Product Information **Ultramid®**

A3X2G5

07/2015 **PA66-GF25 FR**

We create chemistry

Product description

Glass fibre reinforced injection moulding grade with improved flame retardance based on red phosphorus, giving outstanding mechanical and electrical properties for components requiring high stiffness

Physical form and storage

The product is supplied extensively dry in moisture-proof packaging 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 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air the containers must be stored in dry rooms and always carefully sealed again after portions of material have been withdrawn. The product 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

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.

Safety instructions

Provide suitable exhaust ventilation at the drying process and in the area surrounding the melt outlet of processing machines.
Closed containers should only be opened in well-ventilated areas.
Ensure thorough ventilation of stores and work areas.

When incorrectly processing an unpleasant odour can be produced, especially when the recommended processing parameters are exceeded.
Check
- Moisture content of pellets
- Melt temperature
- Residence time

When there is a strong odour, immediately check processing parameters, ventilate the area well and recheck moisture content of material. If necessary stop processing and redry the material.

Any short stoppages in production, it is recommended that you inject material into the mould not purge an air shot.
Any molten material drooling from the machine nozzle or hot runner nozzles can self-ignite when in open atmosphere.
It is therefore advisable to dispose of purgings etc into water containers.

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

Ultramid® A3X2G5

Product Information

Typical values for uncoloured product at 23 °C[1)]	Test method	Unit	Values[2)]
Properties			
Polymer abbreviation	-	-	**PA66-GF25 FR**
Density	ISO 1183	kg/m³	**1340**
Viscosity number (0.5% in 96 % H2SO4)	ISO 307, 1157, 1628	cm³/g	**140**
Water absorption, saturation in water at 23°C	similar to ISO 62	%	**5.7 - 6.3**
Moisture absorption, equilibrium 23°C/50% r.h.	similar to ISO 62	%	**1.20 - 1.60**
Processing			
Melting temperature, DSC	ISO 11357-1/-3	°C	**260**
MVR 275 °C/5 kg	ISO 1133	cm³/10min	**30**
Melt temperature, injection moulding/extrusion	-	°C	**280 - 300**
Mould temperature, injection moulding	-	°C	**60 - 90**
Moulding shrinkage, constrained [3)]	-	%	**0.5**
Molding shrinkage (parallel)	ISO 2577, 294-4	%	**0.48**
Molding shrinkage (normal)	ISO 2577, 294-4	%	**1.23**
Flammability (UL yellow card see attachment)			
Automotive materials (Thickness >= 1mm) [4)]	FMVSS 302	-	**+**
Mechanical properties			**dry / cond.**
Tensile modulus	ISO 527-1/-2	MPa	**8000 / 6000**
Stress at break	ISO 527-1/-2	MPa	**140 / 100**
Strain at break	ISO 527-1/-2	%	**3 / 4.5**
Tensile creep modulus, 1000 h, strain <= 0.5%, 23°C	ISO 899-1	MPa	*** / 3500**
Flexural modulus	ISO 178	MPa	**7100 / -**
Charpy unnotched impact strength (23°C)	ISO 179/1eU	kJ/m²	**65 / 70**
Charpy unnotched impact strength (-30°C)	ISO 179/1eU	kJ/m²	**60 / 65**
Charpy notched impact strength (23°C)	ISO 179/1eA	kJ/m²	**13 / 17**
Izod notched impact strength (23°C)	ISO 180/A	kJ/m²	**12 / 17**
Thermal properties			
HDT A (1.80 MPa)	ISO 75-1/-2	°C	**250**
HDT B (0.45 MPa)	ISO 75-1/-2	°C	**250**
Max. service temperature (short cycle operation)	-	°C	**220**
Temperature index at 50% loss of tensile strength after 5000 h	IEC 60216	°C	**157**
Temperature index at 50% loss of tensile strength after 20000 h	IEC 60216	°C	**139**
Coefficient of linear thermal expansion, longitudinal (23-80)°C	ISO 11359-1/-2	E-6/K	**25 - 35**
Coefficient of linear thermal expansion, transverse (23-80)°C	ISO 11359-1/-2	E-6/K	**60 - 80**
Thermal conductivity	DIN 52612-1	W/(m K)	**0.33**
Specific heat capacity	-	J/(kg*K)	**1500**
Electrical properties			**dry / cond.**
Relative permittivity (1 MHz)	IEC 60250	-	**3.7 / 5**
Dissipation factor (1 MHz)	IEC 60250	E-4	**200 / 1000**
Volume resistivity	IEC 60093	Ohm*m	**1E13 / 1E10**
Surface resistivity	IEC 60093	Ohm	*** / 1E10**
Comparative tracking index, CTI, test liquid A	IEC 60112	-	**550**
Electric strength K20/K20, (60*60*1 mm^3)	IEC 60243-1	kV/mm	**33 / 30**

Footnotes
1) If product name or properties don't state otherwise.
2) The asterisk symbol '*' signifies inapplicable properties.
3) Test box with central gating, dimensions of base (107*47*1,5) mm, processing condition: TM = 320°C (unreinforced) or 330°C (reinforced), TW = 80°C
4) + = passed

BASF SE

67056 Ludwigshafen, Germany

Ultramid® A3X2G5

UL - Yellow Card

Component - Plastics **E41871**

BASF SE

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

A3X2G5(f2)(r)

Polyamide 66 (PA66), glass reinforced, "Ultramid", furnished as pellets

Color	Min Thk (mm)	Flame Class	HWI	HAI	RTI Elec	RTI Imp	RTI Str
NC, BK	0.40	HB	4	0	110	115	-
	0.60	HB	2	0	110	115	-
NC, BK, GY	0.81	V-0	0	0	120	115	130
	3.0	V-0, 5VA	0	0	120	115	130
	1.5	V-0	0	0	120	115	130

Comparative Tracking Index (CTI): **0**

Inclined Plane Tracking (IPT): **109 min at 1kV**

Dielectric Strength (kV/mm): **19**

Volume Resistivity (10^Xohm-cm) : **11**

High-Voltage Arc Tracking Rate (HVTR): **1**

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.

(r) - Virgin and regrind up to 50% by weight inclusive have the same flammability characteristics for black (BK) colored material only, excluding UL 746C suitability for outdoor use coverage (f2) and Incline Plane Tracking

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: 1974-10-24
Last Revised: 2015-06-26

© 2015 UL LLC

IEC and ISO Test Methods

Test Name	Test Method	Units	Thickness Tested (mm)	Value
Flammability	IEC 60695-11-10, IEC 60695-11-20	Class (color)	0.40	HB75 (NC, BK)
			0.60	HB75 (NC, BK)
			0.81	V-0 (NC, BK, GY)
			3.0	V-0, 5VA (NC, BK, GY)
			1.5	V-0 (NC, BK, GY)
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	3.0	252
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	-	-

© 2015 UL LLC

BASF SE
67056 Ludwigshafen, Germany

Ultramid® A3X2G5

UL - Yellow Card

Component - Plastics **E41871**

BASF SE

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

A3X2G5(f1)

Polyamide 66 (PA66), glass reinforced, "Ultramid", furnished as pellets

Color	Min Thk (mm)	Flame Class	HWI	HAI	RTI Elec	RTI Imp	RTI Str
BK	1.6	V-0	0	0	120	115	130

Comparative Tracking Index (CTI):	0	Inclined Plane Tracking (IPT):	109 min at 1kV
Dielectric Strength (kV/mm):	19	Volume Resistivity (10^xohm-cm) :	11
High-Voltage Arc Tracking Rate (HVTR):	1	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.

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: 1974-10-24
Last Revised: 2015-06-26

© 2015 UL LLC

IEC and ISO Test Methods

Test Name	Test Method	Units	Thickness Tested (mm)	Value
Flammability	IEC 60695-11-10	Class (color)	1.6	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 Ball Pressure	IEC 60695-10-2	C	3.0	252
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	-	-

© 2015 UL LLC