

Product description

Glass fibre reinforced and heat aging resistance injection moulding grade for industrial articles having very high rigidity.

Physical form and storage

Ultramid® is supplied dry and ready to use in moisture-proof packaging in the form of cylindrical or flat pellets. Its bulk density is about 0,7g/cm³. Standard packs are the special 25kg bag and the 1000kg bulk container (octagonal IBC= intermediate bulk container made from corrugated board with a liner bag). Subject to agreement other forms of packaging and shipment in tankers by road or rail are also possible. All containers are tightly sealed and should be opened only immediately prior to processing. To ensure that the perfectly dry material delivered cannot absorb moisture from the air the containers must be stored in dry rooms and always carefully sealed again after portions of material have been withdrawn. Ultramid® can be kept indefinitely in the undamaged bags. Experience has shown that product supplied in IBCs can be stored for about 3 months without any adverse effects on processing properties due to moisture absorption. Containers stored in cold rooms should be allowed to equilibrate to normal temperature so that no condensation forms on the pellets.

Product safety

Ultramid® melts are thermally stable at the usual temperature for PA66, PA6 and PA66/6 up to 310°C and 330°C for PA6/6T and do not give rise to hazards due to molecular degradation or the evolution of gases and vapors. Like all thermoplastic polymers Ultramid® decomposes on exposure to excessive thermal load, e.g. when it is overheated or as a result of cleaning by burning off. In such cases gaseous decomposition products are formed. Decomposition accelerates above 310°C (PA6/6T >350°C) approximately, the initial products formed being mainly carbon monoxide and ammonia, and caprolactam too in the case of Ultramid® PA6. At temperatures above about 350°C (PA6/6T>400°C) small quantities of pungent smelling vapors of aldehydes, amines and other nitrogenous decomposition products are also formed. Further safety information see safety data sheet of the individual product.

Note

The data contained in this publication are based on our current knowledge and experience. In view of the many factors that may affect processing and application of our product, these data do not relieve processors from carrying out their own investigations and tests; neither do these data imply any guarantee of certain properties, nor the suitability of the product for a specific purpose. Any descriptions, drawings, photographs, data, proportions, weights etc. given herein may change without prior information and do not constitute the agreed contractual quality of the product. It is the responsibility of the recipient of our products to ensure that any proprietary rights and existing laws and legislation are observed. In order to check the availability of products please contact us or our sales agency.

Product Information

Typical values for uncoloured product at 23 °C ¹⁾	Test method ²⁾	Unit	Values ³⁾
Properties			
Polymer abbreviation	-	-	PA66-GF50
Density	ISO 1183	kg/m ³	1560
Viscosity number (0.5% in 96 % H ₂ SO ₄)	ISO 307, 1157, 1628	cm ³ /g	130
Moisture absorption, equilibrium 23°C/50% r.h.	similar to ISO 62	%	1 - 1.4
Water absorption, saturation in water at 23°C	similar to ISO 62	%	3.7 - 4.3
Processing			
Melting temperature, DSC	ISO 11357-1/-3	°C	260
MVR 275 °C/5 kg	ISO 1133	cm ³ /10min	10
Melt temperature, injection moulding/extrusion	-	°C	290 - 310
Mould temperature, injection moulding	-	°C	80 - 90
Moulding shrinkage, constrained ⁴⁾	-	%	0.45
Flammability			
UL 94 rating at 1,6 mm thickness	IEC 60695-11-10	class	HB
Automotive materials (Thickness >= 1mm)	FMVSS 302	-	+
Mechanical properties			
			dry / cond.
Tensile modulus	ISO 527-1/-2	MPa	16800 / 12500
Stress at break	ISO 527-1/-2	MPa	240 / 180
Strain at break	ISO 527-1/-2	%	2.5 / 3.5
Tensile creep modulus, 1000 h, strain <= 0.5%, 23°C	ISO 899-1	MPa	* / 7800
Flexural modulus	ISO 178	MPa	15000 / 13500
Flexural strength	ISO 178	MPa	360 / 300
Charpy unnotched impact strength (23°C)	ISO 179/1eU	kJ/m ²	95 / 100
Charpy unnotched impact strength (-30°C)	ISO 179/1eU	kJ/m ²	90 / 103
Charpy notched impact strength (23°C)	ISO 179/1eA	kJ/m ²	18 / 25
Charpy notched impact strength (-30°C)	ISO 179/1eA	kJ/m ²	13 / 12.6
Izod notched impact strength (23°C)	ISO 180/A	kJ/m ²	13 / 14.5
Thermal properties			
HDT A (1.80 MPa)	ISO 75-1/-2	°C	250
HDT B (0.45 MPa)	ISO 75-1/-2	°C	250
Max. service temperature (short cycle operation) ⁵⁾	-	°C	240
Temperature index at 50% loss of tensile strength after 5000 h	IEC 216	°C	175
Temperature index at 50% loss of tensile strength after 20000 h	IEC 216	°C	145
Coefficient of linear thermal expansion, longitudinal (23-80)°C	ISO 11359-1/-2	E-6/K	5 - 20
Coefficient of linear thermal expansion, transverse (23-80)°C	ISO 11359-1/-2	E-6/K	50 - 60
Thermal conductivity	DIN 52612-1	W/(m K)	0.37
Specific heat capacity	-	J/(kg*K)	1300
Electrical properties			
Relative permittivity (1 MHz)	IEC 60250	-	3.8 / 6.6
Dissipation factor (1 MHz)	IEC 60250	E-4	150 / 3000
Volume resistivity	IEC 60093	Ohm*m	1E13 / 1E10
Surface resistivity	IEC 60093	Ohm	* / 1E10
Comparative tracking index, CTI, test liquid A	IEC 60112	-	450

Footnotes

1) If product name or properties don't state otherwise.

2) Specimens according to CAMPUS.

3) The asterisk symbol "*" signifies inapplicable properties.

4) Test box with central gating, dimensions of base (107*47*1,5) mm, processing conditions: TM = 290°C, TW = 80°C

5) Empirical values determined on articles repeatedly subjected to the temperature concerned for several hours at a time over a period of several years. Provisio Proper design and processing according to our recommendations.

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