Ultradur® (PBT)

Product Range

BASF

We create chemistry

Ultradur® (PBT)

Ultradur® is BASF's trade name for its line of partially crystalline saturated polyesters. This line is based on polybutylene terephthalate and is employed in applications demanding a high performance level such as load bearing parts in different industrial sectors. Ultradur® is outstanding for its high rigidity and strength, very good dimensional stability, low water absorption and high resistance to many chemicals. Moreover, Ultradur® exhibits exceptional resistance to weathering and excellent heat aging behavior.

Ultradur® (PBT)

Overview Product Portfolio

Unreinforced grades	
B1520 FC R01 B1523 FC R01	Very easy-flowing injection-molding grade for thin-walled packaging with food contact and reduced THF emission.
B2550/B2550 FC	Easy-flowing grade for coating paper and board with high heat resistance, for example for packaging of frozen goods and ready-prepared meals. Also suitable for injection-molding applications with demands on the flowability and for the manufacture of fibers in the spinning process.
B4500/B4500 FC B4520 B4520 FC Aqua®	Medium-viscosity grade for manufacturing thin-walled profiles and pipes. The grade is also suitable for the manufacture of industrial functional parts in injection-molding.
B4560	Medium viscosity injection-molding grade with good processability for technical components in the automotive sector, such as headlamp housings. Suitable for direct metallizing.
Grades with high viscosity	
B6550/B6550 FC B6550 L/B6550 LN B6550 LNX B6551 LNI B4440 R01	Unreinforced, highly viscous grades for extrusion of jacketing of fiber optic cables as well as plates, semi-finished products for shape-cutting, profiles and tubes.
Reinforced grades	
B4300 G2/G4/G6/G10	Injection-molding grades with 10 % to 50 % glass fibers, for industrial parts, rigid, tough and dimensionally stable, for example for thermostat parts, small-motor housings for vehicles, headlamp frames, cams, windshield wiper arms, plug-in connectors, housings, consoles, contact mounts and covers.
B4040G4/G6/G10	Injection-molding grades with 10 % to 50 % glass fibers for industrial parts with excellent surface quality, for example for door handles in vehicles, sunroof frames, oven door handles, toaster casings, exterior mirrors, rear screen wiper arms in vehicles and sunroof wind deflectors.
S4090G2/G4/G6	Low-warpage, easy flowing injection-molding grades with 10 % to 30 % glass fibers for industrial parts with high dimensional stability requirements, for example for plug-in connectors and housings.
S4090GX/G4X/G6X	Low-warpage, easy-flowing injection-molding grades with very good processing properties, with 14 % to 30 % glass fibers, for industrial parts with high dimensional stability requirements, for example for internal applications for vehicles, plug-in connectors and housings.
Grades with excellent flowability	
B4520 High Speed B4300G2/G3/G4/G6 High Speed	Easy-flowing injection-molding grades with 10 % to 30 % glass fibers, for industrial parts, rigid, tough and dimensionally stable, for example for housings, consoles, plug-in connectors, contact carriers and covers.
S4090G4/G6 High Speed	Low-warpage, easy-flowing injection-molding grades with 20 % or 30 % glass fibers for industrial parts with high dimensional stability requirements, for example for internal applications for vehicles, plug-in connectors and housings.
Grades with particularly short cycle times and good flowability	
B4300G2/G3/G4 HPP	Fast-crystallizing, easy-flowing injection-molding grades with 10 % to 20 % glass fibers. Optimized for short cycle times in injection-molding. Suitable for technical parts that are rigid, tough, and dimensionally stable, such as housings, brackets, connectors, contact carriers, and covers.
Impact-modified grades	
B4340ZG2 High Speed B4340ZG3	Impact-modified injection-molding grade with 10 % or 15 % glass fibers and high creep resistance. For technical parts such as automotive connectors.
Grades with very low distortion	
B4300K4/K6	Injection-molding grades with 20 % to 30 % glass beads for industrial parts with low warpage, for example precision parts for optical instruments, chassis, housings (including gas meter housings).

B4300M5	Mineral-reinforced injection-molding grades for rigid parts with good surface quality and low warpage, for example central automotive door locks, housings and visible parts of domestic appliances.
B4300GM42	Mixed glass-fiber reinforced and mineral-reinforced injection-molding grade with good surface quality and rigidity and with low warpage for parts such as housings and printed circuit boards.
Flame-retardant grades	
B4406 unreinforced B4406G2/G4/G6	Flame-retardant injection-molding grades, unreinforced or with 10 % to 30 % glass fibers, for parts requiring enhanced flame-retardance, for example plug-in connectors and housings, coil formers and lighting components.
B4406G6 High Speed	Easy-flowing injection-molding grade with 30 % glass-fiber content, with flame-retardant properties, for components that require enhanced flame-retardance, e.g. plug-in connectors and housings, coil formers and lighting components.
B4441G5	Halogen-free flame-retardant injection-molding grade with 25 % of glass fibers for parts requiring enhanced flame-retardance. Specially optimized for the filament requirements of IEC 60335 for increased tracking resistance, for example for plug-in connectors, switch parts and housings for domestic appliances.
B4450G5	Halogen-free flame-retardant injection-molding grade with 25 % glass fibers for parts requiring enhanced flameretardance as well as maximum tracking resistance, for example for plug-in connectors, switch parts or housings for power electronics.
B4450G5 HR	Halogen-free flame-retardant injection-molding grade with 25 % glass fibers for parts requiring enhanced flame-retardance as well as maximum tracking resistance and additionally meeting the requirements in terms of hydrolysis stability.
B4440 unreinforced B4440G2	Flame-retardant injection-molding grades, unreinforced or with 10 % to 20 % glass fibers for parts requiring enhanced flame-retardance, for example plug-in connectors and housings, coil formers and lighting components.
Reinforced grades with outstanding hydrolysis resistance	
B4330G3/G6 HR B4335G3 HR High Speed B4330G6 HR High Speed	Impact-modified injection-molding grade with 15 % or 30 % glass fibers, for industrial parts with increased demands on the hydrolysis stability with increased resistance to alkaline solutions, for example for housings and plug-in connectors in the engine compartment.
B4331G3 HR B4331G6 HR	Impact-modified injection-molding grades with 15 % or 30 % glass fibers and optimized processing behavior. Suitable for technical parts with increased requirements for hydrolysis stability and enhanced resistance to alkalis, such as housings and connectors in the engine compartment. CTI600 for injection-molding grades with a 15 % glass fiber content.
B4300G6 HR LT	Injection-molding grade with 30 % glass fibers, for industrial parts with increased demands on the hydrolysis stability, for example for housings and plug-in connectors in the engine compartment. Laser-weldable grades with 20 % or 30 % glass fibers; specified transparency for radiation in the near infrared area (800-1100 nm), e.g. of Nd:YAG or diode lasers.
B4331C3 HR	Impact-modified injection-molding grade with 15 % carbon fiber content, for technical components with increased hydrolysis-stability requirements, durably antistatic, electrically conductive, e.g. for components of measurement and control devices, components in explosion-proof areas, automotive sensors.
Reinforced grades with particularly high laser transparency for laser welding	
LUX B4300G4/G6	Highly laser-weldable grades with 20 % or 30 % glass fibers; particularly high specified transparency for radiation in the near infrared area (800-1100 nm), e.g. of Nd:YAG or diode lasers.
Grades with special properties	
LS	Laser-markable products; can be marked with a Nd:YAG laser (1064 nm).
LT	Laser-transparent grades with specified laser transparency; for radiation in the near infrared area (800-1100 nm), e.g. of Nd:YAG or diode lasers.
FC/FC Aqua®	Products suitable for use in drinking water and/or food contact. They meet the regulatory requirements for the corresponding areas of use.
PRO	Products which meet the regulatory requirements in particular in the area of medical devices, such as insulin pens or inhalers.

We also offer further products with special properties or for special applications. For more information on products with a special finish, please contact the Ultra-Infopoint.

Ultradur® Grades

Unreinforced grades

Typical values at 23 °C for uncolored products	Unit	Test method	B1520 FC R01
Product Features			
Symbol	–	ISO 1043	PBT
Colors: uncolored (UN), black (BK)	–	–	UN
Density	kg/m³	ISO 1183	1,310
Viscosity number, solution 0.005 g/ml phenol/1.2-dicholoro benzene (1:1)	cm³/g	ISO 1628	88
Water absorption, saturation in water at 23 °C	%	similar to ISO 62	0.5
Moisture absorption, saturation in standard atmosphere 23 °C / 50 % r. h.	%	similar to ISO 62	0.25
Processing methods			
Melting temperature, DSC	°C	ISO 11357-1/-3	223
Melt volume rate MVR 250 / 2.16	cm³/10 min	ISO 1133	110
Melt volume rate MVR 275 / 2.16	cm³/10 min	ISO 1133	
Melt volume rate MVR 260 / 5	cm³/10 min	ISO 1133	
Melt temperature range, injection-molding	°C	–	260-280
Mold temperature range, injection-molding	°C	–	20-60
Melt temperature range, extrusion	°C	–	
Molding shrinkage, free, longitudinal/transversal	%	ISO 2577, 294-4	1.90/1.80
Fire behavior			
Flammability according to UL94 (thickness)[1]	class (mm)	UL94	
Flammability (thickness)	class (mm)	IEC 60695-11-10	
Flammability of materials in cars at d ≥ 1 mm thickness[2]	–	FMVSS 302	
Mechanical properties			
Tensile modulus of elasticity	MPa	ISO 527-1/-2	2,500
Tensile stress at yield (v = 50 mm / min), stress at break* (v = 5 mm / min)	MPa	ISO 527-1/-2	58
Strain at yield (v = 50 mm / min)	%	ISO 527-1/-2	4
Nominal strain at break (v = 50 mm / min), strain at break* (v = 5 mm / min)	%	ISO 527-1/-2	12
Tensile creep modulus, 1.000 h, elongation ≤ 0.5 %, +23 °C	MPa	ISO 899-1	
Flexural modulus	MPa	ISO 178	
Flexural strength	MPa	ISO 178	
Charpy impact strength (23 °C)[3]	kJ/m²	ISO 179/1eU	130
Charpy impact strength (-30 °C)[3]	kJ/m²	ISO 179/1eU	
Charpy notched impact strength (23 °C)[3]	kJ/m²	ISO 179/1eA	3
Charpy notched impact strength (-30 °C)[3]	kJ/m²	ISO 179/1eA	
Ball intendation hardness H 358 N / 30 sec, H 961 N / 30 sec*	MPa	ISO 2039-1	
Thermal properties			
Heat deflection temperature under 1.8 MPa (HDT/A)	°C	ISO 75-1/-2	55
Heat deflection temperature under 0.45 MPa (HDT/B)	°C	ISO 75-1/-2	150
Max. service temperature (short cycle operation)[4]	°C	–	
Temperature index, at 50 % loss of tensile strength after 20,000 h / 5.000 h	°C	IEC 60216-1	
Thermal coefficient of linear expansion, longitudinal/perpendicular (23-55) °C	10^{-6}/K	ISO 11359-1/-2	
Thermal conductivity (23 °C)	W/(m·K)	DIN 52 612-1	
Specific heat capacity (23 °C)	J/(kg·K)		1,150
Electrical properties			
Dielectric constant at 100 Hz / 1 MHz	–	IEC 60250	
Dissipation factor at 100 Hz / 1 MHz	10^{-4}	IEC 60250	
Volume resistivity	Ω·m	IEC 60093	
Surface resistivity	Ω	IEC 60093	
Comparative tracking index CTI, test solution A	–	IEC 60112	
Available versions			
Laser-markable (LS) / Laser-transparent (LT)	–	–	

[1] yellow card available
[2] + = passed
[3] NB = no break

[4] Typical values for parts required to withstand repeated exposure to this temperature for several hours over years of use, assuming appropriate shaping and processing for the material.

B1523 FC R01	B2500	B4500	B4520	B4560	B4521 Pro
PBT	PBT	PBT	PBT	PBT	PBT
UN	UN	UN	UN/BK	BK	UN
1,300	1,300	1,300	1,300	1,300	1,300
100	107	130	130	112	127
	0.5	0.5	0.5	0.5	0.5
	0.25	0.25	0.25	0.25	0.25
224	223	223	223	223	223
90	45	21	21	35	25
260-280	245-275	250-275	250-275	230-275	250-270
20-60	40-70	40-70	40-70	40-70	40-70
		230-260			
2.04/2.22	1.60/1.90	1.60/1.90	1.50/1.70	1.31/1.64	2.10/2.50
		HB (≥ 0.8 mm)	HB (≥ 0.8 mm)		
	HB (≥ 0.8 mm)			HB (≥ 1.5 mm)	
1,600	2,500	2,500	2,500	2,600	2,600
43	57	55	55	60	60
10	3.7	3.7	3.7	3.7	10.8
20	35	>50	>50	30	30
	1,100	1,200	1,200		
1,650		2,300	2,400	2,600	
60		85	85	90	
225	250	N	N	140	228
	120	180	180	85	140
5	4.1	5.2	5	3.8	4.5
	4	4	3	4.9	
	130	130	130		
53	65	65	55	60	55
145	165	165	165	135	155
	200	200	200	160	
		135/145	135/145		
	110/110		110/ –	115/115	110/110
	0.27	0.27	0.27	0.27	
1,450	1,250	1,250	1,250		
	3.3/3.3	3.3/3.3	3.4/3.3	3.4/3.3	3.4/3.3
	13/200	10/200	20/200	20/200	20/200
	10^{14}	10^{14}	10^{14}	10^{14}	10^{14}
	10^{13}	10^{13}	10^{13}	10^{13}	10^{13}
	500	550	550	550	550

Ultradur® Grades

Grades with high viscosity

Typical values at 23 °C for uncolored products	Unit	Test method	B6550
Product Features			
Symbol	–	ISO 1043	PBT
Colors: uncolored (UN), black (BK)	–	–	UN
Density	kg/m³	ISO 1183	1,300
Viscosity number, solution 0.005 g/ml phenol/1.2-dicholoro benzene (1:1)	cm³/g	ISO 1628	160
Water absorption, saturation in water at 23 °C	%	similar to ISO 62	0.5
Moisture absorption, saturation in standard atmosphere 23 °C/50 % r.h.	%	similar to ISO 62	0.25
Processing methods			
Melting temperature, DSC	°C	ISO 11357-1/-3	223
Melt volume rate MVR 250 / 2.16	cm³/10 min	ISO 1133	9.5
Melt volume rate MVR 275 / 2.16	cm³/10 min	ISO 1133	
Melt volume rate MVR 260 / 5	cm³/10 min	ISO 1133	
Melt temperature range, injection-molding	°C	–	250-275
Mold temperature range, injection-molding	°C	–	40-80
Melt temperature range, extrusion	°C	–	230-260
Molding shrinkage, free, longitudinal/transversal	%	ISO 2577, 294-4	1.70/2.10
Fire behavior			
Flammability according to UL94 (thickness)[1]	class (mm)	UL94	
Flammability (thickness)	class (mm)	IEC 60695-11-10	HB (≥ 0.8 mm)
Flammability of materials in cars at d ≥ 1 mm thickness[2]	–	FMVSS 302	
Mechanical properties			
Tensile modulus of elasticity	MPa	ISO 527-1/-2	2,400
Tensile stress at yield (v = 50 mm/min), stress at break* (v = 5 mm/min)	MPa	ISO 527-1/-2	54
Strain at yield (v = 50 mm/min)	%	ISO 527-1/-2	3.5
Nominal strain at break (v = 50 mm/min), strain at break* (v = 5 mm/min)	%	ISO 527-1/-2	>50
Tensile creep modulus, 1.000 h, elongation ≤ 0.5 %, +23 °C	MPa	ISO 899-1	1,100
Flexural modulus	MPa	ISO 178	2,500
Flexural strength	MPa	ISO 178	85
Charpy impact strength (23 °C)[3]	kJ/m²	ISO 179/1eU	N
Charpy impact strength (-30 °C)[3]	kJ/m²	ISO 179/1eU	250
Charpy notched impact strength (23 °C)[3]	kJ/m²	ISO 179/1eA	6.1
Charpy notched impact strength (-30 °C)[3]	kJ/m²	ISO 179/1eA	
Ball intendation hardness H 358 N/30 sec, H 961 N/30 sec*	MPa	ISO 2039-1	130
Thermal properties			
Heat deflection temperature under 1.8 MPa (HDT/A)	°C	ISO 75-1/-2	55
Heat deflection temperature under 0.45 MPa (HDT/B)	°C	ISO 75-1/-2	135
Max. service temperature (short cycle operation)[4]	°C	–	200
Temperature index, at 50 % loss of tensile strength after 20,000 h/5.000 h	°C	IEC 60216-1	
Thermal coefficient of linear expansion, longitudinal/perpendicular (23-55) °C	10^{-6}/K	ISO 11359-1/-2	
Thermal conductivity (23 °C)	W/(m·K)	DIN 52 612-1	0.27
Specific heat capacity (23 °C)	J/(kg·K)		1,250
Electrical properties			
Dielectric constant at 100 Hz/1 MHz	–	IEC 60250	3.3/3.3
Dissipation factor at 100 Hz/1 MHz	10^{-4}	IEC 60250	10/200
Volume resistivity	Ω·m	IEC 60093	10^{14}
Surface resistivity	Ω	IEC 60093	10^{13}
Comparative tracking index CTI, test solution A	–	IEC 60112	600
Available versions			
Laser-markable (LS)/Laser-transparent (LT)	–	–	

[1] yellow card available
[2] + = passed
[3] NB = no break
[4] Typical values for parts required to withstand repeated exposure to this temperature for several hours over years of use, assuming appropriate shaping and processing for the material.

B6550 L	B6550 LN	B6550 LNX R01	B6551 LNI R01
PBT	PBT	PBT	PBT
UN	UN	UN	UN
1,300	1,300	1,300	1,300
160	160	145	165
0.5	0.4	0.4	0.4
0.25	0.25	0.25	0.25
223	223	223	223
9.5	9.5	6	3
250-275	260-270	260-270	260-270
40-80	40-80	40-80	
230-260	250-270	250-270	250-270
HB (≥ 0.8 mm)	HB (≥ 0.8 mm)		HB (≥ 1.5 mm)
2,500	2,600	2,500	2,500
55	56	55	54
3.5	3.5	10	3.2
>50	>50	>50	>50
2,030	2,700	2,400	2.600
76	85	80	80
N	N	280	N
220	220		
5.8	5.2	5	5
	5.3		3
55	50	60	53
135	135	150	
	135/145		
	110/110		105/105
3.4/3.2	3.4/3.2		
13/221	19/219		
10^{14}	10^{14}		
10^{13}	10^{13}		
600	600		

Ultradur® Grades

Reinforced grades

Typical values at 23 °C for uncolored products	Unit	Test method	B4300G2
Product Features			
Symbol	–	ISO 1043	PBT GF10
Colors: uncolored (UN), black (BK)	–	–	UN/BK
Density	kg/m³	ISO 1183	1,370
Viscosity number, solution 0.005 g/ml phenol/1.2-dicholoro benzene (1:1)	cm³/g	ISO 1628	115
Water absorption, saturation in water at 23 °C	%	similar to ISO 62	0.4
Moisture absorption, saturation in standard atmosphere 23 °C/50 % r.h.	%	similar to ISO 62	0.2
Processing methods			
Melting temperature, DSC	°C	ISO 11357-1/-3	223
Melt volume rate MVR 250/2.16	cm³/10 min	ISO 1133	16
Melt volume rate MVR 275/2.16	cm³/10 min	ISO 1133	
Melt volume rate MVR 260/5	cm³/10 min	ISO 1133	
Melt temperature range, injection-molding	°C	–	250-275
Mold temperature range, injection-molding	°C	–	60-100
Melt temperature range, extrusion	°C	–	
Molding shrinkage, free, longitudinal/transversal	%	ISO 2577, 294-4	1.22/1.38
Fire behavior			
Flammability according to UL94 (thickness)[1]	class (mm)	UL94	HB (≥ 0.8 mm)
Flammability (thickness)	class (mm)	IEC 60695-11-10	
Flammability of materials in cars at d ≥1 mm thickness[2]	–	FMVSS 302	
Mechanical properties			
Tensile modulus of elasticity	MPa	ISO 527-1/-2	4,400
Tensile stress at yield (v = 50 mm/min), stress at break* (v = 5 mm/min)	MPa	ISO 527-1/-2	80*
Strain at yield (v = 50 mm/min)	%	ISO 527-1/-2	
Nominal strain at break (v = 50 mm/min), strain at break* (v = 5 mm/min)	%	ISO 527-1/-2	4.5*
Tensile creep modulus, 1.000 h, elongation ≤0.5 %, +23 °C	MPa	ISO 899-1	
Flexural modulus	MPa	ISO 178	4,100
Flexural strength	MPa	ISO 178	140
Charpy impact strength (23 °C)[3]	kJ/m²	ISO 179/1eU	37
Charpy impact strength (-30 °C)[3]	kJ/m²	ISO 179/1eU	38
Charpy notched impact strength (23 °C)[3]	kJ/m²	ISO 179/1eA	3.5
Charpy notched impact strength (-30 °C)[3]	kJ/m²	ISO 179/1eA	
Ball intendation hardness H 358 N/30 sec, H 961 N/30 sec*	MPa	ISO 2039-1	160*
Thermal properties			
Heat deflection temperature under 1.8 MPa (HDT/A)	°C	ISO 75-1/-2	175
Heat deflection temperature under 0.45 MPa (HDT/B)	°C	ISO 75-1/-2	210
Max. service temperature (short cycle operation)[4]	°C	–	210
Temperature index, at 50 % loss of tensile strength after 20,000 h/5.000 h	°C	IEC 60216-1	130/150
Thermal coefficient of linear expansion, longitudinal/perpendicular (23-55) °C	10^{-6}/K	ISO 11359-1/-2	60/125
Thermal conductivity (23 °C)	W/(m·K)	DIN 52 612-1	0.23
Specific heat capacity (23 °C)	J/(kg·K)		1,200
Electrical properties			
Dielectric constant at 100 Hz/1 MHz	–	IEC 60250	3.6/3.6
Dissipation factor at 100 Hz/1 MHz	10^{-4}	IEC 60250	12/150
Volume resistivity	Ω·m	IEC 60093	10^{14}
Surface resistivity	Ω	IEC 60093	10^{13}
Comparative tracking index CTI, test solution A	–	IEC 60112	300
Available versions			
Laser-markable (LS)/Laser-transparent (LT)	–	–	

[1] yellow card available
[2] + = passed
[3] NB = no break

[4] Typical values for parts required to withstand repeated exposure to this temperature for several hours over years of use, assuming appropriate shaping and processing for the material.

B4300G4	B4300G6	B4300G10	B4040G4	B4040G6	B4040G10
PBT GF20	PBT GF30	PBT GF50	PBT+PET GF20	PBT+PET GF30	PBT+PET GF50
UN/BK	UN/BK	UN/BK	BK	BK	BK
1,450	1,530	1,730	1,470	1,550	1,730
107	105	97	105	105	90
0.4	0.4	0.4	0.4	0.4	0.4
0.2	0.2	0.2	0.2	0.2	0.2
223	223	223	223	223	223
15	11	3.5			
			22	15	1.8
250-275	250-275	260-275	250-280	250-280	250-280
60-100	60-100	80-120	60-100	60-100	60-100
0.43/1.16	0.34/1.07		0.40/0.90	0.30/0.90	0.24/0.77
HB (≥ 0.8 mm)	HB (≥ 0.8 mm)	HB (≥ 0.8 mm)			
			HB (≥ 0.8 mm)	HB (≥ 0.8 mm)	HB (≥ 0.8 mm)
7,000	9,800	16,500	7,500	10,500	18,000
115*	137*	160*	120*	145*	170*
3.5*	3*	1.7*	2.8*	2.6*	1.6*
	7,500				
6,570	9,460	15,000	7,010		17,700
170	210		190		270
54	70	60	40	60	60
50	68	70	40	55	70
6.5	9	11	5.5	8	10
6	8.5	10			
180*	190*	220*	190		
205	215	215	180	200	205
220	220	220	215	220	221
210	210	210	210	210	210
140/160	150/165	150/170			
35/125	25/115	20/95	35/105	25/110	15/80
0.25	0.27	0.36			
1,150	1,050	950	1,100	1,050	950
3.7/3.7	4/3.8	4/4	3.7/3.5	4/3.8	4.7/4.5
12/150	25/170	12/150	14/180	16/170	20/150
10^{14}	10^{14}	10^{14}	10^{14}	10^{14}	10^{14}
10^{13}	10^{13}	10^{13}	10^{13}	10^{13}	10^{13}
300	375	425	300	250	225
	LS/LT	LS			

Ultradur® Grades

Reinforced grades

Typical values at 23 °C for uncolored products	Unit	Test method	S4090G2
Product Features			
Symbol	–	ISO 1043	PBT+ASA+PET GF10
Colors: uncolored (UN), black (BK)	–	–	BK
Density	kg/m³	ISO 1183	1,310
Viscosity number, solution 0.005 g/ml phenol/1.2-dicholoro benzene (1:1)	cm³/g	ISO 1628	105
Water absorption, saturation in water at 23 °C	%	similar to ISO 62	0.4
Moisture absorption, saturation in standard atmosphere 23 °C/50 % r.h.	%	similar to ISO 62	0.2
Processing methods			
Melting temperature, DSC	°C	ISO 11357-1/-3	223
Melt volume rate MVR 250 / 2.16	cm³/10 min	ISO 1133	
Melt volume rate MVR 275 / 2.16	cm³/10 min	ISO 1133	20
Melt volume rate MVR 260 / 5	cm³/10 min	ISO 1133	
Melt temperature range, injection-molding	°C	–	250-275
Mold temperature range, injection-molding	°C	–	60-100
Melt temperature range, extrusion	°C	–	
Molding shrinkage, free, longitudinal/transversal	%	ISO 2577, 294-4	
Fire behavior			
Flammability according to UL94 (thickness)[1]	class (mm)	UL94	HB (≥ 0.8 mm)
Flammability (thickness)	class (mm)	IEC 60695-11-10	
Flammability of materials in cars at d ≥ 1 mm thickness[2]	–	FMVSS 302	
Mechanical properties			
Tensile modulus of elasticity	MPa	ISO 527-1/-2	4,500
Tensile stress at yield (v = 50 mm/min), stress at break* (v = 5 mm/min)	MPa	ISO 527-1/-2	75*
Strain at yield (v = 50 mm/min)	%	ISO 527-1/-2	
Nominal strain at break (v = 50 mm/min), strain at break* (v = 5 mm/min)	%	ISO 527-1/-2	2.9*
Tensile creep modulus, 1.000 h, elongation ≤ 0.5 %, +23 °C	MPa	ISO 899-1	3,300
Flexural modulus	MPa	ISO 178	4,100
Flexural strength	MPa	ISO 178	119
Charpy impact strength (23 °C)[3]	kJ/m²	ISO 179/1eU	37
Charpy impact strength (-30 °C)[3]	kJ/m²	ISO 179/1eU	24
Charpy notched impact strength (23 °C)[3]	kJ/m²	ISO 179/1eA	4
Charpy notched impact strength (-30 °C)[3]	kJ/m²	ISO 179/1eA	3.2
Ball intendation hardness H 358 N/30 sec, H 961 N/30 sec*	MPa	ISO 2039-1	140*
Thermal properties			
Heat deflection temperature under 1.8 MPa (HDT/A)	°C	ISO 75-1/-2	105
Heat deflection temperature under 0.45 MPa (HDT/B)	°C	ISO 75-1/-2	190
Max. service temperature (short cycle operation)[4]	°C	–	170
Temperature index, at 50 % loss of tensile strength after 20,000 h/5.000 h	°C	IEC 60216-1	
Thermal coefficient of linear expansion, longitudinal/perpendicular (23-55) °C	10^{-6}/K	ISO 11359-1/-2	50/–
Thermal conductivity (23 °C)	W/(m·K)	DIN 52 612-1	0.27
Specific heat capacity (23 °C)	J/(kg·K)		1,200
Electrical properties			
Dielectric constant at 100 Hz/1 MHz	–	IEC 60250	3.6/3.4
Dissipation factor at 100 Hz/1 MHz	10^{-4}	IEC 60250	31/205
Volume resistivity	Ω·m	IEC 60093	10^{14}
Surface resistivity	Ω	IEC 60093	10^{14}
Comparative tracking index CTI, test solution A	–	IEC 60112	375
Available versions			
Laser-markable (LS)/Laser-transparent (LT)	–	–	

[1] yellow card available
[2] + = passed
[3] NB = no break
[4] Typical values for parts required to withstand repeated exposure to this temperature for several hours over years of use, assuming appropriate shaping and processing for the material.

S4090G4	S4090G6	S4090GX	S4090G4X	S4090G6X
PBT+ASA+PET GF20	PBT+ASA+PET GF30	PBT+ASA GF14	PBT+ASA GF20	PBT+ASA GF30
UN/BK	UN/BK	UN	BK	BK
1,390	1,470	1,330	1,390	1,470
105	105	110	104	104
0.4	0.4	0.4	0.4	0.4
0.2	0.2	0.2	0.2	0.2
223	223	223	223	223
20	20	23	30	20
250-275	250-275	250-275	250-275	250-275
60-100	60-100	60-100	60-100	60-100
0.43/0.74	0.29/0.75	0.54/0.83	0.46/0.91	0.29/0.82
HB (≥ 0.8 mm)	HB (≥ 0.8 mm)			
		HB (≥ 0.8 mm)		HB (≥ 0.8 mm)
6,900	9,700	5,500	6,600	9,600
105*	125*	95*	100*	128*
2.4*	2.2*	3.2*	2.6*	2.5*
4,700	6,700			
6,400	8,700			
151	183	140		190
50	58	52	49	61
40	50	43		52
5.5	7	7	5.5	7.5
5.3				
153*	164*			
160	175	170	185	205
205	210	210	210	220
170	170			
	145/–			145/–
35/110	25/105	45/120		25/115
0.28	0.29			
1,150	1,100	1,070		1,150
3.7/3.6	3.8/3.7	3.6/ 3.4		3.9/3.7
30/190	30/180	39/208		46/202
10^{14}	10^{14}	10^{14}	10^{14}	10^{14}
10^{14}	10^{14}	10^{14}	10^{14}	10^{14}
450	500	375		425
LS	LS			LS

Ultradur® Grades

Grades with excellent flowability

Typical values at 23 °C for uncolored products	Unit	Test method	B4520 High Speed
Product Features			
Symbol	–	ISO 1043	PBT
Colors: uncolored (UN), black (BK)	–	–	UN/BK
Density	kg/m³	ISO 1183	1,300
Viscosity number, solution 0.005 g/ml phenol/1.2-dicholoro benzene (1:1)	cm³/g	ISO 1628	115
Water absorption, saturation in water at 23 °C	%	similar to ISO 62	0.5
Moisture absorption, saturation in standard atmosphere 23 °C/50 % r.h.	%	similar to ISO 62	0.25
Processing methods			
Melting temperature, DSC	°C	ISO 11357-1/-3	223
Melt volume rate MVR 250/2.16	cm³/10 min	ISO 1133	50
Melt volume rate MVR 275/2.16	cm³/10 min	ISO 1133	
Melt volume rate MVR 260/5	cm³/10 min	ISO 1133	
Melt temperature range, injection-molding	°C	–	250-275
Mold temperature range, injection-molding	°C	–	40-70
Melt temperature range, extrusion	°C	–	
Molding shrinkage, free, longitudinal/transversal	%	ISO 2577, 294-4	
Fire behavior			
Flammability according to UL94 (thickness)[1]	class (mm)	UL94	HB (≥ 0.8 mm)
Flammability (thickness)	class (mm)	IEC 60695-11-10	
Flammability of materials in cars at d ≥ 1 mm thickness[2]	–	FMVSS 302	
Mechanical properties			
Tensile modulus of elasticity	MPa	ISO 527-1/-2	2,200
Tensile stress at yield (v = 50 mm/min), stress at break* (v = 5 mm/min)	MPa	ISO 527-1/-2	53
Strain at yield (v = 50 mm/min)	%	ISO 527-1/-2	3.5
Nominal strain at break (v = 50 mm/min), strain at break* (v = 5 mm/min)	%	ISO 527-1/-2	>50
Tensile creep modulus,1.000 h, elongation ≤ 0.5 %, +23 °C	MPa	ISO 899-1	
Flexural modulus	MPa	ISO 178	
Flexural strength	MPa	ISO 178	
Charpy impact strength (23 °C)[3]	kJ/m²	ISO 179/1eU	190
Charpy impact strength (-30 °C)[3]	kJ/m²	ISO 179/1eU	
Charpy notched impact strength (23 °C)[3]	kJ/m²	ISO 179/1eA	4
Charpy notched impact strength (-30 °C)[3]	kJ/m²	ISO 179/1eA	
Ball intendation hardness H 358 N/30 sec, H 961 N/30 sec*	MPa	ISO 2039-1	
Thermal properties			
Heat deflection temperature under 1.8 MPa (HDT/A)	°C	ISO 75-1/-2	55
Heat deflection temperature under 0.45 MPa (HDT/B)	°C	ISO 75-1/-2	130
Max. service temperature (short cycle operation)[4]	°C	–	200
Temperature index, at 50 % loss of tensile strength after 20,000 h/5.000 h	°C	IEC 60216-1	
Thermal coefficient of linear expansion, longitudinal/perpendicular (23-55) °C	10^{-6}/K	ISO 11359-1/-2	
Thermal conductivity (23 °C)	W/(m·K)	DIN 52 612-1	
Specific heat capacity (23 °C)	J/(kg·K)		
Electrical properties			
Dielectric constant at 100 Hz/1 MHz	–	IEC 60250	
Dissipation factor at 100 Hz/1 MHz	10^{-4}	IEC 60250	
Volume resistivity	Ω·m	IEC 60093	
Surface resistivity	Ω	IEC 60093	
Comparative tracking index CTI, test solution A	–	IEC 60112	
Available versions			
Laser-markable (LS)/Laser-transparent (LT)	–	–	

[1] yellow card available
[2] + = passed
[3] NB = no break
[4] Typical values for parts required to withstand repeated exposure to this temperature for several hours over years of use, assuming appropriate shaping and processing for the material.

B4300G2 High Speed	B4300G3 High Speed	B4300G4 High Speed	B4300G6 High Speed	S4090G4 High Speed	S4090G6 High Speed
PBT GF10	PBT GF15	PBT GF20	PBT GF30	PBT+ASA+PET GF20	PBT+ASA+PET GF30
UN/BK	UN/BK	UN/BK	UN/BK	BK	UN/BK
1,374	1,410	1,450	1,530	1,390	1,480
105	100	100	90	105	100
0.4	0.4	0.4	0.4	0.4	0.4
0.2	0.2	0.2	0.2	0.2	0.2
223	223	223	223	223	223
28	24	22	23		
				35	25
230-275	230-275	230-275	230-275	250-275	250-275
60-100	60-100	60-100	60-100	60-100	60-100
0.90/1.10	0.70/1.10	0.47/1.10	0.35/1.10	0.40/0.80	0.27/0.80
HB (≥ 1.5 mm)	HB (≥ 0.8 mm)	HB (≥ 0.8 mm)	HB (≥ 1.5 mm)		
				HB (≥ 1.5 mm)	HB (≥ 1.5 mm)
4,400	5,600	7,000	9,700	6,900	9,600
85*	100*	115*	140*	100*	120*
3.9*	3.7*	3.3*	2.7*	2.4*	2.1*
			10,000	6,800	
			210	155	
25	30	45	60	43	50
26	30	40	50	30	44
3.5	5	6	7.5	5.5	7
165	185	195	200	180	187
210	215	220	220	210	215
210	210	210	210	170	170
	140/160		150/170		
		30/145	25/110	35/120	25/115
3.6/3.6	3.7/3.7	3.7/3.7	4/3.8	3.7/3.6	3.8/3.7
12/150	12/150	12/150	25/170	30/190	30/180
10^{14}	10^{14}	10^{14}	10^{14}	10^{14}	10^{14}
10^{13}	10^{13}	10^{13}	10^{13}	10^{14}	10^{14}
300	300	300	350	325	325
LS	LS	LS	LS	LS	LS

Ultradur® Grades

Grades with particularly short cycle times and good flowability

Typical values at 23 °C for uncolored products	Unit	Test method	B4300G2 HPP
Product Features			
Symbol	–	ISO 1043	PBT-GF10
Colors: uncolored (UN), black (BK)	–	–	UN/BK
Density	kg/m³	ISO 1183	1,390
Viscosity number, solution 0.005 g/ml phenol/1.2-dicholoro benzene (1:1)	cm³/g	ISO 1628	100
Water absorption, saturation in water at 23 °C	%	similar to ISO 62	0.4
Moisture absorption, saturation in standard atmosphere 23 °C/50 % r.h.	%	similar to ISO 62	0.2
Processing methods			
Melting temperature, DSC	°C	ISO 11357-1/-3	223
Melt volume rate MVR 250 / 2.16	cm³/10 min	ISO 1133	25
Melt volume rate MVR 275 / 2.16	cm³/10 min	ISO 1133	
Melt volume rate MVR 260 / 5	cm³/10 min	ISO 1133	
Melt temperature range, injection-molding	°C	–	230-275
Mold temperature range, injection-molding	°C	–	60-100
Melt temperature range, extrusion	°C	–	
Molding shrinkage, free, longitudinal/transversal	%	ISO 2577, 294-4	
Fire behavior			
Flammability according to UL94 (thickness)[1]	class (mm)	UL94	
Flammability (thickness)	class (mm)	IEC 60695-11-10	
Flammability of materials in cars at d ≥ 1 mm thickness[2]	–	FMVSS 302	
Mechanical properties			
Tensile modulus of elasticity	MPa	ISO 527-1/-2	4,750
Tensile stress at yield (v = 50 mm/min), stress at break* (v = 5 mm/min)	MPa	ISO 527-1/-2	90
Strain at yield (v = 50 mm/min)	%	ISO 527-1/-2	3.8
Nominal strain at break (v = 50 mm/min), strain at break* (v = 5 mm/min)	%	ISO 527-1/-2	
Tensile creep modulus,1.000 h, elongation ≤ 0.5 %, +23 °C	MPa	ISO 899-1	
Flexural modulus	MPa	ISO 178	4,430
Flexural strength	MPa	ISO 178	145
Charpy impact strength (23 °C)[3]	kJ/m²	ISO 179/1eU	26
Charpy impact strength (-30 °C)[3]	kJ/m²	ISO 179/1eU	27
Charpy notched impact strength (23 °C)[3]	kJ/m²	ISO 179/1eA	3.5
Charpy notched impact strength (-30 °C)[3]	kJ/m²	ISO 179/1eA	3.5
Ball intendation hardness H 358 N/30 sec, H 961 N/30 sec*	MPa	ISO 2039-1	
Thermal properties			
Heat deflection temperature under 1.8 MPa (HDT/A)	°C	ISO 75-1/-2	190
Heat deflection temperature under 0.45 MPa (HDT/B)	°C	ISO 75-1/-2	
Max. service temperature (short cycle operation)[4]	°C	–	
Temperature index, at 50 % loss of tensile strength after 20,000 h/5.000 h	°C	IEC 60216-1	
Thermal coefficient of linear expansion, longitudinal/perpendicular (23-55) °C	10^{-6}/K	ISO 11359-1/-2	50/130
Thermal conductivity (23 °C)	W/(m·K)	DIN 52 612-1	
Specific heat capacity (23 °C)	J/(kg·K)		
Electrical properties			
Dielectric constant at 100 Hz/1 MHz	–	IEC 60250	
Dissipation factor at 100 Hz/1 MHz	10^{-4}	IEC 60250	
Volume resistivity	Ω·m	IEC 60093	10^{15}
Surface resistivity	Ω	IEC 60093	10^{15}
Comparative tracking index CTI, test solution A	–	IEC 60112	300
Available versions			
Laser-markable (LS)/Laser-transparent (LT)	–	–	LS

[1] yellow card available
[2] + = passed
[3] NB = no break

[4] Typical values for parts required to withstand repeated exposure to this temperature for several hours over years of use, assuming appropriate shaping and processing for the material.

B4300G3 HPP	B4300G4 HPP
PBT-GF15	PBT-GF20
BK	BK
1,420	1,460
100	100
0.4	0.4
0.2	0.2
223	223
23	17
230-275	23-275
60-100	60-100
6,100	7,250
100	120
3.3	3.3
5,660	6,660
162	192
28	45
27	39
4.4	6.3
4	6
205	207
40/125	30/120
10^{15}	10^{15}
10^{15}	10^{15}
275	275
LS	LS

Ultradur® Grades

Impact-modified grades/grades with very low distortion

Typical values at 23 °C for uncolored products	Unit	Test method	B4340ZG2 High Speed
Product Features			
Symbol	–	ISO 1043	PBT-I GF10
Colors: uncolored (UN), black (BK)	–	–	UN/BK
Density	kg/m³	ISO 1183	1,335
Viscosity number, solution 0.005 g/ml phenol/1.2-dicholoro benzene (1:1)	cm³/g	ISO 1628	100
Water absorption, saturation in water at 23 °C	%	similar to ISO 62	
Moisture absorption, saturation in standard atmosphere 23 °C/50 % r.h.	%	similar to ISO 62	
Processing methods			
Melting temperature, DSC	°C	ISO 11357-1/-3	223
Melt volume rate MVR 250/2.16	cm³/10 min	ISO 1133	30
Melt volume rate MVR 275/2.16	cm³/10 min	ISO 1133	
Melt volume rate MVR 260/5	cm³/10 min	ISO 1133	
Melt temperature range, injection-molding	°C	–	250-275
Mold temperature range, injection-molding	°C	–	60-100
Melt temperature range, extrusion	°C	–	
Molding shrinkage, free, longitudinal/transversal	%	ISO 2577, 294-4	1.07/1.05
Fire behavior			
Flammability according to UL94 (thickness)[1]	class (mm)	UL94	
Flammability (thickness)	class (mm)	IEC 60695-11-10	HB (≥ 0.8 mm)
Flammability of materials in cars at d ≥ 1 mm thickness[2]	–	FMVSS 302	
Mechanical properties			
Tensile modulus of elasticity	MPa	ISO 527-1/-2	4,100
Tensile stress at yield (v = 50 mm/min), stress at break* (v = 5 mm/min)	MPa	ISO 527-1/-2	79*
Strain at yield (v = 50 mm/min)	%	ISO 527-1/-2	
Nominal strain at break (v = 50 mm/min), strain at break* (v = 5 mm/min)	%	ISO 527-1/-2	3.8*
Tensile creep modulus,1.000 h, elongation ≤ 0.5 %, +23 °C	MPa	ISO 899-1	
Flexural modulus	MPa	ISO 178	3,700
Flexural strength	MPa	ISO 178	128
Charpy impact strength (23 °C)[3]	kJ/m²	ISO 179/1eU	49
Charpy impact strength (-30 °C)[3]	kJ/m²	ISO 179/1eU	30
Charpy notched impact strength (23 °C)[3]	kJ/m²	ISO 179/1eA	8
Charpy notched impact strength (-30 °C)[3]	kJ/m²	ISO 179/1eA	5
Ball intendation hardness H 358 N/30 sec, H 961 N/30 sec*	MPa	ISO 2039-1	
Thermal properties			
Heat deflection temperature under 1.8 MPa (HDT/A)	°C	ISO 75-1/-2	180
Heat deflection temperature under 0.45 MPa (HDT/B)	°C	ISO 75-1/-2	218
Max. service temperature (short cycle operation)[4]	°C	–	
Temperature index, at 50 % loss of tensile strength after 20,000 h/5.000 h	°C	IEC 60216-1	
Thermal coefficient of linear expansion, longitudinal/perpendicular (23-55) °C	10^{-6}/K	ISO 11359-1/-2	55/175
Thermal conductivity (23 °C)	W/(m·K)	DIN 52 612-1	
Specific heat capacity (23 °C)	J/(kg·K)		
Electrical properties			
Dielectric constant at 100 Hz/1 MHz	–	IEC 60250	
Dissipation factor at 100 Hz/1 MHz	10^{-4}	IEC 60250	
Volume resistivity	Ω·m	IEC 60093	
Surface resistivity	Ω	IEC 60093	
Comparative tracking index CTI, test solution A	–	IEC 60112	600
Available versions			
Laser-markable (LS)/Laser-transparent (LT)	–	–	LS

[1] yellow card available
[2] + = passed
[3] NB = no break
[4] Typical values for parts required to withstand repeated exposure to this temperature for several hours over years of use, assuming appropriate shaping and processing for the material.

B4340ZG3	B4300K4	B4300K6	B4300M5	B4300GM42
PBT-I GF15	PBT GB20	PBT GB30	PBT M25	PBT (GF20+M10)
UN/BK	UN/BK	UN/BK	UN	UN
1,360	1,450	1,530	1,510	1,550
106	115	113	117	101
	0.4	0.4	0.4	0.4
	0.2	0.2	0.2	0.2
223	223	223	223	223
17	16	9	14	17
250-275	250-275	250-275	250-275	250-275
60-100	40-80	40-80	40-80	60-90
0.82/1.02	1.90/1.90		1.80/1.68	
			HB (≥ 0.8 mm)	HB (≥ 0.8 mm)
HB (≥ 0.8 mm)	HB (≥ 1.5 mm)	HB (≥ 1.5 mm)		
5,300	3,500	4,000	4,000	7,900
90*	48*	50*	56*	105*
3.6*	6*	5*	7.5*	2.7*
	1,300	2,200	2,000	4,500
4,700	3,400			
145	100			
60	35	35	100	45
50	26	24	80	43
12	3	3	4	4.5
-				
	150	165	170	195*
186	65	75	70	210
219	170	175	170	220
	200	200	200	200
45/185	100/100			
	0.27	0.27		
	1,150	1,500	1,100	1,000
	4/3.7	3.8/3.8	3.6/3.6	3.8/3.8
	12/190	12/190	12/150	12/150
	10^{14}	10^{14}	10^{14}	10^{14}
	10^{13}	10^{13}	10^{13}	10^{13}
600	250	225	225	300
LS				

Ultradur® Grades

Flame-retardant grades

Typical values at 23 °C for uncolored products	Unit	Test method	B4406
Product Features			
Symbol	–	ISO 1043	PBT FR(17)
Colors: uncolored (UN), black (BK)	–	–	UN
Density	kg/m³	ISO 1183	1,450
Viscosity number, solution 0.005 g/ml phenol/1.2-dicholoro benzene (1:1)	cm³/g	ISO 1628	123
Water absorption, saturation in water at 23 °C	%	similar to ISO 62	0.4
Moisture absorption, saturation in standard atmosphere 23 °C/50 % r.h.	%	similar to ISO 62	0.25
Processing methods			
Melting temperature, DSC	°C	ISO 11357-1/-3	223
Melt volume rate MVR 250 / 2.16	cm³/10 min	ISO 1133	
Melt volume rate MVR 275 / 2.16	cm³/10 min	ISO 1133	30
Melt volume rate MVR 260 / 5	cm³/10 min	ISO 1133	
Melt temperature range, injection-molding	°C	–	245-270
Mold temperature range, injection-molding	°C	–	40-70
Melt temperature range, extrusion	°C	–	
Molding shrinkage, free, longitudinal/transversal	%	ISO 2577, 294-4	1.80 / 1.90
Fire behavior			
Flammability according to UL94 (thickness)[1]	class (mm)	UL94	V-0 (0.4)
Flammability (thickness)	class (mm)	IEC 60695-11-10	
Flammability of materials in cars at d ≥ 1 mm thickness[2]	–	FMVSS 302	+
Mechanical properties			
Tensile modulus of elasticity	MPa	ISO 527-1/-2	3,000
Tensile stress at yield (v = 50 mm/min), stress at break* (v = 5 mm/min)	MPa	ISO 527-1/-2	65*
Strain at yield (v = 50 mm/min)	%	ISO 527-1/-2	3.9*
Nominal strain at break (v = 50 mm/min), strain at break* (v = 5 mm/min)	%	ISO 527-1/-2	5.3
Tensile creep modulus, 1.000 h, elongation ≤ 0.5 %, +23 °C	MPa	ISO 899-1	
Flexural modulus	MPa	ISO 178	
Flexural strength	MPa	ISO 178	
Charpy impact strength (23 °C)[3]	kJ/m²	ISO 179/1eU	50
Charpy impact strength (-30 °C)[3]	kJ/m²	ISO 179/1eU	
Charpy notched impact strength (23 °C)[3]	kJ/m²	ISO 179/1eA	3.5
Charpy notched impact strength (-30 °C)[3]	kJ/m²	ISO 179/1eA	3.5
Ball intendation hardness H 358 N/30 sec, H 961 N/30 sec*	MPa	ISO 2039-1	120
Thermal properties			
Heat deflection temperature under 1.8 MPa (HDT/A)	°C	ISO 75-1/-2	60
Heat deflection temperature under 0.45 MPa (HDT/B)	°C	ISO 75-1/-2	170
Max. service temperature (short cycle operation)[4]	°C	–	200
Temperature index, at 50 % loss of tensile strength after 20,000 h / 5.000 h	°C	IEC 60216-1	110 / 135
Thermal coefficient of linear expansion, longitudinal/perpendicular (23-55) °C	10^{-6}/K	ISO 11359-1/-2	95 / 103
Thermal conductivity (23 °C)	W/(m·K)	DIN 52 612-1	0.27
Specific heat capacity (23 °C)	J/(kg·K)		1,200
Electrical properties			
Dielectric constant at 100 Hz / 1 MHz	–	IEC 60250	3.3 / 3.3
Dissipation factor at 100 Hz / 1 MHz	10^{-4}	IEC 60250	110/170
Volume resistivity	Ω·m	IEC 60093	10^{12}
Surface resistivity	Ω	IEC 60093	10^{13}
Comparative tracking index CTI, test solution A	–	IEC 60112	250
Available versions			
Laser-markable (LS) / Laser-transparent (LT)	–	–	

[1] yellow card available
[2] + = passed
[3] NB = no break
[4] Typical values for parts required to withstand repeated exposure to this temperature for several hours over years of use, assuming appropriate shaping and processing for the material.

B4406G2	B4406G4	B4406G6	B4406G6 High Speed	Exp. B4410G6	Exp. S4490G6
PBT-GF10 FR(17)	PBT-GF20 FR(17)	PBT-GF30 FR(17)	PBT-GF30 FR(17)	PBT-GF30 FR(16+63)	(PBT+ASA)-GF30 FR(16+63)
UN	UN/BK/GR	UN/BK	UN/BK	BK	BK
1,520	1,600	1,650	1,700	1,700	1,620
120	116	108	90		
0.4	0.4	0.4	0.4		
0.2	0.2	0.2	0.2		
223	223	223	223	220	220
15	11	8	12	10	4
250-275	250-275	250-275	250-280	250-275	260-285
60-100	60-100	60-100	60-100	60-100	60-100
1.10/1.30		0.30/1.10	0.30/1.10	0.30/0.80	0.30/0.60
V-0 (0.4) 5VA (2)	V0 (0.4)	V-0 (0.4) 5VA (1.5)	V0 (0.4)	V-0 (0.4)	V-0 (0.8)
+	+	+			
5,500	8,200	11,300	11,700	11,000	10,800
95*	125*	145*	140*	135*	125*
3.3*	2.6*	2.3*	1.9*	2.2*	2*
		7,500			
			11,300		
			200		
40	48	60	50	55	40
40	50	55		60	
5	8	10	7	8	7
				7.5	
	190*	220*			
190	200	205	205	185	
215	220	220	220		
210	210	210			
120/130	120/130				
51/110	31/105	23/97	22/108		
		0.32			
1,100	1,000	900	900		
3.5/3.5	3.8/3.6	3.9/3.9			
80/150	70/170	20/150			
10^{12}	10^{12}	10^{12}	10^{12}		
10^{13}	10^{13}	10^{13}	10^{13}		
225	200	200	175	200	200

Ultradur® Grades

Flame-retardant grades

Typical values at 23 °C for uncolored products	Unit	Test method	B4441G5
Product Features			
Symbol	–	ISO 1043	PBT-GF25 FR(40+30)
Colors: uncolored (UN), black (BK)	–	–	UN/BK/GR
Density	kg/m³	ISO 1183	1,530
Viscosity number, solution 0.005 g/ml phenol/1.2-dicholoro benzene (1:1)	cm³/g	ISO 1628	105
Water absorption, saturation in water at 23 °C	%	similar to ISO 62	0.4
Moisture absorption, saturation in standard atmosphere 23 °C/50 % r.h.	%	similar to ISO 62	0.2
Processing methods			
Melting temperature, DSC	°C	ISO 11357-1/-3	223
Melt volume rate MVR 250/2.16	cm³/10 min	ISO 1133	
Melt volume rate MVR 275/2.16	cm³/10 min	ISO 1133	11
Melt volume rate MVR 260/5	cm³/10 min	ISO 1133	
Melt temperature range, injection-molding	°C	–	260-280
Mold temperature range, injection-molding	°C	–	60-100
Melt temperature range, extrusion	°C	–	
Molding shrinkage, free, longitudinal/transversal	%	ISO 2577, 294-4	0.44/1.24
Fire behavior			
Flammability according to UL94 (thickness)[1]	class (mm)	UL94	V-0 (0.4) 5VA (1.5)
Flammability (thickness)	class (mm)	IEC 60695-11-10	
Flammability of materials in cars at d ≥1 mm thickness[2]	–	FMVSS 302	+
Mechanical properties			
Tensile modulus of elasticity	MPa	ISO 527-1/-2	9,800
Tensile stress at yield (v=50 mm/min), stress at break* (v=5 mm/min)	MPa	ISO 527-1/-2	100*
Strain at yield (v=50 mm/min)	%	ISO 527-1/-2	
Nominal strain at break (v=50 mm/min), strain at break* (v=5 mm/min)	%	ISO 527-1/-2	2.3*
Tensile creep modulus,1.000 h, elongation ≤0.5 %, +23 °C	MPa	ISO 899-1	
Flexural modulus	MPa	ISO 178	10,000
Flexural strength	MPa	ISO 178	180
Charpy impact strength (23 °C)[3]	kJ/m²	ISO 179/1eU	45
Charpy impact strength (-30 °C)[3]	kJ/m²	ISO 179/1eU	47
Charpy notched impact strength (23 °C)[3]	kJ/m²	ISO 179/1eA	7
Charpy notched impact strength (-30 °C)[3]	kJ/m²	ISO 179/1eA	
Ball intendation hardness H 358 N/30 sec, H 961 N/30 sec*	MPa	ISO 2039-1	
Thermal properties			
Heat deflection temperature under 1.8 MPa (HDT/A)	°C	ISO 75-1/-2	210
Heat deflection temperature under 0.45 MPa (HDT/B)	°C	ISO 75-1/-2	220
Max. service temperature (short cycle operation)[4]	°C	–	210
Temperature index, at 50 % loss of tensile strength after 20,000 h/5.000 h	°C	IEC 60216-1	
Thermal coefficient of linear expansion, longitudinal/perpendicular (23-55) °C	10^{-6}/K	ISO 11359-1/-2	35/118
Thermal conductivity (23 °C)	W/(m·K)	DIN 52 612-1	
Specific heat capacity (23 °C)	J/(kg·K)		1,000
Electrical properties			
Dielectric constant at 100 Hz/1 MHz	–	IEC 60250	3.7/3.6
Dissipation factor at 100 Hz/1 MHz	10^{-4}	IEC 60250	35/137
Volume resistivity	Ω·m	IEC 60093	10^{12}
Surface resistivity	Ω	IEC 60093	10^{13}
Comparative tracking index CTI, test solution A	–	IEC 60112	525
Available versions			
Laser-markable (LS)/Laser-transparent (LT)	–	–	LS

[1] yellow card available
[2] + = passed
[3] NB = no break
[4] Typical values for parts required to withstand repeated exposure to this temperature for several hours over years of use, assuming appropriate shaping and processing for the material.

B4450G5	B4450G5 HR	Exp. B4440G4
PBT-GF25 FR(53+30)	PBT-GF25 FR(53+30)	PBT-I-GF20 FR(40)
UN/BK/GR	UN/BK/OR	UN
1,600	1,580	1,460
100	110	
0.4	0.4	
0.2	0.2	
223	223	220
17	10	2.4
250-280	250-270	
60-100	60-100	
0.50/1.30	0.50/1.30	0.70/1.20
V-2 (0.4) V-0 (1.6) 5VA (2)	V-2 (0.4) V-0 (1.6) 5VA (2)	V-1 (0.4) V-0 (3.0)
+	+	
10,000	8,700	6,500
110*	120*	70*
3.3*	2.7*	3*
9,700	8,700	
180	210	
45	55	40
45	45	
6	7	6
210	210	185
220	220	215
	210	
	120/130	
35/118	29/167	
1,000	1,000	
4/3.8	4.1/3.9	
40/140	90/150	
10^{12}	10^{11}	
10^{13}	10^{14}	
600	600	600
	LS	

Ultradur® Grades

Reinforced grades with outstanding hydrolysis resistance

Typical values at 23 °C for uncolored products	Unit	Test method	B4330G3 HR
Product Features			
Symbol	–	ISO 1043	PBT-I GF15
Colors: uncolored (UN), black (BK), orange (OR)	–	–	UN / BK
Density	kg/m³	ISO 1183	1,390
Viscosity number, solution 0.005 g/ml phenol/1.2-dicholoro benzene (1:1)	cm³/g	ISO 1628	106
Water absorption, saturation in water at 23 °C	%	similar to ISO 62	0.4
Moisture absorption, saturation in standard atmosphere 23 °C / 50 % r.h.	%	similar to ISO 62	0.2
Processing methods			
Melting temperature, DSC	°C	ISO 11357-1/-3	223
Melt volume rate MVR 250 / 2.16	cm³/10 min	ISO 1133	12
Melt volume rate MVR 275 / 2.16	cm³/10 min	ISO 1133	
Melt volume rate MVR 260 / 5	cm³/10 min	ISO 1133	
Melt temperature range, injection-molding	°C	–	250-275
Mold temperature range, injection-molding	°C	–	60-100
Melt temperature range, extrusion	°C	–	
Molding shrinkage, free, longitudinal/transversal	%	ISO 2577, 294-4	0.90/1.15
Fire behavior			
Flammability according to UL94 (thickness)[1]	class (mm)	UL94	
Flammability (thickness)	class (mm)	IEC 60695-11-10	HB (≥ 0.8 mm)
Flammability of materials in cars at d ≥ 1 mm thickness[2]	–	FMVSS 302	
Mechanical properties			
Tensile modulus of elasticity	MPa	ISO 527-1/-2	5,300
Tensile stress at yield (v = 50 mm / min), stress at break* (v = 5 mm / min)	MPa	ISO 527-1/-2	100*
Strain at yield (v = 50 mm / min)	%	ISO 527-1/-2	
Nominal strain at break (v = 50 mm / min), strain at break* (v = 5 mm / min)	%	ISO 527-1/-2	3.5*
Tensile creep modulus, 1.000 h, elongation ≤ 0.5 %, +23 °C	MPa	ISO 899-1	
Flexural modulus	MPa	ISO 178	4,900
Flexural strength	MPa	ISO 178	160
Charpy impact strength (23 °C)[3]	kJ/m²	ISO 179/1eU	62
Charpy impact strength (-30 °C)[3]	kJ/m²	ISO 179/1eU	35
Charpy notched impact strength (23 °C)[3]	kJ/m²	ISO 179/1eA	10
Charpy notched impact strength (-30 °C)[3]	kJ/m²	ISO 179/1eA	6
Ball intendation hardness H 358 N / 30 sec, H 961 N / 30 sec*	MPa	ISO 2039-1	
Thermal properties			
Heat deflection temperature under 1.8 MPa (HDT/A)	°C	ISO 75-1/-2	200
Heat deflection temperature under 0.45 MPa (HDT/B)	°C	ISO 75-1/-2	220
Max. service temperature (short cycle operation)[4]	°C	–	210
Temperature index, at 50 % loss of tensile strength after 20,000 h / 5.000 h	°C	IEC 60216-1	
Thermal coefficient of linear expansion, longitudinal/perpendicular (23-55) °C	10^{-6}/K	ISO 11359-1/-2	50/225
Thermal conductivity (23 °C)	W/(m·K)	DIN 52 612-1	
Specific heat capacity (23 °C)	J/(kg·K)		
Electrical properties			
Dielectric constant at 100 Hz / 1 MHz	–	IEC 60250	
Dissipation factor at 100 Hz / 1 MHz	10^{-4}	IEC 60250	
Volume resistivity	Ω·m	IEC 60093	10^{14}
Surface resistivity	Ω	IEC 60093	10^{15}
Comparative tracking index CTI, test solution A	–	IEC 60112	500
Available versions			
Laser-markable (LS) / Laser-transparent (LT)	–	–	LS

[1] yellow card available
[2] + = passed
[3] NB = no break
[4] Typical values for parts required to withstand repeated exposure to this temperature for several hours over years of use, assuming appropriate shaping and processing for the material.

B4335G3 HR High Speed	B4330G6 HR	B4330G6 HR High Speed	B4331G6 HR	B4300G6 HR	B4331C3 HR
PBT-I GF15	PBT-I GF30	PBT-I GF30	PBT-I GF30	PBT GF30	PBT-I CF15
BK	UN/BK	BK	UN/BK/OR	UN/BK	BK
1,360	1,490	1,500	1,490	1,510	1,320
90	108	85	100	108	103
	0.4		0.4	0.4	0.4
	0.2		0.2	0.2	0.2
223	223	223	222	223	222
25	4	16	7	5.5	10
	19				
250-280	250-280	250-280	250-280	250-275	250-275
60-100	60-100	60-100	60-100	60-100	60-100
0.70/1.00	0.50/1.10	0.43/1.00	0.40/1.01	0.45/1.30	0.37/0.71
	HB (≥ 0.8 mm)				
HB (≥ 0.8 mm)		HB (≥ 0.8 mm)	HB (≥ 0.8 mm)		HB (≥ 0.8 mm)
4,700	8,500	8,880	8,400	8,700	11,600
90*	120*	130*	115*	130*	130*
3.5*	3.4*	2.6*	3.6*	3.3*	3.2*
4,300	7,860	8,700	8,100		10,100
135	190	205	190		205
55	74	68	75	70	60
32	65		70		48
11	14	9	14	12	9
7	8		8.8		4.8
200	205	208	205	205	200
220	220	223	220	220	220
	210		210	210	
45/240	25/215	20/200	20/215		
	1,250				
	10^{14}				10^{03}
	10^{15}				10^{05}
	400		500	400	
LS	LS	LS	LS	LT	LS

Ultradur® Grades

Reinforced grades with particularly high laser transparency for laser welding

Typical values at 23 °C for uncolored products	Unit	Test method	LUX B4300G4
Product Features			
Symbol	–	ISO 1043	PBT GF20
Colors: uncolored (UN), black (BK)	–	–	UN/BK
Density	kg/m³	ISO 1183	1,460
Viscosity number, solution 0.005 g/ml phenol/1.2-dicholoro benzene (1:1)	cm³/g	ISO 1628	100
Water absorption, saturation in water at 23 °C	%	similar to ISO 62	0.4
Moisture absorption, saturation in standard atmosphere 23 °C/50 % r.h.	%	similar to ISO 62	0.2
Processing methods			
Melting temperature, DSC	°C	ISO 11357-1/-3	220
Melt volume rate MVR 250/2.16	cm³/10 min	ISO 1133	
Melt volume rate MVR 275/2.16	cm³/10 min	ISO 1133	
Melt volume rate MVR 260/5	cm³/10 min	ISO 1133	9
Melt temperature range, injection-molding	°C	–	250-270
Mold temperature range, injection-molding	°C	–	60-100
Melt temperature range, extrusion	°C	–	
Molding shrinkage, free, longitudinal/transversal	%	ISO 2577, 294-4	0.75/1.25
Fire behavior			
Flammability according to UL94 (thickness)[1]	class (mm)	UL94	HB (≥ 0.8 mm)
Flammability (thickness)	class (mm)	IEC 60695-11-10	
Flammability of materials in cars at d ≥1 mm thickness[2]	–	FMVSS 302	
Mechanical properties			
Tensile modulus of elasticity	MPa	ISO 527-1/-2	7,300
Tensile stress at yield (v = 50 mm/min), stress at break* (v = 5 mm/min)	MPa	ISO 527-1/-2	125*
Strain at yield (v = 50 mm/min)	%	ISO 527-1/-2	
Nominal strain at break (v = 50 mm/min), strain at break* (v = 5 mm/min)	%	ISO 527-1/-2	3.5*
Tensile creep modulus, 1.000 h, elongation ≤0.5 %, +23 °C	MPa	ISO 899-1	
Flexural modulus	MPa	ISO 178	6,800
Flexural strength	MPa	ISO 178	195
Charpy impact strength (23 °C)[3]	kJ/m²	ISO 179/1eU	40
Charpy impact strength (-30 °C)[3]	kJ/m²	ISO 179/1eU	35
Charpy notched impact strength (23 °C)[3]	kJ/m²	ISO 179/1eA	6.5
Charpy notched impact strength (-30 °C)[3]	kJ/m²	ISO 179/1eA	6.3
Ball intendation hardness H 358 N/30 sec, H 961 N/30 sec*	MPa	ISO 2039-1	
Thermal properties			
Heat deflection temperature under 1.8 MPa (HDT/A)	°C	ISO 75-1/-2	200
Heat deflection temperature under 0.45 MPa (HDT/B)	°C	ISO 75-1/-2	220
Max. service temperature (short cycle operation)[4]	°C	–	210
Temperature index, at 50 % loss of tensile strength after 20,000 h/5.000 h	°C	IEC 60216-1	
Thermal coefficient of linear expansion, longitudinal/perpendicular (23-55) °C	10^{-6}/K	ISO 11359-1/-2	35/125
Thermal conductivity (23 °C)	W/(m·K)	DIN 52 612-1	
Specific heat capacity (23 °C)	J/(kg·K)		
Electrical properties			
Dielectric constant at 100 Hz/1 MHz	–	IEC 60250	
Dissipation factor at 100 Hz/1 MHz	10^{-4}	IEC 60250	
Volume resistivity	Ω·m	IEC 60093	10^{14}
Surface resistivity	Ω	IEC 60093	10^{15}
Comparative tracking index CTI, test solution A	–	IEC 60112	300
Available versions			
Laser-markable (LS)/Laser-transparent (LT)	–	–	LT

[1] yellow card available
[2] + = passed
[3] NB = no break
[4] Typical values for parts required to withstand repeated exposure to this temperature for several hours over years of use, assuming appropriate shaping and processing for the material.

LUX B4300G6
PBT GF30
UN/BK
1,540
105
0.4
0.2
220
7
250-270
60-100
0.55/1.20
HB (≥ 0.8 mm)
10,000
145*
3.2*
9,300
235
65
45
8.5
7.5
205
220
210
25/125
3.8/3.6
27/170
10^{14}
10^{15}
300
LT

Nomenclature

Structure

The name of Ultradur® commercial products generally follows the scheme below:

Ultradur®	Subname	Technical ID	Suffixes	Color

Subnames

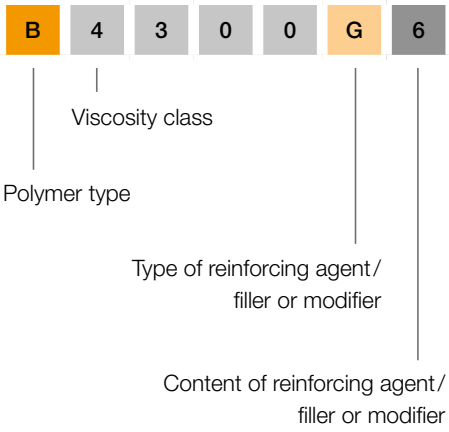
Subnames are optionally used in order to particularly emphasize a product feature that is characteristic of part of a range.

Examples of subnames:

LUX Particularly high transparency to the radiation from Nd:YAG lasers and lasers of a similar wavelength, e.g. diode lasers

Technical ID

The technical ID is made up of a series of letters and numbers which give hints about the polymer type, the melt viscosity and the finish with reinforcing agents, fillers or modifiers. The following classification scheme is found with most products:



Letters for identifying polymer types

B Polybutylene terephthalate (PBT) or polybutylene terephthalate + polyethylene terephthalate (PET)

S Polybutylene terephthalate + acrylonitrile styrene acrylate polymer (ASA)

Numbers for identifying viscosity classes

1 very low viscosity

2 Low viscosity

4 Medium viscosity

6 High viscosity

Letters for identifying reinforcing agents, fillers and modifiers

G Glass fibers

C Carbon fibers

K Glass beads

M Minerals

Z Impact modifiers

GM Glass fibers in combination with minerals

Key numbers for describing the content of reinforcing agents and fillers

2 approx. 10 % by mass

3 approx. 15 % by mass

4 approx. 20 % by mass

6 approx. 30 % by mass

10 approx. 50 % by mass

12 approx. 60 % by mass

In the case of combinations of glass fibers with minerals, the respective contents are indicated by two numbers, e.g.

GM13 approx. 5 % by mass of glass fibers and approx. 15 % by mass of minerals

Suffixes

Suffixes are optionally used in order to indicate specific processing or application-related properties. They are frequently acronyms whose letters are derived from the English term.

Examples of suffixes:

Aqua®	suitable for drinking water applications
FC	Food Contact; meets specific regulatory requirements for applications in contact with food
High Speed	High flowability of the melt
HPP	High Productivity Plus; short cycle time and good flowability
HR	Hydrolysis Resistant, increased hydrolysis resistance
LS	Laser Sensitive, can be marked with Nd:YAG laser
LT	Laser Transparent, can be penetrated well with Nd:YAG lasers and lasers of a similar wavelength
PRO	Profile Covered Raw Materials Only; fulfill specific regulatory requirements and demands for medical device applications
RC	Products with recyclate content: RCX YZ; X=1 for consumer waste, X=2 for industrial waste, YZ for the proportion in the compound, e.g. Ultradur® B4040G6 RC1 30 BKQ29 15075 for 30 % recyclate in relation to the compound

Color

The color is generally made up of a color name and a color number.

Examples of colors:
Uncolored
Black 00110
Black 05110

Selected Product Literature for Ultradur®:

- Ultradur® – Product Brochure
- Ultradur® – Product Range
- Ultramid®, Ultradur® and Ultraform® – Resistance to Chemicals

PACIFIC – The **automated platform solution** streamlines the provision and receipt of **Product Carbon Footprint (PCF) data across the entire value chain**, significantly **reducing manual work.** It translates the benefits of BASF's SCOTT PCF calculation tool to the n-Tier chain, ensuring **trustworthy and immutable data exchange** for seamless sharing with partners. Additionally, this solution can be integrated with other systems within the **Catena-X ecosystem.**

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. (August 2025)

Further information on Ultradur® (PBT) Product Range can be found on the internet:
www.ultradur.basf.com

Please visit our websites:
www.plastics.basf.com
www.plastics.basf.de

If you have any technical questions about the products, please contact the Infopoints:

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PME/EP 2504 BE