

Product Information **Ultramid®**

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PA6-(GF10+GB20)



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Product Information

A combined glass-fibre and glass-bead reinforced injection moulding grade for industrial articles having very high dimensional stability, used e.g. for automobile ashtrays and housings for electronics.

Physical form and storage

The product is supplied in the form of granules with a bulk density of approx. 0.7 g/cm³. Standard packs are bag and bulk container (octagonal IBC=intermediate bulk container made from corrugated board with a liner bag). Other packaging materials and shipping in road or rail silo wagons are possible by agreement. The containers should only be opened immediately before processing or drying. To ensure that the delivered product absorbs as little moisture as possible, the containers should be stored in dry rooms and always carefully closed again after partial quantities have been withdrawn. In principle, the product can be stored for a long period of time. Containers stored in cold rooms should be equalized to ambient temperature before opening in order to avoid condensation on the granules. Regardless of the storage conditions, the product should be pre-dried according to our recommendations and the machine should preferably be loaded using a closed conveyor system.

Product safety

In case processing is done under conditions as recommended (cf. processing data sheet) melts are thermally stable and do not generate hazards by molecular degradation or the evolution of gases and vapors. Like all thermoplastic polymers the product decomposes on exposure to excessive thermal load, e.g. when it is overheated or as a result of cleaning by burning off. Further information is available from the safety data sheet.

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	Unit	Values ²⁾
Properties			
Polymer abbreviation	-	-	PA6-(GF10+GB20)
Density	ISO 1183	kg/m ³	1340
Viscosity number (0.5% in 96% H ₂ SO ₄)	ISO 307, 1157, 1628	cm ³ /g	140
Water absorption, saturation in water at 23°C	similar to ISO 62	%	6.3 - 6.9
Moisture absorption, equilibrium 23°C/50% r.h.	similar to ISO 62	%	1.9 - 2.3
Halogen content (Cl, Br, I) based on chloride, coulometry ³⁾	similar to DIN 51408-2	mg/kg	< 50
Processing			
Melting temperature, DSC	ISO 11357-1/-3	°C	220
MVR 275 °C/5 kg	ISO 1133	cm ³ /10min	50
Melt temperature, injection moulding/extrusion	-	°C	270 - 290
Mould temperature, injection moulding	-	°C	80 - 90
Moulding shrinkage, constrained ⁴⁾	-	%	0.45
Moulding shrinkage (parallel)	ISO 294-4	%	0.60
Moulding shrinkage (normal)	ISO 294-4	%	0.80
Pre/Post-processing, Pre-drying, Temperature	-	°C	80
Pre/Post-processing, Pre-drying, Time	-	h	4
Melt temperature	-	°C	290
Mold temperature	-	°C	80
Flammability			
UL94 flammability rating at nominal 1.5 mm (thickness tested)	IEC 60695-11-10	class (mm)	HB (1.6)
Yellow Card available	-	-	yes
UL94 flammability rating (thickness tested)	IEC 60695-11-10	class (mm)	HB (0.8)
Yellow Card available	-	-	yes
Automotive materials (Thickness >= 1 mm) ⁵⁾	ISO 3795, FMVSS 302	-	+
UL 94 rating at 3.2 mm thickness	UL-94, IEC 60695	class	HB
Mechanical properties			
dry / cond.			
Tensile modulus	ISO 527-1/-2	MPa	6000 / 3000
Stress at break	ISO 527-1/-2	MPa	110 / 60
Strain at break	ISO 527-1/-2	%	3.5 / 15
Tensile creep modulus, 1000 h, strain 0.5%, 23°C	ISO 899-1	MPa	2000
Flexural strength	ISO 178	MPa	175 / 100
Charpy unnotched impact strength (23°C)	ISO 179/1eU	kJ/m ²	40 / 90
Charpy unnotched impact strength (-30°C)	ISO 179/1eU	kJ/m ²	39 / -
Charpy notched impact strength (23°C)	ISO 179/1eA	kJ/m ²	5 / 11
Charpy notched impact strength (-30°C)	ISO 179/1eA	kJ/m ²	5 / -
Izod notched impact strength (23°C)	ISO 180/A	kJ/m ²	5 / 8.5
Izod notched impact strength (23 °C)	ASTM D 256	J/m	30 / 80
Thermal properties			
Deflection temp. under load 1.8 MPa (HDT A)	ISO 75-1/-2	°C	200
Deflection temp. under load 0.45 MPa (HDT B)	ISO 75-1/-2	°C	215
Max. service temperature (short cycle operation)	-	°C	200
Temperature index at 50% loss of tensile strength after 20000 h	IEC 60216	°C	100
Coefficient of linear thermal expansion, longitudinal (23-55)°C	ISO 11359-1/-2	E-6/K	48
Coefficient of linear thermal expansion, transverse (23-55)°C	ISO 11359-1/-2	E-6/K	79
Thermal conductivity	DIN 52612-1	W/(m K)	0.34
Specific heat capacity	-	J/(kg*K)	1400
Electrical properties			
Relative permittivity (1 MHz)	IEC 62631-2-1	-	3.9 / 4.6
Dissipation factor (1 MHz)	IEC 62631-2-1	E-4	200 / 700
Volume resistivity	IEC 62631-3-1	Ohm*m	1E13 / 1E10
Surface resistivity	IEC 62631-3-2	Ohm	1E12 / 1E10
Comparative tracking index, CTI, test liquid A	IEC 60112	-	- / 425

Footnotes

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

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

3) Products colored in other ways may have increased halogen contents.

4) Test box with central gating, dimensions of base (107*47*1,5) mm, processing condition: TM = 280°C, TW = 80°C

5) + = passed

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