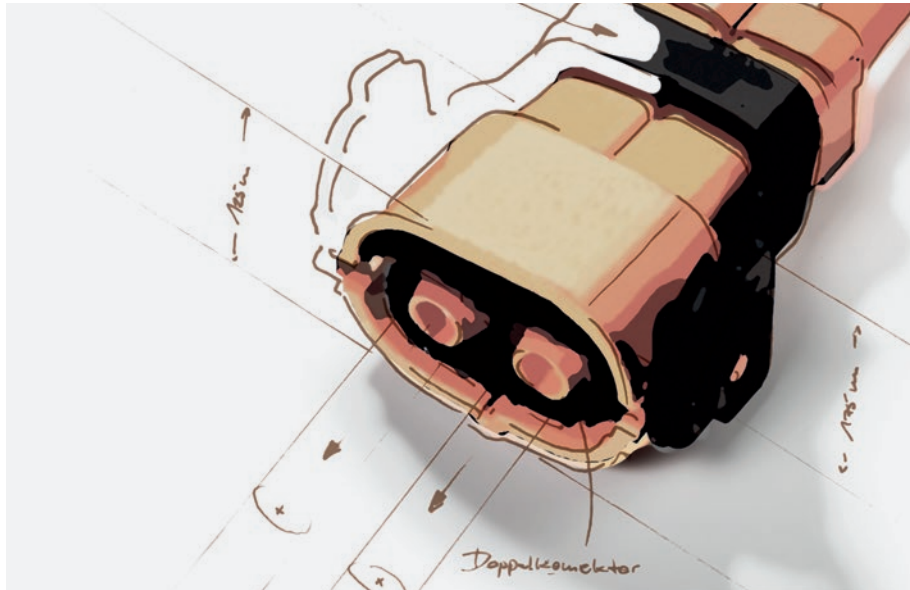


# The flame retardant grades

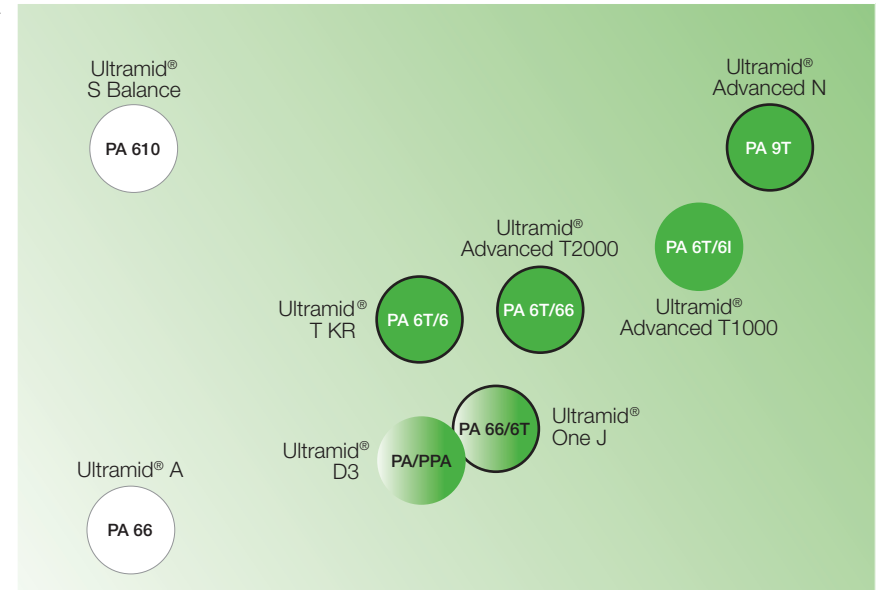
## Ultramid® PPA FR grades

BASF offers a broad range of PPA flame retardant grades, unreinforced and glass-fiber reinforced. Different colors are available. BASF experts support with developing individual colors.



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

## Mechanical properties

Ultramid®	FR grades available	Polymer	T <sub>m</sub> [°C]	HDT A [°C]	Moisture absorption equilibrium 23 °C / 50 % r.h. [%]	Charpy unnotched impact strength at 23 °C [kJ/m <sup>2</sup> ]	Charpy notched impact strength at 23 °C [kJ/m <sup>2</sup> ]	Strain at break at 23 °C [%]
<b>A</b> e.g. A3U42G6	yes	PA66	260	230	1.6 - 1.8	70 / cond. 75	8 / cond. 11	3 / cond. 5
<b>One J</b> e.g. 60X1 V30	yes	PA66/6T	280	257	1.3	55 / cond. 62	9.5 / cond. -	2.5 / cond. 3.3
<b>T KR</b> e.g. TKR4340G6	yes	PA6T/6	290	240	2.0 - 2.4	65 / cond. 50	6.5 / cond. 6.5	2.5 / cond. 2.2
<b>Advanced T1000</b> e.g. T1000HG7	no	PA6T/6I	320	> 280	1.6	75 / cond. -	10 / cond. -	2.2 / cond. 2.1
<b>Advanced T2000</b> e.g. T2340G6	yes	PA6T/66	310	275	1.4 - 1.5	55 / cond. 55	6.5 / cond. 6.5	2.8 / cond. 2.7
<b>Advanced N</b> e.g. N3U41G6	yes	PA9T	300	260	1.0	60 / cond. 50	7 / cond. 7	2.2 / cond. 2.2

## E&E properties

Ultramid®	UL 94 Class [mm]	RTI elec d = 1.5 mm [°C]	GWFI thickness [°C (mm)]	GWIT thickness [°C (mm)]	Halogen-free flame retardant	CTI [V]	SMT performance (blistering)
<b>A</b> e.g. A3U42G6	V-0 (0.4)	140	960 (1)	-	+	600, class 0	limited
<b>One J</b> e.g. 60X1 V30	V-0 (0.4)	150	960 (0.8)	800 (0.8)	+	600, class 0	possible, limited
<b>T KR</b> e.g. TKR4340G6	V-0 (0.4)	160	960 (0.4)	775 (0.4)	+	600, class 0	good
<b>Advanced T1000</b> e.g. T1000HG7	-	-	-	-	-	600, class 0	very good
<b>Advanced T2000</b> e.g. T2340G6	V-0 (0.4)	150	960 (1.5)	-	+	600, class 0	very good
<b>Advanced N</b> e.g. N3U41G6	V-0 (0.25)	150	960 (1)	775 (1)	+	600, class 0	best

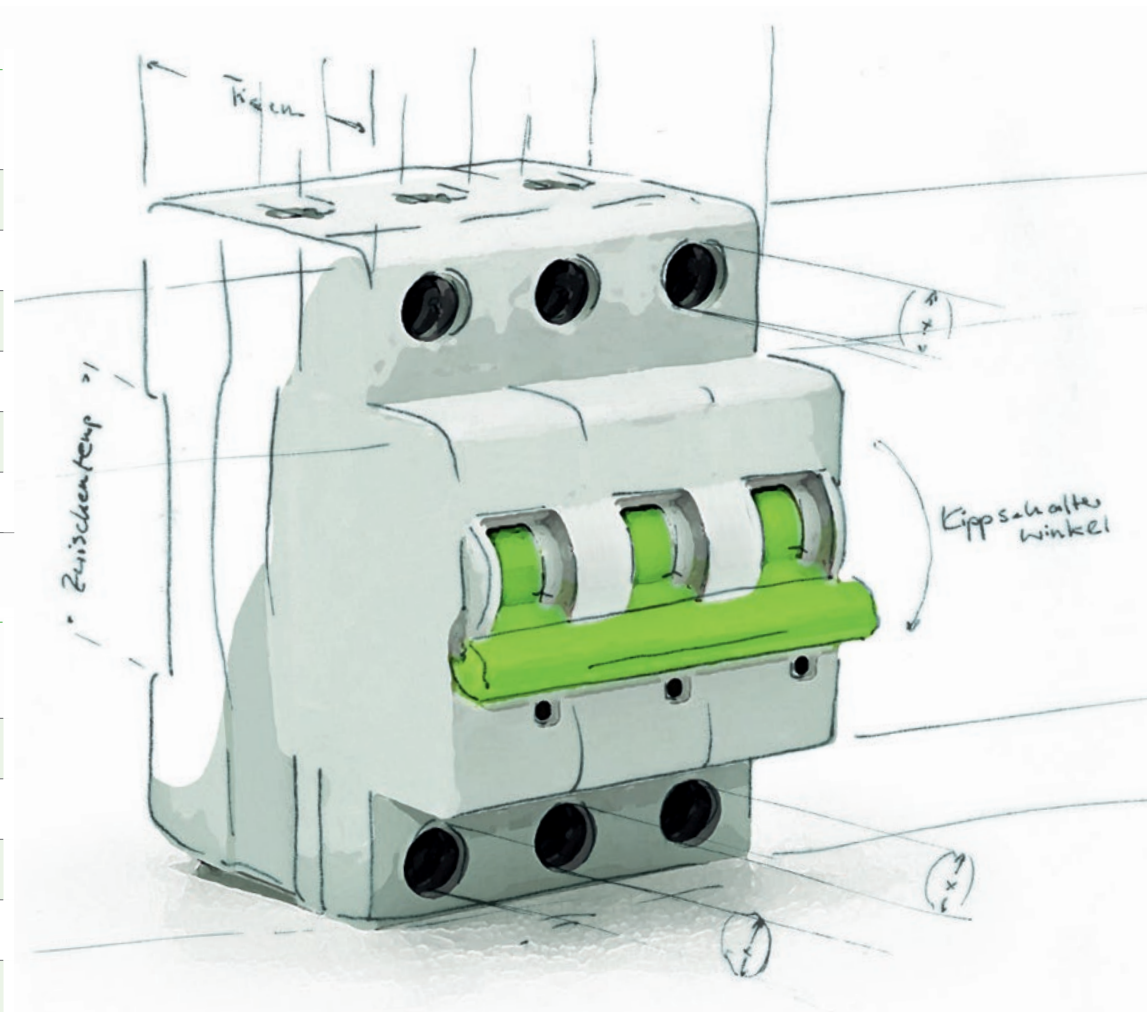
# FR

## Processing

Ultramid®	Melt temperature [°C]	Mold temperature [°C]	Flow spiral length for a thickness of 2 mm [mm]
<b>A</b> e.g. A3U42G6	280-300	80-90	280
<b>One J</b> e.g. 60X1 V30	285-300	90-110	-
<b>T KR</b> e.g. TKR4340G6	310-330	80-120	190
<b>Advanced T1000</b> e.g. T1000HG7	345-360	140-160	370
<b>Advanced T2000</b> e.g. T2340G6	310-330	120-160	390
<b>Advanced N</b> e.g. N3U41G6	310-340	100-160	360

## Best properties

Ultramid®	
<b>A</b> e.g. A3U42G6	Standard PA66
<b>One J</b> e.g. 60X1 V30	Easy processing similar to standard PA, high flowability, good colorability with even white color shades
<b>T KR</b> e.g. TKR4340G6	Highest RTI elec 160 °C for FR grades, lowest mold temperature, highest toughness of all PPAs
<b>Advanced T1000</b> e.g. T1000HG7	Highest strength and stiffness of all Ultramid® grades and stable mechanical properties up to -120 °C (dry) and 80 °C (cond.), chemical resistance
<b>Advanced T2000</b> e.g. T2340G6	Best flow, high HDT
<b>Advanced N</b> e.g. N3U41G6	Lowest water uptake and thermal expansion, best chemical resistance, highest T <sub>g</sub> conditioned, strongest performance at elevated temperatures



# Ultramid® PPA FR

## Product portfolio and applications

Application field	Ultramid® One J	Ultramid® T KR	Ultramid® Advanced T1000	Ultramid® Advanced T2000	Ultramid® Advanced N
Consumer electronics	**	**	*	***	***
E&E connectors	***	***	*	***	***
E-mobility	**	**	*	***	***
Fuel cell	**	*	***	*	***
MCB, MCCB	***	**			**
Sensors		**	***	***	***

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

### Ultramid® PPA FR grades feature:

- A PPA semi-aromatic base resin with high melting point of > 290 °C suited for SMT applications
- FR system without halogens allowing for V-0 rating at thicknesses down to < 0.4 mm
- 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
- Ultramid® One J bridges the gap between PA66 and PPA for E&E applications



The right material for the right part: choose the suitable material for your application!  
**PPA Product Selector on [www.ppa.basf.com](http://www.ppa.basf.com)**

#### 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. (March 2022)

For further questions please contact the Ultra-Infopoint: +49 621 60-78780 / [ultraplaste.infopoint@basf.com](mailto:ultraplaste.infopoint@basf.com)

[www.ppa.basf.com](http://www.ppa.basf.com)

