

PPA[®]assion for perfection

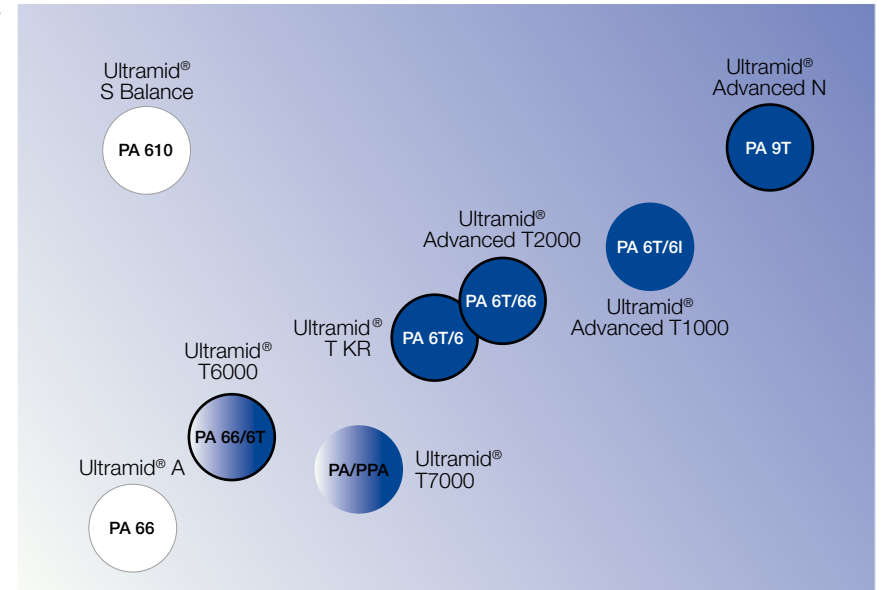
The Ultramid[®] PPA portfolio

BASF is in the unique position to offer customers a state-of-the-art portfolio based on four polyphthalamide (PPA) polymers comprising a product range of about 50 compounded grades. The PPA portfolio is globally available and covers materials which succeed under demanding application conditions and enable customers to develop new parts for future applications.



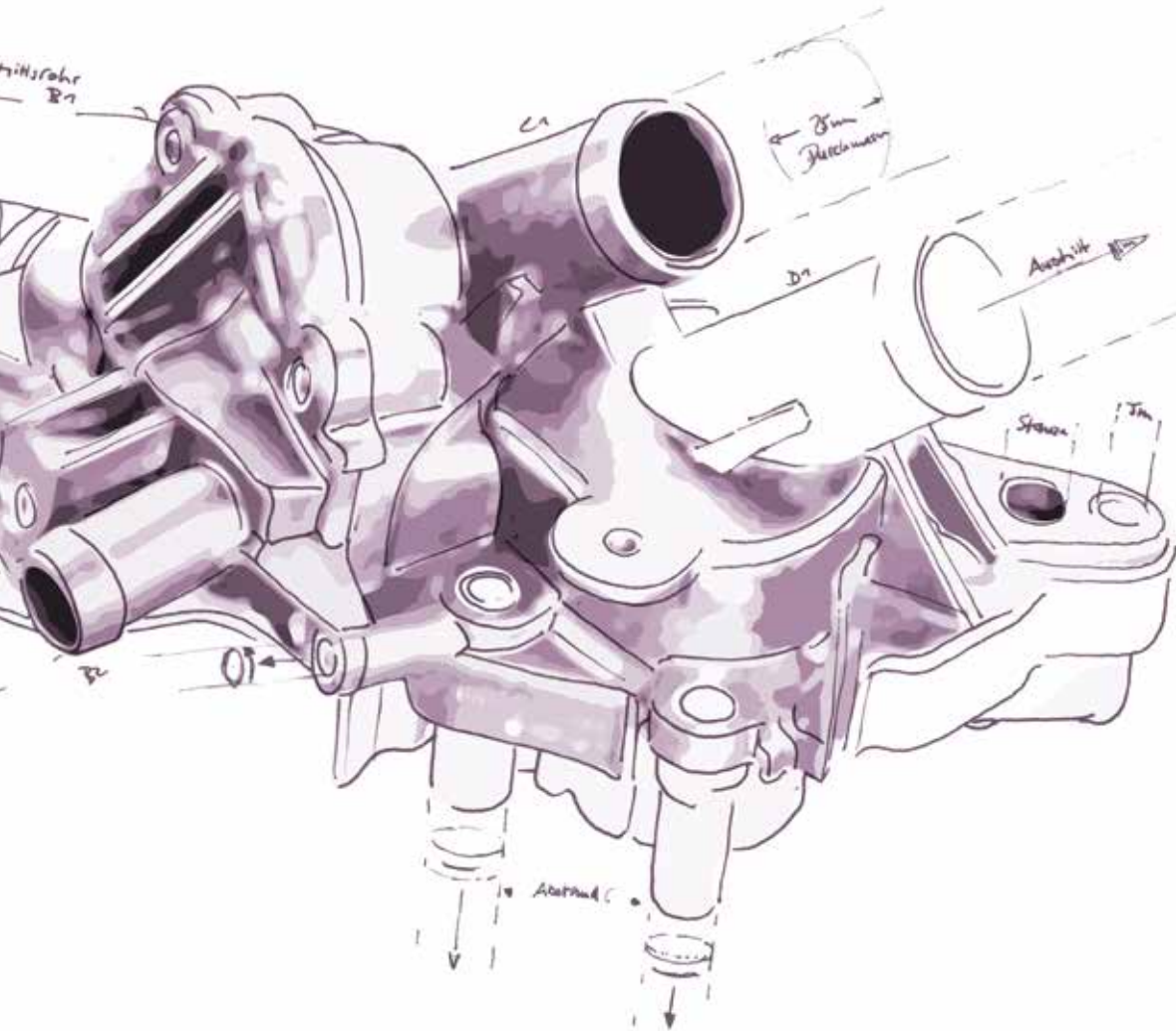
chemical resistance
low water uptake
dimensional stability
hydrophobicity

- PPA = Polyphthalamide
- PPA blend or PPA copolymer, < 55% aromatic diacid content
- PA = Polyamide
- Flame retardant grades available



Performance at elevated temperatures and in humid conditions Glass transition temperature, conditioned

ULTRAMID® PPA P



All PPAs feature:

- A PPA semi-aromatic and semi-crystalline base resin with a high melting point of > 290 °C
- High glass transition temperatures with high mechanical and dielectric strength at elevated temperatures
- Very good dimensional stability due to low and slow water uptake and low thermal expansion coefficient
- Increased resistance to moisture and chemicals
- Ultramid® T7000 (PA/PPA blend) bridges the gap between PA66 and PPA for metal replacement
- Ultramid® T6000 bridges the gap between PA66 and PPA for E&E applications

Best properties

Ultramid®

A e.g. A3HG7	Standard PA66
T6000 e.g. T6340G6	Easy processing similar to standard PA, high flowability, good colorability with even white color shades
T7000 e.g. T7300EG10	PA/PPA blend with good stiffness and strength, low moisture absorption, suited for metal replacement
T KR e.g. TKR4355G7	Highest RTI elec 160 °C for HTPA FR grades, lowest mold temperature, highest toughness of all PPAs
Advanced T1000 e.g. T1300HG7	Highest strength and stiffness of all Ultramid® grades and stable mechanical properties up to ~120 °C (dry) and 80 °C (cond.), chemical resistance
Advanced T2000 e.g. T2300HG7	Best flow, high HDT, good E&E performance
Advanced N e.g. N4HG7	Lowest water uptake, highest T_g cond., excellent chemical and hydrolysis resistance, high toughness, unreinforced materials suitable for extrusion

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Mechanical properties

Ultramid®	Polymer	T _m [°C]	T _g [°C]	HDT A [°C]	Tensile modulus at 23 °C [GPa]	Tensile modulus at 80 °C [GPa]	Tensile modulus at 170 °C [GPa]	Chemical resistance	Chemical resistance lifetime/retention of > 50 % initial strength 120 °C [h]	Chemical resistance lifetime/retention of > 50 % initial strength 130 °C [h]	Chemical resistance lifetime/retention of > 50 % initial strength 135 °C [h]	Saturation at 23 °C in water [%]	Charpy unnotched impact strength at 23 °C [kJ/m²]	Charpy notched impact strength at 23 °C [kJ/m²]	Strain at break at 23 °C [%]
A e.g. A3HG7	PA66	260	60 / cond. 10	250	11.2 / cond. 8.5	cond. 5	3	standard	ca. 2,000	ca. 1,000	ca. 500	5-6	99 / cond. 109	11.9 / cond. 15.3	3 / 5
T6000 e.g. T6340G6	PA66/6T	280	80 / cond. 20	257	11 / cond. 9.1	-	-	good	-	-	-	-	55 / cond. 62	9 / cond. 10	2.5 / 3.3
T7000 e.g. T7300EG10	PA/PPA	255	60-80 / cond. 40	240	17.7 / cond. 16.6	-	-	good	-	-	-	4-5	108 / cond. 100	15 / cond. 15	2.8 / 3.0
T KR e.g. TKR4355G7	PA6T/6	295	90 / cond. 50	245	12 / cond. 12	cond. 5.4	-	high	ca. 2,500	ca. 1,500	ca. 700	4-5	100 / cond. -	14.5 / cond. -	3 / 3
Advanced T1000 e.g. T1300HG7	PA6T/6I	320	125 / cond. 80	> 280	13.5 / cond. 13.5	cond. 12	5	very high	ca. 3,000	ca. 2,000	ca. 1,000	3-4	70 / cond. 60	10 / cond. 8.6	2.2 / 2.0
Advanced T2000 e.g. T2300HG7	PA6T/66	310	95 / cond. 55	280	12 / cond. 11.6	cond. 5.5	4	high	ca. 2,500	ca. 1,500	ca. 700	4-5	90 / cond. 80	9.3 / cond. 9.6	2.6 / 2.8
Advanced N e.g. N4HG7	PA9T	300	125 / cond. 100	270	11.5 / cond. 11.5	cond. 9	5	highest	> 5,000	> 3,000	ca. 3,000	2-3	90 / cond. 70	10 / cond. 8	2.6 / 2.5

Processing

Ultramid®	Melt temperature [°C]	Mold temperature [°C]	Mold shrinkage parallel / normal [%]	Flow spiral length for a thickness of 2 mm [mm]
A e.g. A3HG7	280-300	80-90	0.4 / 1.0	400
T6000 e.g. T6340G6	285-300	90-110	0.3 / 0.95	-
T7000 e.g. T7300EG10	300-320	80-120	0.5 / 0.7	340
T KR e.g. TKR4355G7	310-330	80-120	0.3 / 1.0	325
Advanced T1000 e.g. T1300HG7	335-355	140-170	0.4 / 0.9	370
Advanced T2000 e.g. T2300HG7	320-340	120-160	0.5 / 1.1	400
Advanced N e.g. N4HG7	320-340	125-175	0.5 / 0.9	290

The Ultramid® PPA portfolio

Applications

Application / Technology	Ultramid® T6000	Ultramid® T7000	Ultramid® T KR	Ultramid® Advanced T1000	Ultramid® Advanced T2000	Ultramid® Advanced N
E&E Connectors¹ (e.g., auto connectors)	**		**		***	***
Power electronics¹ (e.g., IGBT)	*		**		**	***
Safe connection & control¹ (e.g., MCB)	***		*		***	**
Consumer electronics¹ (e.g., mobile CCM)						***
Electric powertrain¹ (e.g., e-motor)	*	**		***	**	***
Battery systems¹ (e.g., busbar)	**			**	**	*
Fuel cell (e.g., humidifier)	**	*		***		***
Vehicle sensors¹ (e.g., sensor housing)			**	***	*	*
Motors & actuators (e.g., actuator housing)	*	**		***	**	***
Thermal management (e.g., pumps)	*	**	*	***	*	***
Structural parts (e.g., metal replacement)	**	***	*	***		**
Extrusion (e.g., tubes)						***

1) Flame retardant grades available: please see flyer on flame retardant PPA grades

*** perfect fit / ** good fit / * moderate fit



The right material for the right part: choose the suitable material for your application!
PPA Product Selector on www.ppa.basf.com

Precise part design with Ultrasilim®

The PPA portfolio is supplemented by BASF's exceptional simulation tool Ultrasilim® and its profound application experience. This makes it possible for customers to choose the right material for the right part with a matching, tailor-made application profile.

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 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. (February 2025)

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