



**ISO 9001:2015**





VND Cell Plast is a Hyderabad based Manufacturing unit having more than 15 years of expertise with two production units.

A Company with Strong Brand and large Channel, we are inching to be one of the Leader in Fire Resistance Phenolic Foam Manufacturing Company in India with an added advantage of Quantum Technology.



## WHO WE ARE



VND has been developing and delivering products for the Construction, Railways, Defense, Mining and Petrochemical Industries since 2004.

Today, we continue to offer innovative products and solutions, for injection chemicals, thermal insulations for safety, efficiency and energy optimization.

Our technology road map tracks the major changes developing in our core sectors.

We provide thermal insulation solutions to the construction, Railways, Defense, mining and petrochemicals for supporting new build construction and repair projects on existing assets.

We create long-lasting proactive partnerships with our customers, focussing on delivery of quality products and services.



# Introduction To Ecotherm<sup>®</sup>: Phenolic Foam Insulation



## WHAT THERMAL INSULATION CAN DO

- Creates an envelope outside the building
- Stop heat / cold ingress from outside
- Maintains at least 8-9 degrees temperature difference
- Maintains controlled temperature for longer periods
- Human comfort
- High Quality of Life
- Fire protection against accidents
- Extremely low thermal conductivity
- Excellent self extinguishing properties
- Emits zero toxic gases



## WHAT THERMAL INSULATION CAN DO

Insulation of Building is necessary for various reasons . Some of the important functions of Thermal Insulation are

- ❖ Energy conservation – Reduces the heating / cooling load
- ❖ Human comfort improves the efficiency of the workers
- ❖ In a tropical country with high ambient conditions roof is mostly heated up so roof insulation is prevalent.
- ❖ In a cold country wall is critical as cold remains at ground level, so wall insulation plays major roll in cold ingress.
- ❖ Roof & wall insulation creates a major impact on indoor temperature and comfort in a building



## Various Ecotherm® Applications

- Prefabricated wall panels
- Underdeck Insulation
- False Ceiling
- Partition Cavity
- Over deck Insulation
- Cavity Flooring
- Duct Insulation
- Chilled/Hot Water Pipes
- Vessel Insulations
- Hull Insulations in Ships





## Insulation Benefits

Industry & Society require Low Emission Buildings,  
Energy – Efficient Architecture & Sustainable Solutions

- Stop heat / cold ingress from outside
- Saves on fossil fuel
- Reduces emission of GHG.
- Lower energy losses; avoid the danger of oversized heating or cooling systems that works hard to compensate for the heat or cold losses through the building envelope.

ENVIRONMENTAL



- Effective insulation lowers heating or cooling bills, thus no longer being affected by rising energy costs
- Maintains controlled temp. for longer periods.

ECONOMICAL



- Human Comfort – improves the efficiency of occupier/user.
- Provides fungus-free and microbe-free healthier environ, due to absence of cold walls

SOCIAL







## ENVIRONMENT

For buildings applications, an optimum material solution would have the essential structural properties of concrete but with lower thermal conductivity. The reduced thermal conductivity provides a better thermal insulation system that consumes less energy for cooling and heating in the use phase.

In the present study, thermal conductivity analysis and environmental analysis were carried out for various materials that are intended for use as external walls for buildings. Life Cycle Assessment (LCA) methodology was applied to evaluate the environmental impacts of four different proposed systems.

- Significant CO<sub>2</sub> savings can be achieved compared to other insulation materials. According to the European Phenolic Foam Association (EPFA), compared to other insulation materials, using phenolic foam provides significant CO<sub>2</sub> (carbon) reduction. The EPFA further reports using phenolic insulation affords the ability to play a considerable role in meeting the United Nations 2004 Kyoto Protocol, targeting 37 industrialized countries to reduce greenhouse gases for the future generations.
- Phenolic foam is available in both CFC and HCFC free forms

The reasons for this excellent performance are:

- Phenolic foam has a low water vapor permeance and is therefore highly resistant to the passage of water vapor
- Phenolic foam has low water absorption which takes place predominantly in the cut/broken surface cells of the foam
- Phenolic foam is non-wicking. This means that if water enters the insulation system due to the vapor barrier becoming punctured, any moisture ingress is limited and confined to the punctured area. This ensures moisture does not build up and compromise the whole system.



## STRUCTURAL STRENGTH

Though lightweight, higher density Phenolic insulation foam offers structural strength to steel faced composites of walk-on ceilings. Both pipe and duct supports made from phenolic brand insulation remain structurally stable whether above or under water.

Suitable for a broad range of uses, phenolic insulation foam cuts into any desired shape and size including half sections, foil-faced laminate duct board, flange and valve box covers. Phenolic foam works with roofing, plasterboard dry lining systems and floor insulation as well. Factory-engineered composite panels of the foam joined with double sided steel facings create insulation applications for food processing factories, cold storage and hospitals.

Mechanical Properties of Ecotherm® are:

- BS 4370 Part 2 (KN/M2)
- Compressive Strength - 100 to 250
- Shear Strength - 100 to 110
- Tensile Strength - 250 to 280

Phenolic foam has been used successfully in structural applications for over 24 years.



## THERMAL PERFORMANCE

Phenolic foams give an array of advantages in thermal performance. With correct applications, Phenolic foam supplies up to 50 percent more thermal efficiency than other common insulation products resulting in reduced long-term energy costs. Presenting higher thermal efficiency with reduced thickness over other materials, Phenolic foams save valuable space.

Typically phenolic insulation has a thermal conductivity of around  $0.018\text{W/m.K}$  at  $+10^{\circ}\text{C}$ , (This is an initial value, the "aged" value is usually more like  $0.025\text{W/m.K}$  for a good quality foam) compared to around  $0.036\text{W/m.K}$  for glass wool at the same temperature.

It has got one decided advantage over certain other insulation products in that its thermal properties do not deteriorate over time, provided that the material remains undamaged.

The low thermal conductivity of this foam is attributed also to its close cell structure as well as the presence of gases. Its thermal performance also allows utilization of thinner panels without sacrificing the low conductivity.



## FIRE PROPERTIES

Ignitability, BS:476 part-5	: Class – P
Fire Propegation , BS:476 part-6	: S<12 Surface
Spread of flame, BS:476 part-7	:Class I Building
Regulations	: Class O
Critical Oxygen Index.	: 48
Smoke Index	: <4
Punking Behaviour	: Non-Punking
Toxicity Index	: <4
Closed Cell Contenet	:90% plus



## RECOMMENDED INSULATION THICKNESS FOR PHENOLIC FOAM

Insulation Thickness (mm)	Highest Average Temperature in Summer (°C)					Insulation Thickness (mm)
Lowest Avg. Temp. in Winter (°C)	20°C	30°C	40°C	50°C	60°C	
20°C	10	15	20	30	40	
10°C	20	20	20	30	40	
0°C	30	30	30	40	40	
-10°C	40	40	40	50	50	
-20°C	50	50	50	55	55	
-30°C	60	60	60	60	60	
-40°C	80	80	80	80	80	
-50°C	100	100	100	100	100	
-60°C	120	120	120	120	120	



## PRODUCT RANGE

1	Blocks form	Any specified size
2	Slabs Size Thickness	1) 1200 x 2400 mm 2) 1200 x 1200 mm 3) 1200 x 600 mm 4) 1000 x 500 mm Any Specified thickness
	Facings	Kraft Paper,Aluminium foil,Decorative paper and Glass cloth
3	Pipe Sections:	
	Size	Nominal Bore 0.25 inch to 20 inch
	Thickness(mm)	30,40,50,60,75&100mm
	Facings	Bare,Aluminium foil and glass cloth



## ECOTHERM® Vs GLASSWOOL

PARAMETERS	GLASSWOOL-24KG WITH AL FOIL	ECOTHERM®-30 MM KRAFT PAPER FACING
THICKNESS	50 mm – Tends to squeeze/ sag over a period of time	30mm Rigid Board no sagging/squeezing
DENSITY	50-100 Kg/Cu.Mt	35 Kg/Cu.Mt
MOISTURE / WATER ABSORPTION	Absorbs moisture ,squeezes, thickness reduction & disintegrate & loses insulation property over a period of time	Having 95% closed cells, does not absorb much water-little water absorbed will be breathed out – no damage to structure
RIGIDITY	Loose fibers	Rigid Foam
FIRE RESISTANCE	Burns & emits dense smoke	Does not Burn
BS-476 CONFORMATION	Does Not conform to BS 476	Conforms to BS-476 Obtained Class-I Class-O & Class-P Ratings
APPLICATION	Wire mesh with wire netting	Adhesive plus screw – easy and fast application

**Note: Ecotherm® is superior to Glasswool in terms of Fire & Thermal properties, life & applications**



## ECOTHERM<sup>®</sup> Vs EPS

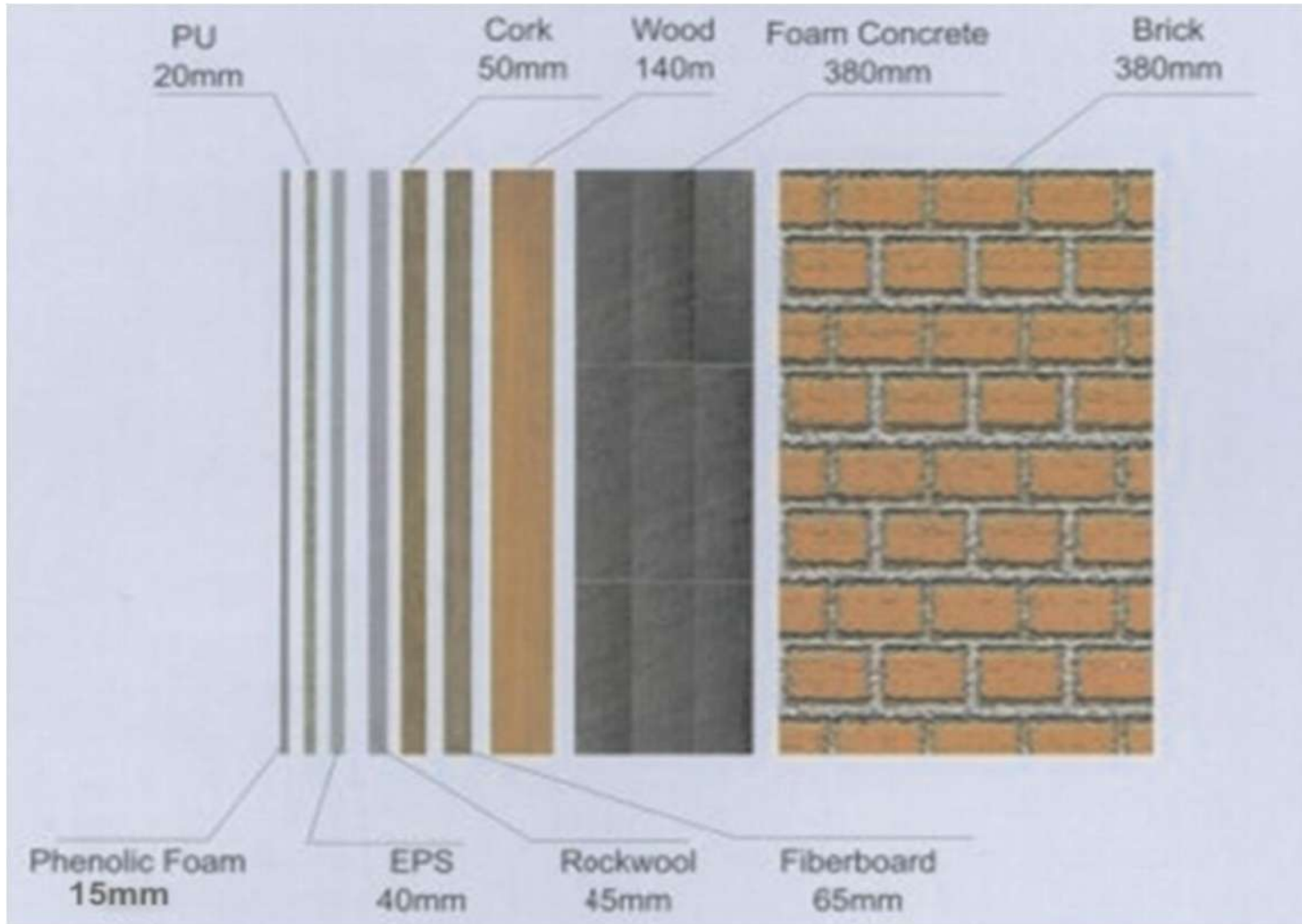
PARAMETERS	EXPANDED POLYSTYRENE(EPS)	ECOTHERM
THERMAL CONDUCTIVITY	0.033 to 0.045	0.018 to 0.034
DENSITY	20-40	35-70
SERVICE TEMPERATURE	Up to 60°C	-196°C TO +130°C
BS 476 PT.7 SURFACE SPREAD	CLASS-IV (LOWEST RATING)	CLASS-I(HIGHEST RATING)
SMOKE GENERATION(BS 5111)	25%	<5%
OXYGEN INDEX	18-21	42
TOXITY	HIGHLY TOXIC	NON-TOXIC
COMPATABILITY WITH SOLVENTS	REACTS WITH ALL SOLVENTS- LEAKAGE WOULD EAT AWAY THE MATERIAL	RESISTANT TO MOST OF SOLVENTS. WEAK ACIDS & ALKALIES
BIOLOGICAL	SUSPECT OF BEING ATTACKED BY RODENTS, FUNGUS FORMATION IN WET CONDITIONS	MILDLY ANTISEPTIC, IMMUNE TO VERMIN,INSECTS,DOES NOT CORRODE METAL.





## ECOTHERM® Vs PUF

PARAMETERS	ECOTHERM®	POLYURETHANE (PUF)
THERMAL CONDUCTIVITY	0.018 to 0.034	0.02 to 0.036
TOXICITY	NON-TOXIC	HIGHLY TOXIC
CRITICAL OXYGEN INDEX	42	25
FIRE RESISTANT	FIRE RESISTANT	‘HIGHLY FLAMMABLE
SMOKE DENSITY	<5	50(Approx)
MELT CONDITION	NO	DRIP WITH FLAME
CHEMICAL RESISTANCE	BEST	GOOD
MAXIMUM WORKING TEMPERATURE	180°	120°
LIMITATION	200° (COLOUR CHANGE)	100° (SHRINK)
APPROVED BY	DEFENCE, NAVY, CPWD, RITES, AIRPORT AUTHORITY AND MANY MORE	NOT RECOMMENDED DUE TO TOXICITY
STANDARDS CONFORMS TO	IS 13204, BS- 476 (PART 5,6, & 7), BS5111, BS 3927	DOES NOT CONFORM





## DIFFERENT FORMS OF ECOTHERM®





# INDUSTRY -APPLICATIONS







## ECOTHERM® APPLICATION AREAS

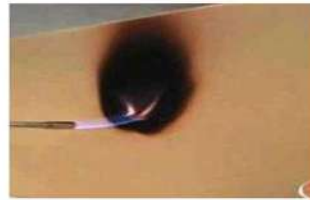
Some of the other advantages and industries where we can have the Ecotherm® are

- Exterior Buildings
- Agriculture/residential/commercial buildings
- Fire wall for office and/or other interiors
- Cold storage
- Ceilings
- Aircraft Hangers
- Hot and cold water pipelines (including underground lines)
- Ethanol plants
- Petroleum and chemical transportation pipelines
- Food processing plants
- For any pipes that require insulation



## Ecotherm Phenolic Insulation with Plasterboard

30 mm Ecotherm with Plasterboard is a wall dry lining insulation comprising 12 mm plasterboard facing bonded to high performance rigid phenolic insulation core. The phenolic core Ecotherm is manufactured with a blowing agent that has zero Ozone Depletion Potential and low Global Warming Potential



### APPLICATIONS

Ecotherm Insulated Plasterboard is a 2in1 product specifically designed to provide thermal insulation and dry lining in one operation significantly reducing installation time. Ecotherm can be specified for use in a variety of applications including

All Cavity Masonry Wall Constructions

- Solid Walls
- Timber Frame Walls
- Ceilings
- Metal Furring Systems
- Fixing to Timber Framing/Battens
- Mechanical Fixing directly to masonry substrates
- Ceiling linings (Horizontal & Sloping)
- Fixing to Structural Insulated Panels.

Variety of fixing methods can be utilized to apply Ecotherm Plasterboard. These include:

- Traditional Plaster Dab Bonding
- Proprietary Adhesive Bonding
- Nailing / screwing to vertical timber framing or batten
- Screwing to adhesive bonded metal furring systems
- Nailing / screwing to timber joists or rafters
- Mechanical fixing directly to masonry substrates



### With 30 mm Ecotherm Insulated Plasterboard Characteristics:

- Thermal conductivities as low as 0.020 W/mk
- Class 0 fire rating
- Negligible smoke obscuration
- Insulation, dry-lining and vapour control in one board
- Unaffected by air infiltration
- Resistant to the passage of water vapour
- Easy to handle and install
- Ideal for new build and refurbishment
- Non deleterious material
- CFC/HCFC free with zero ozone depletion potential (ODP)
- Low global warming potential (GWP)

### TECHNICAL DATA

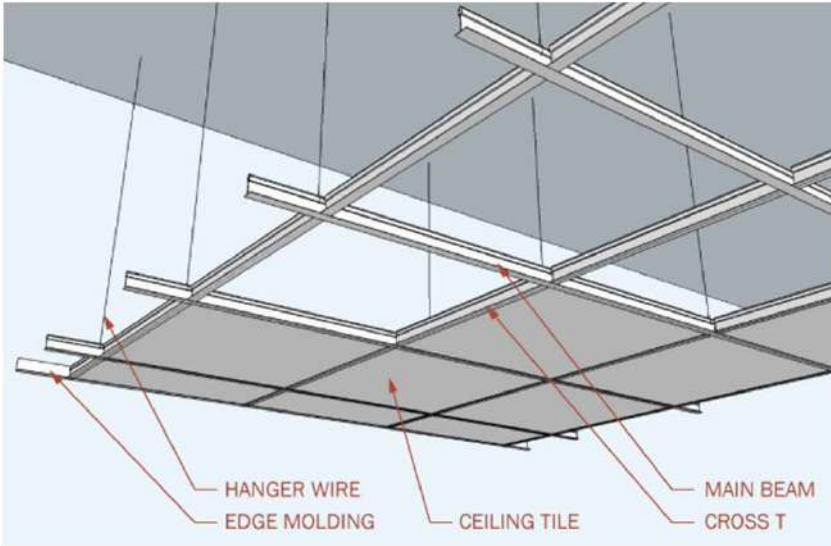
- Thickness : 30 mm
- Width : 1200 mm
- Length : 1830 mm
- Core Density : 45kg/m<sup>3</sup>
- Weight/ m<sup>2</sup> : 9.17kg
- Thermal Conductivity: 0.019W/mK
- R-Value : 0.9m<sup>2</sup>K/W
- Compressive Strength: 125kPa

### CERTIFICATION

- 30 mm Ecotherm plaster board is CFC/HCFC free with zero ozone depletion potential (ODP) and low global warming potential (GWP)
- 30 mm Ecotherm plaster board is manufactured to the highest standards under the management system certified to ISO 9001:2015



# ECOTHERM® INSTALLATION FOR FALSE CEILING







# ECOTHERM® INSTALLATION FOR FALSE CEILING







## INDUSTRIES SERVED



**Defense**



**Marine**



**Cryogenic**



**Aerospace**



**Railways**



**Mining**



**Automobile**



**Textile**



**Pharmaceuticals**



**Petrochemicals**



**HVAC**



**Hospitals / Malls**





# TEST REPORTS

सेन्ट्रल इनस्टीट्यूट ऑफ प्लास्टिक्स इंजीनियरिंग एण्ड टेक्नॉलाजी  
चेरलापल्ली, हैदराबाद - ५०० ०५१.  
**CENTRAL INSTITUTE OF PLASTICS ENGINEERING & TECHNOLOGY**  
Cherlapally, Hyderabad - 500 051.

**Test Certificate**

No.: 0129555

REPORT No. 1900844/1  
PART - C

Page 2 of 2

**TEST RESULTS**

S.No.	Test	Test Method	Results Obtained	Unit
1.	Compressive Strength	BS-4370 (Pt.1) Method 5	135.0	KPa
2.	Dimensional Stability	BS 4370	0.40	%
	a) Change in Length		0.50	%
	b) Change in Width		0.31	%
	c) Change in Thickness			
3.	Water Absorption	ISO 2896	3.68	%
4.	Water Vapour Permeability	BS 4370	4.66	µg/m.s.pa
5.	Smoke Density	ASTMD 2843/ NCD 1411	2.0	%
6.	Critical Oxygen Index	NCD1410/ ASTMD 2863	49.0	%
7.	Punking Behaviour	BS 5946	No Punking Behaviour Observed	-
8.	Acid Resistance	BS 5946	No Change Observed	-
9.	Alkali Resistance	BS 5946	No Change Observed	-
10.	Ignitability	BS 476 (Pt.5)	Not easily ignitable	-
11.	Surface Spread of Flame	BS 3869	Self extinguishing	-

PART D: REMARKS : Nil

NB: 1. The results related only to items/samples tested.  
2. The report shall not be reproduced in full/part without written approval of the laboratory.  
3. Any anomaly/discrepancy in this report should be brought to be the notice of CIPET within 30 days from the date of issue

K.S. Vidyasagar  
AUTHORISED SIGNATORY

S. Udhayamalar  
AUTHORISED SIGNATORY

सेन्ट्रल इनस्टीट्यूट ऑफ प्लास्टिक्स इंजीनियरिंग एण्ड टेक्नॉलाजी  
चेरलापल्ली, हैदराबाद - ५०० ०५१.  
**CENTRAL INSTITUTE OF PLASTICS ENGINEERING & TECHNOLOGY**  
Cherlapally, Hyderabad - 500 051.

**Test Certificate**

No.: 0129556

REPORT No. 1900844/2  
PART - C

Page 2 of 2

**TEST RESULTS**

S.No.	Test	Test Method	Results Obtained	Unit
5.	Thermal Conductivity (@55° C mean Temperature)	BS 4370/(Pt.2) ASTME 1530	0.0187	w/m <sup>2</sup> k

PART D: REMARKS : Nil

NB: 1. The results related only to items/samples tested.  
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“Thank You”

