3M™ Flame Barrier FRB-NT Laminate

Data Sheet **August 2012**

Description

3M™ Flame Barrier FRB-NT Laminate series is 3M™ Flame Barrier FRB-NT laminated to both sides of Polyester (PET) film.

These barriers are available in roll or sheet form.

The flame barrier FRB-NT laminated series provides the reliability you need from 3M, a trusted company with over 30 years of experience providing insulating solutions that protect people, equipment, and property around the globe.

Applications

The flame barrier FRB-NT laminate series provides both electric shock and flame protection for electrical and electronic device applications such as:

- Appliance enclosures (timers, drip and contact shields)
- Lighting, Electrical devices (e.g., timers, actuators, switches)

Features

The flame barrier FRB-NT laminate series is:

- Composed of inorganic-based, halogen free UL 94 V-0, 5VA outer layers
- Made with UL Recognized UL 94 VTM-2 PET film inner layer
- Strong physical and dielectric properties
- Dimensionally stable and easily slit, cut, formed and die cut
- Densified for high dielectric strength and smooth surface
- Available in thicknesses from 11 to 17.5 mils (0.380 to 0.445 mm)

Regulatory

The flame barrier FRB-NC laminate series is:

- **REACH compliant**. Product contains no Substances of Very High Concern (SVHC's) on the REACH candidate lists according to article 59 of Regulation (EC) No 1970/2006 up to June 2012. For current status, go to *www.3M.com/REACH*
- **RoHS Meets MCVs 2011/65/EU**. "**RoHS** meets MCVs" means that the product or part does not contain any of the substances in excess of the maximum concentration values ("MCVs") in EU RoHS Directive 2011/65/EU. The MCVs are by weight in homogeneous materials.
- **Halogen Free** defined as both 1) no halogen compounds are intentionally added to the product or used in the manufacturing process for the product and 2) any impurities present are less than 900 ppm bromine, less than 900 ppm chlorine, and/or less than 1500 ppm total bromine and chlorine. The latter are the levels set forth in certain industry standards, such as the International Electrotechnical Commission (IEC) 61249-2-21 standard.
- The above information represents 3M's knowledge and belief which may be based in whole or in part on information provided by 3rd party suppliers to 3M.

Flammability

The UL 94 test method is used to classify materials based on results from specified small-scale flame tests. These classifications (5VA, 5VB, V-0, V-1, V-2, HB), listed in decreasing order of flame resistance, are used to distinguish a material's burning characteristics after test specimens have been exposed to a specified test flame under controlled laboratory conditions. These classifications typically apply to materials used in manufacturing enclosures, structural parts, and insulators found in consumer electronic products.

A material classified as 5VA or 5VB is subjected to a flame ignition source that is approximately five times more severe than that used in the V-0, V-1, V-2 and HB tests. Furthermore, specimens in 5VA or 5VB may not drip any flaming particles and 5VA rated specimens may not develop any burn-through holes during the test.

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Typical Properties for FRB-NT Laminates

Technical information provided consists of typical product data and should not be used for specification purposes. All tests are performed at room temperature unless otherwise noted.

Property	Units	Test Method	FRB-NT Laminate 3-5-3	FRB-NT Laminate 5-5-5	FRB-NT Laminate 5-7.5-5
Nominal Thickness	mm mil	ASTM D-645	0.279 11.0	0.380 15.0	0.445 17.5
Color			Beige and white, marbled	Beige and white, marbled	Beige and white, marbled
Construction			FRB-NT076 PET 5 mil FRB-NT076	FRB-NT127 PET 5 mil FRB-NT127	FRB-NT127 PET 7.5 mil FRB-NT127
Physical Properties					
Basis Weight	g/m^2 lb/yd^2	ASTM D-202	395 0.72	570 1.05	664 1.22
Density	g/cc		1.4	1.5	1.5
Moisture Absorption	%	ASTM D-644	<1	<1	<1
Mechanical Properties					
Tensile Strength, MD	lb/inch N/cm	ASTM D-828	120 210	142 249	195 341
Tensile Strength, CD	lb/inch N/cm	ASTM D-828	143 250	118 207	220 385
Elongation to Break, MD	%	ASTM D-828	4	3	4
Elongation to Break, CD	%	ASTM D-828	4	4	4
Elmendorf Tear, MD	g N	ASTM D-689	484 4.8	552 5.4	740 7.3
Elmendorf Tear, CD	g N	ASTM D-689	676 6.7	648 6.4	896 8.9
Electrical Properties					
Dielectric Breakdown Voltage	kV	ASTM D-149	15	15	18

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Typical Properties for Outer Layers of FRB-NT Laminates

Flame barrier FRB-NT laminate is made using UL Recognized flame barrier FRB-NT series insulation.

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Property	Units	Test Method	FRB-NT076	FRB-NT127
Nominal Thickness	Mm mil	ASTM D-645	0.076 3.0	0.127 5.0
Color			Beige and white, marbled	Beige and white, marbled
Physical Properties				
Flame Rating (UL File E65069)	Flammability rating	UL94	V-0, 5VA	V-0, 5VA
Relative Thermal Index, Component, Electrical	℃	UL 746B	140	140
Relative Thermal Index, Component, Mechanical without impact	℃	UL 746B	130	130
Electrical Properties				
High-Voltage Arc Tracking Rate (HVTR)	PLC assigned	UL 746A	0	0
Comparative Tracking Index (CTI)	PLC assigned	UL 746A	0	0
Hot Wire Ignition (HWI)	PLC assigned	UL 746A	4	4
High Current Arc to Ignition (HAI)	PLC assigned	UL 746A	2	2
High Volt, Low Current Arc Resistance	PLC assigned	ASTM D-495	4	4
Glow Wire Ignition Temperature (GWIT)	℃	IEC 60695-2-13	990	990
Glow Wire Flammability Index (GWFI)	℃	IEC 60695-2-1	960	960
Dielectric Breakdown Voltage	kV	ASTM D-149	1.1	3.1
Dielectric Breakdown Strength	V/mil	ASTM D-149	370	610

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Typical Properties for Inner Layer of FRB-NT Laminates (Electrical Grade Polyester Film)

Flame barrier FRB-NT laminate is made using UL Recognized QMFZ2 polyester film.

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Property	Units	Test Method	5 mil	7.5 mil
Nominal Thickness	mm mil	ASTM D-645	0.127 5	0.191 7.5
Color			Clear	Clear
Physical Properties				
Basis Weight	g/m^2 lb/yd^2	ASTM D-202	175 0.32	271 0.50
Density	g/cc		1.39	1.39
Tensile Strength, MD	lb/in N/cm	ASTM D-828	125 219	188 328
Tensile Strength, CD	lb/in N/cm	ASTM D-828	125 219	188 328
Elongation to Break, MD	%	ASTM D-828	130	130
Electrical Properties				
Dielectric Breakdown Voltage	kV	ASTM D-149	15	19

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Shelf Life & Storage	This product has a 5-year shelf life from date of manufacture when stored in a humidity controlled storage (from 10℃ / 50℉ to 27℃ / 80° F and <75% relative humidity)
Availability	For availability, please contact your local distributor. Names and addresses are available from 3M.com/electrical [Where to Buy] or call 1-800-676-8381.

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78-8141-5613-5 Rev A