

Product Information

03/2006

Ultramid[®] A3W

PA66

 **BASF**
The Chemical Company

Product description

Easy flowing, heat aging resistant injection moulding grade for fast processing. Uses include highly stressed parts such as bearings, bearing cages, gear-wheels, coil formers and cable connectors.

Physical form and storage

Ultramid[®] is supplied dry and ready to use in moisture-proof packaging in the form of cylindrical or flat pellets. Its bulk density is about 0,7g/cm³. Standard packs are the special 25kg bag and the 1000kg 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air the containers must be stored in dry rooms and always carefully sealed again after portions of material have been withdrawn. Ultramid[®] can be kept indefinitely in the undamaged bags. Experience has shown that product supplied in IBCs can be stored for about 3 months without any adverse effects on processing properties due to moisture absorption. Containers stored in cold rooms should be allowed to equilibrate to normal temperature so that no condensation forms on the pellets.

Product safety

Ultramid[®] melts are thermally stable at the usual temperature for A, B and C up to 310°C and 350°C for T and do not give rise to hazards due to molecular degradation or the evolution of gases and vapors. Like all thermoplastic polymers Ultramid decomposes on exposure to excessive thermal load, e.g. when it is overheated or as a result of cleaning by burning off. In such cases gaseous decomposition products are formed. Decomposition accelerates above 310°C (T >350°C) approximately, the initial products formed being mainly carbon monoxide and ammonia, and caprolactam too in the case of Ultramid[®] B. At temperatures above about 350°C (T >400°C) small quantities of pungent smelling vapors of aldehydes, amines and other nitrogenous decomposition products are also formed. Further safety information see safety data sheet of the individual product.

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.

Typical values at 23°C ¹⁾	Test method ²⁾	Unit	Values ³⁾
Properties			
Polymer abbreviation	-	-	PA66
Density	ISO 1183	kg/m ³	1130
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	%	8 - 9
Moisture absorption, equilibrium 23°C/50% r.h.	similar to ISO 62	%	2.5 - 3.1
Processing			
Melting point	ISO 11357-1/-3	°C	260
Melt volume-flow rate MVR	ISO 1133	cm ³ /10min	100
Temperature	ISO 1133	°C	275
Load	ISO 1133	kg	5
Melt temperature, injection moulding/extrusion	-	°C	280 - 300
Mould temperature, injection moulding	-	°C	40 - 80
Moulding shrinkage, constrained ⁴⁾	-	%	0.85
Flammability			
UL 94 rating at 1,6 mm thickness	UL 94	class	V-2
Automotive materials (Thickness >= 1mm)	-	-	+
Mechanical properties			
			dry / cond.
Tensile modulus	ISO 527-1/-2	MPa	3000 / 1100
Yield stress, 50 mm/min	ISO 527-1/-2	MPa	85 / 50
Yield strain, 50 mm/min	ISO 527-1/-2	%	4.4 / 20
Nominal strain at break, 50 mm/min	ISO 527-1/-2	%	25 / >50
Tensile creep modulus, 1000 h, strain <= 0.5%, 23°C	ISO 899-1	MPa	* / 700
Flexural modulus	ISO 178	MPa	2900 / -
Charpy unnotched impact strength (23°C)	ISO 179/1eU	kJ/m ²	N / N
Charpy notched impact strength (23°C)	ISO 179/1eA	kJ/m ²	6 / 20
Charpy notched impact strength (-30°C)	ISO 179/1eA	kJ/m ²	5 / -
Izod notched impact strength 1A (23°C)	ISO 180/1A	kJ/m ²	5.5 / N
Izod notched impact strength 1A (-30°C)	ISO 180/1A	kJ/m ²	6 / -
Thermal properties			
HDT A (1.80 MPa)	ISO 75-1/-2	°C	75
HDT B (0.45 MPa)	ISO 75-1/-2	°C	220
Max. service temperature (short cycle operation)	-	°C	200
Temperature index at 50% loss of tensile strength after 5000 h	IEC 216	°C	147
Temperature index at 50% loss of tensile strength after 20000 h	IEC 216	°C	121
Coefficient of linear thermal expansion, longitudinal (23-80)°C	ISO 11359-1/-2	E-4/°C	0.7 - 1
Thermal conductivity	DIN 52612-1	W/(m K)	0.33
Specific heat capacity	-	J/(kg*K)	1700
Electrical properties			
			dry / cond.
Relative permittivity (1 MHz)	IEC 60250	-	3.2 / 5
Dissipation factor (1 MHz)	IEC 60250	E-4	250 / 2000
Volume resistivity	IEC 60093	Ohm*m	1E13 / 1E9
Surface resistivity	IEC 60093	Ohm	* / 1E9
Comparative tracking index, CTI, test liquid A	IEC 60112	-	500

Footnotes

1) If the product definition doesn't state otherwise.

2) Specimens according to CAMPUS.

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

4) Test box with central gating, dimensions of base (107*47*1.5) mm, processing condition: TM = 290°C, TW = 60°C