Fluorosint® 135

QUADRANT ENGINEERING PLASTIC PRODUCTS

PRODUCT DATA SHEET

Fluorosint® 135 is a high performance Fluorosint grade, where the benefits of PTFE-based materials also require strength, stiffness and stability. Also this grade has excellent high pressure-velocity capabilities in combination with a low wear rate. Further on this grade delivers high mechanical performance at elevated temperature and as a result it also can be used in seat, seal and wear applications where extreme conditions are present.

Physical properties (indicative values)

PROPERTIES	Test methods	Units	VALUES (PLATE)	VALUES (TUBE)	Test methods	Units	VALUES
Colour	-	-	Black	Black	-	-	Black
Density	ISO 1183-1	g/cm³	1.89	1.89			
Specific Gravity					ASTM D792	-	1.91
- after 24/96 h immersion in water of 23 °C (73°F)	ISO 62	%	-	-	ASTM D570	%	0.1 / NT
- at saturation in air of 23 °C (73°F)/ 50 % RH	-	%	-	-	-	%	-
- at saturation in water of 23 °C (73°F)	-	%	-	-	ASTM D570	%	0.3
Thermal Properties (1)							
Melting temperature (DSC, 10 °C/min)	ISO 11357	°C	330	330	ASTM D3418	°F	327
Glass transition temperature (DSC, 20 °C/min) - (2)	ISO 11357	°C			ASTM D3418	°F	NA
Thermal conductivity at 23 °C (73°F)	-	W/(K.m)	-	-	-	BTU in./(hr.ft².°F)	-
Coefficient of linear thermal expansion:							
- average value between -40 and 150 °C (-40°F to 300°F)	ASTM E-831 (TMA)	m/(m.K)	38 x 10^{-6}	NT	ASTM E-831 (TMA)	in./in./°F	25 x 10^{-6}
Temperature of deflection under load:							
- method A: 1.8 MPa (264 psi)	ISO 75-1/-2	°C	-	91	ASTM D648	°F	220
Max. allowable service temperature in air:							
- for short periods	-	°C	-	-	-	°F	-
- continuously : for min. 20,000 h (3)	-	°C	260	260	-	°F	500
Flammability (4):							
- "Oxygen Index"	ISO 4589-1/-2	%	NT	NT	ISO 4589-1/-2	%	NT
- according to UL 94 [1.5 mm (1/16 in.) thickness]	-	-	V0	V0	-	-	V0
Mechanical Properties at 23 °C (73°F) (5)							
Tension test:							
- tensile stress at yield / tensile stress at break	ISO 527-1/-2 /1B	MPa	11 / -	- / 8	ASTM D638	psi	NT
- tensile strength	ISO 527-1/-2 /1B	MPa	11	8	ASTM D638	psi	1,300
- tensile strain at yield	ISO 527-1/-2 /1B	%	3	NT	ASTM D638	%	NT
- tensile strain at break	ISO 527-1/-2 /1B	%	3.1	1.6	ASTM D638	%	3
- tensile modulus of elasticity	ISO 527-1/-2 /1B	MPa	1230	1030	ASTM D638	psi	370,000
Compression test:							
- compressive stress at 1 / 2 / 5 / 10 % nominal strain	ISO 604	MPa	19 / 25 / 30 / 32	17 / 28 / 41 / 47	ASTM D695	psi	- / - / - / 7,000
- compressive modulus of elasticity	ISO 604	MPa	2075	1916	ASTM D695	psi	200,000
Flexural test :							
- flexural strength	ISO 178	MPa	26	18	ASTM D790	psi	2,500
-flexural modulus of elasticity	ISO 178	MPa	1818	1771	ASTM D790	psi	300,000
Shear Strength					ASTM D732	psi	-
Charpy impact strength - unnotched	ISO 179-1/1eA	kJ/m²	5.4	4.6	-	-	-
Charpy impact strength - notched	ISO 179-1/1eA	kJ/m²	3.5	2.4	-	-	-
Izod impact	-	-	NT	NT	ASTM D256 Type "A"	ft.lb./in.	0.5
Ball indentation hardness	ISO 868	-	65	79	ASTM D2240	-	-
Rockwell hardness	ISO 2039-2	-	R67	R82	ASTM D785	-	R80
Sliding Properties							
Wear rate	ISO 7148-2:1999 (6)	µm/km	1.87	1.63	QTM 55100 (7)	In^3.min/ft.lbs.hr	32.10^{-10}
Dynamic Coefficient of Friction (-)	ISO 7148-2:1999 (6)	-	0.20 - 0.30	0.16 - 0.27	QTM 55007 (8)	-	0.15
Electrical Properties at 23 °C (73°F)							
Electric strength	IEC 60243-1	kV/mm	-	-	ASTM D149	Volts/mil	-
Volume resistivity	IEC 60093	Ohm.cm	-	-	IEC 60093	Ohm.cm	-
Surface resistivity	ANSI/ESD STM 11.11	Ohm/sq.	< 10^3	NT	ANSI/ESD STM 11.11	Ohm/sq.	< 10^5
Relative permittivity ε_r : - at 100 Hz	IEC 60250	-	-	-	-	-	-
- at 1 MHz	IEC 60250	-	-	-	ASTM D150	-	-
Dielectric dissipation factor tan δ: - at 100 Hz	IEC 60250	-	-	-	-	-	-
- at 1 MHz	IEC 60250	-	-	-	ASTM D150	-	-
Comparative tracking index (CTI)	IEC 60112	-	-	-	IEC 60112	-	-

NA: Not Applicable
NT: Not Tested

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Legend:

(1) The figures given for these properties are for some part derived from raw material supplier data and other publications.
(2) Values for this property are only given here for amorphous materials and for materials that do not show a melting temperature (PBI & PI).
(3) Temperature resistance over a period of min. 20,000 hours. After this period of time, there is a decrease in tensile strength – measured at 23 °C – of about 50 % as compared with the original value. The temperature value given here is thus based on the thermal-oxidative degradation which takes place and causes a reduction in properties. Note, however, that the maximum allowable service temperature depends in many cases essentially on the duration and the magnitude of the mechanical stresses to which the material is subjected.
(4) These estimated ratings, derived from raw material supplier data and other publications, are not intended to reflect hazards presented by the material under actual fire conditions. There is no 'UL File Number' available for these stock shapes.
(5) Most of the figures given for the mechanical properties of the materials (stock shapes) are average values of tests run on dry test samples
(6) Test procedure similar to Test Method A: "Pin-on-disk" as described in ISO 7148-2:1999, Load 3MPa, sliding velocity= 0,33 m/s, mating plate steel Ra= 0.7-0.9 µm, tested at 23°C, 50%RH.
(7) Test using journal bearing system, 100 ft/min, 50 PSI, steel shaft roughness 16±2 RMS micro inches with Hardness Brinell of 180-200
(8) Test using Plastic Thrust Washer rotating against steel, 20 ft/min and 250 PSI, Stationary steel washer roughness 16±2 RMS micro inches with Rockwell C 20-24