

LNP* high-temperature thermoplastic compounds



High performance materials for
extreme environments

High temperature engineering thermoplastic compounds for demanding structural applications

When operating temperatures climb and the chemical environment is demanding, high temperature engineering thermoplastic compounds may be the solution to a part designers problems. The high temperature series of compounds from SABIC Innovative Plastics are based on resins like Polysulfone (G Series), Polyethersulfone (J Series), Polyphenylene Sulfide (O Series), Polyetherimide (E Series), PEEK (L Series) or PPA (U Series) and are generally reinforced with glass and/or carbon fiber for enhanced strength and stiffness.

LNP* glass and carbon fiber reinforced compounds extend the base resin's high temperature capability in structural applications. By adding well dispersed, randomly orientated glass and carbon fibers, dramatic improvements in stiffness, tensile strength, dimensional stability, load bearing ability, high temperature properties, creep resistance, flammability resistance, thermal aging resistance, fatigue endurance and chemical resistance have been realized.

In addition, compounds utilizing these high temperature resins make excellent bearings, gears and washers as they withstand extreme heat generation from friction. SABIC Innovative Plastics' family of internally lubricated compounds—Lubricomp* compounds—display excellent wear and low coefficients of friction. These products combine structural reinforcement like glass and carbon fiber with internal lubricants like PTFE for a balance of good wear and high strength.

Advantages of high temperature compounds

- Excellent mechanical properties
- Excellent thermal properties
- High heat deflection temperature
- Dimensional stability
- UL 94V-0 flame ratings
- Excellent chemical resistance
- Excellent dielectric properties
- Colorability

High heat applications

- Connectors
- Electrical devices and housings
- Chemical process valves and components
- Pump impellers and housings
- Compressor plates
- Bobbins
- Valves
- Under-the-hood automotive applications — engine components
- Automotive transmission seals
- Bearing cages
- Sensor housings
- Actuator housings
- Bearings
- Gears
- Thrust washers

High temperature thermoplastic compounds

Polyetherimide “E” series — ASTM methods, English units

Property	ASTM method	Units	Thermocomp* EF-1004 20% glass fiber	Thermocomp EF-1006 30% glass fiber	Lubricomp* EL-4030 15% PTFE	Lubricomp EFL-4036 15% PTFE, 30% glass fiber	Stat-Kon* EC-1002 10% carbon fiber
Physical							
Density	D792	g/cm ³	1.43	1.53	1.35	1.62	1.31
Moisture absorption, 50% RH, 24 hrs	D570	%	0.19	0.15	0.21	0.15	0.3
Mold shrinkage, flow, 24 hrs	D955	%	0.3 – 0.5	0.1 – 0.3	0.8 – 1.1	0.2 – 0.2	1.0 – 0.3
Mold shrinkage, xflow, 24 hrs	D955	%	0.6 – 0.8	0.4 – 0.6	0.8 – 1.1	0.4 – 0.5	0.3 – 0.5
Mechanical							
Tensile stress, break	D638	psi	21756	27267	12328	25382	23351
Tensile strain, break	D638	%	3.4	2.4	10.3	2	1.6
Tensile modulus, 50 mm/min	D638	psi	1041371	1659232	398854	1839079	1689690
Flexural stress	D790	psi	34809	39160	19580	36550	34954
Flexural modulus	D790	psi	1097936	1649079	419159	1638926	1566408
Izod impact, unnotched, 23°C	D4812	ft.-lb./in.	13	–	14	13	8
Izod impact, notched, 23°C	D256	ft.-lb./in.	1	–	1	2	1
Instrumented impact energy @ peak, 23°C	D3763	in.-lb.	–	106	80	89	97
Thermal							
HDT, 1.84 MPa, 3.2mm, unannealed	D648	°F	405	397	360	396	401
CTE, -40°C to 40°C, flow	E831	10 ⁻⁵ 1/°F	–	2.3	2.7	–	1.8
CTE, -40°C to 40°C, xflow	E831	10 ⁻⁵ 1/°F	–	3.1	4.8	–	3.3
Flammability	UL Subj. 94	–	V0 @ 0.75mm	V0 @ 0.75mm	V0 @ 1.7mm	V0 @ 0.75mm	V0 @ 1.5mm
Electrical							
Surface resistivity	D4496	ohm/sq	–	–	–	–	10 ² – 10 ⁶

Polyetherimide “E” series continued — ASTM methods, English units

Property	ASTM method	Units	Stat-Kon EC-1004 20% carbon fiber	Stat-Kon EC-1006 30% carbon fiber
Physical				
Density	D792	g/cm ³	1.34	1.39
Moisture absorption, 50% RH, 24 hrs	D570	%	–	0.2
Mold shrinkage, flow, 24 hrs	D955	%	0.1 – 0.3	0.1 – 0.3
Mold shrinkage, xflow, 24 hrs	D955	%	0.3 – 0.5	0.3 – 0.5
Mechanical				
Tensile stress, break	D638	psi	24656	28427
Tensile strain, break	D638	%	2	1.3
Tensile modulus, 50 mm/min	D638	psi	–	19440
Flexural stress	D790	psi	–	2819534
Flexural modulus	D790	psi	37565	40611
Izod impact, unnotched, 23°C	D4812	ft.-lb./in.	10	7
Izod impact, notched, 23°C	D256	ft.-lb./in.	1	1
Instrumented impact energy @ peak, 23°C	D3763	in.-lb.	–	71
Thermal				
HDT, 1.84 MPa, 3.2mm, unannealed	D648	°F	414	423
CTE, -40°C to 40°C, flow	E831	10 ⁻⁵ 1/°F	–	–
CTE, -40°C to 40°C, xflow	E831	10 ⁻⁵ 1/°F	–	–
Flammability	UL Subj. 94	N/A	V0 @ 0.5mm	V0 @ 0.75mm
Electrical				
Surface resistivity	D4496	ohm/sq	10 ² – 10 ⁶	10 ² – 10 ⁶

Polysulfone “G” series — ASTM methods, English units

Property	ASTM method	Units	Thermocomp* GF-1006 30% glass fiber	Lubricomp* GFL-4034 EM M 15% PTFE, 20% milled glass fiber
Physical				
Density	D792	g/cm ³	1.48	1.53
Moisture absorption, 50% RH, 24 hrs	D570	%	0.2	–
Mold shrinkage, flow, 24 hrs	D955	%	0.1 – 0.3	0.6 – 0.8
Mold shrinkage, xflow, 24 hrs	D955	%	0.5 – 0.7	0.5 – 0.7
Mechanical				
Tensile stress, break	D638	psi	15084	6382
Tensile strain, break	D638	%	2	2.4
Tensile modulus, 50 mm/min	D638	psi	1279233	–
Flexural stress	D790	psi	22626	11313
Flexural modulus	D790	psi	1199462	498930
Izod impact, unnotched, 23°C	D4812	ft.-lb./in.	–	4
Izod impact, notched, 23°C	D256	ft.-lb./in.	–	1
Instrumented impact energy @ peak, 23°C	D3763	in.-lb.	71	–
Thermal				
HDT, 1.84 MPa, 3.2mm, unannealed	D648	°F	358	–
CTE, -40°C to 40°C, flow	E831	10 ⁻⁵ 1/°F	–	–
CTE, -40°C to 40°C, xflow	E831	10 ⁻⁵ 1/°F	–	–
Flammability	UL Subj. 94	N/A	–	–
Electrical				
Surface resistivity	D4496	ohm/sq	–	–

Polyethersulfone “J” series — ASTM methods, English units

Property	ASTM method	Units	Thermocomp JF-1006 30% glass fiber	Thermocomp JF-1008 40% glass fiber	Lubricomp JFL-4036 15% PTFE, 30% glass fiber	Stat-Kon* JC-1003 EM 15% carbon fiber
Physical						
Density	D792	g/cm ³	1.58	1.66	1.70	1.41
Moisture absorption, 50% RH, 24 hrs	D570	%	0.34	–	0.29	–
Mold shrinkage, flow, 24 hrs	D955	%	0.1 – 0.4	–	0.1 – 0.4	–
Mold shrinkage, xflow, 24 hrs	D955	%	0.3 – 0.6	–	0.3 – 0.6	–
Mechanical						
Tensile stress, break	D638	psi	20595	21611	13489	21466
Tensile strain, break	D638	%	2.2	2.1	1.5	2.3
Tensile modulus, 50 mm/min	D638	psi	1559156	–	1769460	–
Flexural stress	D790	psi	30458	–	20740	30893
Flexural modulus	D790	psi	1409767	–	1489538	1479385
Izod impact, unnotched, 23°C	D4812	ft.-lb./in.	12	12	7	8
Izod impact, notched, 23°C	D256	ft.-lb./in.	2	2	2	1
Instrumented impact energy @ peak, 23°C	D3763	in.-lb.	89	–	80	–
Thermal						
HDT, 1.84 MPa, 3.2mm, unannealed	D648	°F	410	–	405	–
CTE, -40°C to 40°C, flow	E831	10 ⁻⁵ 1/°F	1.7	–	1.3	–
CTE, -40°C to 40°C, xflow	E831	10 ⁻⁵ 1/°F	2.1	–	1.9	–
Flammability	UL Subj. 94	N/A	VO @ 0.5mm	–	–	–
Electrical						
Surface resistivity	D4496	ohm/sq	–	–	–	10 ² – 10 ⁶

High temperature thermoplastic compounds

Polyphenylene sulfide "O" series — ASTM methods, English units

Property	ASTM method	Units	Thermocomp* OF-1006 30% glass fiber	Thermocomp OF-1008 40% glass fiber	Thermocomp OFM-3166 black 30% glass fiber, 30% mineral	Lubricomp* OFL-4036 15% PTFE, 30% glass fiber	Stat-Kon* OC-1006 30% carbon fiber
Physical							
Density	D792	g/cm ³	1.59	1.70	1.96	1.69	1.44
Moisture absorption, 50% RH, 24 hrs	D570	%	0.03	–	0.03	0.01	0.02
Mold shrinkage, flow, 24 hrs	D955	%	0.1 – 0.3	–	0.1 – 0.2	0.1 – 0.2	0.05 – 0.2
Mold shrinkage, xflow, 24 hrs	D955	%	0.4 – 0.7	–	0.3 – 0.5	0.3 – 0.5	0.3 – 0.5
Mechanical							
Tensile stress, break	D638	psi	18855	23206	19435	21030	30458
Tensile strain, break	D638	%	1.3	1.5	1.2	1.7	1.1
Tensile modulus, 50 mm/min	D638	psi	1846330	–	–	1789766	47499986
Flexural stress	D790	psi	28137	34519	28863	29008	44091
Flexural modulus	D790	psi	1631675	2062437	2786175	1599766	3049837
Izod impact, unnotched, 23°C	D4812	ft.-lb./in.	8	10	–	10	8
Izod impact, notched, 23°C	D256	ft.-lb./in.	1	2	1	2	1
Instrumented impact energy @ peak, 23°C	D3763	in.-lb.	71	–	–	27	27
Thermal							
HDT, 1.84 MPa, 3.2mm, unannealed	D648	°F	513	507	509	514	511
CTE, -40°C to 40°C, flow	E831	10 ⁻⁵ 1/°F	1.3	–	0.9	1.3	0.5
CTE, -40°C to 40°C, xflow	E831	10 ⁻⁵ 1/°F	2.6	–	1.7	2.8	2.3
Flammability	UL Subj. 94	N/A	V0 @ 0.45mm	V0 @ 0.45mm	V0 @ 1.50mm	V0 @ 1.50mm	V0 @ 1.0mm
Electrical							
Surface resistivity	D4496	ohm/sq	–	–	–	–	10 ² – 10 ⁶

PPA "U" series — ASTM methods, English units

Property	Standard	Units	Thermocomp UF-1006 HS	Thermocomp UF-1008	Thermocomp UC-1006	Lubricomp UFL-4036 HS
Physical						
Density	ASTM D 792	g/cm ³	1.43	1.55	1.324	1.55
Moisture absorption, 50% RH, 24 hrs	ASTM D 570	%	0.25	0.27	0.31	0.33
Mold shrinkage, flow, 24 hrs	ASTM D 955	%	0.2 - 0.4	0.3	0.2	0.2
Mold shrinkage, xflow, 24 hrs	ASTM D 955	%	0.5 - 0.7	1.2	0.6	0.8
Mechanical						
Tensile stress, break	ASTM D 638	psi	28565	34220	41600	28420
Tensile strain, break	ASTM D 638	%	2.4	2.1	1.5	2.5
Tensile modulus, 50 mm/min	ASTM D 638	psi	1966200	2338850	3787000	1799450
Flexural stress	ASTM D 790	psi	40310	45095	60800	40600
Flexural modulus	ASTM D 790	psi	1480450	1948800	3282000	1566000
Izod impact, unnotched, 23°C	ASTM D 4812	ft*lb/in	13.60	16.29	15.5	19.38
Izod impact, notched, 23°C	ASTM D 256	ft*lb/in	1.69	1.59	1.4	2.19
Instrumented impact energy @ peak, 23°C	ASTM D 3763	in-lb	N/A	44.3	78	53.1
Thermal						
HDT, 1.84 MPa, 3.2mm, unannealed	ASTM D 648	°F	496	538	546	498
CTE, -40°C to 40°C, flow	ASTM E 831	x 10 ⁻⁵ 1/°F	4.72	1.39	1.0	N/A
CTE, -40°C to 40°C, xflow	ASTM E 831	x 10 ⁻⁵ 1/°F	6.78	1.67	2.2	N/A
UL 94 flammability	UL Subject 94	N/A	HB @ 1.5 mm	N/A	N/A	N/A

PEEK "L" series — ASTM methods, English units

Property	Standard	Units	Thermocomp* LF-1006 EM	Thermocomp LC-1003 EM	Thermocomp LC-1006	Lubricomp* LCL-4033 EM	Lubricomp LL-4040
Physical							
Density	ASTM D 792	g/cm ³	1.54	1.33	1.41	1.43	1.37
Moisture absorption, 50% RH, 24 hrs	ASTM D 570	%	0.10	0.07	0.05	0.07	0.06
Mold shrinkage, flow, 24 hrs	ASTM D 955	%	-	0.2 - 0.3	0.1	0.1 - 0.3	1.3
Mold shrinkage, xflow, 24 hrs	ASTM D 955	%	-	0.5 - 0.6	0.4	0.4 - 0.7	1.9
Mechanical							
Tensile stress, break	ASTM D 638	psi	25500	22300	32700	26000	10000
Tensile strain, break	ASTM D 638	%	2	1.8	1.5	1.7	23.30
Tensile modulus, 50 mm/min	ASTM D 638	psi	1919000	1669000	4459000	2409000	419000
Flexural stress	ASTM D 790	psi	356000	37500	47100	38600	17100
Flexural modulus	ASTM D 790	psi	1559000	1379000	2929000	1879000	429000
Izod impact, unnotched, 23°C	ASTM D 4812	ft/lb-in	16.4	7.5	11.4	9.2	29.1
Izod impact, notched, 23°C	ASTM D 256	ft/lb-in	2.2	0.7	1.4	1.2	1.8
Instrumented impact energy @ peak, 23°C	ASTM D 3763	J	121	38	110	77	24
Thermal							
HDT, 1.84 MPa, 3.2mm, unannealed	ASTM D 648	°F	>570	518	>570	>570	-
CTE, -40°C to 40°C, flow	ASTM E 831	x 10 ⁻⁵ 1/°F	0.90	2.89	0.66	1.31	-
CTE, -40°C to 40°C, xflow	ASTM E 831	x 10 ⁻⁵ 1/°F	2.60	2.98	1.63	2.32	-
UL rating	UL 94 by GE	in	V0 @ 0.03	-	0.03	0.06	-
Electrial							
Surface resistivity	ASTM D 257	Ohm	-	10 ^{2-10⁶}	-	-	-

High temperature thermoplastic compounds

Polyetherimide “E” series — ASTM methods, SI units

Property	ASTM method	Units	Thermocomp* EF-1004 20% glass fiber	Thermocomp EF-1006 30% glass fiber	Lubricomp* EL-4030 15% PTFE	Lubricomp EFL-4036 15% PTFE, 30% glass fiber	Stat-Kon* EC-1002 10% carbon fiber
Physical							
Density	D792	g/cm ³	1.43	1.53	1.35	1.62	1.31
Moisture absorption, 50% RH, 24 hrs	D570	%	0.19	0.15	0.21	0.15	0.3
Mold shrinkage, flow, 24 hrs	D955	%	0.3 – 0.5	0.1 – 0.3	0.8 – 1.1	0.2 – 0.2	1.0 – 0.3
Mold shrinkage, xflow, 24 hrs	D955	%	0.6 – 0.8	0.4 – 0.6	0.8 – 1.1	0.4 – 0.5	0.3 – 0.5
Mechanical							
Tensile stress, break	D638	MPa	150	188	85	175	161
Tensile strain, break	D638	%	3.4	2.4	10.3	2	1.6
Tensile modulus, 50 mm/min	D638	MPa	7180	114400	2750	12680	11650
Flexural stress	D790	MPa	240	270	135	252	241
Flexural modulus	D790	MPa	7570	11370	2890	11300	10800
Izod impact, unnotched, 23°C	D4812	J/m	694	–	747	710	427
Izod impact, notched, 23°C	D256	J/m	74	–	69	122	53
Instrumented impact energy @ peak, 23°C	D3763	J	–	12	9	10	11
Thermal							
HDT, 1.84 MPa, 3.2mm, unannealed	D648	°C	207	203	182	202	205
CTE, -40°C to 40°C, flow	E831	10 ⁻⁵ 1/°C	–	4.2	4.8	–	3.3
CTE, -40°C to 40°C, xflow	E831	10 ⁻⁵ 1/°C	–	3.1	4.8	–	3.3
Flammability	UL Subj. 94	N/A	V0 @ 0.75mm	V0 @ 0.75mm	V0 @ 1.7mm	V0 @ 0.75mm	V0 @ 1.5mm
Electrical							
Surface resistivity	D4496	ohm/sq	–	–	–	–	10 ² –10 ⁶

Polyetherimide “E” Series continued — ASTM Methods, SI Units

Property	ASTM Method	Units	Stat-Kon EC-1004 20% carbon fiber	Stat-Kon EC-1006 30% carbon fiber
Physical				
Density	D792	g/cm ³	1.34	1.39
Moisture absorption, 50% RH, 24 hrs	D570	%	–	0.2
Mold shrinkage, flow, 24 hrs	D955	%	0.1 – 0.3	0.1 – 0.3
Mold shrinkage, xflow, 24 hrs	D955	%	0.3 – 0.5	0.3 – 0.5
Mechanical				
Tensile stress, break	D638	MPa	170	196
Tensile strain, break	D638	%	2	1.3
Tensile modulus, 50 mm/min	D638	MPa	–	19440
Flexural stress	D790	MPa	259	280
Flexural modulus	D790	MPa	12330	18170
Izod impact, unnotched, 23°C	D4812	J/m	534	373
Izod impact, notched, 23°C	D256	J/m	58	42
Instrumented impact energy @ peak, 23°C	D3763	J	–	8
Thermal				
HDT, 1.84 MPa, 3.2mm, unannealed	D648	°C	212	217
CTE, -40°C to 40°C, flow	E831	10 ⁻⁵ 1/°C	–	–
CTE, -40°C to 40°C, xflow	E831	10 ⁻⁵ 1/°C	–	–
Flammability	UL Subj. 94	N/A	V0 @ 0.5mm	V0 @ 0.75mm
Electrical				
Surface resistivity	D4496	ohm/sq	10 ² – 10 ⁶	10 ² – 10 ⁶

Polysulfone “G” series — ASTM methods, SI units

Property	ASTM method	Units	Thermocomp* GF-1006 30% glass fiber	Lubricomp* GFL-4034 EM M 15% PTFE, 20% milled glass fiber
Physical				
Density	D792	g/cm ³	1.48	1.53
Moisture absorption, 50% RH, 24 hrs	D570	%	0.2	–
Mold shrinkage, flow, 24 hrs	D955	%	0.1 – 0.3	0.6 – 0.8
Mold shrinkage, xflow, 24 hrs	D955	%	0.5 – 0.7	0.5 – 0.7
Mechanical				
Tensile stress, break	D638	MPa	104	44
Tensile strain, break	D638	%	2	2.4
Tensile modulus, 50 mm/min	D638	MPa	8820	–
Flexural stress	D790	MPa	156	78
Flexural modulus	D790	MPa	8270	3440
Izod impact, unnotched, 23°C	D4812	J/m	–	240
Izod impact, notched, 23°C	D256	J/m	–	53
Instrumented impact energy @ peak, 23°C	D3763	J	8	–
Thermal				
HDT, 1.84 MPa, 3.2mm, unannealed	D648	°C	181	–
CTE, -40°C to 40°C, flow	E831	10 ⁻⁵ 1/°C	–	–
CTE, -40°C to 40°C, xflow	E831	10 ⁻⁵ 1/°C	–	–
Flammability	UL Subj. 94	N/A	–	–
Electrical				
Surface resistivity	D4496	ohm/sq	–	–

Polyethersulfone “J” series — ASTM methods, SI units

Property	ASTM method	Units	Thermocomp JF-1006 30% glass fiber	Thermocomp JF-1008 40% glass fiber	Lubricomp JFL-4036 15% PTFE, 30% glass fiber	Stat-Kon* JC-1003 EM 15% carbon fiber
Physical						
Density	D792	g/cm ³	1.58	1.66	1.70	1.41
Moisture absorption, 50% RH, 24 hrs	D570	%	0.34	–	0.29	–
Mold shrinkage, flow, 24 hrs	D955	%	0.1 – 0.4	–	0.1 – 0.4	–
Mold shrinkage, xflow, 24 hrs	D955	%	0.3 – 0.6	–	0.3 – 0.6	–
Mechanical						
Tensile stress, break	D638	MPa	142	149	93	148
Tensile strain, break	D638	%	2.2	2.1	1.5	2.3
Tensile modulus, 50 mm/min	D638	MPa	10750	–	12200	–
Flexural stress	D790	MPa	210	–	143	213
Flexural modulus	D790	MPa	9720	–	10270	10200
Izod impact, unnotched, 23°C	D4812	J/m	641	619	363	421
Izod impact, notched, 23°C	D256	J/m	96	96	85	42
Instrumented impact energy @ peak, 23°C	D3763	J	10	–	9	–
Thermal						
HDT, 1.84 MPa, 3.2mm, unannealed	D648	°C	210	–	207	–
CTE, -40°C to 40°C, flow	E831	10 ⁻⁵ 1/°C	3.1	–	2.3	–
CTE, -40°C to 40°C, xflow	E831	10 ⁻⁵ 1/°C	3.7	–	4	–
Flammability	UL Subj. 94	N/A	VO @ 0.5mm	–	–	–
Electrical						
Surface resistivity	D4496	ohm/sq	–	–	–	10 ^{2–10} 6

High temperature thermoplastic compounds

Polyphenylene sulfide "O" series — ASTM methods, SI units

Property	ASTM method	Units	Thermocomp* OF-1006 30% glass fiber	Thermocomp OF-1008 40% glass fiber	Thermocomp OFM-3166 black 30% glass fiber, 30% mineral	Lubricomp* OFL-4036 15% PTFE, 30% glass fiber	Stat-Kon* OC-1006 30% carbon fiber
Physical							
Density	D792	g/cm ³	1.59	1.70	1.96	1.69	1.44
Moisture absorption, 50% RH, 24 hrs	D570	%	0.03	–	0.03	0.01	0.02
Mold shrinkage, flow, 24 hrs	D955	%	0.1 – 0.3	–	0.1 – 0.2	0.1 – 0.2	0.05 – 0.2
Mold shrinkage, xflow, 24 hrs	D955	%	0.4 – 0.7	–	0.3 – 0.5	0.3 – 0.5	0.3 – 0.5
Mechanical							
Tensile stress, break	D638	MPa	130	160	134	145	210
Tensile strain, break	D638	%	1.3	1.5	1.2	1.7	1.1
Tensile modulus, 50 mm/min	D638	MPa	12730	–	–	12340	32750
Flexural stress	D790	MPa	194	238	199	200	304
Flexural modulus	D790	MPa	11250	14220	19210	11030	23510
Izod impact, unnotched, 23°C	D4812	J/m	405	524	–	5250	437
Izod impact, notched, 23°C	D256	J/m	69	96	45	85	49
Instrumented impact energy @ peak, 23°C	D3763	J	8	–	–	3	3
Thermal							
HDT, 1.84 MPa, 3.2mm, unannealed	D648	°C	267	264	265	268	266
CTE, -40°C to 40°C, flow	E831	10 ⁻⁵ 1/°C	2.4	–	1.7	2.4	0.9
CTE, -40°C to 40°C, xflow	E831	10 ⁻⁵ 1/°C	5	–	3.1	5	4.1
Flammability	UL Subj. 94	N/A	V0 @ 0.45mm	V0 @ 0.45mm	V0 @ 1.50mm	V0 @ 1.50mm	V0 @ 1.0mm
Electical							
Surface resistivity	D4496	ohm/sq	–	–	–	–	10 ² – 10 ⁶

PPA "U" series — ASTM methods, SI units

Property	Standard	Units	Thermocomp UF-1006 HS	Thermocomp UF-1008	Thermocomp UC-1006	Lubricomp UFL-4036 HS
Physical						
Density	ASTM D 792	g/cm ³	1.43	1.55	1.324	1.55
Moisture absorption, 50% RH, 24 hrs	ASTM D 570	%	0.25	0.27	0.31	0.33
Mold shrinkage, flow, 24 hrs	ASTM D 955	%	0.2 - 0.4	0.3	0.2	0.2
Mold shrinkage, xflow, 24 hrs	ASTM D 955	%	0.5 - 0.7	1.2	0.6	0.8
Mechanical						
Tensile stress, break	ASTM D 638	MPa	197	236	287	196
Tensile strain, break	ASTM D 638	%	2.4	2.1	1.5	2.5
Tensile modulus, 50 mm/min	ASTM D 638	MPa	13560	16130	26110	12410
Flexural stress	ASTM D 790	MPa	278	311	419	280
Flexural modulus	ASTM D 790	MPa	10210	13440	22630	10800
Izod impact, unnotched, 23°C	ASTM D 4812	J/m	726	870	827	1035
Izod impact, notched, 23°C	ASTM D 256	J/m	90	85	74	117
Instrumented impact energy @ peak, 23°C	ASTM D 3763	J	N/A	5	8	6
Thermal						
HDT, 1.84 MPa, 3.2mm, unannealed	ASTM D 648	°C	258	281	285	259
CTE, -40°C to 40°C, flow	ASTM E 831	x 10 ⁻⁵ 1/°C	8.5	2.5	1.8	N/A
CTE, -40°C to 40°C, xflow	ASTM E 831	x 10 ⁻⁵ 1/°C	12.2	3.0	4.0	N/A
UL 94 flammability	UL Subject 94	N/A	HB @ 1.5 mm	N/A	N/A	N/A

PEEK "L" series — ASTM methods, SI units

Property	Standard	Units	Thermocomp* LF-1006 EM	Thermocomp LC-1003 EM	Thermocomp LC-1006	Lubricomp* LCL-4033 EM	Lubricomp LL-4040
Physical							
Density	ASTM D 792	g/cm ³	1.538	1.33	1.413	1.43	1.37
Moisture absorption, 50% RH, 24 hrs	ASTM D 570	%	0.08	0.07	0.08	0.07	0.06
Mold shrinkage, flow, 24 hrs	ASTM D 955	%	-	0.2 - 0.3	0.1	0.1 - 0.3	1.3
Mold shrinkage, xflow, 24 hrs	ASTM D 955	%	-	0.5 - 0.6	0.4	0.4 - 0.7	1.9
Mechanical							
Tensile stress, break	ASTM D 638	MPa	181	153	225	179	69
Tensile strain, break	ASTM D 638	%	2.00	1.8	1.5	1.7	23.3
Tensile modulus, 50 mm/min	ASTM D 638	MPa	13000	11510	30750	16610	2890
Flexural stress	ASTM D 790	MPa	264	259	325	266	117
Flexural modulus	ASTM D 790	MPa	11000	9510	20200	12960	2960
Izod impact, unnotched, 23°C	ASTM D 4812	J/m	913	400	608	491	1553
Izod impact, notched, 23°C	ASTM D 256	J/m	117	37	74	64	96
Instrumented impact energy @ peak, 23°C	ASTM D 3763	J	8	4	12	8	2
Thermal							
HDT, 1.84 MPa, 3.2mm, unannealed	ASTM D 648	°C	>298	270	>298	>298	-
CTE, -40°C to 40°C, flow	ASTM E 831	10 ⁻⁵ 1/°C	0.63	1.60	0.37	0.73	-
CTE, -40°C to 40°C, xflow	ASTM E 831	10 ⁻⁵ 1/°C	1.11	1.65	0.90	1.26	-
UL compliant, 94V-0 flame class rating (3)(4)	UL 94 by GE	mm	-	-	0.7	1.5	-
Electrical							
Surface resistivity	ASTM D 257	Ohm	-	10 ² - 10 ⁶	-	-	-

High temperature thermoplastic compounds

Polyetherimide "E" series-ISO method

Property	ISO method	Units	Thermocomp* EF-1004 20% glass fiber	Thermocomp EF-1006 30% glass fiber	Lubricomp* EL-4030 15% PTFE	Lubricomp EFL-4036 15% PTFE, 30% glass fiber	Stat-Kon* EC-1002 EM 10% carbon fiber	Stat-Kon EC-1004 20% carbon fiber	Stat-Kon EC-1006 30% carbon fiber
Physical									
Density	ISO 1183	g/cm ³	1.43	1.53	1.35	1.62	1.31	1.34	1.39
Moisture absorption (23°C/ 50% RH)	ISO 62	%		0.21	0.25	0.22	0.35		0.29
Mold shrinkage, flow, 24 hrs	ISO 294	%	0.3 - 0.5	0.1 - 0.3	0.8 - 1.1	0.2 - 0.2	0.1 - 0.3	0.1 - 0.3	0.1 - 0.3
Mold shrinkage, xflow, 24 hrs	ISO 294	%	0.6 - 0.8	0.4 - 0.6	0.8 - 1.1	0.4 - 0.5	0.3 - 0.5	0.3 - 0.5	0.3 - 0.5
Mechanical									
Tensile stress, break	ISO 527	MPa	155	177	82	168	137	175	183
Tensile strain, break	ISO 527	%	2.9	2.2	8.1	2	1.2	2	1.1
Tensile modulus, 1 mm/min	ISO 527	MPa	6800	10380	2740	11180	12630	14500	20870
Flexural stress	ISO 178	MPa	226	263	130	248	216	250	269
Flexural modulus	ISO 178	MPa	6800	11510	3020	11390	10310	12000	17930
Izod impact, unnotched 80*10*4 +23°C	ISO 180/1U	kJ/m ²	30	48	61	46		30	
Izod impact, notched 80*10*4 +23°C	ISO 180/1A	kJ/m ²	10	10	8	13	5	7	5
Thermal									
HDT/Af, 1.8 MPa Flatw 80*10*4 sp=64mm	ISO 75/Af	°C	205	206	182	204	207	210	219
CTE, -40°C to 40°C, flow	ISO 11359-2	10 ⁻⁵ 1/°C	2.50	4.16	4.77	3.98	3.33	1.00	3.64
CTE, -40°C to 40°C, xflow	ISO 11359-2	10 ⁻⁵ 1/°C	6.00	3.09	4.76	2.84	3.30	6.00	2.25
Flammability	UL Subj. 94		VO @ 0.75mm	VO @ 0.75mm	VO @ 1.7mm	VO @ 0.75mm	VO @ 1.5mm	VO @ 0.5 mm	VO @ 0.75mm
Electrical									
Surface resistivity	ASTM D4496	ohm/sq.					10 ² -10 ⁶	10 ² -10 ⁶	10 ² -10 ⁶

Polysulfone "G" series-ISO method

Property	Standard	Units	Thermocomp GF-1006 30% glass fiber	Thermocomp GF-1008 40% glass fiber
Physical				
Density	ISO 1183	g/cm ³	1.47	1.60
Moisture absorption (23°C / 50% RH)	ISO 62	%	0.3	
Mold shrinkage, flow, 24 hrs	ISO 294	%	0.1 - 0.3	0.1-0.4
Mold shrinkage, xflow, 24 hrs	ISO 294	%	0.5 - 0.7	0.3-0.5
Mechanical				
Tensile stress, break	ISO 527	MPa	100	113
Tensile strain, break	ISO 527	%	1.9	1.4
Tensile modulus, 1 mm/min	ISO 527	MPa	8420	
Flexural stress	ISO 178	MPa	150	164
Flexural modulus	ISO 178	MPa	8390	9900
Izod impact, unnotched 80*10*4 +23°C	ISO 180/1U	kJ/m ²	27	25.7
Izod impact, notched 80*10*4 +23°C	ISO 180/1A	kJ/m ²	7	9.4
Thermal				
HDT/Af, 1.8 MPa Flatw 80*10*4 sp=64mm	ISO 75/Af	°C	182	180
CTE, -40°C to 40°C, flow	ISO 11359-2	10 ⁻⁵ 1/°C	3.10	
CTE, -40°C to 40°C, xflow	ISO 11359-2	10 ⁻⁵ 1/°C	3.66	
Flammability	UL Subj. 94			
Electrical				
Surface resistivity	ASTM D4496	ohm/sq.		

Polyethersulfone "J" series-ISO methods

Property	Standard	Units	Thermocomp* JF-1006 30% glass fiber	Thermocomp JF-1008 40% glass fiber	Lubricomp* JFL-4036 15% PTFE, 30% glass fiber
Physical					
Density	ISO 1183	g/cm ³	1.58	1.66	1.70
Moisture absorption (23°C / 50% RH)	ISO 62	%	0.46		0.5
Mold shrinkage, flow, 24 hrs	ISO 294	%	0.1 - 0.4		0.1 - 0.4
Mold shrinkage, xflow, 24 hrs	ISO 294	%	0.3 - 0.6		0.3 - 0.6
Mechanical					
Tensile stress, break	ISO 527	MPa	136	134	89
Tensile strain, break	ISO 527	%	2.1	1.4	1.5
Tensile modulus, 1 mm/min	ISO 527	MPa	9450		9540
Flexural stress	ISO 178	MPa	207	202	138
Flexural modulus	ISO 178	MPa	10000	11900	10840
Izod impact, unnotched 80*10*4 +23°C	ISO 180/1U	kJ/m ²	40	31.2	24
Izod impact, notched 80*10*4 +23°C	ISO 180/1A	kJ/m ²	9	8.3	9
Thermal					
HDT/Af, 1.8 MPa Flatw 80*10*4 sp=64mm	ISO 75/Af	°C	210		210
CTE, -40°C to 40°C, flow	ISO 11359-2	10 ⁻⁵ 1/°C	3.1		2.28
CTE, -40°C to 40°C, xflow	ISO 11359-2	10 ⁻⁵ 1/°C	3.7		3.52
Flammability	UL Subj. 94		VO @ 0.5mm		
Electrial					
Surface resistivity	ASTM D4496	ohm/sq.			

PPS "O" series-ISO method

Property	ISO method	Units	Thermocomp OF-1006 30% glass fiber	Thermocomp OF-1008 40% glass fiber	Thermocomp OFM-3166 30% glass fiber, 30% mineral	Lubricomp OFL-4036 15% PTFE, 30% glass fiber	Stat-Kon* OC-1006 30% carbon fiber
Physical							
Density	ISO 1183	g/cm ³	1.59	1.70	1.96	1.69	1.44
Moisture absorption (23°C / 50% RH)	ISO 62	%				0.04	0.03
Mold shrinkage, flow, 24 hrs	ISO 294	%	0.1 - 0.3		0.1 - 0.2	0.1 - 0.2	0.05 - 0.2
Mold shrinkage, xflow, 24 hrs	ISO 294	%	0.4 - 0.7		0.3 - 0.5	0.3 - 0.5	0.3 - 0.5
Mechanical							
Tensile stress, break	ISO 527	MPa	133	160	130	124	204
Tensile strain, break	ISO 527	%	2	1.2	1.2	1.4	1
Tensile modulus, 1 mm/min	ISO 527	MPa	11690		19000	11100	25450
Flexural stress	ISO 178	MPa	211	190	210	197	311
Flexural modulus	ISO 178	MPa	10470	13400	18800	10950	24720
Izod impact, unnotched 80*10*4 +23°C	ISO 180/1U	kJ/m ²	34	21	20	26	
Izod impact, notched 80*10*4 +23°C	ISO 180/1A	kJ/m ²	7	7	6	9	5
Thermal							
HDT/Af, 1.8 MPa Flatw 80*10*4 sp=64mm	ISO 75/Af	°C	266	272	270	266	268
CTE, -40°C to 40°C, flow	ISO 11359-2	10 ⁻⁵ 1/°C	2.41	2.60	1.90	2.36	0.87
CTE, -40°C to 40°C, xflow	ISO 11359-2	10 ⁻⁵ 1/°C	4.57		2.40	5.01	4.08
Flammability	UL Subj. 94		VO @ 0.45mm	VO @ 0.45mm	VO @ 1.50mm	VO @ 1.50mm	VO @ 1.0mm
Electrial							
Surface resistivity	ASTM D4496	ohm/sq.					10 ² -10 ⁶

High temperature thermoplastic compounds

PPA “U” series- ISO methods

Property	ISO method	Units	Thermocomp* UF-1006 HS 30% glass fiber	Thermocomp UF-1008 40% glass fiber	Thermocomp UC-1006 30% carbon fiber	Lubricomp* UFL-4036 HS 15% PTFE, 30% glass fiber
Physical						
Density	ISO 1183	g/cm ³	1.45	1.54	1.32	1.55
Moisture absorption (23°C / 50% RH)	ISO 62	%	0.41	0.42	0.66	
Mold shrinkage, flow, 24 hrs	ISO 294	%	0.2 - 0.4	0.3	0.2	0.2
Mold shrinkage, xflow, 24 hrs	ISO 294	%	0.5 - 0.7	1.2	0.6	0.8
Mechanical						
Tensile stress, break	ISO 527	MPa	167	205	263	196
Tensile strain, break	ISO 527	%	1.6	2	1.3	2.5
Tensile modulus, 1 mm/min	ISO 527	MPa	14790	14340	28160	9880
Flexural stress	ISO 178	MPa	255	321	413	285
Flexural modulus	ISO 178	MPa	11220	13800	22320	11220
Izod impact, unnotched 80*10*4 +23°C	ISO 180/1U	kJ/m ²	30	51	51	70
Izod impact, notched 80*10*4 +23°C	ISO 180/1A	kJ/m ²	7	9	6	12
Thermal						
HDT/Af, 1.8 MPa Flatw 80*10*4 sp=64mm	ISO 75/Af	°C	260	272	-	263
CTE, -40°C to 40°C, flow	ISO 11359-2	10 ⁻⁵ 1/°C	8.5	2.5	1.8	N/A
CTE, -40°C to 40°C, xflow	ISO 11359-2	10 ⁻⁵ 1/°C	12.2	3.0	4.0	N/A
Flammability	UL Subj. 94		HB @ 1.5 mm	N/A	N/A	N/A

PEEK “L” series-ISO method

Property	ISO method	Units	Thermocomp LF-1006 EM	Thermocomp LC-1003 EM	Thermocomp LC-1006	Lubricomp LCL-4033 EM	Lubricomp LL-4040
Physical							
Density	ISO 1183	g/cm ³	1.53	1.33	1.4	1.43	1.37
Moisture absorption (23°C / 50% RH)	ISO 62	%		0.13	0.07	0.7	0.12
Mold shrinkage, flow, 24 hrs	ISO 294	%		0.2 - 0.3	0.1	0.1 - 0.3	1.3
Mold shrinkage, xflow, 24 hrs	ISO 294	%		0.5 - 0.6	0.4	0.4 - 0.7	1.9
Mechanical							
Tensile stress, break	ISO 527	MPa	187	163	230	187	69
Tensile strain, break	ISO 527	%	2	1.8	1.5	1.6	11.8
Tensile modulus, 1 mm/min	ISO 527	MPa	12900	10520	24700	14700	3060
Flexural stress	ISO 178	MPa	278	263	346	275	118
Flexural modulus	ISO 178	MPa	12500	9850	24300	14700	3320
Izod impact, unnotched 80*10*4 +23°C	ISO 180/1U	kJ/m ²	58	29	42	34	91
Izod impact, notched 80*10*4 +23°C	ISO 180/1A	kJ/m ²	11	4	7	6	8
Thermal							
HDT/Af, 1.8 MPa Flatw 80*10*4 sp=64mm	ISO 75/Af	°C	>240	298	>240	>240	
CTE, -40°C to 40°C, flow	ISO 11359-2	10 ⁻⁵ 1/°C	0.63	1.60	0.37	0.73	
CTE, -40°C to 40°C, xflow	ISO 11359-2	10 ⁻⁵ 1/°C	1.11	1.65	0.90	1.26	
Flammability	UL Subj. 94				0.7	1.5	
Electrical							
Surface resistivity	ASTM D4496	ohm/sq.		10 ² - 10 ⁶			

LNP Colorcomp* compounds

Colorcomp pre-colored unfilled engineering resins are excellent candidates for the OEM or molder with lot releases of 110 to 40,000 pounds, critical color accuracy requirements and/or a need for short lead times. Colorcomp resins can be manufactured from virtually any thermoplastic resin in the LNP product line, in addition to select trademark resins from other major suppliers. A full line of special effects resins is available. All Colorcomp resins are manufactured to meet QS/ISO standards for lot traceability.

LNP Konduit* compounds

Composites of thermally conductive fillers and engineering thermoplastics, Konduit compounds have up to 2 to 10 times more thermal conductivity than traditional unfilled resins, while remaining electrically insulative, plus CLTEs similar to many metals. Konduit composites may reduce thermal rise and increase the efficiency of clutch coils, motors, transformers and many other coil wound systems.

LNP Lubricomp* compounds

Lubricomp internally lubricated compounds offer inherent lubrication through the addition of PTFE, silicone, aramid fiber and/or other materials to a wide variety of engineering thermoplastics. Lubriloy* compounds, a family of proprietary lubricated alloys, offers properties approaching PTFE-lubricated materials at reduced cost. These products may find use in demanding wear applications in the business machines, automotive, medical, appliance and industrial markets.

LNP Starflam* compounds

Most Starflam flame retardant (FR) nylon compounds meet the requirements for halogen and red phosphorous free materials, and can be formulated to comply with voluntary ECO labels such as Blue Angel and TCO. They also provide higher impact strength, faster cycle times, lower specific gravity and less mold corrosion versus brominated and chlorinated FR systems. UL flame retardancy ratings of V-2 to V-0 can be typical on 1.6mm thickness samples. Starflam compounds are laser markable and offer high relative thermal index, comparative tracking index and glow wire test electrical properties. They may be suitable candidates for electrical and electronic applications, including mini circuit breakers, contactors, connectors, switch gear housings, relays and motor housings.

LNP Stat-Kon* compounds

Stat-Kon electrically conductive compounds may provide economical and reliable solutions against electrostatic buildup. Faradex* compounds offer EMI/RFI shielding and ESD protection, eliminating the need for most special coatings or paints. Stat-Loy* composites contain permanent anti-static additives that are non-humidity dependent and non-migratory. Formulated for ease of processing, these compounds can be injection molded or extruded. Common applications include automotive fuel delivery systems, electronic and electrical equipment/instruments, business machines and more.

LNP Thermocomp* compounds

Thermocomp glass and/or carbon fiber reinforced compounds offer enhanced mechanical and thermal properties, including exceptional resistance to high temperature, fatigue, creep, impact and chemicals. Thermotuf* composites have been impact modified for additional toughness. The Thermocomp line also includes high specific gravity (HSG) compounds, melt processible fluoropolymer compounds and exceptional processing (EP) compounds for thin wall molding. Products from the Thermocomp line are typically used in automotive functional components, business machines, electrical/electronic components, consumer goods, appliances and industrial applications.

LNP Verton* compounds

Verton composites combine nylon, polypropylene, polyphthalamide and other engineering thermoplastics with long reinforcing fibers using SABIC Innovative Plastics' pultrusion process, which may provide an outstanding balance of cost and performance in structural applications. Specifically, these remarkably lightweight materials offer exceptional mechanical properties, combining rigidity with outstanding strength and resistance to impact failures. Verton composites find use in demanding structural applications, primarily in the automotive, industrial and recreational markets, and frequently replace die-cast metal.

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