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Specialty Foams

COOLTOP[®]

Extruded Polystyrene Foam
The blue thermal insulation board
Manufactured in Sultanate of Oman

A Subsidiary of
MUTRAH INSOFOAM CO (SAOC)

Properties And Applications



شركة الخليج للمواد العازلة ش.م.م

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THE REASON FOR THERMAL INSULATION

The prime reason thermal insulation is provided to a building is to inhibit the transfer of heat energy to or from a building. In practical terms, in the Middle East environment, thermal insulation is provided to reduce the heat gain across the building envelop from the higher ambient temperatures to the artificially maintained internal conditions of comfort. This in turn has the desirable effect of promoting a more comfortably stable internal environment together with reduced air conditioning costs both in terms of reduction in capital cost of air conditioning plant and subsequent lower energy costs in plant operation.

PRODUCT DESCRIPTION

COOL TOP, the blue coloured extruded polystyrene rigid foam from AKIC has particularly good thermal insulation, low water absorption and high compressive strength. In the manufacturing process, the polystyrene / additive mixture is extruded out at high pressure between guiding plates, whereupon the expansion agent expands the polystyrene. At the same time, the temperature of the polymer falls and the structure becomes rigid. In the production process, the structure and the properties of the material are precisely controlled.

COOL TOP XPS

COOL TOP is the trade name of the blue coloured extruded rigid foam boards made out of top quality general purpose polystyrene. Manufactured by state-of-the-art computerized extrusion machines according to international norms and standards, COOL TOP XPS boards are made in a continuous skin surface and developed into a closed cell structure. This process allows high thermal resistance and superior water resistance properties. COOL TOP XPS provides the uniform density, distribution, dimensional stability, very high compressive strength and aging resistance. It also provides good physical properties and long term performance.

PROPERTIES OF COOL TOP BOARDS

The extrusion method results in an expanded plastic whose cellular structure is closed, uniform and tight. No capillaries or air channels remain between the cells. This uniform structure gives the boards good mechanical strength and rigidity, which allow them to be used structurally. Furthermore, the boards also protect building components from damage.

COOL TOP boards absorb very little water. There are no gaps or capillaries in the structure so the capillary suction of the product is zero. The thermal insulation ability of the boards does not decline even under harsh conditions. The thermal conductivity of extruded polystyrene foam depends on the size of the cells and the average temperature. COOL TOP Board's thermal conductivity is 0.028 W/Mk. The dimensional stability of the product is good. The flexibility of the boards also means that they withstand vibration well. COOL TOP boards do not decay or rot. They do not either act as a source for micro organisms. The COOL TOP boards expansion process does not use materials hazardous to occupational health and safety.

PRODUCT ADVANTAGES OF COOL TOP

The use of Cool Top saves heating and cooling energy, reduces the thermal stress to which constructions are subjected and consequently prolongs their useful life time and increases their value.

COOL TOP possess:

1. Closed and uniform cell structure.
2. Extremely low moisture absorption.
3. Very good mechanical strength.
4. Long term high insulation performance efficiency.
5. Good dimensional stability.
6. High resistance to temperature cycling.
7. High resistance to aging.

DIMENSIONS

COOL TOP is supplied in the form of boards with the following dimensions.

Length : For Roof : 1250mm / For Wall : 2500mm



Width : 600mm

Thickness : 40mm, 50mm, 75mm, 100mm and 120mm

COOL TOP is available in the density of 26-28 kg/m³, 32-35 kg/m³, 38-42 kg/m³ and 42-45 kg/m³.

EDGE DESIGN

To avoid cold bridges, to simplify laying or to improve the visual appearance, COOL TOP boards are available with:

1. Square Edges. 
2. Rebated Edges. 

Thermal Conductivity

COOL TOP has a homogeneous structure and high resistance to water and vapour diffusion that delays the change in the cell gas composition. Aging phenomenon is thus tremendously slowed down, leading to a stable, long term low thermal conductivity.

Resistance to Water And Vapour Penetration

COOL TOP has a structure that consists of small size closed cells and outer foam skin of denser material on both sides. This allows it to remain dry in the high relative humidity and ambient temperatures of the Middle East.

Chemical Resistance

COOL TOP is stable and has excellent resistance to acids, cold bitumen and silicon oil. On the other hand, it is unstable to tars, organic solvents, hydrocarbon gasoline and oil based paints.

Cavity Wall Insulation with COOL TOP

The most cost effective and simple way to save energy and improve thermal characteristics of a new cavity wall is to build in insulation as the wall is constructed.

This is the traditional, tried and tested type of construction in many areas. The low water absorption and the good thermal insulation properties of COOL TOP allow installation between the two walls without an additional air gap.

Advantages of Cavity Wall Insulation

1. It is extremely cost effective in cavity wall applications.
2. It protects the inner walls from condensation.
3. It has a very high resistance to water absorption.
4. It does not require water vapour barrier.
5. It is not easily damaged and easy to handle, cut and install.

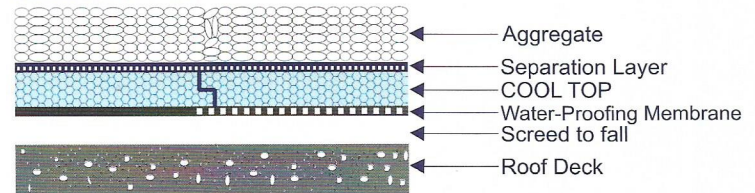
Storage, handling and application

COOL TOP should be stored in a clean flat area, protected from sun light and kept away from open flames and other sources of ignition.

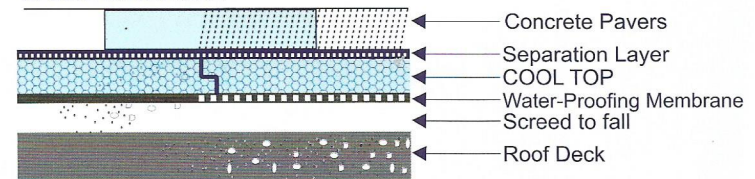
During summer the built up temperature underneath the protected film directly exposed to the sunlight may rise which may damage the insulation board. Once placed on the roof the insulation boards should not be left exposed to avoid damage. It is recommended that insulation boards should be covered immediately with the follow up system, eg. Paving slabs, screed, etc.

Roof Applications

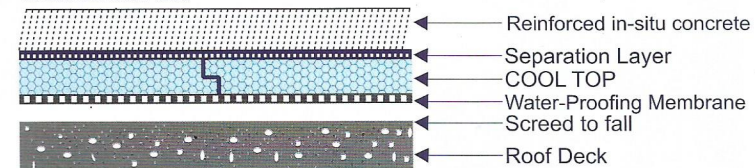
UPSIDE DOWN ROOF GRAVEL PROTECTION



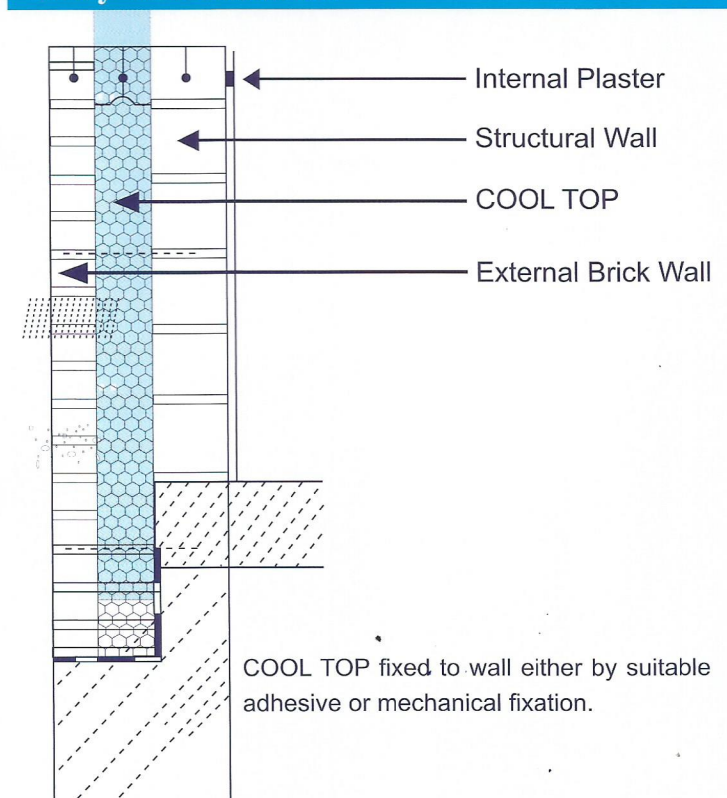
UPSIDE DOWN ROOF



UPSIDE DOWN ROOF In Situ Concrete Slab



Cavity Wall Insulation



PROPERTIES OF COOL TOP BOARDS

GRADE			LD	ND	MD	HD	VHD
PROPERTY	STANDARD	UNIT	COOL TOP 26-28	COOL TOP 32-35	COOL TOP 38-42	COOL TOP 42-45	COOL TOP 45-50
Density, min	DIN 53420	Kg/m ³	26	32-35	38-42	42-45	45-50
	ASTM D 1622	Lb/ft ³	1.6	2-2.2	2.4-2.6	2.6-2.8	2.8-3.1
Thermal Conductivity at 10 degree C mean temperature	ASTM C 177	W/m.k	0.029	0.028	0.027	0.026	0.025
	ASTM C 518	Btu.In/ft ² .hr.F	0.021	0.20	0.19	0.18	0.18
Compressive strength at 10% deflection	DIN 53421	KPA	210	300	400-450	450-700	450-700
	ASTM D 1621	Psi	30	43	65	100	100
Water Vapour permeability	ASTM E 96	Perm - inch	1.0	0.4-0.6	0.4-0.5	0.4	0.4
Water absorption by submersion	ASTM 272	% by vol	0.2	0.2	0.2	0.09	0.09
	ASTM D 2842	% by vol	<1.00	<1.00	<1.00	<1.00	<1.00
Capillarity	-	%	None	Nil	Nil	Nil	Nil
Dimentional Stability	Up to 60°C	%	Nil	Nil	Nil	Nil	Nil
Linear coefficient of thermal expansion and contraction (heating soaking conditions)	-	°C ⁻¹	70.10 ⁻⁶	70.10 ⁻⁶	70.10 ⁻⁶	70.10 ⁻⁶	70.10 ⁻⁶
	-	°F ⁻¹	39.10 ⁻⁶	39.10 ⁻⁶	39.10 ⁻⁶	39.10 ⁻⁶	39.10 ⁻⁶
Fire Classification (Germany)	DIN 4102	Building Material Class	B1 Dificult to Ignite	B1 -	B1 -	B1 -	B1 -

Made in Sultanate of Oman

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