



Dow Plastics

STYROFOAM

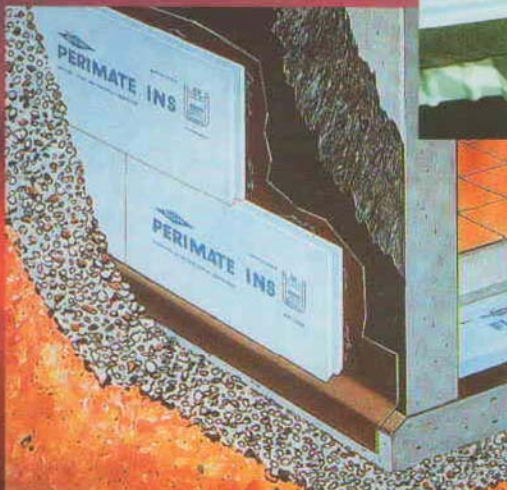
Blue

Extruded

Polystyrene

Foam

**Product
Properties
and
Applications
Guide**

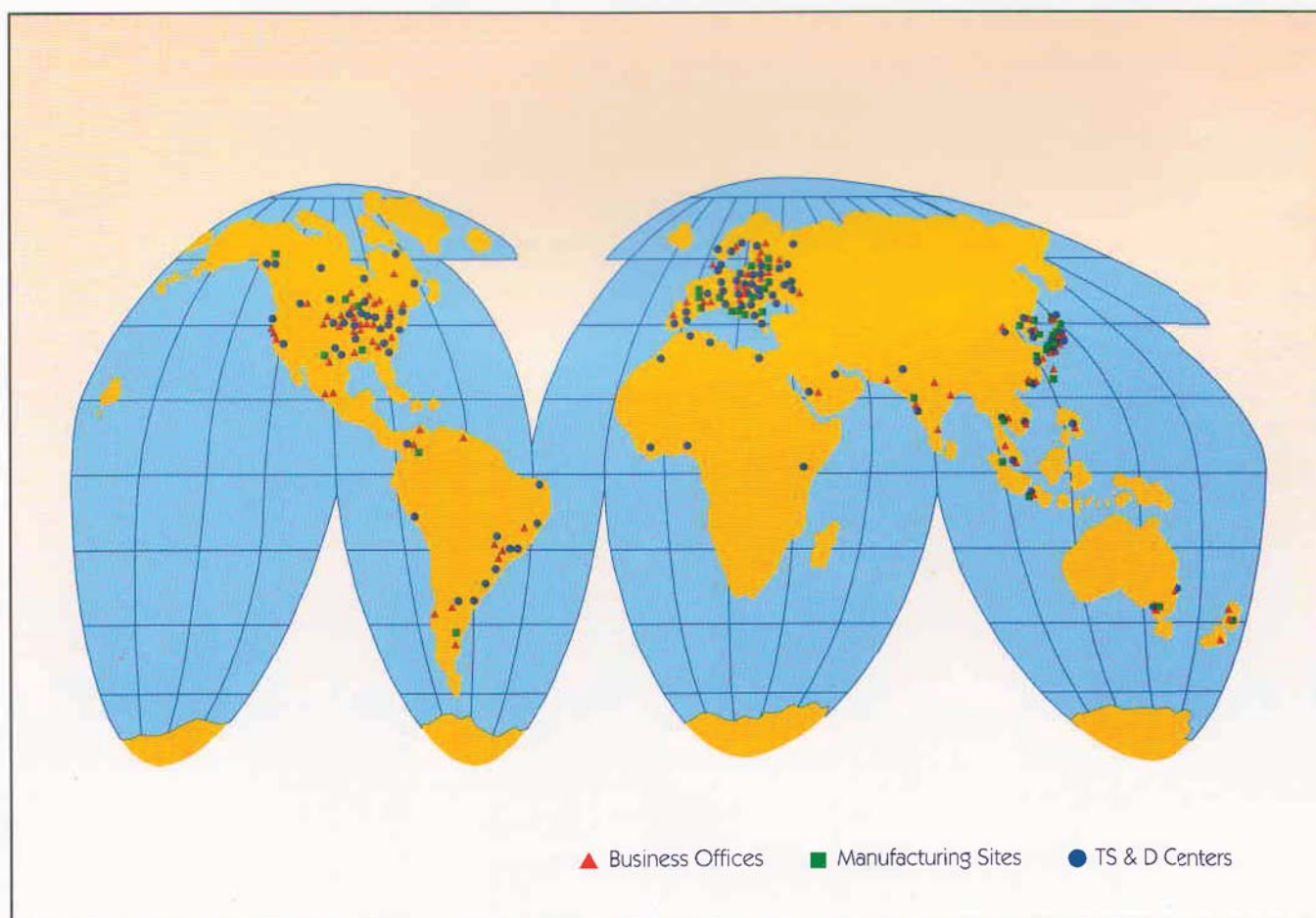


Dow - An Industry Leader

The Dow Chemical Company, with headquarters in Midland, Michigan, U.S.A., is the world's fifth largest chemical company, with annual global sales of more than US\$20 billion. The company operates 115 manufacturing sites in 37 countries, and employs about 43,000 employees worldwide.

Dow manufactures and supplies more than 2,400 product families, including chemicals, plastics, energy, agricultural products and environmental services for customers in 164 countries around the world. Dow is also the world's largest manufacturer of extruded polystyrene foam.

Dow's Global Operations



Blue Insulation - STYROFOAM Brand Extruded Polystyrene Foam



STYROFOAM* is the trade-name of a range of blue **extruded polystyrene foam** insulation boards originally developed and marketed by The Dow Chemical Company in the early 1940's.

Manufactured through a continuous extrusion process, STYROFOAM products possess a rigid **closed cell structure** (as shown above at 25X magnification) with unique properties such as low thermal conductivity, high resistance to water penetration and high compressive strength. It is lightweight and easily bonded.

STYROFOAM products are **CFC Free**, they do not contain fully halogenated chlorofluorocarbons (CFCs) regulated by the United Nations Environment Program (UNEP) in the Montreal Protocol.

STYROFOAM products are produced at 24 Dow manufacturing locations in North America, Europe, Middle East, and Japan.

The products are branded for easy identification:

- STYROFOAM* ROOFMATE* brand insulation for roofs
- STYROFOAM* DECKMATE* brand insulation for use in single ply roof structures
- STYROFOAM* WALLMATE* brand insulation for walls
- STYROFOAM* FLOORMATE* brand insulation for floors
- STYROFOAM* PERIMATE* brand insulation for foundations and basement walls
- STYROFOAM* insulation for building laminates, refrigerated transport and cold storage

This guide provides an introduction to each product to help you identify the right STYROFOAM product for each application. Technical data is available from the insert, or you can contact your Dow representative for further information.

Applications

STYROFOAM extruded polystyrene was invented by Dow more than 50 years ago and was first used as a flotation material in life-rafts and life-boats as its fully closed cell structure made it highly resistant to water absorption. By the early 1950's, the combination of excellent mechanical strength, high insulation value and extremely low water absorption properties led to STYROFOAM being regarded as the perfect thermal insulation material. It is

the ideal structural core for a wide range of building composites such as roofing, walls, and floors.

Today, STYROFOAM products are being used extensively throughout the world in both residential and commercial buildings, civil construction projects, cold stores, laminated panels, refrigerated trucks and containers.

ROOFING

The long term thermal resistance of an insulation material is essential for both building owners and designers. With its excellent moisture resistance and thermal performance retention properties, STYROFOAM ROOFMATE is the ideal insulation material for Upside-Down roofing, while STYROFOAM DECKMATE is the perfect choice for single-ply roofing.



Ballasted Upside-Down roofing



STYROFOAM DECKMATE over metal roof-deck

WALLS

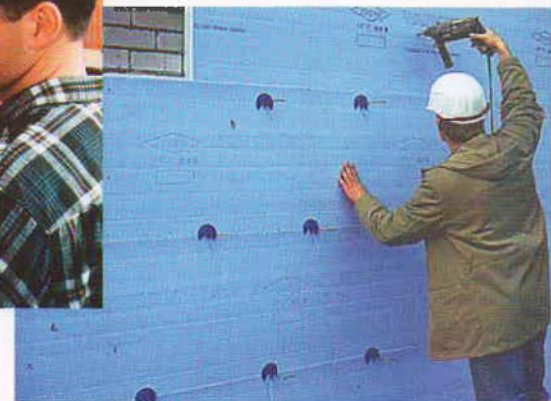
STYROFOAM WALLMATE extruded polystyrene boards considerably reduce energy loss through external walls of new and existing buildings. They keep their structural and thermal integrity even when buried, and are extremely resistant to the rigors of site conditions. Whereas STYROFOAM IB, one of the STYROFOAM Plan range of products, provides a good substrate for any finishing jobs such as plastering, dry lining and rendering.



Plastering



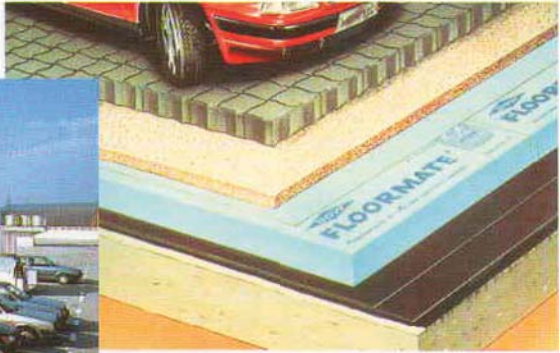
Fixing of insulation boards



FLOORS

The excellent mechanical strength of STYROFOAM FLOORMATE extruded polystyrene foam makes it an ideal heavy-load-bearing insulation material for any kind of floors in warehouses, parking areas, as well as residential and commercial buildings.

Rack warehouse floor



Car parking on roof

COLD STORES AND PANELS

STYROFOAM is the ideal insulation for high-load-bearing floors such as those found in cold stores, while its close tolerance, dust-free surface allows for perfect bonding to a variety of sheet materials in high quality sandwich panels used in the cold storage industry.



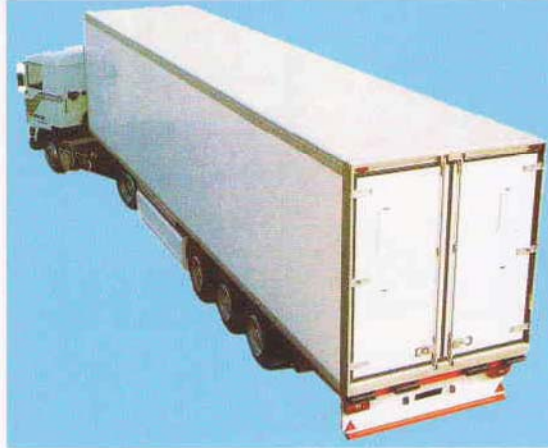
Load-bearing floor



Sandwich panel and floor

REFRIGERATED TRANSPORT

The core material of refrigerated trucks and container panels has to withstand severe dynamic loads and stresses which may eventually lead to fatigue and panel failure. STYROFOAM RTM brand extruded polystyrene foam has been specially designed to resist such forces and in tests has been shown to perform extremely well under dynamic load cycling.



Refrigerated truck

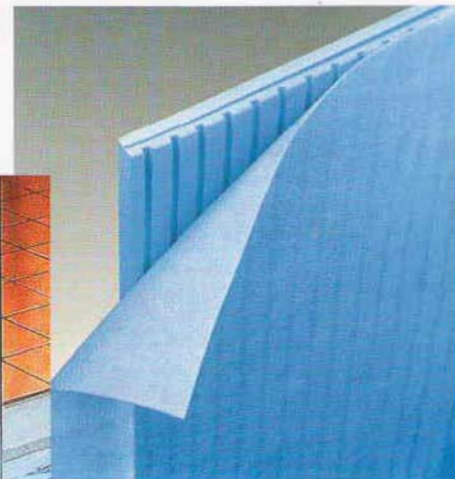
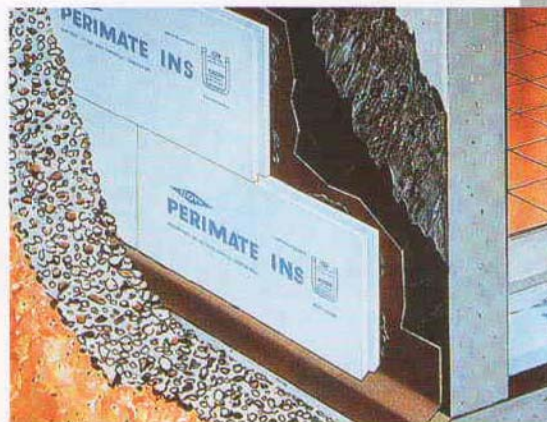


Refrigerated container

LAMINATES/ FABRICATION

For fabricators and laminate manufacturers who demand ease of fabrication as well as thermal and mechanical performance, Dow's broad line of STYROFOAM extruded polystyrene boardstock is designed to meet a wide variety of such needs. STYROFOAM PERIMATE is an excellent example of a combined drainage, insulation and protection board.

Laminates



STYROFOAM PERIMATE
drainage board

Fire Performance, Site Handling & Storage, and Environment

FIRE

STYROFOAM extruded polystyrene products contain a flame retardant additive to inhibit accidental ignition from a small fire source. However STYROFOAM products are combustible and, if exposed to an intense fire, may burn rapidly. In most countries, fire classifications are based on small scale tests and may not reflect the reaction of the material under actual fire conditions.

STYROFOAM extruded polystyrene products will melt when brought into direct contact with high temperature heat sources. The maximum recommended continuous operating temperature is 75°C.

HANDLING AND STORAGE

STYROFOAM extruded polystyrene products should be stored on a clean, flat surface in an area free from flammable or volatile materials. When large quantities of the boards are stored indoors it is recommended that the building be ventilated to allow a minimum of two air changes per hour.

To avoid surface degradation, the boards should be protected from direct sunlight when stored for long periods in the open. Light colored plastic sheeting is a suitable protective cover, but dark or transparent materials should be avoided as they may cause excessively high temperatures to develop underneath.

Solvent attacks may occur if the blue extruded polystyrene products are used in direct contact with materials containing volatile components.

Care should be taken to protect the boards from flames or other ignition sources during storage, installation, and in-use.

ENVIRONMENT

Dow has taken a leadership role in defining and implementing solutions for environmental concerns. STYROFOAM brand products are manufactured with HCFC blowing agents which have an ozone depletion potential less than 10 percent of standard CFC blowing agents. STYROFOAM brand products can be re-used, even after having been installed for decades.



Applications and Properties for STYROFOAM™ Products

CONSTRUCTION APPLICATIONS			DECKMATE CM	ROOFMATE SL	FLOORMATE 200	FLOORMATE 500	PERIMATE DI	STYROFOAM IB	STYROFOAM LB
ROOFS	Warm Flat Roof	Insulation beneath light coloured SPRM	●						
	Lightweight Inverted Roof	Gravel covered		●					
Paved			●						
Roof Garden			●						
Roof top car park			●		●				
	Cold Roof	"Lost formwork"					●	●	
WALLS	External Insulation	Render and/or cladding system					●	●	
		Cold bridge insulation					●	●	
	Internal Insulation	STYROFOAM plasterboard laminate						●	
		Tile backing					●		
		Beneath wet plaster					●		
FLOORS	Above Concrete Slab	Covered with screed			●				
		Covered with chipboard/timber			●				
	Below Concrete Slab	Below ground bearing slab			●	●			
		Industrial floors				●			
	Soffit Insulation	"Lost formwork"					●		
UNDER-GROUND	Basement Walls and Foundations	Insulation against tanking					●		
		Drainage and insulation					●		
		Foundations					●		

PROPERTIES	STANDARD	UNIT	DECKMATE CM	ROOFMATE SL	FLOORMATE 200	FLOORMATE 500	PERIMATE DI	STYROFOAM IB
Density (minimum)	BS4370: Method 2	kg/m ³	26	32	25	38	32	28
Thermal conductivity (90 days, 10 °C)	BS3837: Part 2: 1990 Appendix G	W/mk	0.028	0.028	0.028	0.026	0.028	0.033
Compressive strength at 10% deflection	BS4370: Method 3	kN/m ²	200	300	200	500	300	250
Design load for traffic		kN/m ²	60	110	60	180	100	90
Water vapour permeability (δ)	BS3837: Part 2: 1990 Appendix D	ngm/Ns	1.4	1.2	1.6	1.0	1.2	1.9
Water absorption	BS3837: Part 2: 1990 Appendix E	% - vol.	0.3	0.3	0.3	0.3	0.5	1.0
Size: Length	—	mm	2500	1250	1200	1250	1250	2438
Width	—	mm	600	600	600	600	600	600
Temperature limits	—	°C	-50/+75	-50/+75	-50/+75	-50/+75	-50/+75	-50/+75
Thickness	—	mm	50, 60, 80, 100	50, 60, 75, 90, 100, 120	25, 30, 35, 50	50, 75	50	25, 50, 60, 75, 150
Edge profile	—	—	tongue and groove	shiplap	butt edge	shiplap	shiplap	butt edge
Surface	—	—	skin	skin	skin	skin	grooved	planed