer weather resistance and rigidity to the panel. The rigid Polyurethane (PUR) or Polyisocyanurate (PIR) provides thermal insulation properties.

The panels can be used for walling, cladding & roofing applications in various types of buildings/ infrastructure works. The panels have advantages in terms of high-energy efficiency, light in weight, easy repair & replacement in case of damage etc. The design & engineering of structure using these panels is carried out based on applicable Indian Standards.

1.3 Size and Profiles of Panels

1.3.1 Wall Panels

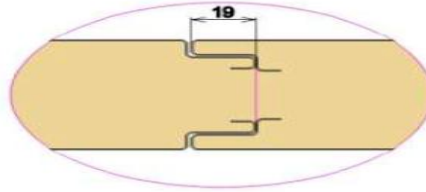
Wall Panel consist of tongue-n-groove joinery panels for air tight joints. It is an external panel for a building which has PUR/ PIR between pre-painted hot dip galvanized steel sheets.

The types & specifications of panel include;

Facing & Finish Options: Pre-painted galvanized steel, stainless steel, bare Galvalume, Pre-painted Aluminium (PPAL), Craft paper, and Aluminum foil (Alu Foil) for the inner skin

i. Single Groove wall Panel

Size of the panel: The panels have a length of 12m or more, a width of 1m, and a thickness ranging from 30mm to 50mm.



Two Panel Joint detail

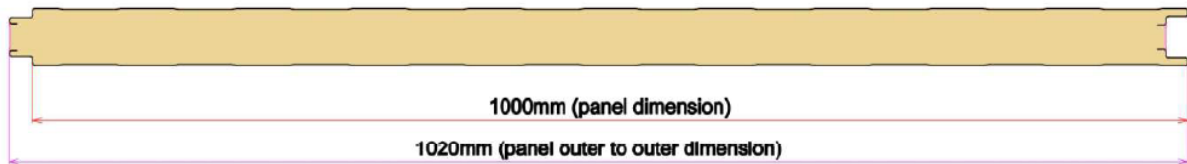
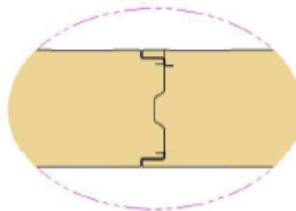


Fig. 1: Wall Panel (Single Tongue & Groove)

ii. Double Groove Wall Panel

Size of the panel: The panels have a length of 12m or more, a width of 1m, and a thickness ranging from 60 mm to 180 mm.



Two Panel Joint detail

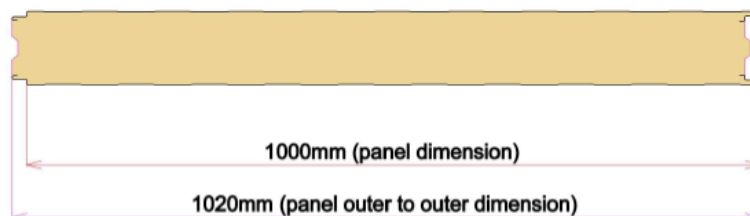


Fig. 2: Wall Panel (Double Tongue & Groove)

1.3.2 Continuous Sandwich Roof Panel for pitched Roof

Continuous sandwich roof panels consist of 5-rib roof panels, featuring a trapezoidal profile on the top surface and a ribbed liner on the inner surface.

Facing & Finish Options: Pre-painted galvanized steel, stainless steel, bare Galvalume, Pre-painted Aluminium (PPAL), Craft paper, and Aluminum foil (Alu Foil) for the inner skin.

Size of the panel: The panels have a length of 12m or more, a width of 1m, and a thickness option of 30mm, 40mm, 50mm, 100mm & 120mm

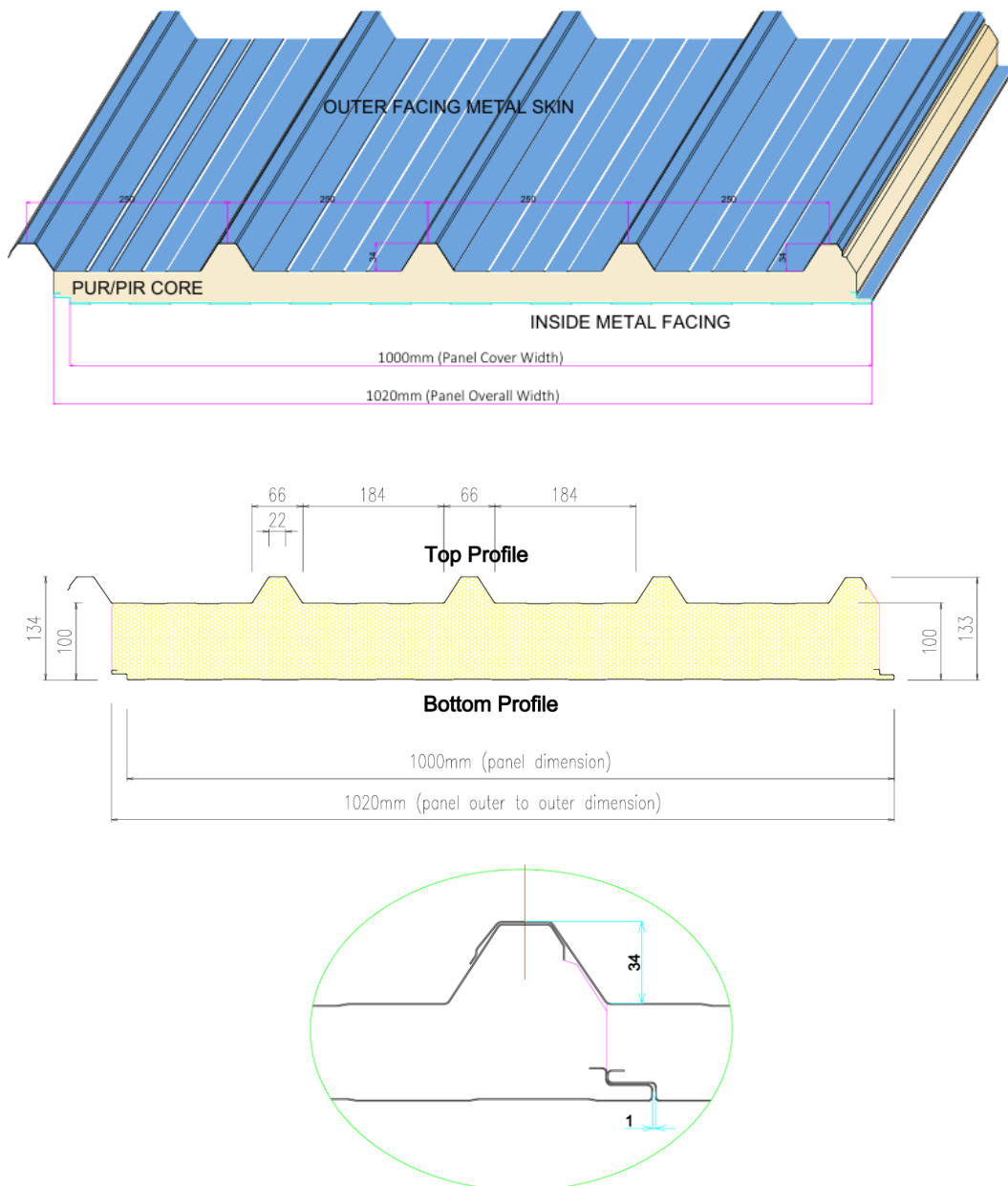


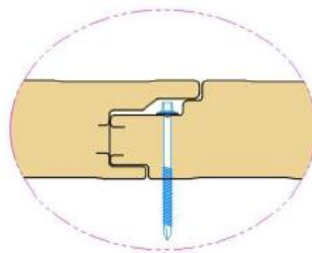
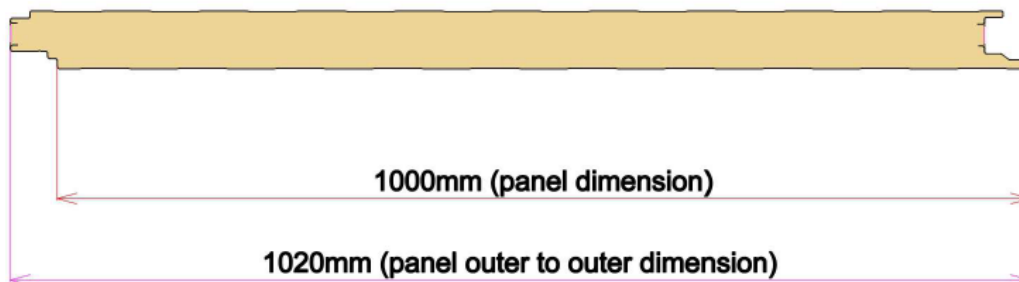
Fig. 3: Roof Panel/Trapezoidal Profile

1.3.3 Concealed Fastener Wall panel

The concealed fasteners are designed to eliminate the exposure of joint bolts (screws). These panels are used as non-load-bearing panels for residential, commercial buildings, etc.

Facing & Finish Options: Pre-painted galvanized steel, stainless steel, bare Galvalume, Pre-painted Aluminium (PPAL), Craft paper, and Aluminum foil (Alu Foil) for the inner skin.

Size of the panel: The panels have a length of 12m or more, a width of 1m, and a thickness option of 40mm, 50mm, 60mm, 80mm & 100mm



Two Panel Joint detail

Fig. 4: Concealed Fastener Panel

1.4 Uses of the Product

The PUF/PIR Sandwich panels have applications as external wall, internal partitions, and roof in Cold storages, Industrial buildings, warehouses, Commercial buildings, prefab buildings, Institutional buildings, etc.

1.5 Assessment

1.5.1 Scope of Assessment

Scope of assessment included suitability of manufactured Sandwich Panels as non-load bearing external/ internal wall and roof panel components, to be used with structural system designed and executed based on the norms & guidelines stipulated in relevant Indian Standards.

1.5.2 Basis of Assessment

Assessment of the suitability of the Sandwich panels is based on:

- i. Test report of PUR Sandwich Panel for test parameters such as Thermal conductivity test, apparent density, Compressive strength, Closed Cell Content & Horizontal burning test conducted by Spectro Analytical Labs Limited, Greater Noida, UP
- ii. Test report of PUR Sandwich Panel for test parameters such as water vapour Transmission, Temperature range test & Climbing Drum Peel Test conducted by Spectro Analytical Labs Limited, Greater Noida, UP
- iii. Test report of PIR Sandwich Panel for test parameters such as, Core & overall density, Compressive strength, Thermal conductivity test, Dimensional stability, Closed Cell Content, Horizontal fire test, conducted by Dow Chemical International Private Limited, Maharashtra.
- iv. Test report of PIR Sandwich Panel for test parameters such as Dimensional Stability, Apparent density, Compressive strength, Water Vapour Transmission Rate, Permeance & Permeability conducted by CSIR- Central Building Research Institute, Roorkee.
- v. Test report of PIR Sandwich Panel for test parameters such as Dimensional Stability, Closed Cell Content, Thermal conductivity test, Apparent density, Compressive strength, Horizontal burning test, Temperature range test, Climbing Peel Test conducted by Spectro Analytical Labs Limited, Greater Noida, UP
- vi. Test report of mechanical properties of stainless steel sheet, salt spray test (corrosion resistance test) & coating thickness by the Unitech Metallurgical services, Ahmedabad, Gujarat
- vii. Test report of Fire Resistance of PIR Panel conducted by Centre for Research and Fire Safety Technology (AFITI), Spain & CSIR- Central Building Research Institute, Roorkee
- viii. Test report of for test parameters such as HCFCs, HFC & CFC are conducted by SGS India Private Limited, Gurugram, Haryana
- ix. Quality Assurance System adopted by the Agency.
- x. Inspection of the factory was carried out on April 23, 2025, which included the assessment of production process, quality control, manpower etc.

1.5.3 Special Aspects of Use/ Limitations

Appropriate care needs to be taken during transportation, storage, erection etc. of the panels for preventing it from damage/ scratches etc.

1.6 Conditions of Certification

1.6.1 Technical Conditions

- i. Raw materials and the finished product shall conform to the requirements of the prescribed specifications.
- ii. The building to be constructed using Sandwich Panels shall be designed by competent structural engineer in accordance with various specifications, following relevant codal requirements, and constructed by trained persons only with technical support or supervision by qualified engineers and builders, based on structural designs. The structural design of the building should clearly demonstrate structural integrity and stability including connection details.
- iii. It is also recommended that Architects and Engineers who undertake such building design and construction gain familiarity with the properties and materials, characteristics of Sandwich Panels and the construction system.

1.6.2 Quality Assurance

The Certificate Holder shall implement & maintain a quality assurance system in accordance with Quality Assurance Plan (QAP) given in **Annex-1** attached with this Certificate.

1.6.3 Handling of User Complaints

The Certificate holder shall provide quick redressal to Consumer/user complaints proved reasonable & genuine and within the conditions of warranty provided by it to customer/purchaser.

As part of PACS Certification, PAC holder shall maintain data on such complaints with a view to assess the complaint satisfaction and suitable preventive measures taken.

1.7 Certification

On the basis of assessment given in Part 3 of this Certificate & subject to the conditions of certification, use & limitations set out in this Certificate and if selected, installed & maintained as set out in Parts 1 & 2 of this Certificate, the Insulated Sandwich Panel covered by this Certificate is fit for use set out in the Scope of Assessment.

PART 2: CERTIFICATE HOLDER'S TECHNICAL SPECIFICATIONS

2.1 General

2.1.1 The PAC holder shall manufacture the panels in accordance with the requirements specified in the relevant Standards (see part 5). In addition, it shall follow the company standards specifying requirements of these sections for various materials used in the manufacturing of the panels.

2.1.2 Technical specification for Raw Materials

Table 1 List of Raw Materials & Technical Specifications

S. No.	Raw Material/ Component	Source	Specification	If quality certified in any form
1.	Rigid PU Chemical POLYOL	DOW Intl Pvt Ltd/ BASF India Ltd	40 to 48 kg Density Insulation	Test Certificate
2.	Rigid PU Chemical MDI	DOW Intl Pvt Ltd/ BASF India Ltd	40 to 48 kg Density Insulation	Test Certificate
3.	Prepainted Galvanized Steel Sheet / SS / ALU / Paper	Steel Supplier JSW/AMNS/ TATA	0.3 mm to 0.8 mm thick	Test Certificate IS14246
4.	N Pentane	Oricon Intl Pvt Ltd	97% purity	Certificate of Analysis
5.	Additive Primer	DOW Intl Pvt Ltd/ BASF India Ltd		Test Certificate

2.2 Specifications for the Product

2.2.1 Specification

The manufacturer shall only use the raw materials supplied with the relevant documents as laid down in the prescribed Quality Assurance Plan. The raw materials shall be subject to agreed controls and tests by the manufacturer before acceptance.

2.2.2 Specifications/ Performance for Rigid Polyurethane/ Polyisocyanurate Core

Table 2

S. No.	Properties	Standards	Acceptance criteria
1.	Thermal Conductivity test	IS 3346:1980/ASTM C518-2021	0.021-0.024 W/mk
2.	Dimensional Stability	IS 11239 (Part 3)	±2 mm, Max
3.	Density	IS 11239 (Part 2)	±40 kg/m ³
4.	Water Vapour Transmission	IS 11239 (Part 4)	5.5 µg/m ² s, Max
5.	Close Cell Content	IS 11239 (Part 5)	>90%
6.	Compressive strength @10% Deformation	IS 11239 (Part 11)	115-205 kN/m ² , Min
7.	Horizontal Burning	IS 11239 (Part 12)	PUR 125 mm, Max PIR 25 mm, Max
8.	ODS & Global warming Substances	US EPA 5021A:2014	Non detection level

2.3 Inspection & Testing at Plant

Inspections & testing shall be done at appropriate stages of the manufacturing process. The inspected panels shall be stored & packed to ensure that no damage occurs during transportation. As part of quality assurance, regular inspections shall be carried out by the trained personnel of the PAC holder.

2.4 Manufacturing Machinery & Equipment

Table 3

S. No.	Date of installation	Name of machine and ID No.	Make	Capacity	Capa-bility	No. of machine	Does the unit have maintenance schedule	Remarks
1	2	3	4	5	6	7	8	9
1	18-05-2021	Continuous Sandwich Puf Panel Line (Fully Automatic)	Il Kwang-Korea	30mm to 200mm thick Panel	5000 sqm per Day	7	Yes	

2	18-05-2021	5 Component Chemical Pumping and Dispensing Machine	SAIP srl-Italy	30mm to 200mm thick Panel	5000 sqm per Day	2	Yes	
---	------------	---	-------------------	------------------------------------	------------------------	---	-----	--

2.5 Manufacturing Process & Flow Chart

- i. Raw materials (Steel & Chemicals) are procured from Standard Supplier with all Test Certificates.
- ii. Facing Materials are loaded on a De Coiler and processed through Profiler on top and bottom side to form required tongue and groove Profile. These Profile sheets are maintained at Uniform temperature before Chemical Dispensing.
- iii. The PUR/PIR Chemicals are stored in separate controlled Storage Tank and processed through Low Pressure recycling and High-Pressure Mixing with Reacting agent catalyst, Blowing Agent & Pentane in a Static Mixer. Then The Blended Polyol and MDI both Mixed on a High Pressure Mixing Head and dispense Liquid foam on the Bottom sheet with a Fix Poker dispenser/Oscillating Dispenser as per required output of Chemical.
- iv. Additive priming system is installed to apply an adhesive primer on the bottom/ outer surface for strengthening the bonding of foam to sheet (Must for PIR & SS Panel).
- v. The Uniform laid down Chemical with both side Metal Facing is then Inserted to a 24 Meter Continuous Line Double Belt (Auto Controllable Heating System) for Panel Curing (Thickness can be produce from 30mm to 200mm).
- vi. The outcome from Double Belt is the required Sandwich PUR/PIR panel which will be cut as per customer requirement with a Bandsaw Machine. The Cut Panels are then cooled under normal ambient condition on a Cooling Conveyor System.
- vii. The Panels from Cooling conveyor then form a bundle with help of a Vacuum Lifter and Stacker. The Stacked Panels/Bundle are packed with stretch film on a wrapping Machine to avoid any dust or foreign particles to be placed on Panel. The Packed bundle is then Stored as Finished goods with the help of Forklift.
- viii. This is a continuous process line for producing sandwich panel of polyurethane / polyisocyanurate foam wall / ceiling, roof, slab with 30 mm to 200 mm thick panel.
- ix. The process flow chart is attached at **Annex-2**.

2.6 Method of erection of Wall panel, ceiling panel system & jointing detail of panels

2.6.1 Wall panel

The wall panel erection process begins by marking the layout as per the approved drawings and ensuring that the floor level is at zero. Bottom flashing of size 30 x panel thickness x 30mm x 1.5mm is fixed along the layout using coach screws and rawl plugs at 600mm center-to-center. The erection starts from one corner after securing the outer 'L' flashing. Wall panels are lifted using a pulley tied to the structure and positioned using a rope. The panels are then placed in the supporting structure and temporarily held in place using SDST screws. Tube struct (provided by the client) is used as a supporting system for the panels. This process continues sequentially until all wall panels are erected. Once completed, inner 'L' flashing of size 40 x 40mm is fixed, and a thermal break is provided to prevent condensation inside the room.

2.6.2 Ceiling panel supporting system

The ceiling panel supporting system consists of a suspended 'T' structure, which is attached to the supporting framework. A C-channel (provided by the client) is fixed onto the rafters to support the ceiling panels. Aluminum 'T' sections are then installed with the help of GI fully threaded rods (10mm diameter) with nuts and washers or using a 4mm wire rope to ensure secure suspension.

Ceiling panel

Ceiling panels are placed onto the suspended 'T' structure and aligned properly. To enhance insulation, thermal breaks are provided at the junctions of wall and ceiling panels, preventing condensation inside the room. The erection process follows the same sequence for all ceiling panels. After installation, white silicone sealant is applied inside the room at all panel joints, while a general-purpose white sealant is used for external joints. Additionally, flashing is installed at the wall-to-ceiling joints using aluminum pop rivets at 200–250mm center-to-center. Coving is then provided along the entire periphery, covering both the wall-to-ceiling joints and vertical corners, secured with aluminum pop rivets at 250–300mm center-to-center, as per client requirements.

2.6.3 Additional application for floor insulation

The floor insulation process begins with cleaning the surface thoroughly and wetting it with water to prepare for the application of primer. A water-based bituminous primer is then applied over the finished PCC floor to enhance adhesion. Once the primer is dry, a layer of bituminous tarfelt is applied using hot or cold bitumen as an adhesive, ensuring a minimum overlap of 50mm at both longitudinal and end lap joints, which are properly sealed with bitumen to prevent leakage.

A coat of bitumen is applied over the tarfelt layer before fixing the first layer of PUF insulation slabs of the required thickness. All joints are completely sealed using hot or cold bitumen to eliminate gaps. A second layer of PUF insulation slabs is then installed in a staggered joint pattern to enhance insulation, followed by another coat of bitumen for complete sealing.

After installing the insulation layers, a second tarfelt layer is applied using bitumen as an adhesive, ensuring a 50mm overlap at all joints. The joints are thoroughly sealed with bitumen to create a waterproof barrier. The ends of the tarfelt are turned up against the inner wall above the height of the protective curb to ensure complete waterproofing and thermal insulation.

2.6.4 The jointing details of the panels, along with corner details, are provided below;

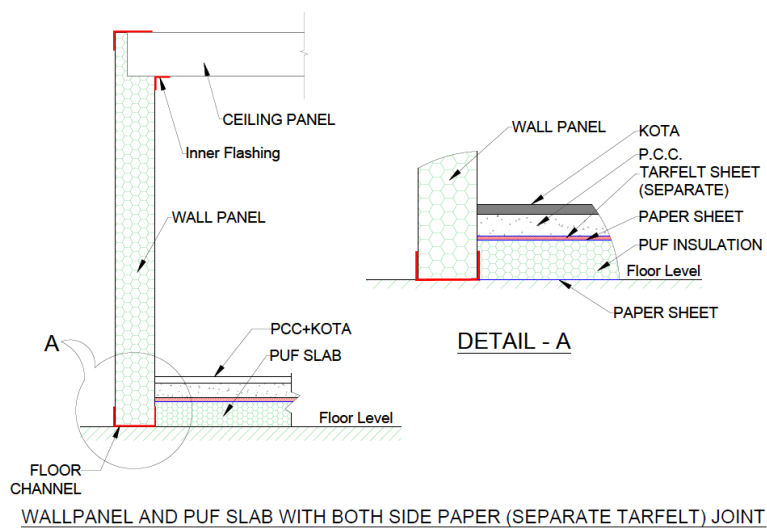


Fig. 5: Wall Panel and PUF Slab with both side paper (Separate Tarfelt) Joint

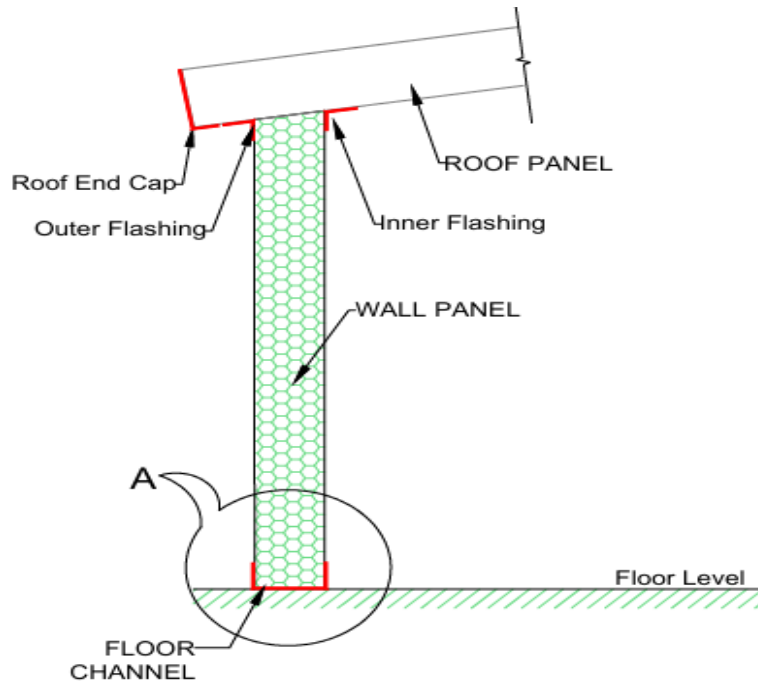


Fig. 6: Periphery Wall Panel to Ceiling Panel Fixing (Structural members not indicated)

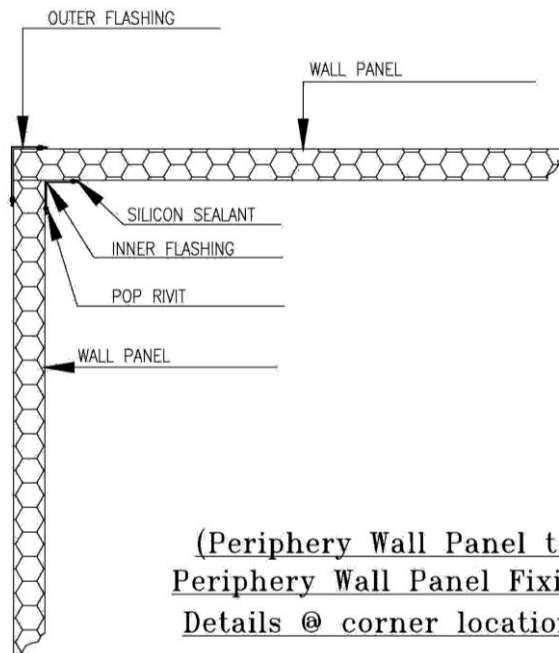


Fig. 7: Periphery Wall Panel Periphery Wall Panel Fixing (Structural members not indicated)

The various standard flashing components are included at **Annex-3**.

2.7 Skill Requirements

The Panels shall be installed under the direct supervision of trained personnel of the Manufacturer or manufacturers authorized Agencies only.

2.8 Guarantees / Warranties provided by the PAC holder to the customer

PAC holder shall furnish various performance warranties as required for the Project Specification.

The items covered by these warranties include corrosion and finished performance. Finished performance is subjected to the use of the manufacturer's Authorized contractor under its technical Engineers' supervision and periodic inspection.

The manufacturer shall ensure that all specifications and shop Drawings are reviewed prior to warranty issuance.

In addition, warranties are limited to materials supplied by the manufacturer.

2.9 Services provided by the PAC holder to the Customer

The PAC holder shall take full care of after-sales services such as inspection of the site, Technical Guidance, Post-installation verification.

2.10 Manuals

Installation Manual, Quality control Manual and a Manual for Health & Safety shall be provided for each Project incorporating the usage of the Panel.

2.11 Responsibility

- Specific design of the product is the responsibility of the PAC Holder/ Authorized agency as per the requirement of the customer according to the contract with the instructions, supervision and guidance of the PAC holder.
- Quality of installation of the product on site is the responsibility of the trade persons engaged by the Client.
- Maintenance of the installation is the responsibility of the client.
- Providing necessary facilities and space for movement of cranes and vehicle is the responsibility of the building developer.

PART 3: BASIS OF ASSESSMENT & BRIEF DESCRIPTION OF ASSESSMENT PROCEDURE

3.1 Scope of Assessment

3.1.1 The technical assessment was done as per provisions of the standard listed in Part 5 of the certificate.

3.2 Various Tests performed for the Assessment

3.2.1 Test conducted: Tensile Test of the profile sheet of Panel

Table 4

Name of Laboratory		Unitech Metallurgical Services, Ahmedabad		
Date of testing		19.06.2023		
Description of Sample		0.45 mm thick sheet		
S. No.	Test Parameters	Test Results	Unit	Test Norm
		Width = 12.65 Thick = 0.44		
1.	Gauge length	50.00	mm	IS 1608 (Part 1): 2022
2.	Area	5.566	mm ²	
3.	Final length	62.02	mm	
4.	Ultimate load	2230	N	
5.	Yield load	1860	N	
6.	Tensile stress	400.6	N/mm ²	
7.	Yield stress	334.2	N/mm ²	
8.	Elongation	24.0	%	
9.	Mass of Zinc Coating			
a.	0.45 mm thick sheet	174.703	gm/m ²	IS 6745:1972 (Reaffirmed 2021)

3.2.2 Test conducted: Salt Spray Test for Profile Sheet

Table 5

Name of Laboratory		Unitech Metallurgical Services, Ahmedabad		
Date of testing		19.06.2023 & 22.06.2023		
Description of Sample		0.45 mm & 0.4 mm		
S. No.	Test Parameters	Test Results		Test Norm
1.	Salt Spray Test (0.45 mm & 0.4 mm)			
	24 hrs	No white rusting observed and no red rusting observed		ASTM B-117-2019
	48 hrs			
	72 hrs			
2.	Paint Thickness in microns (Average)			
		Top	Bottom	ASTM B-487-13
	0.45 mm thick sheet	25.64	9.29	
	0.40 mm thick sheet	25.64	9.29	

3.2.3 Test conducted: Physical properties of PIR Panel

Table 6

Name of Laboratory		Dow Chemical International Private Limited, Maharashtra		
Date of testing		05.02.2024		
Description of Sample		PIR foam Sample		
S. No.	Test Parameters	Test Results	Unit	Test Norm
	Foam thickness	118	mm	
1.	Overall density	45.9	Kg/m ³	ASTM D1622
	Core density	42.9		
2.	Compressive strength (10% compression) – average		kPa	ASTM D1621
	// Thickness	150		
	// Width	192		
	// Length, directions	370		
3.	Thermal conductivity @ 22.5°C (average temperature)	0.0218	W/m.K	EN 12667
4.	Dimensional stability +70°C (Change in dimension for 22 hours)	0.54	%	UNI 8069
	-25°C (Change in dimension for 22 hours)	0.57		
5.	Closed Cell Content	92	%	ASTM D2856
6.	Horizontal fire test	18 Self-extinguish foam	mm	BS 4735

3.2.4 Test conducted: Physical properties of PIR Panel

Table 7

Name of Institute		CSIR-Central Building Research Institute, Roorkee			
Date of testing		29/08/24			
Description of Sample		PIR panel			
S. No.	Test Parameters	Test Results	Unit	Test Norm	Requirement
1.	Average density	42.29	kg/m ³	IS 11239-Part 2	NA
2.	Compressive strength at 10 percent Deformation	365.69	kN/m ²	IS 11239-Part 11	IS 12436 205 kN/m ² Min
3.	Dimension stability at 100°C ± 2°C, for 24 hr, (sample size mm: 100 x 100 x 30)	Length = 0.02 Width = 0.31 Thickness = -0.65	%	IS 11239-Part 3	IS 12436 ±2.0%,Max
4.	Water vapour transmission rate (WVT) (per 24 hrs)	0.57	µg/m ² s	IS	NA

5.	Permeance	0.0041	ng/ Pa.s. m ²	11239- Part 4	
6.	Permeability	0.17	ng/ Pa.s.m		IS 12436 8.5 ng/Pa.s.m Max

3.2.5 Test Conducted: Physical Properties of PIR Panel

Table 8

Name of Laboratory		Eurofins (Spectro Analytical Labs Private Limited, Greater Noida, UP)		
Date of testing		27/02/24		
Description of Sample		PIR panel (300 x 300 x 80 mm)		
S. No.	Test Parameters	Test Results	Unit	Test Norm
1.	Apparent density	39.3	Kg/m ³	ASTM D1622-2020
2.	Thermal Conductivity	0.022	W/mk	ASTM C518-2021
3.	Compressive Strength	132.6	kPa	ASTM D1621-2016
4.	Horizontal Burning Characteristics	12.28	mm	IS:11239(Part-12)-1988
5.	Closed Cell Content	94	%	IS:11239(Part-5)-2019(Method-2a)
6.	Temperature range (at 70 ^o C for 24 hours)	No melting or no shrinkage observed		-
7.	Climbing Drum Peel Test	1.59	mm.kg/mm	ASTM D1781-1998

3.2.6 Test Conducted: Physical Properties of PUR Panel

Table 9

Name of Laboratory		Eurofins (Spectro Analytical Labs Private Limited, Greater Noida, UP)		
Date of testing		26/02/25		
Description of Sample		PUR panel (300 x 300 x 100 mm)		
S. No.	Test Parameters	Test Results	Unit	Test Norm
1.	Apparent Density (Average)	39.0	Kg/m ³	IS:11239 (Part 2) - 2019
2.	Dimension Stability	-0.67	%	ASTM D2126-2015
3.	Thermal Conductivity	0.01951	W/mK	ASTM C518
4.	Compressive Strength (at 10% deformation) (Average)	381.5	kPa	ASTM D1621-2016
5.	Closed Cell Content	96	%	IS:11239(Part5)-2019 (Method-2a)
6.	Horizontal Burning Characteristics Burning Extent	16	mm	IS:11239(Part12)-1988

3.2.7 Test Conducted: Physical Properties of PUR Panel

Table 10

Name of Laboratory		Eurofins (Spectro Analytical Labs Private Limited, Greater Noida, UP)		
Date of testing		30/06/24		
Description of Sample		PUR panel (400 x 400 x 50 mm)		
S. No.	Test Parameters	Test Results	Unit	Test Norm
1.	Water Vapour Transmission, (At 23°C % 50% RH for 7 days) (Average)	0.84	g/m ² /h	IS: 11239(Part4)-2014

3.2.8 Test Conducted: Physical Properties of PUR Panel

Table 11

Name of Laboratory		Eurofins (Spectro Analytical Labs Private Limited, Greater Noida, UP)		
Date of testing		27/02/24		
Description of Sample		PUR panel (300 x 300 x 80 mm)		
S. No.	Test Parameters	Test Results	Unit	Test Norm
1.	Temperature range (at 70 ⁰ C for 24 hours)	No melting or no shrinkage observed		-
2.	Climbing Drum Peel Test	1.59	mm.kg/mm	ASTM D1781-1998

3.2.9 Test Conducted: Physical Properties of PIR Panel

Table 12

Name of Laboratory		AFITI - Centre for Research and Fire Safety Technology, Spain		
Date of testing		15/11/2024		
Description of Sample		PIR sample (4000mm x 3950mm x100 mm)		
S. No.	Test Parameters	Test Results	Unit	Test Norm
1	Fire Resistance Test			
	Integrity(E)	32	min	EN 1364-1:2015/ EN 1363-1:2020
Thermal Insulation(I)	31			

Further, the 100 mm PIR panel has been classified as **B – s2, d0** as per Fire Classification Standard UNE-EN 13501-1-2019.

3.2.10 Test Conducted: Physical Properties of PIR Panel

Table 13

Name of Laboratory		CSIR-Central Building Research Institute, Roorkee		
Date of testing		10/09/2024		
Description of Sample		PIR sample (900 mm x 270 mm x 50 mm)		
S. No.	Test Parameters	Test Results	Unit	Test Norm
1	Surface Spread of Flame			
	Spread of Flame at 1.5 min	NIL	mm	BS 476 Part 7
	Spread of Flame at Termination/10min			

3.2.11 Test Conducted: Physical Properties of PIR Panel

Table 14

Name of Laboratory		CSIR-Central Building Research Institute, Roorkee		
Date of testing		17/09/2024		
Description of Sample		PIR sample (3000 mm x 3000 mm x 100 mm)		
S. No.	Test Parameters	Test Results	Unit	Test Norm
1	Fire Resistance			
	Thermal insulation(I)	31	min	BS 476 (20& 22)
	Integrity(E)			
	Stability(R)			

3.2.12 Test Conducted: Ozone Depleting Substances (ODS) and Global Warming Substances

Table 15

Name of Laboratory		SGS India Private Limited, Gurugram, Haryana			
Date of testing		04/07/24			
Description of Sample		Insulated Sandwich Panel			
S. No.	Test Parameters	Test Results	RL	Unit	Test Norm
1.	CFCs-Group I&III				
	Chlorofluorocarbon(CFC) substances	Not detected	1	mg/kg	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS
2.	HCFCs				
	Hydrochlorofluorocarbons (HCFCs) substances	Not detected	1	mg/kg	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS
3.	HFCs				
	Hydrofluorocarbons (HFCs) substances	Not detected	1	mg/kg	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS

RL* -Reporting Limit

3.3 Site Inspection

The inspection of the factory was carried out by on April 23, 2025. During the inspection, the production process, quality assurance plan were reviewed & technical persons were interacted.

3.4 Projects Executed

The recently executed projects using PUF/PIR Panels as submitted by the Agency are included in the Table below. The photographs of the executed projects are placed at **Annex-4**.

Table 16

Project Completed (Industrial Buildings)					
S. No.	Project Name	Location	Product Storage	Approx. Sq.mtr.	Year of Completion
1	GFC Cold Storage	Indore	Dates	7800	2023
2	Devi Fishries	Kakinada	Fisheries	9500	2023
3	Freshblow	Hyderabad	Mashroom	5250	2023
4	Amul Choclote	Anand Gujarat	Chocolate	4580	2023
5	Advait JNS Agrotech	Dehgam, Gujarat	Potato	5817	2023
6	Honest Cold Storage	Modasa, Gujarat	Potato	11890	2023
7	Keshri Cold Storage	Gandhinagar	Potato	5826	2023
8	Carrier Air Condition & Refrigerator Ltd.	Mumbai	For Abbott pharma	6203	2023
9	DP World	Pune	CS Warehouse	7397	2024
10	Unitek Solutions	Zirakpur	For Sun Pahrma	7397	2024
11	Natural Storage Solutions Pvt. Ltd.	Mehsana	Food Processing Unit		

PART 4: STANDARD CONDITIONS

This certificate holder shall satisfy the following conditions:

- 1 The certificate holder shall continue to have the product reviewed by BMBA.
- 2 The Product shall be continued to be manufactured according to and in compliance with the manufacturing specification and quality assurance measures which applied at the time of issue or revalidation of this certificate. The scheme of quality Assurance separately approved shall be followed.
- 3 The Quality of the Product shall be maintained by the certificate holder.
- 4 The Product user should install, use and maintained the product in accordance with the Provisions in the certificate.
- 5 The certificate does not cover uses of the Product outside the scope of this appraisal.
- 6 The Product is appraised against performance provision contained in the standard listed in part v. Provisions of any subsequent revisions or provisions introduced after the date of the certificate do not apply.
- 7 Where reference is made in this certificate to any Act of parliament of India, Rules & Regulation made there under, statutes specification, code of practices, standard etc. Of the bureau of Indian standard or any other or any other national standards body and the international organization for standardization, manufacturers company standard, instruction manual etc. Its shall be construed as reference to such publication in the form in which they were in force on the date of grant of this certificate.
- 8 The certificate holder agrees to provide to BMBA of their distributors / licensees whenever appointed by him and agrees to provide to BMBA a six-monthly update list thereof.
- 9 The certificate holder agrees to provide to BMBA feedback on the complaint received, the redressal provided, and the time taken to provide redressal on complaint-to-complaint basis as soon as redressal is Provided. BMBA agrees to provide the certificate holder the user feedback received by it, if any.
- 10 If at any time during the validity Period PACH is unable to fulfill the condition in the PAC, he should at his own initiative suspend using the PAC and notify chairman, TAC the date from which he has suspended its use the reason for suspension and the Period by which he will be able to resume. He shall not resume without the prior permission of BMBA. He shall also inform simultaneously his agent, Licensees, distributors, institutional, government public sector buyers and all those whom he has informed about his holding the PAC. He shall also inform all those who buy his products during the period of suspension. He shall provide to BMBA at the earliest the list of who have been so informed by him.
- 11 In Granting this certificate, BMBA takes no position as to:
 - a) The Presence or absence of patent or similar rights relating to the product.
 - b) The legal right of the performance holder to market, install or maintain the product.
 - c) The nature of the individual installation of the Product, including method of workmanship.

- 12 BMTPC and the Board of agreement of BMTPC (BMBA) take no position relating to the holder of the performance Appraisal Certificate (PAC) and the user of the performance Appraisal certificate respecting the patent right / copy right asserted relating to the product / system / Design / method of installation etc. covered by this PAC. Consideration relating to the patent? Copy right are beyond the scope of performance Appraisal certificate scheme (PACS) under which this PAC has been issue. PAC and user of this PAC are expressly advice that determination of the claim? Validity of any such patent right / copy right and the risk of infringement of such right are entirely the responsibility of PACH on the one hand and that of user on the others.
- 13 It should be noted that any recommendation relating to the safe use of the Product which are contained or referred to in this certificate are the minimum standard required to be met with. When the product is installed used and maintained. They do not purport in any way to restate or cover all the requirement of related Act such as factory Act, or Any other statutory or common law duties of care, or Any duty of care which exist at the date of this certificate or in the future, nor is conformity with the provisions of this certificate to be taken as satisfying the requirement of related Act.
- 14 In Granting this certificate BMTPC and BMBA does not accept Responsibility to any person or body for any loss or damage, including personal injury, arising as direct or indirect result of the use of this product
- 15 The certificate holder indemnifies BMBA its officer and official involved in this assessment against any consequence of actions taken in good faith including contents of this certificate. The responsibility fully rests with the certificate holder and the user of the Product.
- 16 The responsibility for conformity to condition specified in the PAC lies with the manufacturer who is granted this PAC. The Board (BMBA) will only consider request for modification or withdrawal of the PAC.
- 17 The PAC holder shall not use this certificate for legal defense in case against him or for legal claims he may ask from others.

Place: New Delhi

Date of issue: 03rd June, 2025

A handwritten signature in orange ink, appearing to read 'Uday Kumar', written over a horizontal line.

Chairman TAC & for and on behalf of Member
Secretary, BMBA

PART 5: LIST OF APPLICABLE STANDARDS AND CODES


IS : 12436 - 1988	Specification For Preformed Rigid Polyurethane (PUR) And Polyisocyanurate (PIR) Foams For Thermal Insulation
IS 16203: 2016 (Reaff. 2021)	Prefabricated Polyurethane Sandwich Panels – Specification
IS 3346: 1980 (Reaff. 2004)	Method of the determination of thermal conductivity of thermal insulation materials (two slab guarded hot plate method)
IS: 11239 (Part 2,3,4,5,9,11,12,)	Method of Test For Rigid Cellular Thermal Insulation Materials
EN 14509: 2013(Main)	Self supporting double skin metal faced insulating panels
IS 14246: 1995 (Reaff. 2000)	Continuously Pre-Painted Galvanized Steel Sheets And Coils – Specification
ASTM C518-2021	Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
US/EPA 5021A:2014	Volatile Organic Compounds In Various Sample Matrices Using Equilibrium Headspace Analysis
ASTM D 1623	Standard Test Method for Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics
NBC of India Part 6 (Section 7B)	Panels made by Sandwiching a layer of insulation materials between two outer layers of hard durable materials like steel sheet PPGI / PPGL/ PPAL sheet. The three layers bonded together and process in a continuous line process and behave as a composite material.

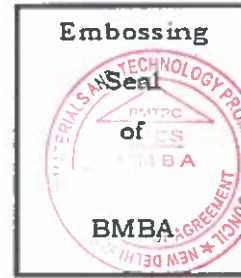
CERTIFICATION

In the opinion of Building Materials & Technology Promotion Council's Board of Agreement (BMBA), **Insulated Sandwich Panel (Rigid Polyurethane/ Polyisocyanurate Core)** is satisfactory if used as set out above in the text of the Certificate. This **Certificate PAC No. 1073-P/2025** is awarded to **M/s Suchi Foams Private Limited, Mehsana, Gujarat.**

The period of validity of this Certificate is for a period of one year i.e. from 03/06/2025 to 02/06/2026 as shown on Page 1 of this PAC.

This Certificate consists of a cover page and pages 1 to 34.


Dr. Shailesh Kr. Agrawal
Chairman, TAC
& Member Secretary, BMBA
Building Materials and Technology Promotion Council
Ministry of Housing and Urban Affairs, Govt. of India
Core 5A, 1st Floor, India Habitat Centre
Lodhi Road, New Delhi-110003



On behalf of BMTPC Board of Agreement, Chairman, Technical Assessment Committee (TAC) of BMBA & Member Secretary, BMTPC Board of Agreement (BMBA) under Ministry of Housing and Urban Affairs, Government of India

Place: New Delhi, India
Date: 03rd June, 2025

PART 6: LIST OF ABBREVIATIONS

BMBA	Board of Agreement of BMTPC
BMTPC	Building Materials and Technology Promotion Council
CPWD	Central Public Works Department
ED	Executive Director of BMTPC
IO	Inspecting Officer
MS	Member Secretary of BMBA
PAC	Performance Appraisal Certificate
PACH	PAC Holder
PACS	Performance Appraisal Certification Scheme
SQA	Scheme of Quality Assurance
TAC	Technical Assessment Committee (of BMBA)

PERFORMANCE APPRAISAL CERTIFICATION SCHEME – A BRIEF

Building Materials & Technology Promotion Council (BMTPC) was set up by the Government of India as a body under the Ministry of Housing & Urban Poverty Alleviation to serve as an apex body to provide inter-disciplinary platform to promote development and use of innovative building materials and technologies laying special emphasis on sustainable growth, environmental friendliness and protection, use of industrial, agricultural, mining and mineral wastes, cost saving, energy saving etc. without diminishing needs of safety, durability and comfort to the occupants of buildings using newly developed materials and technologies.

During the years Government, public and private sector organizations independently or under the aegis of BMTPC have developed several new materials and technologies. With liberalization of the economy several such materials and technologies are being imported.

However, benefits of such developments have not been realized in full measure, as understandably the ultimate users are reluctant to put them to full use for want of information and data to enable them to make informed choice.

In order to help the user in this regard and derive the envisaged social and economic benefits the Ministry of Housing & Urban Poverty Alleviation instituted a scheme called Performance Appraisal Certification Scheme (PACS) under which a Performance Appraisal Certificate (PAC) is issued covering new materials and technologies. PAC provides after due investigation, tests and assessments, amongst other things information to the user to make informed choice.

To make the PACS transparent and authentic it is administered through a Technical Assessment Committee (TAC) and the BMTPC Board of Agreement (BMBA) in which scientific, technological, academic, professional organizations and industry interests are represented.

The Government of India has vested the authority for the operation of the Scheme with BMTPC through Gazette Notification No. 1-16011/5/99 H-II in the Gazette of India No. 49 dated 4th December, 1999.

Builders and construction agencies in the Government, public and private sectors can help serve the economic, development and environmental causes for which the people and Government stand committed by giving preference to materials and technologies which have earned Performance Appraisal Certificates.

Further information on PACS can be obtained from the website: www.bmtpc.org

Standard Quality Assurance Plan
Product: Sandwich Panel
Rigid Polyurethane Foam

Formal T No. SFPL/QA/IR 03
Thickness: 100 mm

Rev No.: 00

S. No.	Components & Operation	Characteristics	Class	Type of check	Frequency of Check	Reference documents	Acceptance norms	Format of record	Inspection Agency			Remark
1.	Outer & Inner Facing Material	Facing material thickness & width	Major	Measurement	Daily	IS 513	0.5 mm TCT & 1065 mm width	MTC & IR	M	C	T	MTC: Coil Manufacturer Test Certificate can be reviewed
		Facing Material Spec.			Once in a lot	IS 513	340 Mpa of PPGL sheet & 150 GSM Alu Zn Coating	MTC	P	R	R	
		Paint Coating of Sheet				IS 14246	Top 25 Micron Epoxy / Btm 7 Micron Epoxy	MTC & IR	P	R	R	
		Paint Adhesion of Sheet				IS 14246	No paint peel-off on 1 mm cross hatch cutter	MTC	P	R	R	
2.	PUF Sandwich Wall Panel (Rigid Polyurethane Foam)	Length of panel	Major	Measurement	Daily	EN 14509	L +/- 2 mm	IR	P	R	R	
		Effective width of panel				EN 14509	1000 mm +/- 1 mm	IR	P	W	W	
		Thickness of panel				EN 14509	T +/- 1 mm	IR	P	W	W	
		Density of PUF (kg/m ³)				IS 11239 (Part 2)	40+ / - 2 kg/m ³	IR	P	W	W	
		Compressive strength @ 10% deformation (kPa)		Mechanical	Once in a lot	ASTM D 1621	>110 kPa	IR	P	R	R	
		Close Cell Content		Measurement		IS 11239 (Part 5)	>90%	IR	P	R	R	

S. No.	Components & Operation	Characteristics	Class	Type of check	Frequency of Check	Reference documents	Acceptance norms	Format of record	Inspection Agency			Remark
									P	R	R	
		Thermal Conductivity at mean temp (W/mK)		Thermal		ASTM C 518	<0.023 W/mK	IR	P	R	R	
		Dimensional stability at 100 deg C for 24 hrs		Thermal		IS 11239 (Part 3)	2mm tolerance	IR	P	R	R	
		Horizontal burning test (mm)		Burning Characteristics		IS 11239 (Part 12)	< 125	IR	P	R	R	

MTC: Manufacturer Test Certificate

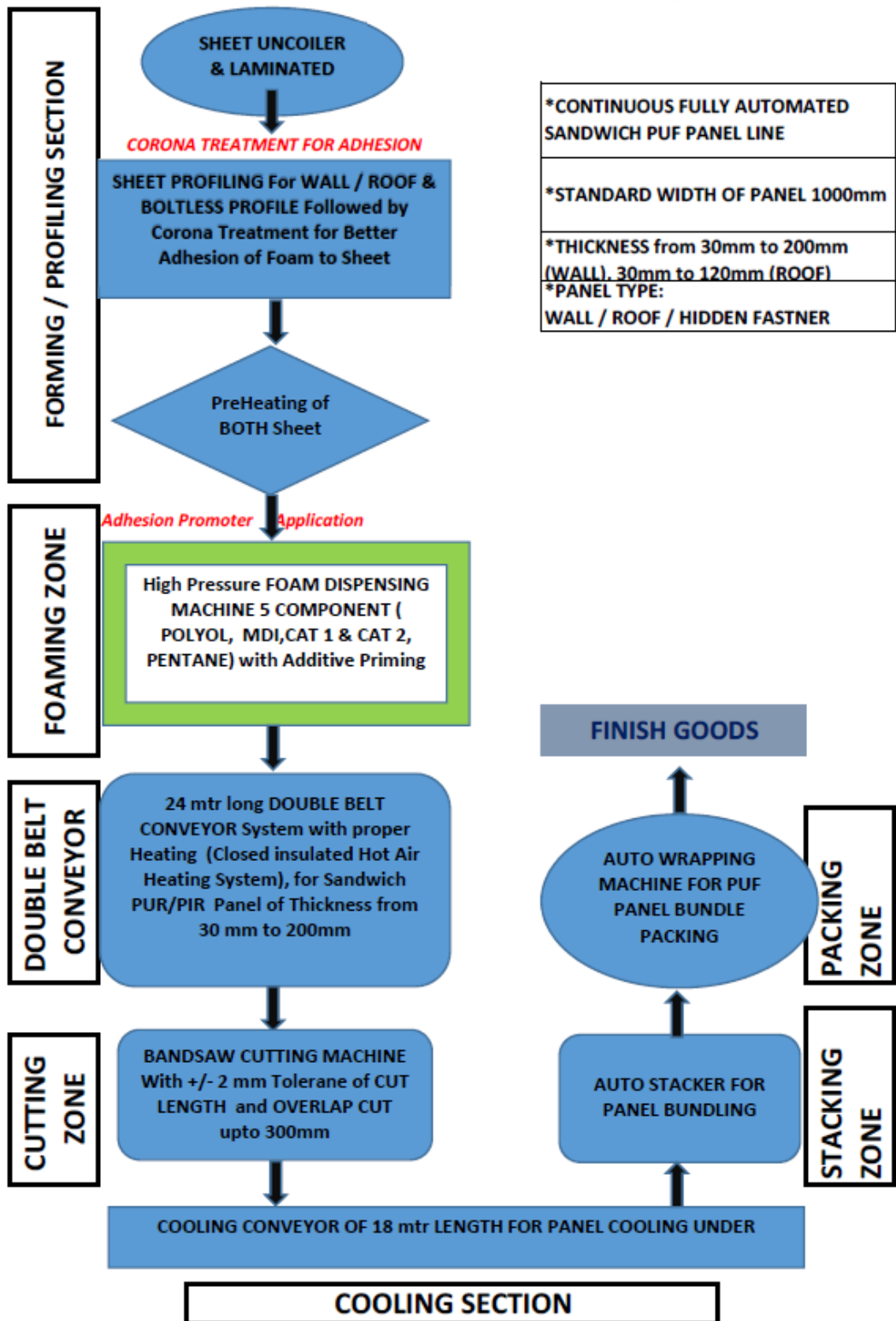
IR: Inspection Report

P: Perform

W: Witness

R: Review

PROCESS FLOW CHART

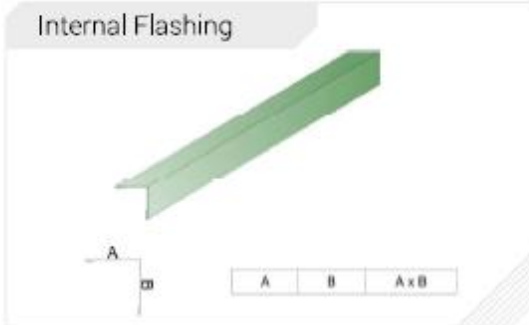


Annex-3

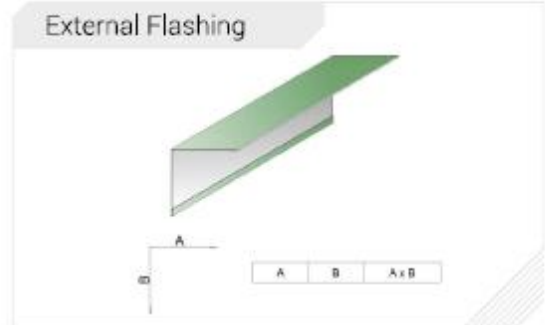
STANDARD FLASHING

Bottom Flashing

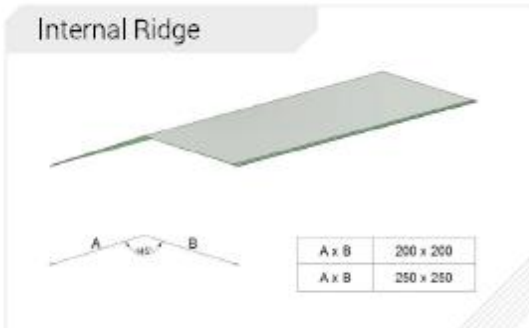
Internal Flashing



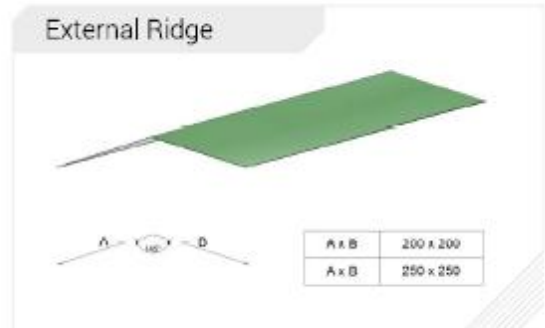
External Flashing



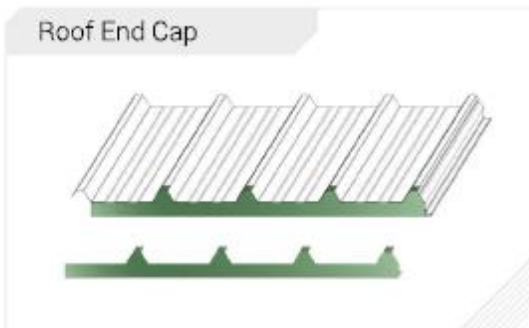
Internal Ridge



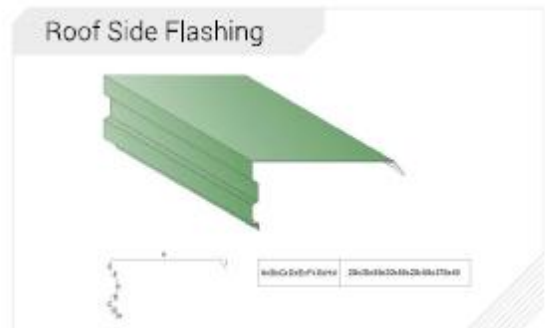
External Ridge



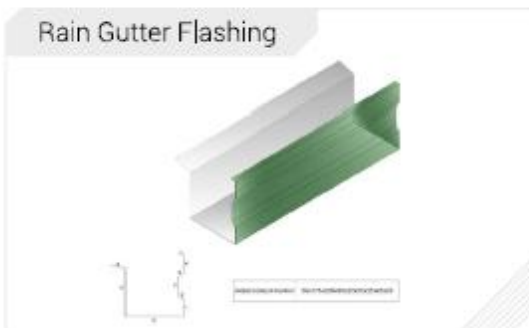
Roof End Cap



Roof Side Flashing

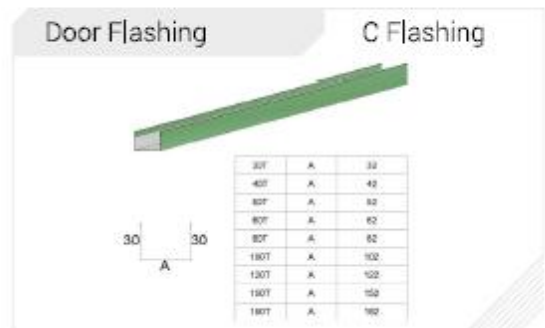


Rain Gutter Flashing



Door Flashing

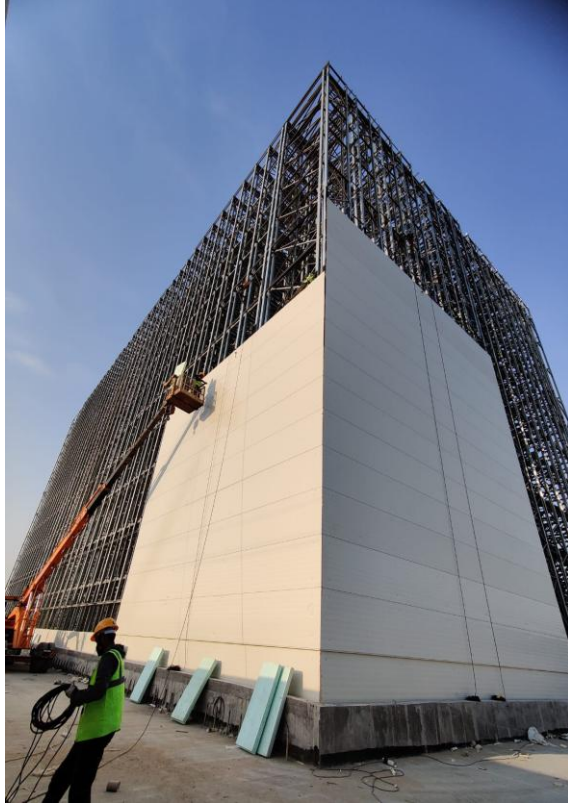
C Flashing



Annex-4

Photographs of the Projects

**GODWITT ASIA Largest ASRS Project at Mehsana, Gujarat
(180 mm THK & -25 Deg C)**



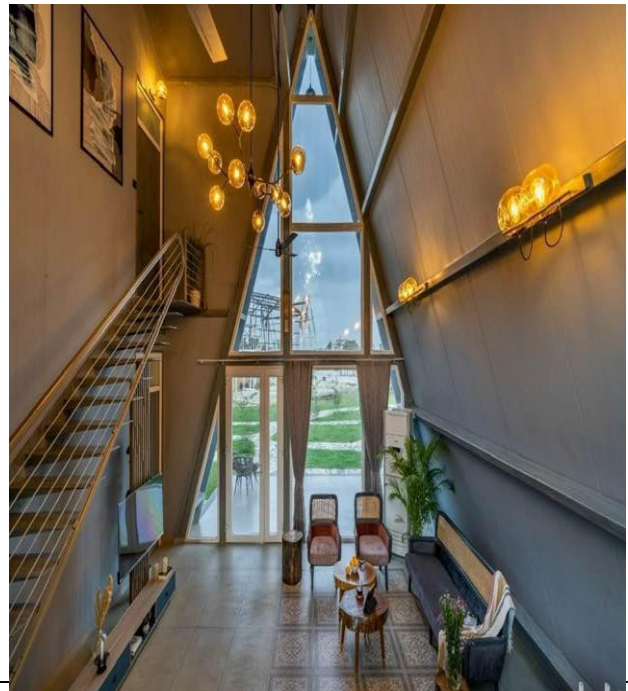
GFC-Indore for Dates storage



DP World Pune, Maharashtra



Weekends Home at Dholka, Gujarat



Natural Storage Solutions Pvt Ltd., Chatral



Indian Army Camp, Guwahati

