

Description

High Density Polyethylene (HDPE, PE-HD) has excellent impact properties at very low temperatures. It has very good chemical resistance, and is easy to thermoform and fabricate. It has very good stiffness, being the most rigid of the Polyethylene range. It is particular resistant to stress whitening when bent.

Applications

Automotive, industrial, construction, tanks, containers, handling trays and low temperature applications.

Key Features

Chemical Resistance

Very good chemical resistance to many chemicals including strong acids and oils.

Low Temperature Resistance

Very good impact resistance below 0 °C.

Product Availability

Colour

Standard range of colours, customer matches and special effects.

Finish

Smooth and a collection of embossed finishes.

Thickness

Fabrication: 0,7 mm to 30 mm.

Sheet/Roll Size Specifications

Gauge	Width	
	Minimum	Maximum
> 0,7 mm to 1,0 mm	500	1250
> 1,0 mm to 20 mm	500	2000
> 20 mm to 30 mm	500	1500

NB: Available sizes may vary depending on gauge/colours/embosses/order size, please ask confirmation to sales department.

Typical Physical Properties

Properties	Unit	Standard	Method	Value
Density #	g/cm ³	ISO 1183	-	0,96
Charpy Impact Strength (notched)	kJ/m ²	ISO 179	1eA at 23°C	29
Charpy Impact Strength (unnotched)	kJ/m ²	ISO 179	1eU at 23°C	without break
Tensile Modulus	MPa	ISO 527-3	1 mm/min	950
Yield strength	MPa	ISO 527-3	50 mm/min	23
Tenile strength at break	MPa	ISO 527-3	50 mm/min	10
Elongation at Break	%	ISO 527-3	50 mm/min	>150
Vicat Softening Point	°C	ISO 306	B50/oil	66

#The density quoted should only be used as a guide. This value can change depending upon the type and quantity of pigments or additives used.

Additional Information

Thermoforming

Compared to High Impact Polystyrene (HIPS), HDPE tends to require greater heating and cooling cycle times. It is also susceptible to distortion and shrinkage, therefore Vacuum forming equipment with good heating and vacuum controls are recommended. HDPE has very low moisture absorption and pre-drying is not normally required. HDPE has a particularly high shrinkage, and is known to have distortion problems. To reduce distortion issues the tool should be Aluminium, which is temperature controllable. Having a moat and sandblasting the tool will further improve processing. Typical mould temperature of 40-75 °C, and the moulded article temperature should be below 80°C before removing from the mould. Mould shrinkage is typically 1.8 to 3.5%.

Certification/Approvals

The following approvals are only available on request:

Food: European Legislation 2002/72/EC. ROHS: European Legislation 2002/95/EC.

Fabrication

It can be fabricated using standard plastic methods of fixing and machining. Sheet can be cut with a band/circular saw, and drilled using standard metal working tools. HDPE can be riveted, welded and punched.

ADHESIVES Polyethylene belongs to the group of high-polymer paraffins. This group is chemically slow-acting and possesses a low surface energy, which prevents the moistening of the surface with a substrate, which is a prerequisite for any adhesion. For this reason, pre-treated PE can only be glued with a permanent adhesive. By corona treating the surface, treating it with a primer or dipping it in a chromium sulphuric acid bath, contact adhesives (PUR, synth. rubber) or two-component adhesives (EP, PUR) can be used.

WELDING HDPE can also be welded. Usual methods are hot gas welding (warm air temperature 300 - 350°C) and hot plate welding (weld butt temperature 190 - 210°C). High frequency welding is not possible.

UV Resistance

In outdoor or strong UV light conditions, HDPE can become brittle in a matter of months. Black pigmentation will improve UV resistance. The addition of UV stabiliser additives will significantly improve longevity. Please contact of Sales office to discuss further.

Cleaning and Maintenance

Typical detergents and soaps dissolved in warm water can be used to effectively clean surface contamination from the surface. For the more stubborn marks organic solvents such as isopropyl alcohol and n-heptane will be more effective.

Chemical Resistance

Chemical resistance is influenced by many factors, including concentration, temperature, exposure time and material stress. Therefore the data below should only be used as a guide.

Reagent	Chemical resistance	Reagent	Chemical resistance
Acetone	Very good	Beer	Excellent
Acid – (Weak)	Excellent	Brake Fluid	Very good
Acid – (Strong)	Very good	Coffee	Excellent
Alcohol	Very good	Detergent	Excellent
Anti-freeze	Excellent	Diesel	Good
Base (Weak)	Excellent	Foodstuffs	Excellent
Base (Strong)	Good	Lubricating Oil	Good
Battery Acid	Very good	Petrol	Good

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