Kynar® 1000 HD

Polyvinylidene Fluoride

Arkema

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Technical Data

General			
Material Status	• Commercial: Active		
Literature [1]	• Processing - Kynar (English) • Technical Datasheet (English)		
UL Yellow Card [2]	• E54699-244842		
Search for UL Yellow Card	• Arkema		
Availability	• Africa & Middle East • Asia Pacific	• Europe • Latin America	• North America
Features	• Fatigue Resistant • Fungus Resistant • Good Chemical Resistance • Good Creep Resistance	• Good Processability • Good Strength • Good Thermal Stability • Good Toughness	• Good Weather Resistance • Kosher Approved • Low to No Outgassing • Ozone Resistant
Agency Ratings	• FDA 21 CFR 177.1520 • FDA 21 CFR 177.2510 • FDA 21 CFR 177.2600	• NSF 51 • NSF 61 • USDA Food Contact, Unspecified Rating	• USP Class VI
Appearance	• Natural Color		
Forms	• Pellets		
Processing Method	• Extrusion	• Injection Molding	
Multi-Point Data	• Creep Modulus vs. Time (ISO 11403-1) • Isochronous Stress vs. Strain (ISO 11403-1)	• Isothermal Stress vs. Strain (ISO 11403-1) • Secant Modulus vs. Strain (ISO 11403-1)	• Shear Modulus vs. Temperature (ISO 11403-1) • Viscosity vs. Shear Rate (ISO 11403-2)

Physical	Nominal Value (English)	Nominal Value (SI)	Test Method
Specific Gravity			
--	1.76 to 1.78	1.76 to 1.78 g/cm³	ASTM D792
--	0.0639 lb/in³	1770 kg/m³	ISO 1183 [4]
Melt Mass-Flow Rate (MFR) (450°C/5.0 kg)	1.5 to 2.5 g/10 min	1.5 to 2.5 g/10 min	ASTM D1238
Melt volume-flow rate (230°C/5.0 kg)	0.0671 in³/10min	1.10 cm³/10min	ISO 1133 [4]
Water Absorption			
73°F (23°C), 24 hr	0.010 to 0.030 %	0.010 to 0.030 %	ASTM D570
Saturation	0.030 %	0.030 %	ISO 62 [4]
Equilibrium	0.015 %	0.015 %	ISO 62 [4]

Mechanical	Nominal Value (English)	Nominal Value (SI)	Test Method
Tensile Modulus			
73°F (23°C)	200000 to 335000 psi	1380 to 2310 MPa	ASTM D638
--	290000 psi	2000 MPa	ISO 527-2 [4]
Tensile Strength			
Yield, 73°F (23°C)	6500 to 8000 psi	44.8 to 55.2 MPa	ASTM D638
Yield	7250 psi	50.0 MPa	ISO 527-2 [4]
Break, 73°F (23°C)	5000 to 7000 psi	34.5 to 48.3 MPa	ASTM D638
Tensile Elongation			
Yield, 73°F (23°C)	5.0 to 10 %	5.0 to 10 %	ASTM D638
Yield	9.0 %	9.0 %	ISO 527-2 [4]
Break, 73°F (23°C)	20 to 100 %	20 to 100 %	ASTM D638
Nominal strain at break	> 50 %	> 50 %	ISO 527-2 [4]
Tensile Creep Modulus			ISO 899-1 [4]
1 hr	152000 psi	1050 MPa	
1000 hr	94300 psi	650 MPa	
Flexural Modulus (73°F (23°C))	240000 to 335000 psi	1650 to 2310 MPa	ASTM D790

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Mechanical	Nominal Value (English)	Nominal Value (SI)	Test Method
Flexural Strength			ASTM D790
5.0% Strain, 73°F (23°C)	8500 to 11000 psi	58.6 to 75.8 MPa	
Compressive Strength (73°F (23°C))	10000 to 15000 psi	68.9 to 103 MPa	ASTM D695
Coefficient of Friction			ASTM D1894
vs. Steel - Dynamic	0.15	0.15	
vs. Steel - Static	0.22	0.22	
Taber Abrasion Resistance			No Standard
1000 Cycles, 1000 g, CS-17 Wheel	5.00 to 9.00 mg	5.00 to 9.00 mg	
Impact	**Nominal Value (English)**	**Nominal Value (SI)**	**Test Method**
Charpy notched impact strength			ISO 179/1eA [4]
-22°F (-30°C)	2.38 ft·lb/in²	5.00 kJ/m²	
73°F (23°C)	10.5 ft·lb/in²	22.0 kJ/m²	
Charpy impact strength			ISO 179/1eU [4]
-22°F (-30°C)	95.6 ft·lb/in²	201 kJ/m²	
73°F (23°C)	120 ft·lb/in²	252 kJ/m²	
Notched Izod Impact (73°F (23°C))	1.8 to 4.0 ft·lb/in	96 to 210 J/m	ASTM D256
Unnotched Izod Impact (73°F (23°C))	20 to 80 ft·lb/in	1100 to 4300 J/m	ASTM D256
Hardness	**Nominal Value (English)**	**Nominal Value (SI)**	**Test Method**
Durometer Hardness (Shore D, 73°F (23°C))	77 to 82	77 to 82	ASTM D2240
Thermal	**Nominal Value (English)**	**Nominal Value (SI)**	**Test Method**
Deflection Temperature Under Load			
264 psi (1.8 MPa), Unannealed	220 to 230 °F	104 to 110 °C	ASTM D648
264 psi (1.8 MPa)	219 °F	104 °C	ISO 75-2 [4]
Glass Transition Temperature			
-- [5]	-40 °F	-40 °C	ISO 11357-2 [4]
-- [6]	-41.0 to -37.0 °F	-40.6 to -38.3 °C	DMA
Vicat Softening Temperature			ISO 306 [4]
50°C/h, B (50N)	280 °F	138 °C	
Peak Melting Temperature			
--	329 to 342 °F	165 to 172 °C	ASTM D3418
-- [5]	336 °F	169 °C	ISO 11357-3 [4]
CLTE - Flow			
--	0.000066 to 0.000080 in/in/°F	0.00012 to 0.00014 cm/cm/°C	ASTM D696
--	0.000083 in/in/°F	0.00015 cm/cm/°C	ISO 11359-2 [4]
Specific Heat	0.280 to 0.360 Btu/lb/°F	1170 to 1510 J/kg/°C	DSC
Thermal Conductivity	1.2 to 1.3 Btu·in/hr/ft²/°F	0.17 to 0.19 W/m/K	ASTM C177
Electrical	**Nominal Value (English)**	**Nominal Value (SI)**	**Test Method**
Surface resistivity	4.0E+13 ohm	4.0E+13 ohm	IEC 60093 [4]
Volume Resistivity			
68°F (20°C) [7]	2.0E+14 ohm·cm	2.0E+14 ohm·cm	ASTM D257
--	9.1E+11 ohm·in	2.3E+10 ohm·m	IEC 60093 [4]
Dielectric Strength			
73°F (23°C)	1600 V/mil	63 kV/mm	ASTM D149
--	690 V/mil	27 kV/mm	IEC 60243-1 [4]
Dielectric Constant			
73°F (23°C) [8]	4.50 to 9.50	4.50 to 9.50	ASTM D150
100 Hz	10.5	10.5	IEC 60250 [4]
1 MHz	7.00	7.00	IEC 60250 [4]

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Electrical	Nominal Value (English)	Nominal Value (SI)	Test Method
Dissipation Factor			
73°F (23°C), 100 Hz	0.10 to 0.25	0.10 to 0.25	ASTM D150
100 Hz	0.027	0.027	IEC 60250 [4]
1 MHz	0.24	0.24	IEC 60250 [4]
Comparative tracking index	600	600	IEC 60112 [4]
Flammability	**Nominal Value (English)**	**Nominal Value (SI)**	**Test Method**
Flame Rating	V-0	V-0	UL 94
Burning Behav. at 1.6mm nom. thickn.			ISO 1210 [4]
0.06 in (1.60 mm)	V-0	V-0	
Burning Behav. at thickness h			ISO 1210 [4]
0.0315 in (0.800 mm)	V-0	V-0	
Oxygen Index			
--	60 %	60 %	ASTM D2863
--	83 %	83 %	ISO 4589-2 [4]
Optical	**Nominal Value (English)**	**Nominal Value (SI)**	**Test Method**
Refractive Index [9]	1.420	1.420	ASTM D542
Fill Analysis	**Nominal Value (English)**	**Nominal Value (SI)**	**Test Method**
Melt Viscosity (842°F (450°C), 100 sec^-1)	1500 to 2000 Pa·s	1500 to 2000 Pa·s	ASTM D3835
Additional Information	**Nominal Value (English)**	**Nominal Value (SI)**	**Test Method**
Thermal Decomposition Temperature			TGA
-- [10]	707 °F	375 °C	
-- [11]	770 °F	410 °C	

Notes

[1] These links provide you with access to supplier literature. We work hard to keep them up to date; however you may find the most current literature from the supplier.

[2] A UL Yellow Card contains UL-verified flammability and electrical characteristics. UL IDES continually works to link Yellow Cards to individual plastic materials in Prospector, however this list may not include all of the appropriate links. It is important that you verify the association between these Yellow Cards and the plastic material found in Prospector. For a complete listing of Yellow Cards, visit the UL Yellow Card Search.

[3] Typical properties: these are not to be construed as specifications.

[4] Tested in accordance with ISO 10350. 23°C/50%r.h. unless otherwise noted.

[5] 18 °F/min (10 °C/min)

[6] 1 Hz

[7] 65%RH

[8] 100MHz to 100Hz

[9] Sodium D line, 77°F

[10] 1% wt. loss / in air

[11] 1% wt. loss / in nitrogen

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Where to Buy

Supplier

Arkema
Paris, France
Telephone: 33-1490-08080
Web: http://www.arkemagroup.com/

Distributor

Polymix
Telephone: +33-3-8920-1380
Web: http://www.polymix.eu/
Availability: France

RESINEX Group
RESINEX is a Pan European distribution company. Contact RESINEX for availability of individual products by country.
Telephone: +32-14-672511
Web: http://www.resinex.com/
Availability: Europe

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