Product Information **Ultramid® Advanced**

N4U41 LS BK

11/2024 **PA9T FR(40)**

Product description

Partially aromatic polyphthalamide for injection molding and extrusion with strong mechanical properties especially at elevated temperatures and excellent chemical resistance for highly stressed parts, electrical insulating parts and cable ducts. The flame retardant is without halogens and can be characterized as polymer with extremely low water absorption and outstanding dimensional stability. It features a high melting point (300°C) and excellent melt stability.

Markets & applications
Automotive: Automotive electrics & electronics (E&E), sensors
E&E: Connectors, SMT (surface mount technology) applications
Consumer goods: Consumer 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the containers should be stored in dry rooms and always carefully closed again after partial quantities have been withdrawn.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.

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	-	-	**PA9T FR(40)**
Density	ISO 1183	kg/m³	**1180**
Viscosity number (0.5% in 96% H_2SO_4)	ISO 307, 1157, 1628	cm³/g	**120**
Water absorption, saturation in water at 23°C	similar to ISO 62	%	**2.9**
Moisture absorption, equilibrium 23°C/50% r.h.	similar to ISO 62	%	**1.2**
Processing			
Melting temperature, DSC	ISO 11357-1/-3	°C	**300**
MVR 325 °C/5 kg	ISO 1133	cm³/10min	**50**
Melt temperature, injection moulding/extrusion	-	°C	**320 - 340**
Mould temperature, injection moulding	-	°C	**100 - 160**
Molding shrinkage, model-housing 1.5 mm	-	%	**1.2**
Molding shrinkage (parallel)	ISO 294-4	%	**1.60**
Molding shrinkage (normal)	ISO 294-4	%	**1.70**
Test specimen production, injection moulding, melt temp.	ISO 294	°C	**330**
Test specimen production, injection moulding, mould temp.	ISO 294	°C	**140**
Thermal properties			
Deflection temp. under load 1.8 MPa (HDT A)	ISO 75-1/-2	°C	**130**
Temperature limit for high temperatures, 20000 h, related to 50% decrease of tensile strength	IEC 60216	°C	**110**
Temperature limit for high temperatures, 5000 h, related to 50% decrease of tensile strength	IEC 60216	°C	**128**
Coeff. of linear therm. expansion 23°C - 55°C (parallel)	ISO 11359-1/-2	E-6/K	**54**
Coeff. of linear therm. expansion 23°C - 55°C (normal)	ISO 11359-1/-2	E-6/K	**61**
Flammability (UL-yellow card see attachment)			
GWFI (thickness)	IEC 60695-2-12	°C (mm)	**960 (0.75)**
Limiting Oxygen Index (LOI)	ISO 4589-1/-2	%	**37**
Electrical properties			**dry / cond.**
Relative permittivity (1 MHz)	IEC 62631-2-1	-	**3.5 / 3.5**
Dissipation factor (1 MHz)	IEC 62631-2-1	E-4	**120 / 220**
Volume resistivity	IEC 62631-3-1	Ohm*m	**1E13 / 1E13**
Surface resistivity	IEC 62631-3-2	Ohm	**- / 1E15**
CTI, solution A	IEC 60112	-	**600**
Mechanical properties			**dry / cond.**
Tensile modulus	ISO 527-1/-2	MPa	**3200 / 3200**
Stress at break	ISO 527-1/-2	MPa	**60 / 60**
Strain at break	ISO 527-1/-2	%	**3.5 / 4**
Flexural modulus	ISO 178	MPa	**3200 / 3200**
Flexural strength	ISO 178	MPa	**110 / 110**
Charpy unnotched impact strength, 23°C	ISO 179/1eU	kJ/m²	**45 / 45**
Charpy unnotched impact strength, -30°C	ISO 179/1eU	kJ/m²	**45 / 45**
Charpy notched impact strength, 23°C	ISO 179/1eA	kJ/m²	**2.5 / 2.5**

Footnotes
1) If product name or properties don't state otherwise.
2) The asterisk symbol '*' signifies inapplicable properties.

BASF SE

67056 Ludwigshafen, Germany

Ultramid® Advanced N4U41 LS BK

UL - Yellow Card

Component - Plastics E41871

BASF SE

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

Advanced N4U41(t)

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

Color	Min. Thk (mm)	Flame Class	HWI	HAI	RTI Elec (°C)	RTI Imp (°C)	RTI Str (°C)
BK	0.40	V-2	1	0	130	105	105
	0.75	V-2	1	0	150	110	110
	1.5	V-0	1	0	150	110	110
	3.0	V-0	0	0	150	110	110

Comparative Tracking Index (CTI):	0	Inclined Plane Tracking (IPT) kV:	-
Dielectric Strength (kV/mm):	32	Volume Resistivity (10^xohm-cm):	-
High-Voltage Arc Tracking Rate (HVTR):	-	Surface Resistivity (10^xohms/square):	-
Dimensional Change (%):	-	High Volt, Low Current Arc Resis (D495):	-

(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: 2019-08-23

Last Revised: 2021-07-21

IEC and ISO Test Methods

Test Name	Test Method	Units	Thk (mm)	Value
Flammability	IEC 60695-11-10	Class (color)	0.40	V-2 (BK)
			0.75	V-2 (BK)
			1.5	V-0 (BK)
			3.0	V-0 (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	-	-
ISO Heat Deflection (1.80 MPa)	ISO 75-2	°C	-	-

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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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67056 Ludwigshafen, Germany