

#### Product description

Partially aromatic, glassfiber reinforced polyphthalamide for injection molding with strong mechanical properties especially at elevated temperatures, good long-term thermal stability and outstanding chemical resistance for highly stressed parts. Ultramid® Advanced N4HG7 LS BK 23593 can be characterized as compound with high toughness, stiffness, extremely low water absorption and outstanding dimensional stability. It is based on a high molecular weight polymer, and features exceptional resistance against many challenging media such as automotive coolant fluids. Ultramid® Advanced N4HG7 LS BK 23593 is easily processable with excellent melt stability.

#### Markets & applications

Automotive: Fuel system, cooling system, powertrain, Auto E&E, sensors, pumps, fuel cell

E&E: Connectors

Consumer goods: Home appliances, consumer electronics

#### Physical form and storage

The product is supplied in the form of granules with a bulk density of approx. 0.7 g/cm<sup>3</sup>. 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the containers should be stored in dry rooms and always carefully closed again after partial quantities have been withdrawn.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 <sup>1)</sup>	Test method	Unit	Values <sup>2)</sup>
<b>Properties</b>			
Polymer abbreviation	-	-	PA9T-GF35
Density	ISO 1183	kg/m <sup>3</sup>	1420
Viscosity number (0.5% in 96 % H <sub>2</sub> SO <sub>4</sub> )	ISO 307, 1157, 1628	cm <sup>3</sup> /g	120
Moisture absorption, equilibrium 23°C/50% r.h.	similar to ISO 62	%	0.8
Water absorption, saturation in water at 23°C	similar to ISO 62	%	1.9
Water absorption, 24 h in water, 23 °C	ISO 62	%	0.2
<b>Processing</b>			
Melting temperature, DSC	ISO 11357-1/-3	°C	300
Melt temperature, injection moulding/extrusion	-	°C	320 - 340
Mould temperature, injection moulding	-	°C	125 - 170
Molding shrinkage (parallel)	ISO 294-4	%	0.48
Molding shrinkage (normal)	ISO 294-4	%	0.88
Test specimen production, injection moulding, melt temp.	ISO 294	°C	330
Test specimen production, injection moulding, mould temp.	ISO 294	°C	140
<b>Flammability</b>			
UL 94 rating at 0.8 mm thickness	IEC 60695-11-10	class	HB
<b>Mechanical properties</b>			
			dry / cond.
Tensile modulus (23°C)	ISO 527-1/-2	MPa	11500 / 11500
Stress at break (23°C)	ISO 527-1/-2	MPa	210 / 190
Strain at break (23°C)	ISO 527-1/-2	%	2.5 / 2.3
Tensile modulus (120°C)	ISO 527-1/-2	MPa	8500 / -
Stress at break (120°C)	ISO 527-1/-2	MPa	120 / 85
Strain at break (120°C)	ISO 527-1/-2	%	3.4 / 4.2
Tensile modulus (170°C)	ISO 527-1/-2	MPa	5000 / -
Stress at break (170°C)	ISO 527-1/-2	MPa	80 / -
Strain at break (170°C)	ISO 527-1/-2	%	5 / -
Flexural modulus (23°C)	ISO 178	MPa	10500 / 10500
Flexural strength	ISO 178	MPa	290 / 265
Charpy unnotched impact strength (-30°C)	ISO 179/1eU	kJ/m <sup>2</sup>	80 / -
Charpy unnotched impact strength (23°C)	ISO 179/1eU	kJ/m <sup>2</sup>	90 / 70
Charpy impact strength (120°C)	ISO 179/1eU	kJ/m <sup>2</sup>	70 / -
Charpy impact strength (170°C)	ISO 179/1eU	kJ/m <sup>2</sup>	70 / -
Charpy notched impact strength (-30°C)	ISO 179/1eA	kJ/m <sup>2</sup>	9 / -
Charpy notched impact strength (23°C)	ISO 179/1eA	kJ/m <sup>2</sup>	10 / 8
Charpy notched impact strength (120°C)	ISO 179/1eA	kJ/m <sup>2</sup>	15 / -
Charpy notched impact strength (170°C)	ISO 179/1eA	kJ/m <sup>2</sup>	28 / -
<b>Thermal properties</b>			
HDT A (1.80 MPa)	ISO 75-1/-2	°C	270
Coefficient of linear thermal expansion, longitudinal (23-55)°C	ISO 11359-1/-2	E-6/K	17 - 18
Coefficient of linear thermal expansion, transverse (23-55)°C	ISO 11359-1/-2	E-6/K	56 - 57
<b>Electrical properties</b>			
			dry / cond.
Volume resistivity	IEC 62631-3-1	Ohm*m	>1E16 / >1E14
Surface resistivity	IEC 62631-3-2	Ohm	- / >1E14
Comparative tracking index, CTI, test liquid A	IEC 60112	-	600 / -

### Footnotes

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

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

BASF SE

67056 Ludwigshafen, Germany