

#### Product description

Polyphthalamide, light colorable, with a high melting point, halogen-free flame-retardant, very low water absorption, good mechanical and dielectrical properties at elevated temperatures as well as excellent chemical resistance, soldering bath resistant. Colors available (e.g. Orange RAL 2003).

#### Markets & applications

Automotive: Automotive electrics & electronics (E&E), sensors, fuel cell, e-mobility  
E&E: Connectors, SMT (surface mount technology) applications, energy distribution  
Consumer goods: Home appliances, consumer electronics, cell phone parts

#### 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the containers should be stored in dry rooms and always carefully closed again after partial quantities have been withdrawn.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-GF30 FR(40)
Density	ISO 1183	kg/m <sup>3</sup>	1440
Viscosity number (0.5% in 96% H <sub>2</sub> SO <sub>4</sub> )	ISO 307, 1157, 1628	cm <sup>3</sup> /g	100
Water absorption, saturation in water at 23°C	similar to ISO 62	%	1.9 - 2.3
Moisture absorption, equilibrium 23°C/50% r.h.	similar to ISO 62	%	0.7 - 1
<b>Processing</b>			
Melting temperature, DSC	ISO 11357-1/-3	°C	300
MVR 325 °C/5 kg	ISO 1133	cm <sup>3</sup> /10min	30
Melt temperature, injection moulding/extrusion	-	°C	310 - 340
Mould temperature, injection moulding	-	°C	100 - 160
Molding shrinkage, model-housing 1.5 mm	-	%	0.5
Molding shrinkage (parallel)	ISO 294-4	%	0.30
Molding shrinkage (normal)	ISO 294-4	%	1.00
Test specimen production, injection moulding, melt temp.	ISO 294	°C	330
Test specimen production, injection moulding, mould temp.	ISO 294	°C	140
<b>Thermal properties</b>			
Deflection temp. under load 1.8 MPa (HDT A)	ISO 75-1/-2	°C	265
Coeff. of linear therm. expansion 23°C - 55°C (parallel)	ISO 11359-1/-2	E-6/K	19
Coeff. of linear therm. expansion 23°C - 55°C (normal)	ISO 11359-1/-2	E-6/K	53
<b>Flammability (UL-yellow card see attachment)</b>			
GWFI (thickness)	IEC 60695-2-12	°C (mm)	960 (0.8)
GWIT (thickness)	IEC 60695-2-13	°C (mm)	775 (0.8)
UL 94 rating (thickness)	UL-94, IEC 60695	class (mm)	V-0 (0.25)
Yellow Card available (1)	UL-94, IEC 60695	-	yes
UL 94 rating (thickness)	IEC 60695-11-20	class (mm)	5VA (1.6)
Yellow Card available (5V)	-	-	yes
Limiting Oxygen Index (LOI)	ISO 4589-1/-2	%	38
<b>Electrical properties</b>			
Relative permittivity (1 MHz)	IEC 62631-2-1	-	dry / cond. 4.1 / 3.5
Dissipation factor (1 MHz)	IEC 62631-2-1	E-4	110 / 160
Volume resistivity	IEC 62631-3-1	Ohm*m	1E13 / 1E13
Surface resistivity	IEC 62631-3-2	Ohm	- / 1E15
CTI, solution A	IEC 60112	-	600
Electric strength K20/K20, (60*60*1 mm <sup>3</sup> )	IEC 60243-1	kV/mm	45 / 44
<b>Mechanical properties</b>			
Tensile modulus	ISO 527-1/-2	MPa	dry / cond. 10500 / 10500
Stress at break	ISO 527-1/-2	MPa	140 / 130
Strain at break	ISO 527-1/-2	%	2.2 / 2.2
Flexural modulus	ISO 178	MPa	10500 / 10500
Flexural strength	ISO 178	MPa	220 / 210
Charpy unnotched impact strength, 23°C	ISO 179/1eU	kJ/m <sup>2</sup>	60 / 50
Charpy unnotched impact strength, -30°C	ISO 179/1eU	kJ/m <sup>2</sup>	60 / -
Charpy notched impact strength, 23°C	ISO 179/1eA	kJ/m <sup>2</sup>	6.5 / 6.5

### Footnotes

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

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

BASF SE

67056 Ludwigshafen, Germany

Component - Plastics

E41871

BASF SE

Performance Materials Europe, PMD/EX - H201, Ludwigshafen 67056 DE

Advanced N3U41G6 (t) (f2)(w2)

Polyamide 9T (PA9T), flame retardant "Ultramid", furnished as pellets

Color	Min. Thk (mm)	Flame Class	HWI	HAI	RTI Elec (°C)	RTI Imp (°C)	RTI Str (°C)
ALL	0.25	V-0	2	1	85	85	85
	0.40	V-0	1	0	150	110	125
	0.75	V-0	0	0	150	115	130
	1.5	V-0, 5VA	0	0	150	115	130
	3.0	V-0, 5VA	0	0	150	130	140

Comparative Tracking Index (CTI): 0

Inclined Plane Tracking (IPT) kV: 1.5

Dielectric Strength (kV/mm): 35

Volume Resistivity (10<sup>9</sup>ohm-cm): -

High-Voltage Arc Tracking Rate (HVTR): -

Surface Resistivity (10<sup>9</sup>ohms/square): -

Dimensional Change (%): -

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

(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.

(w2) - Virgin and regrind up to 50% by weight have the same basic characteristics for BK color, with the exception of the weatherability testing

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.

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### IEC and ISO Test Methods

Test Name	Test Method	Units	Thk (mm)	Value
Flammability	IEC 60695-11-10, IEC 60695-11-20	Class (color)	0.25	V-0 (ALL)
			0.40	V-0 (ALL)
			0.75	V-0 (ALL)
			1.5	V-0, 5VA (ALL)
			3.0	V-0, 5VA (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 AC Dielectric Strength (AC DS)	IEC 60243-1	kV/mm	-	-
IEC DC Dielectric Strength (DC DS)	IEC 60243-2	kV/mm	-	-
IEC Volume Resistivity (VR)	IEC 62631-3-1	10x ohm-m	-	-

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# Ultramid® Advanced N3U41G6



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## UL - Yellow Card

IEC Surface Resistivity (SR)	IEC 62631-3-2	10x ohms	-	-
IEC Inclined Plane Tracking (IPT)	IEC 60587	kV	-	-
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	-	-

## UL - Yellow Card

Component - Plastics

E41871

BASF SE

Performance Materials Europe, PMD/EX - H201, Ludwigshafen 67056 DE

Advanced N3U41G6 (t) (f1)(g)

Polyamide 9T (PA9T), flame retardant "Ultramid", furnished as pellets

Color	Min. Thk (mm)	Flame Class	HWI	HAI	RTI Elec (°C)	RTI Imp (°C)	RTI Str (°C)
BK	0.75	V-0	0	0	150	115	130
	1.5	V-0, 5VA	0	0	150	115	130
	3.0	V-0, 5VA	0	0	150	130	140

Comparative Tracking Index (CTI): 0

Inclined Plane Tracking (IPT) kV: 1.5

Dielectric Strength (kV/mm): 35

Volume Resistivity (10<sup>9</sup>ohm-cm): -

High-Voltage Arc Tracking Rate (HVTR): -

Surface Resistivity (10<sup>9</sup>ohms/square): -

Dimensional Change (%): -

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

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

(g) - Virgin and regrind up to 50% by weight have the same basic characteristics with the exception of the weatherability testing.

(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.

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### IEC and ISO Test Methods

Test Name	Test Method	Units	Thk (mm)	Value
Flammability	IEC 60695-11-10, IEC 60695-11-20	Class (color)	0.75	V-0 (BK)
			1.5	V-0, 5VA (BK)
			3.0	V-0, 5VA (BK)
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 AC Dielectric Strength (AC DS)	IEC 60243-1	kV/mm	-	-
IEC DC Dielectric Strength (DC DS)	IEC 60243-2	kV/mm	-	-
IEC Volume Resistivity (VR)	IEC 62631-3-1	10x ohm-m	-	-
IEC Surface Resistivity (SR)	IEC 62631-3-2	10x ohms	-	-
IEC Inclined Plane Tracking (IPT)	IEC 60587	kV	-	-
IEC Ball Pressure	IEC 60695-10-2	°C	-	-

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## UL - Yellow Card

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	-	-