Product Information **Ultramid®**

B3UG4

02/2017 **PA6-GF20 FR(30)**

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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air the containers must be stored in dry rooms and always carefully sealed again after some of the material has been withdrawn.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.

BASF SE
67056 Ludwigshafen, Germany

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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/m³	**1310**
Viscosity number (0.5% in 96 % H2SO4)	ISO 307, 1157, 1628	cm³/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	cm³/10min	**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**
Flammability (UL-yellow card see attachment)			
GWFI (thickness)	IEC 60695-2-12	°C (mm)	**960 (1)**
Limiting Oxygen Index (LOI)	ISO 4589-1/-2	%	**31**
Specific optical density of smoke Ds max. (20 min), 25kW/m², 2mm	EN ISO 5659-2: 2007	-	**203**
Toxicity of smoke CIT NLP acc. to CEN/TS 45545-2	NF X70-100-1/-2	-	**0.55**
Electrical properties			**dry / cond.**
Relative permittivity (1 MHz)	IEC 60250	-	**3.8 / -**
Dissipation factor (1 MHz)	IEC 60250	E-4	**150 / -**
Volume resistivity	IEC 60093	Ohm*m	**1E13 / 1E11**
Surface resistivity	IEC 60093	Ohm	*** / 1E10**
CTI, solution A	IEC 60112	-	**550**
Mechanical properties			**dry / cond.**
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/m²	**40 / 110**
Charpy unnotched impact strength, -30°C	ISO 179/1eU	kJ/m²	**35 / -**
Charpy notched impact strength, 23°C	ISO 179/1eA	kJ/m²	**3 / 9**
Charpy notched impact strength, -30°C	ISO 179/1eA	kJ/m²	**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

Ultramid® B3UG4

UL - Yellow Card

Component - Plastics **E41871**

BASF SE

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

KR4460(f2), B3UG4(f2), B3UG4 LS(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):	-
Dielectric Strength (kV/mm):	17	Volume Resistivity (10^xohm-cm):	10
High-Voltage Arc Tracking Rate (HVTR):	0	High Volt, Low Current Arc Resis (D495):	6
Dimensional Stability (%):	0		

(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.

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

Last Revised: 2017-01-26

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 (GWFI)	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/m^2	-	-
ISO Izod Impact	ISO 180	kJ/m^2	-	-
ISO Charpy Impact	ISO 179-2	kJ/m^2	-	-

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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):	-
Dielectric Strength (kV/mm):	17	Volume Resistivity (10^xohm-cm):	10
High-Voltage Arc Tracking Rate (HVTR):	0	High Volt, Low Current Arc Resis (D495):	6
Dimensional Stability (%):	0		

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

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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/m^2	-	-
ISO Izod Impact	ISO 180	kJ/m^2	-	-
ISO Charpy Impact	ISO 179-2	kJ/m^2	-	-

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