

Ultraform® (POM)

AT Product Range



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Ultraform® AT (POM)

Ultraform® is the trade name for the range of thermoplastic polyoxymethylene copolymers from BASF.

Products from the new plant in Korea are identified by the suffix "AT". The Ultraform® product family encompasses versatile engineering plastics with a wide variety of characteristics, which are designed for use in complex and heavy-duty components.

Ultraform® grades offer everything you need from an engineering material: they combine high rigidity and strength with superb resilience, favorable sliding friction characteristics and good dimensional stability, even under the influence of mechanical forces, in contact with many chemicals, fuels and other media, and at elevated temperatures.

Ultraform® AT (POM)

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Product range overview

Unreinforced grades

E3320 AT*	High-molecular-weight grade for extrusion blow molding of hollow parts.
N2320 003 AT	Rapid-solidifying standard grade for injection molding. This product replaces the previous grades Ultraform® N2320 003 and N2320 0035.
N2320 003 SC AT	Rapid-solidifying standard grade for injection-molding, optimized for self-coloring.
S1320 003 AT	Free-flowing, rapid-solidifying grade for thin-walled moldings that are difficult to produce by injection molding. Increased rigidity and heat resistance.
S2320 003 AT	Free-flowing, rapid-solidifying grade for thin-walled moldings that are difficult to produce by injection molding. This product replaces the previous grades Ultraform® S2320 003 and S2320 0035.
W2320 003 AT	Very free-flowing, rapid-solidifying grade for use where processing is demanding but mechanical requirements are lower. This product replaces the previous grades Ultraform® W2320 003 and W2320 0035.
Z2320 003 AT	Rapid-solidifying grade for applications with extreme flowability requirements.
H4320 AT	High-molecular-weight grade for extruding semi-finished products. Thick-walled semi-finished products in particular can be extruded at high output rates. High thermal stability and low discoloration tendency.
H2320 004 AT	High-molecular-weight grade for extruding thin-walled tubes and panels.
H2320 006 AT	High-molecular-weight grade with slightly increased flowability for injection molding of thick-walled moldings.

Reinforced grades

N2200 G43 AT N2200 G53 AT	Injection-molding grade for parts requiring high rigidity and strength along with good mold release.
N2720 M210 AT	Product with increased rigidity and strength together with good wear characteristics, used for sliding chains and conveyor systems, for example.
N2720 M63 AT	Mineral-reinforced product for low-warpage moldings with high rigidity, strength and hardness.

Impact-modified grades

N2640 Z2 AT N2640 Z4 AT	Elastomer-modified injection-molding grades with high impact strength for clips, snap-on and fixing elements, and for components subject to impact stress.
N2640 Z6 AT	Elastomer-modified injection-molding grade for applications requiring maximum impact strength together with low rigidity.
N2640 Z2 LEV2 AT* N2640 Z4 LEV2 AT*	Elastomer-modified injection-molding grades with high impact strength and reduced emission potential, for clips, snap-on and fixing elements, and for components subject to impact stress.
N2640 Z6 LEV2 AT*	Elastomer-modified injection-molding grade for applications requiring maximum impact strength together with low rigidity and reduced emission potential.
N2644 Z9 AT	Elastomer-modified injection-molding grade for applications requiring maximum impact strength and a low modulus of elasticity. Good acoustic damping.
N2640 E2 AT	Elastomer-modified injection-molding grade with increased impact strength and high weld line strength.
N2640 E4 AT	Elastomer-modified injection-molding grade with high impact strength and high weld line strength.

Specialty grades

N2310 P AT	Standard injection-molding grade with special lubricant. Extremely low coefficient of friction and sliding abrasion when combined with smooth metal surfaces (low roughness).
N2770 K AT	Injection-molding grade with improved wear characteristics for sliding elements.
N2320 U03 AT	UV-stabilized injection-molding grade.
N2520 L AT	Product with reduced electrical surface resistance.
N2320 C AT ⁺	Injection-molding grade with increased electrical conductivity, for applications with high demands in terms of strength, creep resistance and fuel resistance.
S1320 0021 AT	Free-flowing, rapid-solidifying grade with increased rigidity and heat resistance. Highly stabilized against aggressive fuels and hot diesel.

Low-emission grades

N2320 003 LEV AT	Rapid-solidifying grade with moderate flowability for injection molding, with reduced emission potential. Suitable for food contact applications.
N2320 0035 LEV AT	Rapid-solidifying grade with moderate flowability for injection molding, with reduced emission potential.
N2320 U035 LEV AT	UV-stabilized, rapid-solidifying grade with moderate flowability for injection molding, with reduced emission potential.
S2320 003 LEV AT	Free-flowing, rapid-solidifying standard grade for injection molding, with reduced emission potential. Suitable for food contact applications.
S2320 0035 LEV AT	Free-flowing, rapid-solidifying standard grade for injection molding, with reduced emission potential.
W2320 003 LEV AT	Very free-flowing, rapid-solidifying grade for injection molding, with reduced emission potential. Suitable for food contact applications.
W2320 0035 LEV AT	Very free-flowing, rapid-solidifying grade for injection molding, with reduced emission potential.
W2320 U035 LEV AT	UV-stabilized, very free-flowing and rapid-solidifying grade for injection-molding, with reduced emission potential.

Grades for drinking water applications

Ultraform® AQUA AT grades are suitable for plastic components for which drinking water or food contact approval of the material is essential.

N2320 AQUA AT	Rapid-solidifying grade for injection molding.
S2320 AQUA AT	Free-flowing, rapid-solidifying grade for thin-walled moldings that are difficult to produce by injection molding.
W2320 AQUA AT	Very free-flowing and rapid-solidifying grade for use where processing is demanding but mechanical requirements are lower.

Grades for medical applications

Ultraform® PRO AT grades offer a comprehensive service package (including long-term formulation consistency), specifically tailored to requirements in the medical sector.

N2320 003 PRO AT	Rapid-solidifying grade for injection molding, for applications demanding outstanding mechanical performance.
S1320 003 PRO AT	Free-flowing, rapid-solidifying grade for thin-walled moldings that are difficult to produce by injection molding. Increased rigidity and heat resistance.
S2320 003 PRO AT	Free-flowing, rapid-solidifying grade for thin-walled moldings that are difficult to produce by injection molding.
S2320 003 PRO TR AT	Free-flowing, rapid-solidifying grade with specialty lubricant to minimize friction, stick-slip and squeaking.
W2320 003 PRO AT	Very free-flowing, rapid-solidifying grade for use where processing is demanding but mechanical requirements are lower.

Ultraform® AT Grades

Unreinforced grades

Typical values for uncolored products at 23°C	Unit	Test method	N2320 003 AT	
Product Features				
Abbreviation	–	ISO 1043	POM	
Density	g/cm ³	ISO 1183	1.41	
Water absorption, saturation in water at 23°C	%	similar to ISO 62	0.9	
Moisture absorption, saturation under standard climatic cond. 23°C/50% r.h.	%	similar to ISO 62	0.2	
Processing				
Injection molding (M), extrusion (E), blow molding (B)	–	–	M	
Melting point, DSC	°C	ISO 1183	166	
Melt volume rate MVR 190/2.16	cm ³ /10 min	ISO 1133	7.5	
Melt flow rate MFR 190/2.16	g/10 min	ISO 1133	8.8	
Melt temperature range, injection molding	°C	–	190-230	
Mold temperature range	°C	–	60-120	
Mechanical properties				
Modulus of elasticity in tension	MPa	ISO 527-2	2,700	
Tensile stress at yield (v=50 mm/min)	MPa	ISO 527-2	64	
Tensile stress at break (v=5 mm/min)	MPa	ISO 527-2		
Elongation at yield	%	ISO 527-2	10.7	
Nominal elongation at break/elongation at break*	%	ISO 527-2	32	
Tensile creep modulus, 1,000 h	MPa	ISO 899-1	1,400	
Charpy impact strength ²⁾	+23°C	kJ/m ²	ISO 179/1eU	270
Charpy impact strength ²⁾	-30°C	kJ/m ²	ISO 179/1eU	250
Charpy notched impact strength	+23°C	kJ/m ²	ISO 179/1eA	6.5
Charpy notched impact strength	-30°C	kJ/m ²	ISO 179/1eA	5.5
Izod notched impact strength	+23°C	kJ/m ²	ISO 180/A	6
Izod notched impact strength	-30°C	kJ/m ²	ISO 180/A	5.5
Ball indentation hardness H 358/30	MPa	ISO 2039-1	135	
Ball indentation hardness H 961/30	MPa	ISO 2039-1		
Ball indentation hardness H 132/30	MPa	ISO 2039-1		
Thermal properties				
Heat deflection temp. under 1.8MPa load (HDT A)	°C	ISO 75-2	95	
Vicat softening temperature VST/B/50	°C	ISO 306	150	
Max. service temperature, up to a few hours ¹⁾	°C	–	100	
Coeff. of linear thermal expansion, long. (23-55)°C	10 ⁻⁵ /K	ISO 11359-2	11	
Electrical properties				
Dielectric constant at 100Hz/1MHz	–	IEC 60250	3.8/3.8	
Dissipation factor at 100Hz/1MHz	10 ⁻⁴	IEC 60250	10/50	
Volume resistivity	Ω · cm	IEC 62631-3-1	10 ¹³	
Surface resistivity	Ω	IEC 62631-3-1	10 ¹³	
Comparative tracking index CTI, test solution A	–	IEC 60112	600	
Comparative tracking index CTI, test solution B	–	IEC 60112	600	

¹⁾ Known values for parts that have to withstand this temperature repeatedly for several hours over the course of years of use, presupposing proper shaping and processing of the material.

²⁾ N = not broken

N2320 003 SC AT	S1320 003 AT	S2320 003 AT	W2320 003 AT	Z2320 003 AT
POM	POM	POM	POM	POM
1.41	1.41	1.41	1.41	1.41
0.9	0.9	0.9	0.8	0,9
0.2	0.2	0.2	0.2	0.2
M	M	M	M	M
166	170	167	166	163
7.5	11	11	25	42
8.8	12.9	13	29.4	49.4
190-230	190-230	190-230	190-230	190-220
60-120	60-120	60-120	60-120	60-120
2,700	3,000	2,700	2,850	2,700
64	67	64	65	63
10	10.5	10	8	7
29	25	29	24	19
1,400	1,450	1,300	1,350	1,350
270	230	250	190	130
220	210	230	190	130
6.5	6	6	4.5	3.5
5.5	5.5	5.5	4	3.5
6	5.5	5.5	5	4
5.5	5	5.5	5	4
135	150	145	145	140
95	100	100	100	100
150	150	150	150	150
100	100	100	100	100
11	11	11	11	11
3.8/3.8	3.7/3.7	3.8/3.8	3.8/3.8	3.8/3.8
10/50	20/50	10/50	10/50	10/50
10 ¹⁴	10 ¹³	10 ¹³	10 ¹³	10 ¹⁴
10 ¹⁴	10 ¹⁵	10 ¹³	10 ¹³	10 ¹⁴
600	600	600	600	600
600	600	600	600	600

Ultraform® AT Grades

Unreinforced grades

Typical values for uncolored products at 23°C	Unit	Test method	H4320 AT	
Product Features				
Abbreviation	–	ISO 1043	POM	
Density	g/cm ³	ISO 1183	1.40	
Water absorption, saturation in water at 23°C	%	similar to ISO 62	1.0	
Moisture absorption, saturation under standard climatic cond. 23°C/50% r.h.	%	similar to ISO 62	0.25	
Processing				
Injection molding (M), extrusion (E), blow molding (B)	–	–	E, (M)	
Melting point, DSC	°C	ISO 1183	163	
Melt volume rate MVR 190/2.16	cm ³ /10 min	ISO 1133	2.2	
Melt flow rate MFR 190/2.16	g/10 min	ISO 1133	2.6	
Melt temperature range, injection molding	°C	–	190-230	
Mold temperature range	°C	–	60-120	
Mechanical properties				
Modulus of elasticity in tension	MPa	ISO 527-2	2,400	
Tensile stress at yield (v=50 mm/min)	MPa	ISO 527-2	60	
Tensile stress at break (v=5 mm/min)	MPa	ISO 527-2		
Elongation at yield	%	ISO 527-2	11	
Nominal elongation at break/elongation at break*	%	ISO 527-2	31	
Tensile creep modulus, 1,000 h	MPa	ISO 899-1	1,300	
Charpy impact strength ²⁾	+23°C	kJ/m ²	ISO 179/1eU	280 N
Charpy impact strength ²⁾	-30°C	kJ/m ²	ISO 179/1eU	250
Charpy notched impact strength	+23°C	kJ/m ²	ISO 179/1eA	6.5
Charpy notched impact strength	-30°C	kJ/m ²	ISO 179/1eA	5.5
Izod notched impact strength	+23°C	kJ/m ²	ISO 180/A	6.5
Izod notched impact strength	-30°C	kJ/m ²	ISO 180/A	6
Ball indentation hardness H 358/30	MPa	ISO 2039-1	125	
Ball indentation hardness H 961/30	MPa	ISO 2039-1		
Ball indentation hardness H 132/30	MPa	ISO 2039-1		
Thermal properties				
Heat deflection temp. under 1.8MPa load (HDT A)	°C	ISO 75-2	90	
Vicat softening temperature VST/B/50	°C	ISO 306	150	
Max. service temperature, up to a few hours ¹⁾	°C	–	100	
Coeff. of linear thermal expansion, long. (23-55)°C	10 ⁻⁵ /K	ISO 11359-2	12	
Electrical properties				
Dielectric constant at 100Hz/1MHz	–	IEC 60250	3.8/3.8	
Dissipation factor at 100Hz/1MHz	10 ⁻⁴	IEC 60250	10/50	
Volume resistivity	Ω · cm	IEC 62631-3-1	10 ¹³	
Surface resistivity	Ω	IEC 62631-3-1	10 ¹³	
Comparative tracking index CTI, test solution A	–	IEC 60112	600	
Comparative tracking index CTI, test solution B	–	IEC 60112	600	

¹⁾ Known values for parts that have to withstand this temperature repeatedly for several hours over the course of years of use, presupposing proper shaping and processing of the material.

²⁾ N = not broken

H2320 004 AT

H2320 006 AT

POM	POM
1.41	1.41
0.9	0.9
0.25	0.2

E, (M)	E, M
165	165
2.2	2.9
2.5	3.4
190-230	190-230
60-120	60-120

2,600	2,600
62	62

12	11
30	30
1,200	1,300
250	270
250	260
6	6.5
6	5.5
6.5	6.5
	7
130	135

95	95
150	150
100	100
12	12

3.8/3.8	3.8/3.8
10/50	10/50
10 ¹³	10 ¹³
10 ¹³	10 ¹³
600	600
600	600

Ultraform® AT Grades

Reinforced grades

Typical values for uncolored products at 23°C	Unit	Test method	N2200 G43 AT	
Product Features				
Abbreviation	–	ISO 1043	POM-GF20	
Density	g/cm ³	ISO 1183	1.55	
Water absorption, saturation in water at 23°C	%	similar to ISO 62	1.0	
Moisture absorption, saturation under standard climatic cond. 23°C/50% r.h.	%	similar to ISO 62	0.2	
Processing				
Injection molding (M), extrusion (E), blow molding (B)	–	–	M	
Melting point, DSC	°C	ISO 1183	165	
Melt volume rate MVR 190/2.16	cm ³ /10 min	ISO 1133	4	
Melt flow rate MFR 190/2.16	g/10 min	ISO 1133	4.7	
Melt temperature range, injection molding	°C	–	190-220	
Mold temperature range	°C	–	60-120	
Mechanical properties				
Modulus of elasticity in tension	MPa	ISO 527-2	7,500	
Tensile stress at yield (v=50 mm/min)	MPa	ISO 527-2		
Tensile stress at break (v=5 mm/min)	MPa	ISO 527-2	115	
Elongation at yield	%	ISO 527-2		
Nominal elongation at break/elongation at break*	%	ISO 527-2	3*	
Tensile creep modulus, 1,000 h	MPa	ISO 899-1	4,500	
Charpy impact strength ²⁾	+23°C	kJ/m ²	ISO 179/1eU	50
Charpy impact strength ²⁾	-30°C	kJ/m ²	ISO 179/1eU	50
Charpy notched impact strength	+23°C	kJ/m ²	ISO 179/1eA	7.5
Charpy notched impact strength	-30°C	kJ/m ²	ISO 179/1eA	7.5
Izod notched impact strength	+23°C	kJ/m ²	ISO 180/A	5
Izod notched impact strength	-30°C	kJ/m ²	ISO 180/A	5
Ball indentation hardness H 358/30	MPa	ISO 2039-1	164	
Ball indentation hardness H 961/30	MPa	ISO 2039-1		
Ball indentation hardness H 132/30	MPa	ISO 2039-1		
Thermal properties				
Heat deflection temp. under 1.8MPa load (HDT A)	°C	ISO 75-2	161	
Vicat softening temperature VST/B/50	°C	ISO 306	160	
Max. service temperature, up to a few hours ¹⁾	°C	–	110	
Coeff. of linear thermal expansion, long. (23-55)°C	10 ⁻⁵ /K	ISO 11359-2	5	
Electrical properties				
Dielectric constant at 100Hz/1MHz	–	IEC 60250	4/4.1	
Dissipation factor at 100Hz/1MHz	10 ⁻⁴	IEC 60250	40/70	
Volume resistivity	Ω · cm	IEC 62631-3-1	10 ¹²	
Surface resistivity	Ω	IEC 62631-3-1	10 ¹⁴	
Comparative tracking index CTI, test solution A	–	IEC 60112	600	
Comparative tracking index CTI, test solution B	–	IEC 60112	600	

¹⁾ Known values for parts that have to withstand this temperature repeatedly for several hours over the course of years of use, presupposing proper shaping and processing of the material.

²⁾ N = not broken

N2200 G53 AT	N2720 M210 AT	N2720 M63 AT
POM-GF25	POM-M10	POM-M30
1.58	1.49	1.65
1.1	0.8	0.9
0.2	0.2	0.15
M	M	M
168	166	167
4	7	3.8
5.5	8.8	6.5
190-220	190-230	190-230
60-120	60-120	60-120
8,500	3,800	7,000
	63	75
125	9.5	5
2.5*	18	6
5,800		2,750
45	90	55
50	90	55
8	3.5	3.5
7.5	3.5	3
		3.5
		3.5
	145	
185		190
163	115	140
160	150	155
110	100	110
4	8	4.5
4/4	3.8/3.8	4/4.2
40/70	50/60	70/50
10 ¹²	10 ¹²	10 ¹²
10 ¹⁴	10 ¹⁴	10 ¹⁴
600	600	600
600	600	600

Ultraform® AT Grades

Impact-modified grades

Typical values for uncolored products at 23°C	Unit	Test method	N2640 Z2 AT	
Product Features				
Abbreviation	–	ISO 1043	(POM+PUR)	
Density	g/cm ³	ISO 1183	1.38	
Water absorption, saturation in water at 23°C	%	similar to ISO 62	1.0	
Moisture absorption, saturation under standard climatic cond. 23°C/50% r.h.	%	similar to ISO 62	0.25	
Processing				
Injection molding (M), extrusion (E), blow molding (B)	–	–	M	
Melting point, DSC	°C	ISO 1183	166	
Melt volume rate MVR 190/2.16	cm ³ /10 min	ISO 1133	7	
Melt flow rate MFR 190/2.16	g/10 min	ISO 1133	8.1	
Melt temperature range, injection molding	°C	–	190-215	
Mold temperature range	°C	–	60-80	
Mechanical properties				
Modulus of elasticity in tension	MPa	ISO 527-2	2,000	
Tensile stress at yield (v=50 mm/min)	MPa	ISO 527-2	51	
Tensile stress at break (v=5 mm/min)	MPa	ISO 527-2		
Elongation at yield	%	ISO 527-2	11	
Nominal elongation at break/elongation at break*	%	ISO 527-2	40	
Tensile creep modulus, 1,000 h	MPa	ISO 899-1		
Charpy impact strength ²⁾	+23°C	kJ/m ²	ISO 179/1eU	NC
Charpy impact strength ²⁾	-30°C	kJ/m ²	ISO 179/1eU	
Charpy notched impact strength	+23°C	kJ/m ²	ISO 179/1eA	13
Charpy notched impact strength	-30°C	kJ/m ²	ISO 179/1eA	7
Izod notched impact strength	+23°C	kJ/m ²	ISO 180/A	10
Izod notched impact strength	-30°C	kJ/m ²	ISO 180/A	7
Ball indentation hardness H 358/30	MPa	ISO 2039-1	105	
Ball indentation hardness H 961/30	MPa	ISO 2039-1		
Ball indentation hardness H 132/30	MPa	ISO 2039-1		
Thermal properties				
Heat deflection temp. under 1.8MPa load (HDT A)	°C	ISO 75-2	85	
Vicat softening temperature VST/B/50	°C	ISO 306	140	
Max. service temperature, up to a few hours ¹⁾	°C	–	100	
Coeff. of linear thermal expansion, long. (23-55)°C	10 ⁻⁵ /K	ISO 11359-2	13	
Electrical properties				
Dielectric constant at 100Hz/1MHz	–	IEC 60250	4/4	
Dissipation factor at 100Hz/1MHz	10 ⁻⁴	IEC 60250	100/140	
Volume resistivity	Ω · cm	IEC 62631-3-1	10 ¹²	
Surface resistivity	Ω	IEC 62631-3-1	10 ¹⁴	
Comparative tracking index CTI, test solution A	–	IEC 60112	600	
Comparative tracking index CTI, test solution B	–	IEC 60112	600	

¹⁾ Known values for parts that have to withstand this temperature repeatedly for several hours over the course of years of use, presupposing proper shaping and processing of the material.

²⁾ N = not broken

N2640 Z4 AT	N2640 Z6 AT	N2644 Z9 AT	N2640 E2 AT	N2640 E4 AT
(POM+PUR)	(POM+PUR)	(POM+PUR)	(POM+MBS)	(POM+MBS)
1.36	1.33	1.28	1.35	1.29
1.0	1.1	1.1	0.9	1.0
0.25	0.3	0.35	0.2	0.2
M	M	M	M	M
166	165	165	166	166
5.5	4.5	12	6	3
6.4	5.2		6.8	3.3
190-215	190-215	185-210	190-220	190-220
60-80	60-80	40-80	60-80	60-80
1,700	1,400	770	2,200	1,700
44	37	25	50	39
14	17	32	8	8
>50	>50	>50	50	>50
N	N	N	N	N
N	NC	NC	NC	NC
15	18	25	9	17
8	9	5	7	9
13.5	17.5	19		
8	10	5.5		
85	60		110	80
		33		
75	70	60	80	70
130	110		140	120
100	100	100	100	100
13	14	14	13	14
4.2/4.2	4.5/4.3	5.1/4.9	3.6/3.5	3.5/3.4
110/190	100/250	70/350	30/80	30/80
10 ¹¹	10 ¹¹	10 ¹¹	10 ¹²	10 ¹²
10 ¹⁴	10 ¹²	10 ¹³	10 ¹⁵	10 ¹⁵
600	600	600	600	600
600	600	600	600	600

Ultraform® AT Grades

Specialty grades

Typical values for uncolored products at 23°C	Unit	Test method	N2310 P AT	
Product Features				
Abbreviation	–	ISO 1043	POM	
Density	g/cm ³	ISO 1183	1.41	
Water absorption, saturation in water at 23°C	%	similar to ISO 62	1	
Moisture absorption, saturation under standard climatic cond. 23°C/50% r.h.	%	similar to ISO 62	0.2	
Processing				
Injection molding (M), extrusion (E), blow molding (B)	–	–	M	
Melting point, DSC	°C	ISO 1183	165	
Melt volume rate MVR 190/2.16	cm ³ /10 min	ISO 1133	7.5	
Melt flow rate MFR 190/2.16	g/10 min	ISO 1133	9	
Melt temperature range, injection molding	°C	–	190-230	
Mold temperature range	°C	–	60-120	
Mechanical properties				
Modulus of elasticity in tension	MPa	ISO 527-2	2,700	
Tensile stress at yield (v=50 mm/min)	MPa	ISO 527-2	61	
Tensile stress at break (v=5 mm/min)	MPa	ISO 527-2		
Elongation at yield	%	ISO 527-2	10	
Nominal elongation at break/elongation at break*	%	ISO 527-2	30	
Tensile creep modulus, 1,000 h	MPa	ISO 899-1		
Charpy impact strength ²⁾	+23°C	kJ/m ²	ISO 179/1eU	240
Charpy impact strength ²⁾	-30°C	kJ/m ²	ISO 179/1eU	220
Charpy notched impact strength	+23°C	kJ/m ²	ISO 179/1eA	6
Charpy notched impact strength	-30°C	kJ/m ²	ISO 179/1eA	5.5
Izod notched impact strength	+23°C	kJ/m ²	ISO 180/A	7
Izod notched impact strength	-30°C	kJ/m ²	ISO 180/A	6.5
Ball indentation hardness H 358/30	MPa	ISO 2039-1	135	
Ball indentation hardness H 961/30	MPa	ISO 2039-1		
Ball indentation hardness H 132/30	MPa	ISO 2039-1		
Thermal properties				
Heat deflection temp. under 1.8MPa load (HDT A)	°C	ISO 75-2	90	
Vicat softening temperature VST/B/50	°C	ISO 306		
Max. service temperature, up to a few hours ¹⁾	°C	–	100	
Coeff. of linear thermal expansion, long. (23-55)°C	10 ⁻⁵ /K	ISO 11359-2	11	
Electrical properties				
Dielectric constant at 100Hz/1MHz	–	IEC 60250	3.8/3.8	
Dissipation factor at 100Hz/1MHz	10 ⁻⁴	IEC 60250	10/50	
Volume resistivity	Ω · cm	IEC 62631-3-1	10 ¹³	
Surface resistivity	Ω	IEC 62631-3-1	10 ¹³	
Comparative tracking index CTI, test solution A	–	IEC 60112	600	
Comparative tracking index CTI, test solution B	–	IEC 60112	600	

¹⁾ Known values for parts that have to withstand this temperature repeatedly for several hours over the course of years of use, presupposing proper shaping and processing of the material.

²⁾ N = not broken

³⁾ Preliminary data

⁴⁾ highly dependent on the processing conditions

⁵⁾ ISO 3915 4-Point-Measurement

N2770 K AT	N2320 U03 AT	N2520 L AT ³⁾	N2320 C AT ³⁾	S1320 0021 AT
POM	POM	POM	POM	POM
1.43	1.41	1.4	1.42	1.41
0.9	0.8	0.8	0.9	0.9
0.2	0.2	0.2	0.2	0.25
M	M	M	M	M
166	166	166	167	170
7.5	7.5	7	20 (10kg)	11
9	8.8			12.9
190-230	190-230	190-220	190-220	190-230
60-120	60-120	60-120	60-120	60-120
2,700	2,600	2,300	3,000	3,000
61	64	50	69	66
9.5	10	6	7	10
26	27	7	10	25
	1,400			1,450
100	320	40	70	270
100	270			240
5	6.5	3.5	4	6
4	6			6
5.5	7			5.5
5	6			
140	140	120	145	155
90	95	85	100	100
	150			150
100	100	100	100	100
11	11	12	11	11
3.8/3.8	3.9/3.8	940/120	500 (500 Hz)/60	3.7/3.7
10/50	30/50	3900/5300	10 ⁵ (500 Hz)/4000	20/50
10 ¹⁴	10 ¹³	500 ^{4),5)}	30 ⁵⁾	10 ¹²
10 ¹⁴	10 ¹³	10 ⁷⁻⁴⁾	10 ⁶	10 ¹⁵
600	600			600
600	600			600

Ultraform® AT Grades

Low-emission grades

Typical values for uncolored products at 23°C	Unit	Test method	N2320 003 LEV AT	
Product Features				
Abbreviation	–	ISO 1043	POM	
Density	g/cm ³	ISO 1183	1.41	
Water absorption, saturation in water at 23°C	%	similar to ISO 62	0.9	
Moisture absorption, saturation under standard climatic cond. 23°C/50% r.h.	%	similar to ISO 62	0.2	
Processing				
Injection molding (M), extrusion (E), blow molding (B)	–	–	M	
Melting point, DSC	°C	ISO 1183	166	
Melt volume rate MVR 190/2.16	cm ³ /10 min	ISO 1133	7.5	
Melt flow rate MFR 190/2.16	g/10 min	ISO 1133	8.8	
Melt temperature range, injection molding	°C	–	190-220	
Mold temperature range	°C	–	60-120	
Mechanical properties				
Modulus of elasticity in tension	MPa	ISO 527-2	2,700	
Tensile stress at yield (v=50 mm/min)	MPa	ISO 527-2	64	
Tensile stress at break (v=5 mm/min)	MPa	ISO 527-2		
Elongation at yield	%	ISO 527-2	11	
Nominal elongation at break/elongation at break*	%	ISO 527-2	30	
Tensile creep modulus, 1,000 h	MPa	ISO 899-1	1,400	
Charpy impact strength ²⁾	+23°C	kJ/m ²	ISO 179/1eU	330
Charpy impact strength ²⁾	-30°C	kJ/m ²	ISO 179/1eU	270
Charpy notched impact strength	+23°C	kJ/m ²	ISO 179/1eA	6.5
Charpy notched impact strength	-30°C	kJ/m ²	ISO 179/1eA	5.5
Izod notched impact strength	+23°C	kJ/m ²	ISO 180/A	6
Izod notched impact strength	-30°C	kJ/m ²	ISO 180/A	5.5
Ball indentation hardness H 358/30	MPa	ISO 2039-1	135	
Ball indentation hardness H 961/30	MPa	ISO 2039-1		
Ball indentation hardness H 132/30	MPa	ISO 2039-1		
Thermal properties				
Heat deflection temp. under 1.8MPa load (HDT A)	°C	ISO 75-2	95	
Vicat softening temperature VST/B/50	°C	ISO 306	150	
Max. service temperature, up to a few hours ¹⁾	°C	–	100	
Coeff. of linear thermal expansion, long. (23-55)°C	10 ⁻⁵ /K	ISO 11359-2	11	
Electrical properties				
Dielectric constant at 100Hz/1MHz	–	IEC 60250	3.8/3.8	
Dissipation factor at 100Hz/1MHz	10 ⁻⁴	IEC 60250	10/50	
Volume resistivity	Ω · cm	IEC 62631-3-1	10 ¹³	
Surface resistivity	Ω	IEC 62631-3-1	10 ¹³	
Comparative tracking index CTI, test solution A	–	IEC 60112	600	
Comparative tracking index CTI, test solution B	–	IEC 60112	600	

¹⁾ Known values for parts that have to withstand this temperature repeatedly for several hours over the course of years of use, presupposing proper shaping and processing of the material.

²⁾ N = not broken

N2320 0035 LEV AT	N2320 U035 LEV AT	S2320 003 LEV AT	S2320 0035 LEV AT	W2320 003 LEV AT	W2320 0035 LEV AT	W2320 U035 LEV AT
POM	POM	POM	POM	POM	POM	POM
1.41	1.41	1.41	1.41	1.41	1.41	1.41
0.9	0.9	0.9	1.0	0.8	0.8	0.8
0.2	0.2	0.2	0.25	0.2	0.2	0.2
M	M	M	M	M	M	M
166	165	167	166	166	165	166
7.5	7.5	11	11	25	25	25
8.8	8.8	13	13	29.4	29.4	29.4
190-220	190-220	190-220	190-220	190-220	190-220	190-220
60-120	60-120	60-120	60-120	60-120	60-120	60-120
2,700	2,600	2,700	2,700	2,850	2,700	2,800
63	63	64	63	65	64	65
11	10.5	10	10.5	8	9	8.5
28	26	29	28	24	25	25
1,200	1,300	1,300	1,100	1,350	1,350	1,300
260	300	250	250	190	180	200
250	250	230	210	190	170	190
6.5	6.5	6	6	4.5	4	4
5.5	6	5.5	5.5	4	3.5	4
6.5	6.5	5.5	6.5	5	4	
6	5.5	5.5	6	5	4	
140	145	145	140	145	140	145
95	95	100	95	100	95	95
150	150	150	150	150		150
100	100	100	100	100	100	100
11	11	11	11	11	11	11
3.9/3.8	3.8/3.8	3.8/3.8	3.8/3.8	3.8/3.8	3.8/3.8	3.8/3.8
30/60	10/50	10/50	10/50	10/50	10/60	30/60
10 ¹³	10 ¹³	10 ¹³	10 ¹³	10 ¹³	10 ¹⁴	10 ¹³
10 ¹⁵	10 ¹³	10 ¹³	10 ¹³	10 ¹³	10 ¹⁶	10 ¹⁵
600	600	600	600	600	600	600
600	600	600	600	600	600	600

Ultraform® AT Grades

Grades for drinking water applications

Typical values for uncolored products at 23°C	Unit	Test method	N2320 AQUA AT	
Product Features				
Abbreviation	–	ISO 1043	POM	
Density	g/cm ³	ISO 1183	1.41	
Water absorption, saturation in water at 23°C	%	similar to ISO 62	0.9	
Moisture absorption, saturation under standard climatic cond. 23°C/50% r.h.	%	similar to ISO 62	0.2	
Processing				
Injection molding (M), extrusion (E), blow molding (B)	–	–	M	
Melting point, DSC	°C	ISO 1183	166	
Melt volume rate MVR 190/2.16	cm ³ /10 min	ISO 1133	7.5	
Melt flow rate MFR 190/2.16	g/10 min	ISO 1133	8.8	
Melt temperature range, injection molding	°C	–	190-230	
Mold temperature range	°C	–	60-120	
Mechanical properties				
Modulus of elasticity in tension	MPa	ISO 527-2	2,700	
Tensile stress at yield (v=50 mm/min)	MPa	ISO 527-2	64	
Tensile stress at break (v=5 mm/min)	MPa	ISO 527-2		
Elongation at yield	%	ISO 527-2	10.7	
Nominal elongation at break/elongation at break*	%	ISO 527-2	32	
Tensile creep modulus, 1,000 h	MPa	ISO 899-1	1,400	
Charpy impact strength ²⁾	+23°C	kJ/m ²	ISO 179/1eU	270
Charpy impact strength ²⁾	-30°C	kJ/m ²	ISO 179/1eU	250
Charpy notched impact strength	+23°C	kJ/m ²	ISO 179/1eA	6.5
Charpy notched impact strength	-30°C	kJ/m ²	ISO 179/1eA	5.5
Izod notched impact strength	+23°C	kJ/m ²	ISO 180/A	6
Izod notched impact strength	-30°C	kJ/m ²	ISO 180/A	5.5
Ball indentation hardness H 358/30	MPa	ISO 2039-1	135	
Ball indentation hardness H 961/30	MPa	ISO 2039-1		
Ball indentation hardness H 132/30	MPa	ISO 2039-1		
Thermal properties				
Heat deflection temp. under 1.8MPa load (HDT A)	°C	ISO 75-2	95	
Vicat softening temperature VST/B/50	°C	ISO 306	150	
Max. service temperature, up to a few hours ¹⁾	°C	–	100	
Coeff. of linear thermal expansion, long. (23-55)°C	10 ⁻⁵ /K	ISO 11359-2	11	
Electrical properties				
Dielectric constant at 100Hz/1MHz	–	IEC 60250	3.8/3.8	
Dissipation factor at 100Hz/1MHz	10 ⁻⁴	IEC 60250	10/50	
Volume resistivity	Ω · cm	IEC 62631-3-1	10 ¹⁴	
Surface resistivity	Ω	IEC 62631-3-1	10 ¹⁴	
Comparative tracking index CTI, test solution A	–	IEC 60112	600	
Comparative tracking index CTI, test solution B	–	IEC 60112	600	

¹⁾ Known values for parts that have to withstand this temperature repeatedly for several hours over the course of years of use, presupposing proper shaping and processing of the material.

²⁾ N = not broken

S2320 AQUA AT	W2320 AQUA AT
POM	POM
1.41	1.41
0.9	0.8
0.2	0.2
M	M
167	166
11	25
13	29.4
190-230	190-230
60-120	60-120
2,700	2,850
64	65
10	8
29	24
1,300	1,350
250	190
230	190
6	4.5
5.5	4
5.5	5
5.5	5
145	145
100	100
150	150
100	100
11	11
3.8/3.8	3.8/3.8
10/50	10/50
10 ¹⁴	10 ¹⁴
10 ¹⁴	10 ¹⁴
600	600
600	600

Ultraform® AT Grades

Grades for medical applications

Typical values for uncolored products at 23°C	Unit	Test method	N2320 003 PRO AT	
Product Features				
Abbreviation	–	ISO 1043	POM	
Density	g/cm ³	ISO 1183	1.41	
Water absorption, saturation in water at 23°C	%	similar to ISO 62	0.9	
Moisture absorption, saturation under standard climatic cond. 23°C/50% r.h.	%	similar to ISO 62	0.2	
Processing				
Injection molding (M), extrusion (E), blow molding (B)	–	–	M	
Melting point, DSC	°C	ISO 1183	166	
Melt volume rate MVR 190/2.16	cm ³ /10 min	ISO 1133	7.5	
Melt flow rate MFR 190/2.16	g/10 min	ISO 1133	8.8	
Melt temperature range, injection molding	°C	–	190-230	
Mold temperature range	°C	–	60-120	
Mechanical properties				
Modulus of elasticity in tension	MPa	ISO 527-2	2,700	
Tensile stress at yield (v=50 mm/min)	MPa	ISO 527-2	64	
Tensile stress at break (v=5 mm/min)	MPa	ISO 527-2		
Elongation at yield	%	ISO 527-2	10.7	
Nominal elongation at break/elongation at break*	%	ISO 527-2	32	
Tensile creep modulus, 1,000 h	MPa	ISO 899-1	1,400	
Charpy impact strength ²⁾	+23°C	kJ/m ²	ISO 179/1eU	270
Charpy impact strength ²⁾	-30°C	kJ/m ²	ISO 179/1eU	250
Charpy notched impact strength	+23°C	kJ/m ²	ISO 179/1eA	6.5
Charpy notched impact strength	-30°C	kJ/m ²	ISO 179/1eA	5.5
Izod notched impact strength	+23°C	kJ/m ²	ISO 180/A	6
Izod notched impact strength	-30°C	kJ/m ²	ISO 180/A	5.5
Ball indentation hardness H 358/30	MPa	ISO 2039-1	135	
Ball indentation hardness H 961/30	MPa	ISO 2039-1		
Ball indentation hardness H 132/30	MPa	ISO 2039-1		
Thermal properties				
Heat deflection temp. under 1.8MPa load (HDT A)	°C	ISO 75-2	95	
Vicat softening temperature VST/B/50	°C	ISO 306	150	
Max. service temperature, up to a few hours ¹⁾	°C	–	100	
Coeff. of linear thermal expansion, long. (23-55)°C	10 ⁻⁵ /K	ISO 11359-2	11	
Electrical properties				
Dielectric constant at 100Hz/1MHz	–	IEC 60250	3.8/3.8	
Dissipation factor at 100Hz/1MHz	10 ⁻⁴	IEC 60250	10/50	
Volume resistivity	Ω · cm	IEC 62631-3-1	10 ¹⁴	
Surface resistivity	Ω	IEC 62631-3-1	10 ¹⁴	
Comparative tracking index CTI, test solution A	–	IEC 60112	600	
Comparative tracking index CTI, test solution B	–	IEC 60112	600	

¹⁾ Known values for parts that have to withstand this temperature repeatedly for several hours over the course of years of use, presupposing proper shaping and processing of the material.

²⁾ N = not broken

³⁾ Preliminary data

S1320 003 PRO AT	S2320 003 PRO AT	S2320 003 PRO TR AT ³⁾	W2320 003 PRO AT
POM	POM	POM	POM
1.41	1.41	1.41	1.41
0.9	0.9	0.9	0.8
0.2	0.2	0.2	0.2
M	M	M	M
170	167	166	166
11	11	11	25
12.9	13	13	29.4
190-230	190-230	190-230	190-230
60-120	60-120	60-120	60-120
3,000	2,700	2,600	2,850
67	64	61	65
10.5	10	10	8
25	29	35	24
1,450	1,300		1350
230	250	230	190
210	230	210	190
6	6	6	4.5
5.5	5.5	5.5	4
5.5	5.5	7	5
5	5.5	6.5	5
150	145	135	145
100	100	95	100
150	150		150
100	100	100	100
11	11	12	11
3.7/3.7	3.8/3.8	3.6/3.6	3.8/3.8
20/50	10/50	11/56	10/50
10 ¹⁴	10 ¹⁴	10 ¹³	10 ¹⁴
10 ¹⁶	10 ¹⁴	10 ¹⁶	10 ¹⁴
600	600	600	600
600	600	600	600

Nomenclature

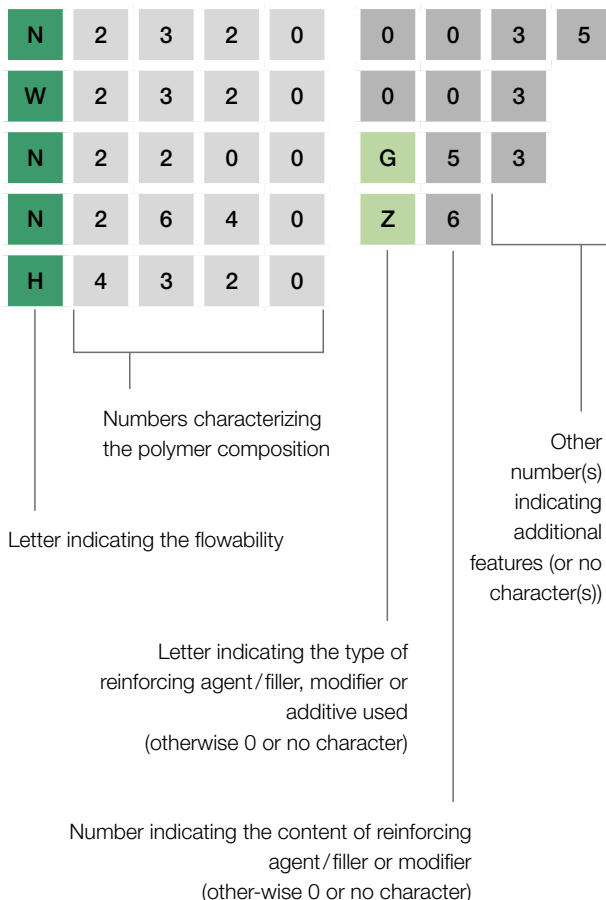
Structure

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



Technical ID

The technical ID is made up of a series of letters and numbers indicating the melt flow rate, the type of reinforcing agents, fillers, modifiers or additives used, their content in the material, and special features where applicable. The following system is used for most products:



Letters indicating the melt flow rate

The melt flow rate corresponds to the position of the letter in the alphabet: the later the letter appears in the alphabet, the higher the melt flow rate. The letters E, H, N, S, W and Z are most commonly used.

The following applies:

- E lowest flow rate, lowest MVR value
- Z highest flow rate, highest MVR value

Letters indicating the type of reinforcing agent, filler, modifier or additive used

- E impact-modified with rubber
- G glass fibers
- K chalk
- L conductive carbon black
- M mineral
- P specialty lubricant
- U UV-stabilized
- Z impact-modified with thermoplastic polyurethane

Indices describing the content of reinforcing agents, fillers or modifiers

The numbers 2, 4, 5, 6 and 9 are most commonly used. The higher the number, the higher the content.

The following rule of thumb applies:

- 2 approx. 10 % by mass
- 4 approx. 20 % by mass
- 5 approx. 25 % by mass
- 6 approx. 30 % by mass
- 9 approx. 45 % by mass

Suffixes

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

Examples of suffixes:

Aqua	Meets specific regulatory requirements for drinking water applications
LEV	Low emission version; low-odor
PRO	Profile covered raw materials only; meets specific regulatory requirements and needs for medical applications
AT	Alternative technology

Color

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

Examples of colors:

Uncolored	
Black 00120	
Black 00140	(for products modified with thermoplastic polyurethane)
Black 00160	(for products modified with rubber)

Selected Product Literature for Ultraform®:

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

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 2019)

Further information on Ultraform® can be found on the internet:

www.ultraform.basf.com

Please visit our websites:

www.plastics.basf.com

www.plastics.basf.de

Request of brochures:

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