ULTEM™ Resin 1010UCL

DESCRIPTION

ULTEM 1010UCL resin is an amorphous, transparent polyetherimide (PEI) thermoplastic offering enhanced flow and a glass transition temperature (Tg) of 217°C. 1010UCL offers the same performance as ULTEM 1010 resin and offers further enhanced cleanliness control for (optical) applications.

The natural (uncolored) version of this grade is compliant with RoHS and also with Halogen Free standards as IEC 61249-2-21 and e.g. IPC 4101E. For colored versions, compliance needs to be checked case by case.

GENERAL INFORMATION	
Features	Flame Retardant, Chemical Resistance, Good Processability, High Flow, Hydrolytic Stability, Low Warpage, Non-Halogenated, Low Smoke and Toxicity, Thin Wall, Dielectrics, Amorphous, Low Shrinkage, Low Corrosivity, IR Transparent, UV-C resistant, Bio-Renewable, Transparent/Translucent, Electroplatable, Low ionics/Outgassing/Liquid particle count, Creep resistant, Dimensional stability, High stiffness/Strength, High temperature resistance, No PFAS intentionally added
Fillers	Unreinforced
Polymer Types	Polyetherimide (PEI)
Processing Techniques	Additive manufacturing, Film Extrusion, Injection Molding, Extrusion, Injection compression molding
Regional Availability	Europe, Asia, Americas

INDUSTRY	SUB INDUSTRY
Automotive	Automotive Interiors, Automotive Under the Hood, Motorcycle, Recreational/Specialty Vehicles
Consumer	Consumer Goods, Sport/Leisure, Personal Accessory, Home Appliances, Commercial Appliance, Furniture
Electrical and Electronics	Mobile Phone - Computer - Tablets, Lighting, Wireless Communication
Industrial	Electrical, Textile, Eyewear

TYPICAL PROPERTY VALUES

Revision 20260826

PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
MECHANICAL [1]			
Tensile Stress, yield, 50 mm/min	110	MPa	ISO 527
Tensile Strain, yield, 50 mm/min	6	%	ISO 527
Tensile Strain, break, 50 mm/min	50	%	ISO 527
Tensile Modulus, 1 mm/min	3200	MPa	ISO 527
Flexural Stress, yield, 2 mm/min	160	MPa	ISO 178
Flexural Modulus, 2 mm/min	3300	MPa	ISO 178
Ball Indentation Hardness, H358/30	140	MPa	ISO 2039-1
Hardness, Rockwell M	106	-	ISO 2039-2
Tensile Stress, yld, Type I, 50 mm/min	115	MPa	ASTM D638
Tensile Strain, yld, Type I, 50 mm/min	7	%	ASTM D638
Tensile Strain, brk, Type I, 50 mm/min	60	%	ASTM D638
Tensile Stress, yld, Type I, 5 mm/min	110	MPa	ASTM D638
Tensile Strain, yld, Type I, 5 mm/min	7	%	ASTM D638
Tensile Strain, brk, Type I, 5 mm/min	60	%	ASTM D638
Tensile Modulus, 5 mm/min	3350	MPa	ASTM D638
Flexural Stress, yld, 1.3 mm/min, 50 mm span	165	MPa	ASTM D790

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PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
Flexural Modulus, 1.3 mm/min, 50 mm span	3200	MPa	ASTM D790
Flexural Stress, yld, 2.6 mm/min, 100 mm span	160	MPa	ASTM D790
Flexural Modulus, 2.6 mm/min, 100 mm span	3400	MPa	ASTM D790
Hardness, Rockwell M	109	-	ASTM D785
Taber Abrasion, CS-17, 1 kg	10	mg/1000cy	ASTM D1044
IMPACT [1]			
Charpy 23°C, V-notch Edgew 80*10*4 sp=62mm	4	kJ/m²	ISO 179/1eA
Charpy -30°C, V-notch Edgew 80*10*4 sp=62mm	4	kJ/m²	ISO 179/1eA
Izod Impact, Reverse Notched, 3.2 mm	1174	J/m	ASTM D256
Gardner, 23°C	33	J	SABIC method
Izod Impact, unnotched 80*10*4 +23°C	NB	kJ/m²	ISO 180/1U
Izod Impact, unnotched 80*10*4 -30°C	NB	kJ/m²	ISO 180/1U
Izod Impact, unnotched, 23°C	1600	J/m	ASTM D4812
Izod Impact, unnotched, -30°C	1500	J/m	ASTM D4812
Izod Impact, notched 80*10*4 +23°C	5	kJ/m²	ISO 180/1A
Izod Impact, notched 80*10*4 -30°C	5	kJ/m²	ISO 180/1A
Izod Impact, notched, 23°C	32	J/m	ASTM D256
Izod Impact, notched, -30°C	41	J/m	ASTM D256
THERMAL [1]			
HDT/Bf, 0.45 MPa Flatw 80*10*4 sp=64mm	209	°C	ISO 75/Bf
HDT/Af, 1.8 MPa Flatw 80*10*4 sp=64mm	192	°C	ISO 75/Af
Vicat Softening Temp, Rate A/50	215	°C	ISO 306
Vicat Softening Temp, Rate B/50	211	°C	ISO 306
Vicat Softening Temp, Rate B/120	212	°C	ISO 306
CTE, -40°C to 150°C, flow	5.2E-05	1/°C	ISO 11359-2
CTE, -40°C to 150°C, xflow	5.2E-05	1/°C	ISO 11359-2
Ball Pressure Test, 125°C +/- 2°C	PASS	-	IEC 60695-10-2
Thermal Conductivity	0.22	W/m·°C	ISO 8302
HDT, 0.45 MPa, 6.4 mm, unannealed	210	°C	ASTM D648
HDT, 1.82 MPa, 6.4 mm, unannealed	201	°C	ASTM D648
HDT, 0.45 MPa, 3.2 mm, unannealed	207	°C	ASTM D648
HDT, 1.82 MPa, 3.2mm, unannealed	190	°C	ASTM D648
Vicat Softening Temp, Rate B/50	211	°C	ASTM D1525
CTE, -20°C to 150°C, flow	5.2E-05	1/°C	ASTM E831
CTE, -20°C to 150°C, xflow	5.2E-05	1/°C	ASTM E831
Thermal Conductivity	0.22	W/m·°C	ASTM C177
PHYSICAL [1]			
Density	1.27	g/cm³	ISO 1183
Moisture Absorption, (23°C/50% RH/24hrs)	0.2	%	ISO 62-4
Moisture Absorption, (23°C/50% RH/Equilibrium)	0.7	%	ISO 62-4
Water Absorption, (23°C/24hrs)	0.25	%	ISO 62-1
Water Absorption, (23°C/saturated)	1.25	%	ISO 62-1
Melt Volume Rate, MVR at 340°C/5.0 kg	13	cm³/10 min	ISO 1133
Melt Volume Rate, MVR at 360°C/5.0 kg	25	cm³/10 min	ISO 1133
Specific Gravity	1.27	-	ASTM D792

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PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
Water Absorption, (23°C/24hrs)	0.25	%	ASTM D570
Water Absorption, (23°C/Saturated)	1.25	%	ASTM D570
Melt Flow Rate, 337°C/6.6 kgf	18	g/10 min	ASTM D1238
Poisson's Ratio	0.36	-	ASTM E132
Mold Shrinkage, flow, 3.2 mm [2]	0.5 – 0.7	%	SABIC method
Mold Shrinkage, xflow, 3.2 mm [2]	0.5 – 0.7	%	SABIC method
OPTICAL [1]			
Light Transmission			
at 1.0 mm and 850 nm	88	%	ASTM D1003
at 1.0 mm and 1350 nm	89	%	ASTM D1003
Refractive Index			
at 850 nm	1.639	-	ISO 489
at 1350 nm	1.626	-	ISO 489
Abbe number	21	-	ISO 489
ELECTRICAL [1]			
Volume Resistivity	1.E+15	Ω.cm	IEC 60093
Surface Resistivity, ROA	>1.E+15	Ω	IEC 60093
Dielectric Strength, in oil, 0.8 mm	33	kV/mm	IEC 60243-1
Dielectric Strength, in oil, 1.6 mm	25	kV/mm	IEC 60243-1
Dielectric Strength, in oil, 3.2 mm	16	kV/mm	IEC 60243-1
Relative Permittivity, 1 MHz	2.9	-	IEC 60250
Relative Permittivity, 50/60 Hz	2.9	-	IEC 60250
Dielectric Constant			
1.1 GHz [3]	3.01	-	-
Dissipation Factor			
1.1 GHz [3]	0.0012	-	-
Comparative Tracking Index	150	V	IEC 60112
Comparative Tracking Index, M	100	V	IEC 60112
Volume Resistivity	1.E+17	Ω.cm	ASTM D257
Dielectric Strength, in air, 1.6 mm	32.7	kV/mm	ASTM D149
Dielectric Strength, in oil, 1.6 mm	28.0	kV/mm	ASTM D149
Dielectric Strength, in oil, 3.2 mm	19.7	kV/mm	ASTM D149
Relative Permittivity, 100 Hz	3.15	-	ASTM D150
Relative Permittivity, 1 kHz	3.15	-	ASTM D150
Arc Resistance, Tungsten {PLC}	5	PLC Code	ASTM D495
FLAME CHARACTERISTICS [4]			
Oxygen Index (LOI)	44	%	ASTM D2863
Oxygen Index (LOI)	47	%	ISO 4589
Glow Wire Flammability Index 960°C, passes at [5]	3.2	mm	IEC 60695-2-12
INJECTION MOLDING [6]			
Drying Temperature	150	°C	
Drying Time	4 – 6	Hrs	
Drying Time (Cumulative)	24	Hrs	
Maximum Moisture Content	0.02	%	
Melt Temperature	350 – 410	°C	

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PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
Nozzle Temperature	345 – 405	°C	
Front - Zone 3 Temperature	345 – 415	°C	
Middle - Zone 2 Temperature	340 – 405	°C	
Rear - Zone 1 Temperature	330 – 400	°C	
Mold Temperature	135 – 180	°C	
Back Pressure	0.3 – 0.7	MPa	
Shot to Cylinder Size	40 – 60	%	
Vent Depth	0.025 – 0.076	mm	
Screw speed (Circumferential speed)	0.2 – 0.3	m/s	

(1) The information stated on Technical Datasheets should be used as indicative only for material selection purposes and not be utilized as specification or used for part or tool design.
(2) Measurements made from laboratory test coupon. Actual shrinkage may vary outside of range due to differences in processing conditions, equipment, part geometry and tool design. It is recommended that mold shrinkage studies be performed with surrogate or legacy tooling prior to cutting tools for new molded article.
(3) Based on SPDR testing technique on dry as molded specimens.
(4) UL Ratings shown on the technical datasheet might not cover the full range of thicknesses and colors. For details, please see the UL Yellow Card.
(5) Value shown here is based on internal measurement.
(6) Injection Molding parameters are only mentioned as general guidelines. These may not apply or may need adjustment in specific situations such as low shot sizes, large part molding, thin wall molding and gas-assist molding.

MORE INFORMATION

For curve data and CAE cards, please visit and register at https://materialfinder.sabic-specialties.com

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