

NORYL™ EFR735 FILM

PRODUCT DATASHEET

DESCRIPTION

NORYL™ EFR 735 is halogen-free flame retardant Polyphenylene Oxide film offering UL94 VTM-0 performance down to 0.006" (152 microns) and excellent temperature performance to meet the requirements in a wide range of electrical, electronic and transportation applications. EFR 735 film has outstanding dielectric strength, ease of fabrication such as thermoforming, embossing, clean-edge die-cutting, score and bend. Gauges available are 6mil, 10mil, 17mil and 25mil in Matte/Velvet texture finish.

TYPICAL PROPERTY VALUES

PROPERTY	ASTM TEST METHOD	UNITS (USCS)	VALUE	ISO TEST METHOD	UNITS (SI)	VALUE
MECHANICAL						
Tensile Strength @ Yield	ASTM D882	psi	9000	ISO 527	MPa	62
Ultimate	ASTM D882	psi	7600	ISO 527	MPa	54.6
Tensile Modulus	ASTM D882	psi	294000	ISO 527	MPa	2030
Tensile Elongation at Break	ASTM D882	%	12	ISO 527	%	12
Tear Strength						
Initiation 0.006"	ASTM D1004	lbf/mil	1.32	-	N/mm	232
Initiation 0.010"	ASTM D1004	lbf/mil	1.35	-	N/mm	236
Initiation 0.017"	ASTM D1004	lbf/mil	1.49	-	N/mm	262
Initiation 0.025"	ASTM D1004	lbf/mil	1.52	-	N/mm	265
Propagation 0.006"	ASTM D1922	g/mil	22	-	N/mm	8.5
Propagation 0.010"	ASTM D1922	g/mil	29	-	N/mm	11.1
Propagation 0.017"	ASTM D1922	g/mil	35	-	N/mm	13.7
Propagation 0.025"	ASTM D1922	g/mil	36	-	N/mm	13.9
Puncture Resistance (Dynatup)						
Total Energy	ASTM D3763	ft-lb/inch	186	-	J/mm	9.9
Fold Endurance (MIT)						
0.006" (0.152mm)	ASTM D2176	double folds	>1000	ISO 5626	folds	>1000
0.010" (0.250mm)	ASTM D2176	double folds	>80	ISO 5626	folds	>80
0.017" (0.432mm)	ASTM D2176	double folds	10	ISO 5626	folds	10
0.025" (0.635mm)	ASTM D2176	double folds	7	ISO 5626	folds	7
THERMAL						
CTE 0-80 deg C, in flow	ASTM E831	1/°F	4.4x10 ⁻⁵	ISO 11359	1/°C	8x10 ⁻⁵
CTE 0-80 deg C, cross flow	ASTM E831	1/°F	4.4x10 ⁻⁵	ISO 11359	1/°C	8x10 ⁻⁵
Vicat Softening Temp, Rate B/50		°F	282/309	ISO 306	°C	162
Glass Transition Temperature	ASTM D3417	°F	342	ISO 11357	°C	172
Shrinkage 130°C 30 min TD	ASTM D1204	%	0.08		%	0.08
Shrinkage 130°C 30 min MD	ASTM D1204	%	0.15		%	0.15

PROPERTY	ASTM TEST METHOD	UNITS (USCS)	VALUE	ISO TEST METHOD	UNITS (SI)	VALUE
PHYSICAL						
Density	ASTM D792	slug/ft ³	2.1	ISO 1183	kg/m ³	1088
Water Absorption						
23°C, 50% Relative Humidity, 24hrs	ASTM D570	% change	0.07	ISO 62	% change	0.07
24hrs water immersion	ASTM D570	% change	0.4	ISO 62	% change	0.4
ELECTRICAL						
Dielectric Strength in oil, short time	ASTM D149-97a					
@23°C, 0.006" (0.152mm)	Method A	kV/mil	2.3	IEC 60243	kV/mm	90
@23°C, 0.010" (0.250mm)		kV/mil	1.8	IEC 60243	kV/mm	70
@23°C, 0.017" (0.432mm)		kV/mil	1.2	IEC 60243	kV/mm	47
@23°C, 0.025" (0.635mm)		kV/mil	1	IEC 60243	kV/mm	38
Break Down Voltage in oil	ASTM D149-97a					
@23°C, 0.006" (0.152mm)	Method A	V	13500	IEC 60243	V	13500
@23°C, 0.010" (0.250mm)		V	18200	IEC 60243	V	18200
@23°C, 0.017" (0.432mm)		V	2100	IEC 60243	V	21000
@23°C, 0.025" (0.635mm)		V	24600	IEC 60243	V	24600
Dielectric Constant @ 1,000,000Hz	ASTM D150	-	2.75	IEC 60250	-	2.75
Dissipation Factor @ 1MHz	ASTM D150	-	0.0028	IEC 60250	-	0.0028

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

MANUFACTURING SPECIFICATIONS

NOMINAL GAUGE RANGES	MIN./MAX LIMIT OF NOMINAL
0.006" (0.152 mm)	+/- 10%
0.010-0.017" (0.250-0.432mm)	+/-5%
0.020-0.030" (0.500- 0.750 mm)	+/-3%

Color Code:
Black Color: BK (BK1005)

UL FILE NUMBER: [E121562](#), [E207780](#)

CONTACT US:

SABIC CORPORATE HQ

PO Box 5101
Riyadh 11422
Saudi Arabia
T +966 (0) 1 225 8000
F +966 (0) 1 225 9000
E info@sabic.com

AMERICAS

SABIC
Functional Forms
2500 CityWest Boulevard
Suite 100
Houston, TX 77042
USA
Toll-free (800) 323 3783
F (888) 443 2033
E spinside.sales@sabic.com

EUROPE

SABIC
Functional Forms
Plasticslaan 1
4612 PX
Bergen op Zoom
The Netherlands
T +31 (0)164 293684
F +31 (0)164 293272
E ff.info@sabic.com

PACIFIC

SABIC
Functional Forms
2550 Xiupu Road
Pudong
201319 Shanghai
China
T +86 21 3222 4500
F +86 21 6289 8998
E ff.info@sabic.com

DISCLAIMER: THE MATERIALS, PRODUCTS AND SERVICES OF SAUDI BASIC INDUSTRIES CORPORATION (SABIC) OR ITS SUBSIDIARIES OR AFFILIATES ("SELLER") ARE SOLD SUBJECT TO SELLER'S STANDARD CONDITIONS OF SALE, WHICH ARE AVAILABLE UPON REQUEST. INFORMATION AND RECOMMENDATIONS CONTAINED IN THIS DOCUMENT ARE GIVEN IN GOOD FAITH. HOWEVER, SELLER MAKES NO EXPRESS OR IMPLIED REPRESENTATION, WARRANTY OR GUARANTEE (I) THAT ANY RESULTS DESCRIBED IN THIS DOCUMENT WILL BE OBTAINED UNDER END-USE CONDITIONS, OR (II) AS TO THE EFFECTIVENESS OR SAFETY OF ANY DESIGN OR APPLICATION INCORPORATING SELLER'S MATERIALS, PRODUCTS, SERVICES OR RECOMMENDATIONS. UNLESS OTHERWISE PROVIDED IN SELLER'S STANDARD CONDITIONS OF SALE, SELLER SHALL NOT BE RESPONSIBLE FOR ANY LOSS RESULTING FROM ANY USE OF ITS MATERIALS, PRODUCTS, SERVICES OR RECOMMENDATIONS DESCRIBED IN THIS DOCUMENT. Each user is responsible for making its own determination as to the suitability of Seller's materials, products, services or recommendations for the user's particular use through appropriate end-use and other testing and analysis. Nothing in any document or oral statement shall be deemed to alter or waive any provision of Seller's Standard Conditions of Sale or this Disclaimer, unless it is specifically agreed to in a writing signed by Seller. Statements by Seller concerning a possible use of any material, product, service or design do not, are not intended to, and should not be construed to grant any license under any patent or other intellectual property right of Seller or as a recommendation for the use of any material, product, service or design in a manner that infringes any patent or other intellectual property right.

SABIC and brands marked with ™ are trademarks of SABIC or affiliates.
© Copyright 2020. All rights reserved.

* Any brands, products or services of other companies referenced in this document are the trademarks, service marks and/or trade names of their respective holders.

