ULTEM™ Resin STM1600
Americas: COMMERCIAL

Siltem 1600 is a flexible copolymer designed for wire and cable applications. It offers a halogen free (according VDE 0472) flame retardant solution that also offers low smoke emission and toxicity. It is an amber colored transparent material that can be selfcolored and easily processed on conventional equipment. The material may also have a fit in flexible profiles or injection molded parts.

TYPICAL PROPERTIES[1]	TYPICAL VALUE	Unit	Standard
MECHANICAL			
Tensile Stress, yld, Type I, 5 mm/min	430	kgf/cm²	ASTM D 638
Tensile Stress, brk, Type I, 5 mm/min	400	kgf/cm²	ASTM D 638
Tensile Strain, yld, Type I, 5 mm/min	10	%	ASTM D 638
Tensile Strain, brk, Type I, 5 mm/min	64	%	ASTM D 638
Tensile Modulus, 5 mm/min	14200	kgf/cm²	ASTM D 638
Flexural Stress	480	kgf/cm²	ASTM D 790
Flexural Stress, yld, 1.3 mm/min, 50 mm span	480	kgf/cm²	ASTM D 790
Flexural Modulus	12700	kgf/cm²	ASTM D 790
Flexural Modulus, 1.3 mm/min, 50 mm span	12700	kgf/cm²	ASTM D 790
Hardness, Shore D	72	-	ASTM D 2240
Taber Abrasion, CS-17, 1 kg	50	mg/1000cy	ASTM D 1044
Tensile Stress, yield, 50 mm/min	42	MPa	ISO 527
Tensile Stress, break, 50 mm/min	41	MPa	ISO 527
Tensile Strain, yield, 50 mm/min	10	%	ISO 527
Tensile Strain, break, 50 mm/min	74	%	ISO 527
Tensile Modulus, 1 mm/min	1380	MPa	ISO 527
Flexural Stress, yield, 2 mm/min	55	MPa	ISO 178
Flexural Modulus, 2 mm/min	1250	MPa	ISO 178
IMPACT			
Izod Impact, notched, 23°C	42	cm-kgf/cm	ASTM D 256
Izod Impact, notched 80*10*4 +23°C	36	kJ/m²	ISO 180/1A
Izod Impact, notched 80*10*4 -30°C	25	kJ/m²	ISO 180/1A

(1) Typical values only. Variations within normal tolerances are possible for various colors. All values are measured after at least 48 hours storage at 23°C/50% relative humidity. All properties, except the melt volume and melt flow rates, are measured on injection molded samples. All samples tested under ISO test standards are prepared according to ISO 294.

(2) Only typical data for selection purposes. Not to be used for part or tool design.
(3) This rating is not intended to reflect hazards presented by this or any other material under actual fire conditions.
(4) Internal measurements according to UL standards.
(5) 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.
(6) Needs hard coat to consistently pass 60 sec Vertical Burn.

Source GMD, last updated:

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THERMAL			
HDT, 1.82 MPa, 3.2mm, unannealed	80	°C	ASTM D 648
Vicat Softening Temp, Rate B/120	167	°C	ISO 306
HDT/Bf, 0.45 MPa Flatw 80*10*4 sp=64mm	144	°C	ISO 75/Bf
PHYSICAL			
Specific Gravity	1.19	-	ASTM D 792
Mold Shrinkage, flow, 3.2 mm (5)	0.86 - 1.01	%	SABIC Method
Melt Flow Rate, 295°C/6.6 kgf	8.6	g/10 min	ASTM D 1238
Density	1.19	g/cm³	ISO 1183
Water Absorption, 23°C/24hrs	0.58	%	ISO 62-1
Water Absorption, (23°C/sat)	0.58	%	ISO 62
Matrix Tg	195	°C	DMA
ELECTRICAL			
Volume Resistivity	>1.E+16	Ohm-cm	ASTM D 257
Surface Resistivity	>1.E+15	Ohm	ASTM D 257
Dielectric Strength, in oil, 3.2 mm	16.6	kV/mm	ASTM D 149
Relative Permittivity, 100 Hz	3.14	-	ASTM D 150
Relative Permittivity, 100 kHz	3	-	ASTM D 150
Relative Permittivity, 1 MHz	3.02	-	ASTM D 150
Dissipation Factor, 100 Hz	0.014	-	ASTM D 150
Dissipation Factor, 100 kHz	0.0064	-	ASTM D 150
Dissipation Factor, 1 MHz	0.0055	-	ASTM D 150
FLAME CHARACTERISTICS			
UL Compliant, 94V-0 Flame Class Rating (3)(4)	1.6	mm	UL 94 by SABIC-IP
Oxygen Index (LOI)	48	%	ASTM D 2863

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PROCESSING PARAMETERS	TYPICAL VALUE	Unit
Injection Molding		
Drying Temperature	105	°C
Drying Time	4 - 6	hrs
Drying Time (Cumulative)	8	hrs
Maximum Moisture Content	0.02	%
Melt Temperature	310 - 320	°C
Nozzle Temperature	310 - 320	°C
Front - Zone 3 Temperature	310 - 320	°C
Middle - Zone 2 Temperature	310 - 320	°C
Rear - Zone 1 Temperature	310 - 320	°C
Mold Temperature	105 - 115	°C
Back Pressure	0.3 - 0.7	MPa
Screw Speed	50 - 100	rpm
Shot to Cylinder Size	40 - 60	%
Vent Depth	0.025 - 0.076	mm
Wire Coating Extrusion		
Drying Temperature	110 - 130	°C
Drying Time	5 - 7	hrs
Maximum Moisture Content	0.02	%
Extruder Length/Diameter Ratio (L/D)	22:1 to 28:1	-
Compression Ratio	2.1:1 to 2.7:1	-
Feed - Compression - Metering	10 - 5 - 10	D
Screw Speed	5 - 50	rpm
Feed Zone Temperature	270 - 310	°C
Middle Zone Temperatures	280 - 320	°C
Head Zone Temperature	290 - 330	°C
Neck Temperature	290 - 330	°C
Cross-head Temperature	290 - 330	°C
Die Temperature	290 - 330	°C

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PROCESSING PARAMETERS	TYPICAL VALUE	Unit
Wire Coating Extrusion		
Melt Temperature	290 - 330	°C
Conductor Pre-heat Temperature	100 - 150	°C
Screen Pack	100 - 200	-
Water Bath Temperature	70 - 90	°C

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