

Polyurethane

Product Features & Applications



الشركة الكويتية لصناعات البوليوريثين (ذ.م.م.)
Kuwait Polyurethane Industry Co. (W.L.L.)



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KUWAIT

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Product Features (finished product)

- Form and dimensional stability
- Thermal conductivity
- Density of the product
- Compressive strength, tensile strength, impact resistance
- Cell structure, open/closed cell content
- Burning properties
- E-modulus, flexibility and elongation
- Surface hardness
- Moisture vapor and gas permeability

Process Features (during processing)

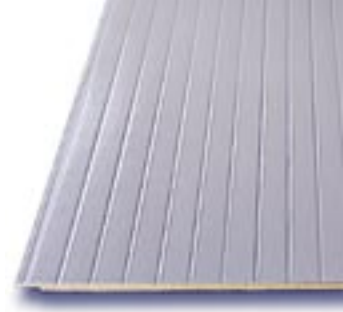
- Good flowability
- Adjusted reactivity and curing
- Component temperature
- Substrate temperature
- Demoulding time and demouldability
- Easy sprayable, low aerosol formation
- Miscibility
- Wide processing tolerance

Environment

Separate and controlled waste management.

Steered by the environmental care system waste sources within KPI are carefully monitored. Waste material, wherever possible is separately stored and removed. This is applicable for waste from the production process as well as from other sources. KPI has dedicated and controlled storage area and removal for chemical waste.

KPI endeavors in its production process and formulation of its systems to provide the least possible consequences for the environment.





The cell formation is obtained by the addition of a blowing agent or inclusion of air. The blowing agent can be an HFC with a low boiling point but also the presence of water in the reacting mixture produces a foaming effect because the isocyanate groups react with water forming carbon dioxide.

POLYURETHANES TECHNICAL CALCULATIONS

INSULATION VALUES AND REALTED CALCULATIONS:

POLYURETHANE FOAMS ARE TODAY USED WORLD WIDE AS INSULATION AGAINST TEMPERATURE EXTREMES.

IN THE MIDDLE EAST THE BUILDING INDUSTRY HAS AADOPTED POLYURETHANE INSULATION AS ONE OF THE BEEST MATERIALS TO CONTROL INTERIOR CONDITIONS OF BUILDINGS AND TO SAVE ENERGY.

TO BE ABLE TO DETERMINE THE "AMOUNT" OF INSULATION REQUIRED FOR A CERTAIN CONSTRUCTION, THE FOLOWING DEFINITIONS AND FORMULAS CAN BE USED:

"Q" - VALUE:

THE AMOUNT OF HEAT EXPRESSED IN WATTS PASSING THROUGH A HOMOGENEOUS CONSTRUCTION WITH

A = SURFACE AREA OF THE CONSTRUCTION (M²)

L = THICKNESS OF THE CONSTRUCTION (M)

T = DIFFERENCE IN THE TEMPERATURE ON THE TWO FACES OF THE CONSTRUCTON (°C)

λ = THERMAL CONDUCTIVITY OF THE CONSTRUCTION (W/M°C)

$$Q = \lambda \frac{A \Delta T}{L} \text{ (W)}$$

"λ" LAMDA - VALUES:

THE THERMAL CONDUCTIVITY (λ) OF A MATERIAL IS THE AMOUNT OF HEAT IN WATTS PASSING THROUGH A MATERIAL HAVING A SURFACE OF 1 M² AND THICKNESS 1 M UNDER A TEMPERATURE DIFFERENTIAL OF 1°C. HENCE A LOW LAMDA VALUE INDICATES THAT THE MATERIAL IS A GOOD INSULATOR. λ IS EXPRESSED IN W/M°C

"K" VALUE:

THE INSULATION VALUE (K) OF A MATERIAL IS THE THERMAL CONDUCTIVITY OF THE MATERIAL (λ) DIVIDED BY THE THICKNESS OF THE MATERIAL (L) EXPRESSED IN METERS (M)

$$K = \frac{\lambda}{L} \text{ (W/M}^2\text{°C)}$$

"U" VALUE:

THE TOTAL INSULATION VALUE (U) OF A COMPOSITE CONSTRUCTION IS DETERMINED BY THE INSULATION VALUES OF THE VARIOUS MATERIALS (K1 K2 ETC) FORMING THE CONSTRUCTION, ACCORDING TO THE FOLLOWING FORMULA:

$$U = \frac{1}{0.2 + \frac{1}{K_1} + \frac{1}{K_2} + \text{ETC}} \text{ (W/M}^2\text{°C)}$$

THESE ARE BASIC INFORMATION ABOUT HEAT-TRANSFER AND INSULATION VALUES FOR CONSULTANT USE AND CALCULATIONS.



POLYURETHANE PRODUCTS

Grade	Applications	Typical Properties			
		Appearance	Viscosity 25°C, cps	Combination ration with MDI	Description
PS 40 / 01	Refrigerator and Freezers	Clear yellow liquid	650 ± 100	100 : 110	With 141B blowing agent and when combined in the given ration with MDI, it gives fine cell structure and good thermal insulation properties
PS 40 / 02	Refrigerated Trucks	Clear yellow liquid	600 ± 100	100 : 110	With 141B blowing agent and gives fine cell structure, very good flow ability, good thermal insulation and good low temperature dimensional stability
PS 40 / 03	Sandwich Panels for profiles and construction	Clear yellow liquid	500 ± 50	100 : 115	With 141B blowing agent and when combined in the given ration with MDI, it gives excellent flow ability, good demoulding characteristics and thermal insulation properties
PS 40 / 04	Rigidisation of Kitchen cabinets, and FRP doors	Clear yellow liquid	700 ± 50	100 : 105	With 141B blowing agent and has a slower reactivity to facilitate for manual mixing and has excellent adhesion, flow and compressive strength.
PS 20 / MH	For water heaters	Clear yellow liquid	200 ± 30	100 : 100	With 141B blowing agent and has a good flow ability, excellent adhesion and good thermal insulation properties
PS 20 / SC	For water heaters	Clear Yellow liquid	400 ± 50	100 : 100	With 141B blowing agent and has good flow ability, excellent adhesion and good thermal insulation properties
PS 30 / GH	For water heaters	Clear yellow liquid	400 ± 50	100 : 100	With 141B blowing agent and has slower reactivity facilitating for manual mix with good cell structure and thermal insulation
SS 40 / GR	Spray on Roof	Clear yellow liquid	650 ± 50	100 : 100	Good surface, excellent adhesion and thermal insulation
SS 40 / GC	Spray on Ceiling	Clear Yellow liquid	700 ± 50	100 : 100	Good surface, excellent adhesion, thermal insulation and non dripping on ceiling
SS 60 / GR	Spray	Clear yellow liquid	700 ± 50	100 : 100	Good surface, excellent adhesion and good thermal insulation
BS 40	PU Slabstock for cutting into boards and pipe sections	Clear yellow liquid	2500 ± 200	Available on request	Foams with very good cell structure, good thermal insulation and compressive strength
BS 40 FR	PIR Slabstock for cutting into boards and pipe sections	Clear yellow liquid	2200 ± 200	Available on request	PIR block foams with very good cell structure, thermal insulation and excellent fire performance
FS 50	For preinsulated pipe	Clear yellow liquid	600 ± 50	100 : 110	With 141B, and has slower reactivity facilitating for manual mix with good cell structure, adhesion and thermal insulation
HD 500	Wood imitation	Clear yellow liquid	2500 ± 200	100 : 105	With 141B blowing agent and has good flow ability, excellent surface finish and good compressive strength

- The above grades are only an indication of our regular supply and any other need of customers can always be fulfilled by developing new products as per the processing method and the desired properties