POLYVANTIS

PRODUCT DATASHEET

VALOX™ FR1 FILM

DESCRIPTION

VALOX™ FR-1 film is an impact modified flame retardant Polybutylene Terephthalate/Polycarbonate (PBT/PC) alloy film offering UL94 VTM-0 performance down to 130 microns and good temperature performance. VALOX™ FR-1 film's outstanding chemical resistance, dielectric strength and ease of fabrication (ie: thermoforming, embossing, clean-edge die- cutting, folding and bending) makes it very suitable for a wide range of electrical, electronic and medical applications.

TYPICAL PROPERTY VALUES*

PROPERTY	ASTM TEST METHOD	UNITS (USCS)	VALUE	ISO TEST METHOD	UNITS (SI)	VALUE
MECHANICAL						
Tensile Strength @ Yield	ASTM D882	psi	7200	ISO 527	MPa	49.7
Ultimate	ASTM D882	psi	6000	ISO 527	MPa	41.1
Tensile Modulus	ASTM D882	psi	277000	ISO 527	MPa	1910
Tensile Elongation at Break	ASTM D882	%	57	ISO 527	%	57
Gardner Impact Strength at 0.03"	ASTM D3029	ft-lb	7	ISO 6603-1	J	10
Tear Strength						
Initiation	ASTM D1004	lb/mil	1.46		kN/m	255
Propagation	ASTM D1922	g/mil	55		kN/m	20
Puncture Resistance (Dynatup)	ASTM D3763	ft-lb	9		J	12
Fold Endurance (MIT)						
0.007" (0.175 mm)	ASTM D2176-69	double folds	2000			
0.020" (0.625 mm)	ASTM D2176-69	double folds	83			
THERMAL						
Coefficient of Thermal Conductivity	ASTM D5470	Btu/hr/ft^2/°F/i	1.35		W/m°K	0.17
Coefficient of Thermal Expansion	ASTM E831	(x10^{-5}/°F)	3.1	ISO 11359	(x10^{-5}/°C)	5.7
Specific Heat @40°F (4°C)	ASTM E1269	Btu/lb/°F	0.3		KJ/Kg-°C	1.31
Glass Transition Temperature	ASTM D3417 / D3418	°F	183	ISO 11357	°C	84
Vicat Softening Temperature, B	ASTM 1525-00	°F	346		°C	174
Heat Deflection Temp. by TMA at		°F	174	ISO 75 Modified	°C	79
Shrinkage at 302°F (150°C)	ASTM D1204	%	0.40		%	0.40
Brittleness Temperature	ASTM D746	°F	-211		°C	-135
PHYSICAL						
Density	ASTM D792	slug/ft^3	2.6	ISO 1183	kg/m^3	1340
Water Absorption, 24 hrs.	ASTM D570	% change	0.48	ISO 62	% change	0.48
Surface Energy(1st surface/ 2nd	ASTM D5946-01	-	36/35			
Surface Tension(1st surface/2nd	Dyne Pens	Dyne	>44/34-36			

Pencil Hardness	ASTM D3363	-	2b-b			
PROPERTY	**ASTM TEST METHOD**	**UNITS (USCS)**	**VALUE**	**ISO TEST METHOD**	**UNITS (SI)**	**VALUE**
OPTICAL						
Light Transmission	ASTM D1003	%	15			
Yellowness Index	ASTM D1925	%	49			
Haze	ASTM D1003	%	103			
Gloss over Flat Black min/max @ 60°	ASTM D523-60	-	5	ISO 2813		5
ELECTRICAL						
Dielectric Strength in oil, short time @ 72°F (23°C), 10 mils	ASTM D 149-97a					
(0.25mm)	Method A	kV/mil	1.09	IEC 60243	kV/mm	43
Dielectric Constant						
@ 60 Hz	ASTM D150	-	3.3	IEC 60250	-	3.3
@1,000,000 Hz	ASTM D150	-	2.8	IEC 60250	-	2.8
Dissipation Factor						
@ 60 Hz	ASTM D150	-	0.0015	IEC 60250	-	0.0015
@1,000,000 Hz	ASTM D150	-	0.01	IEC 60250	-	0.01
Volume Resistivity	ASTM D257	Ω-cm	1E+17	IEC 60093	Ω -cm	1E+17
Surface Resistivity	ASTM D257	Ω /square	1E+16	IEC 60093	Ω /square	1E+16
Arc Resistance, Tungsten Electrodes	ASTM D495	s	21			

- These are typical properties and are not intended for specification purposes. If minimum certifiable properties are required, please contact your local POLYVANTIS representative or the POLYVANTIS Quality Services Department. Reported values are based on 0.250 mm (0.010") thickness film unless otherwise noted.

GLOSS BY GAUGE: (ASTM D 523-85)

	GAUGE	ANGLE		MATTE
	.003" (0.075mm)	85°	Minimum	0.1
FR1			Maximum	25
	0.006 - 0.030" (0.150	85°	Minimum	0.1
			Maximum	17

MANUFACTURING SPECIFICATIONS

NOMINAL GAUGE RANGES	MIN./MAX LIMIT OF NOMINAL
0.003 - 0.010" (0.075 mm-0.250 mm)	-/+10%
0.015 - 0.030" (0.375 - 0.750mm)	-/+5%

Color Code:
Black Color - BK1066 (BK)
Natural Color - 1001 (NC)

UL File Number:E539257, E539253

POLYVANTIS

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