Technical Data Sheet

Lupolen UHM 5000

Ultra High Molecular Weight Polyethylene

Product Description

Lupolen UHM 5000 is an ultra high molecular weight polyethylene (UHMW PE) with an average molecular weight of 5 million. The long molecular chains leed to unique properties:
Highest abrasion resistance of any thermoplastic materials, excellent impact strength, low friction, good chemical resistance and stress crack resistance.
Lupolen UHM 5000 is used in compression molding and ram extrusion processes. The material is supplied in form of coarse natural powder. The larger particle size and the very low fines content result in good free flowing property and less dust generation during handling and processing.

Application	Industrial; Panels & Profiles
Market	Industrial, Building & Construction
Processing Method	Compression Molding
Attribute	Good Abrasion Resistance; Good Chemical Resistance; High ESCR (Environmental Stress Cracking Resistance); Low Friction; Ultra High Impact Resistance; Ultra High Molecular Weight

Typical Properties	Nominal Value	Units	Test Method
Physical			
Melt Flow Rate, (190 °C/21.6 kg)	not measurable	g/10 min	ISO 1133-1
Density	0.931	g/cm³	ISO 1183-1
Bulk Density, (23 °C)	0.450	g/cm³	ISO 60
Viscosity Number	2500	ml/g	ISO 1628-3
Intrinsic Viscosity	2200	ml/g	ISO 1628-3
Mechanical			
Tensile Modulus, (23 °C)	800	MPa	ISO 527-1, -2
Tensile Creep Modulus			
(1 hr / 2 MPa)	550	MPa	ISO 899-1
(1000 hr / 2 MPa)	300	MPa	ISO 899-1
Tensile Stress at Yield, (23 °C, 50 mm/min)	20	MPa	ISO 527-1, -2
Tensile Strain at Yield, (23 °C, 50 mm/min)	12	%	ISO 527-1, -2
Impact			
Charpy Impact Strength - Notched			
(23 °C)	No Break	kJ/m²	ISO 179-1/1eA
(23 °C)	190	kJ/m²	ISO 179
Double Notch according ISO 11542-2 Annex B			

Hardness			
Shore Hardness			
(Shore D, 3 sec)	65		ISO 868
(Shore D, 15 sec)	63		ISO 868
Thermal			
Vicat Softening Temperature, (B50)	82	°C	ISO 306
Heat Deflection Temperature A, (1.80 MPa, Unannealed)	45	°C	ISO 75A-1, -2
Heat Deflection Temperature B, (0.45 MPa, Unannealed)	68	°C	ISO 75B-1, -2
DSC Melting Point	135	°C	DSC
Additional Information			
Abrasion Resistance	90-110 %		ISO 15527, Annex B
Average Particle Size	500	micron	LYB Method

Notes

These are typical property values not to be construed as specification limits.

Processing Techniques

Users should determine the conditions necessary to obtain optimum product properties and suitability of the product for the intended application.

Recommended melt temperatures: 190 °C to 230 °C.

Specific recommendations for resin type and processing conditions can only be made when the end use, required properties and fabrication equipment are known.

Further Information

Health and Safety:

The resin is manufactured to the highest standards, but special requirements apply to certain applications such as food end-use contact and direct medical use. For specific information on regulatory compliance contact your local representative.

Workers should be protected from the possibility of skin or eye contact with molten polymer. Safety glasses are suggested as a minimal precaution to prevent mechanical or thermal injury to the eyes.

Molten polymer may be degraded if it is exposed to air during any of the processing and off-line operations. The products of degradation may have an unpleasant odor. In higher concentrations they may cause irritation of the mucus membranes. Fabrication areas should be ventilated to carry away fumes or vapours. Legislation on the control of emissions and pollution prevention should be observed.

The resin will burn when supplied with excess heat and oxygen. It should be handled and stored away from contact with direct flames and/or ignition sources. While burning, the resin contributes high heat and may generate a dense black smoke.

Recycled resins may have previously been used as packaging for, or may have otherwise been in contact with, hazardous goods. Converters are responsible for taking all necessary precautions to ensure that recycled resins are safe for continued use.

For further information about safety in handling and processing please refer to the Safety Data Sheet.

Conveying:

Conveying equipment should be designed to prevent production and accumulation of fines and dust particles that are contained in polymer resins. These particles can under certain conditions pose an explosion hazard. Conveying systems should be grounded, equipped with adequate filters and regularly inspected for leaks.

Storage:
The resin is packed in 25 kg bags, octabins or bulk containers protecting it from contamination. If it is stored under certain conditions, i. e. if there are large fluctuations in ambient temperature and the atmospheric humidity is high, moisture may condense inside the packaging. Under these circumstances, it is recommended to dry the resin before use. Unfavorable storage conditions may also intensify the resin's slight characteristic odor.

Resin should be protected from direct sunlight, temperatures above 40°C and high atmospheric humidity during storage. Higher storage temperatures may reduce the storage time.

The information submitted is based on our current knowledge and experience. In view of the many factors that may affect processing and application, these data do not relieve processors of the responsibility of carrying out their own tests and experiments; neither do they imply any legally binding assurance of certain properties or of suitability for a specific purpose. This information does not remove the obligation of the customer to inspect the material on arrival and notify us of any faults immediately. It is the responsibility of those to whom we supply our products to ensure that any proprietary rights and existing laws and legislation are observed.