

Product description

An halogen-free flameretardant injection molding grade with outstanding free-flow properties, with good electrical properties and low smoke density; resistant to glow wire test GWFI to 960 °C.

Physical form and storage

The product is supplied dry and ready to use in moisture-proof packaging. The material is in the form of cylindrical or flat pellets. Its bulk density is about 0,7 g/cm³. Standard packs are the special 25 kg bag and the 1000 kg 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air the containers must be stored in dry rooms and always carefully sealed again after some of the material has been withdrawn. Ultramid® can be stored for a longer period of time in dry, well vented rooms without any change to properties. After longer storage times (> 3 months for IBC or > 2 years for bags) or if material from previously opened containers is used, drying is recommended to remove absorbed moisture. Containers stored in cold rooms should be allowed to equalise to normal temperature so that no condensation forms on the pellets.

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-GF20 FR(30)
Density	ISO 1183	kg/m ³	1310
Viscosity number (0.5% in 96 % H ₂ SO ₄)	ISO 307, 1157, 1628	cm ³ /g	150
Water absorption, saturation in water at 23°C	similar to ISO 62	%	6.6 - 7.2
Moisture absorption, equilibrium 23°C/50% r.h.	similar to ISO 62	%	2.00 - 2.40
Processing			
Melting temperature, DSC	ISO 11357-1/-3	°C	220
MVR 275 °C/5 kg	ISO 1133	cm ³ /10min	80
Melt temperature, injection moulding/extrusion	-	°C	250 - 275
Mould temperature, injection moulding	-	°C	80 - 90
Molding shrinkage, model-housing 1.5 mm	-	%	0.5
Molding shrinkage (parallel)	ISO 294-4	%	0.80
Molding shrinkage (normal)	ISO 294-4	%	0.80
Thermal properties			
Deflection temp. 1.8 (HDT A)	ISO 75-1/-2	°C	170
Deflection temp. under load 0.45 MPa (HDT B)	ISO 75-1/-2	°C	210
Temperature limit for high temperatures, 20000 h , related to 50% decrease of tensile strength	IEC 60216	°C	160
Temperature limit for high temperatures, 5000 h, related to 50% decrease of tensile strength	IEC 60216	°C	185
Coeff. of linear therm. expansion 23°C - 55°C (parallel)	ISO 11359-1/-2	E-6/K	41
Coeff. of linear therm. expansion 23°C - 55°C (normal)	ISO 11359-1/-2	E-6/K	86
Flammability (UL-yellow card see attachment)			
GWFI (thickness)	IEC 60695-2-12	°C (mm)	960 (1)
Railway: Hazard level acc. to requ. sets R22 and R23	EN 45545-2	class	HL2 (1 - 3mm)
Electrical properties			
Relative permittivity (1 MHz)	IEC 62631-2-1	-	3.8 / -
Dissipation factor (1 MHz)	IEC 62631-2-1	E-4	150 / -
Volume resistivity	IEC 62631-3-1	Ohm*m	1E13 / 1E9
Surface resistivity	IEC 62631-3-2	Ohm	* / 1E12
CTI, solution A	IEC 60112	-	550
Mechanical properties			
Tensile modulus	ISO 527-1/-2	MPa	6000 / 3000
Stress at break	ISO 527-1/-2	MPa	95 / 50
Strain at break	ISO 527-1/-2	%	3 / 6
Flexural modulus	ISO 178	MPa	5700 / 2800
Flexural strength	ISO 178	MPa	150 / 70
Charpy unnotched impact strength, 23°C	ISO 179/1eU	kJ/m ²	40 / 110
Charpy unnotched impact strength, -30°C	ISO 179/1eU	kJ/m ²	35 / -
Charpy notched impact strength, 23°C	ISO 179/1eA	kJ/m ²	3 / 9
Charpy notched impact strength, -30°C	ISO 179/1eA	kJ/m ²	3.4 / -

Footnotes

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

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

BASF SE

67056 Ludwigshafen, Germany

UL - Yellow Card

Component - Plastics

E41871

BASF SE

Performance Materials Europe, E-PME/NQ - H201, Ludwigshafen 67056 DE

KR4460(f2), B3UG4 (t)(f2)

Polyamide 6 (PA6) "Ultramid", furnished as pellets

Color	Min. Thk (mm)	Flame Class	HWI	HAI	RTI Elec	RTI Imp	RTI Str
ALL	0.71	V-2	3	0	140	125	140
	1.5	V-2	2	0	140	125	140
	3.0	V-2	1	0	140	125	140

Comparative Tracking Index (CTI): 1

Inclined Plane Tracking (IPT) kV: -

Dielectric Strength (kV/mm): 17

Volume Resistivity (10⁹ohm-cm): 10

High-Voltage Arc Tracking Rate (HVTR): 0

Surface Resistivity (10⁹ohms/square): -

Dimensional Stability (%): 0

High Volt, Low Current Arc Resis (D495): 6

(f2) - Subjected to one or more of the following tests: Ultraviolet Light, Water Exposure or Immersion in accordance with UL 746C, where the acceptability for outdoor use is to be determined by UL.

(t) - May be followed by the letters LS and a color code indicating laser sensitive coloring.

ANSI/UL 94 small-scale test data does not pertain to building materials, furnishings and related contents. ANSI/UL 94 small-scale test data is intended solely for determining the flammability of plastic materials used in the components and parts of end-product devices and appliances, where the acceptability of the combination is determined by UL.

Report Date: 1983-09-19

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Last Revised: 2018-01-10

IEC and ISO Test Methods

Test Name	Test Method	Units	Thk (mm)	Value
Flammability	IEC 60695-11-10	Class (color)	0.71	V-2 (ALL)
			1.5	V-2 (ALL)
			3.0	V-2 (ALL)
Glow-Wire Flammability (GWF)	IEC 60695-2-12	°C	-	-
Glow-Wire Ignition (GWIT)	IEC 60695-2-13	°C	-	-
IEC Comparative Tracking Index	IEC 60112	Volts (Max)	-	-
IEC Ball Pressure	IEC 60695-10-2	°C	-	-
ISO Heat Deflection (1.80 MPa)	ISO 75-2	°C	-	-
ISO Tensile Strength	ISO 527-2	MPa	-	-
ISO Flexural Strength	ISO 178	MPa	-	-
ISO Tensile Impact	ISO 8256	kJ/m2	-	-
ISO Izod Impact	ISO 180	kJ/m2	-	-
ISO Charpy Impact	ISO 179-1	kJ/m2	-	-

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KR4460(f1), B3UG4 (t)(f1)

Polyamide 6 (PA6) "Ultramid", furnished as pellets

Color	Min. Thk (mm)	Flame Class	HWI	HAI	RTI Elec	RTI Imp	RTI Str
BK	0.71	V-2	3	0	140	125	140
	1.5	V-2	2	0	140	125	140
	3.0	V-2	1	0	140	125	140

Comparative Tracking Index (CTI): 1

Inclined Plane Tracking (IPT) kV: -

Dielectric Strength (kV/mm): 17

Volume Resistivity (10⁹ohm-cm): 10

High-Voltage Arc Tracking Rate (HVTR): 0

Surface Resistivity (10⁹ohms/square): -

Dimensional Stability (%): 0

High Volt, Low Current Arc Resis (D495): 6

(f1) - Suitable for outdoor use with respect to exposure to Ultraviolet Light, Water Exposure and Immersion in accordance with UL 746C.

(t) - May be followed by the letters LS and a color code indicating laser sensitive coloring.

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			1.5	V-2 (BK)
			3.0	V-2 (BK)
Glow-Wire Flammability (GWF)	IEC 60695-2-12	°C	-	-
Glow-Wire Ignition (GWIT)	IEC 60695-2-13	°C	-	-
IEC Comparative Tracking Index	IEC 60112	Volts (Max)	-	-
IEC Ball Pressure	IEC 60695-10-2	°C	-	-
ISO Heat Deflection (1.80 MPa)	ISO 75-2	°C	-	-
ISO Tensile Strength	ISO 527-2	MPa	-	-
ISO Flexural Strength	ISO 178	MPa	-	-
ISO Tensile Impact	ISO 8256	kJ/m2	-	-
ISO Izod Impact	ISO 180	kJ/m2	-	-
ISO Charpy Impact	ISO 179-1	kJ/m2	-	-

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