Dr. Dietrich Müller GmbH
Zeppelinring 18
D-26197 Ahlhorn

Tel.: +49 (0) 44 35 - 97 10 10
Fax: +49 (0) 44 35 - 97 10 11
Info@mueller-ahlhorn.com

Electrical Insulation Materials

Nomex® 410 | FI 15000

Structure:

Nomex® 410 | FI 15000 is a synthetic electrical insulation paper which consists of a calendered, aromatic polyamide fibrid flake composition.

Characteristics:

Nomex® 410 | FI 15000 is an insulation material of insulation class H (180°C). Temperatures up to 200°C only have a small effect on its electrical properties. The good mechanical properties can be extrapolated from higher temperatures.

Due to the polymer structure Nomex® 410 | FI 15000 can also be used at low temperatures down to -190°C. It has high short-time field intensity. The permanent field intensity, however should not be above 1.5 kV/mm. Nomex® 410 | FI 15000 is compatible with all classes of conventional resins, coatings, adhesives and transformer fluids, lubricating oils and coolants. Common solvents can lead to light reversible expansion. Nomex® 410 | FI 15000 is flame-retardant (UL94V-0), it also has a very high level of beta and gamma ray resistance.

Application:

Nomex® 410 | FI 15000 is used in almost all known electrical sheet insulation applications. The application ranges from AC and DC motors up to large generators, wet and dry transformers and chokes, also under beta and gamma radiation.

Standard color:

Nomex® 410 | FI 15000 is supplied in Beige/Amber.

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Delivery Forms: Nomex® 410 | FI 15000 is available on rolls (up to 910 mm wide) and slit rolls (from 10 mm wide). Slot insulations, wedges, caps, phase insulation, coil insulation, end caps, die-cut and cut blanks can be supplied on request.

Storage Conditions: Nomex® 410 | FI 15000 has an unlimited shelf life under normal conditions (20°C, 50% RH.)

Properties	Test method	Unit	Value					
Nominal thickness	-	µm	50	80	130	180	250	300
Typical thickness	ASTM D-374	µm	60	80	130	180	260	310
Specific weight	ASTM D-646	g/m²	41	63	116	175	249	309
Density	-	g/cm³	0.72	0.80	0.87	0.95	0.96	1.00
Tensile strength MD CMD	ASTM D-828	 N/cm N/cm	 39 18	 65 32	 137 66	 219 111	 285 152	 378 196
Elongation MD CMD	ASTM D-828	 % %	 9 6	 11 8	 15 12	 18 14	 19 15	 22 17
Shrinkage at 300°C MD CMD	ASTM D-828	 - -	 2.2 0.1	 1.1 0.0	 0.9 0.0	 0.6 0.2	 0.4 0.1	 0.4 0.2
Thermal conductivity	-	mW/(m.K)	103	114	123	143	139	-
Dielectric strength Short-time AC Short-time AC	ASTM D-149	 V/mil kV/mm	 430 17	 550 22	 680 27	 840 33	 815 32	 820 32
Full wave impulse AC	ASTM D-3426	V/mil	1000	1000	1400	1400	1600	N/A
Full wave impulse AC	ASTM D-3426	kV/mm	39	39	55	55	36	N/A
Dielectric constant at 60 Hz	ASTM D-150	-	1.6	1.6	2.4	2.7	2.7	2.9
Dissipation factor 60 Hz (x10-3)	ASTM D-150	-	4	5	6	6	6	7

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Properties	Test method	Unit	Value					
Nominal thickness	-	µm	380	510	610	650	730	760
Typical thickness	ASTM D-374	µm	390	520	610	650	730	770
Basis weight	ASTM D-646	g/m²	397	547	693	696	854	847
Density	-	g/cm³	1.03	1.06	1.13	1.08	1.17	1.10
Tensile strength MD CMD	ASTM D-828	 N/cm N/cm	 459 252	 606 354	 741 497	 758 524	 860 630	 841 595
Elongation MD CMD	ASTM D-828	 % %	 19 14	 20 16	 18 14	 19 16	 16 12	 17 13
Shrinkage at 300°C MD CMD	ASTM D-828	 - -	 0.3 0.3	 0.1 0.0	 0.0 0.0	 N/A 0.0	 0.0 0.0	 0.2 0.0
Thermal conductivity	-	mW/(m.K)	149	157	-	-	-	175
Dielectric strength Short-term AC Short-term AC	ASTM D-149	 V/mil kV/mm	 830 33	 810 32	 800 31	 730 29	 - -	 750 30
Full wave impulse AC	ASTM D-3426	V/mil	1400	1400	N/A	N/A	-	N/A
Full wave impulse AC	ASTM D-3426	kV/mm	55	55	N/A	N/A	-	N/A
Dielectric constant at 60 Hz	ASTM D-150	-	3.2	3.4	3.7	N/A	-	3.7
Dissipation factor 60 Hz (x10-3)	ASTM D-150	-	7	7	7	N/A	-	7

Thickness	0,05	0,08	0,13	0,18	0,25	0,30	0,38	0,51	0,61	0,76
Availability	●	●	●	●	●	●	●	●	●	●

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Trademark information: Nomex® is a registered trademark of DuPont.

Information:

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