



## Lupolen UHM 5000

### UHMW PE

#### Product Description

**Lupolen UHM 5000** is an ultra high molecular weight polyethylene (UHMWPE) with an average molecular weight of 5 million. The long molecular chains lead 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 moulding 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.

For regulatory compliance information see **Lupolen UHM 5000** Regulatory Affairs Product Stewardship Information/Certification Data Sheet (RAPIDS).

The material is not intended for medical and pharmaceutical applications.

#### Product Characteristics

Status	Commercial: Active
Test Method used	ISO
Availability	Europe
Processing Methods	Compression Molding
Features	Good Abrasion Resistance , Good Chemical Resistance, High ESCR (Environmental Stress Cracking Resistance), Low Friction, Ultra High Impact Resistance , Ultra High Molecular Weight
Typical Customer Applications	Building and Construction, Industrial, Panels & Profiles

Typical Properties	Method	Value	Unit
<b>Physical</b>			
Density	ISO 1183	0.931	g/cm <sup>3</sup>
Bulk density (23°C)	ISO 60	450	kg/m <sup>3</sup>
Viscosity number	ISO 1628-3	2500	ml/g
<b>Mechanical</b>			
Tensile Modulus (23 °C, v = 1 mm/min, Secant)	ISO 527-1, -2	800	MPa
Tensile Stress at Yield (23 °C, v = 50 mm/min)	ISO 527-1, -2	20	MPa
Tensile Strain at Yield (23 °C, v = 50 mm/min)	ISO 527-1, -2	12	%
Tensile Creep Modulus 1h	ISO 899-1	550 [2.0]	MPa
Note: [Test stress in MPa]			
Tensile Creep Modulus 1000h	ISO 899-1	300 [2.0]	MPa
Note: [Test stress in MPa]			
<b>Impact</b>			
Charpy notched impact strength (23 °C)	ISO 179	190	kJ/m <sup>2</sup>
Note: Double Notch according ISO 11542-2 Annex B.			
(23 °C)		No Break	kJ/m <sup>2</sup>
<b>Hardness</b>			
Shore hardness (Shore D (15 sec))	ISO 868	63	
(Shore D (3 sec))		65	
<b>Thermal</b>			
Vicat softening temperature (VST/B/50 K/h (50 N))	ISO 306	82	°C
Melting temperature	DSC	135	°C
Heat deflection temperature A	ISO 75/ASTM D 648	45	°C
Heat deflection temperature B	ISO 75/ASTM D 648	68	°C

#### Additional Properties

Abrasion Resistance	ISO 15527, Annex B	90-110%
Medium Particle size		800 µm
Intrinsic viscosity	ISO 1628-3	2200 ml/g

Recommended melt temperatures: 190-220 °C

#### Notes

Typical properties; not to be construed as specifications.

#### Further Information

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##### Conveying:

Conveying equipment should be designed to prevent production and accumulation of fines and dust particles that may be contained to a small extent in polymer materials. These particles can under certain conditions pose an explosion hazard. We recommend the conveying system used is equipped with adequate filters, is operated and maintained so that no leak develops and adequate electrical grounding exists at all times.

##### Health and Safety:

Special requirements apply to certain applications such as food contact end-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 minimum 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 have an unpleasant odour. 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 must be observed. If the principles of sound manufacturing practice are adhered to and the place of work is well ventilated, no health hazards in processing the material have been reported.

The material 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. In burning the material generates considerable heat and may generate dense black smoke. Minor fires can be extinguished by water, developed fires should be extinguished by heavy foams forming an aqueous or polymeric film. For further information about safety in handling and processing please refer to the Material Safety Data Sheet (MSDS).

##### Storage:

The material is packed in 25 kg bags or in bulk containers protecting it from contamination. Storage times of natural materials longer than 6 months may have a negative influence on the quality of the final product (for example the brightness). It is generally recommended to convert all materials latest within 6 months from the date of delivery.

The material is subjected to degradation by ultra-violet radiation or by high storage temperatures. Therefore the material must be protected from direct sunlight, temperatures above 40°C and high atmospheric humidity during storage.

Further unfavourable storage conditions are large fluctuations in ambient temperature and high atmospheric humidity. These conditions may lead to moisture condensing inside the packaging. Under these circumstances, it is recommended to dry the material before use. Unfavourable storage conditions may also intensify the material's slight characteristic odour.