SynFlex Elektro GmbH
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Nomex® 411

Nomex® 411 is a synthetic electrical insulating paper constructed of a non-calendered, aromatic polyamide-fibrid flock composition.

Attributes

Nomex® 411 is a Class H (180 °C) insulating material. Temperatures up to 200 °C have only a slight effect on its electrical properties. The good mechanical properties can be extrapolated at much higher temperatures. Due to the polymer structure, Nomex® 411 can also be used an temperatures as low as -190 °C with good effect. It has a high short-time electric strength. The permanent field strength, however, should not be greater than 1.2 kv/mm. Nomex® 411 is compatible with all classes of standard resins, varnishes, adhesives and transfomer fluids, lubricating oils and coolants. Common solvents can result in easily reversible expansion. Nomex® 411 paper is of low flammability (UL 94V-0); in addition, it has a very high resistance to beta and gamma radiation.

Application

High-quality Nomex® 411 is used in practically all known applications for electrical sheet insulating materials. Applications range from AC and DC motors to large generators, wet and dry transformers and chokes, even with beta and gamma radiation exposure.

Standards

- Class H (180 °C), insulating material
- UL listed (Class 220), file no. E 34739

Delivery forms

Film thickness in µm:

130, 180, 250, 380, 580

Nomex® 411 can be supplied:

- in bands: on request, depending on material thickness
- in rolls: 457 mm or 914 mm

Wrap:

- depth approx. 1 - 12 mm, distance approx. 1 -10 mm
- from widths of 10 mm to 240 mm and thickness of 0.25 mm

Base

Uncalendered, aromatic polyamide-fibrid-flock composition.

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Typical mechanical properties	Unit of measure						Test method
Nominal thickness	µm	130	180	250	380	580	
Typical thickness	µm	140	200	260	430	660	TAPPI-411
Specific weight	g/m²	42	64	82	134	205	ASTM D-646
Density	g/cm³	0.30	0.31	0.31	0.31	0.31	
Tensile strength longitudinal	N/cm	18	27	35	55	71	ASTM D-828
Tensile strength transversal	N/cm	9	14	20	33	47	ASTM D-828
Elongation at break longitudinal	%	3.6	3.8	3.4	3.7	3.2	ASTM D-828
Elongation at break transversal	%	4.8	5.6	5.2	5.3	3.9	ASTM D-828
Elmendorf tear strength longitudinal	N	1.1	1.6	1.9	4.1	7.4	TAPPI-414
Elmendorf tear strength transversal	N	1.5	2.5	2.5	5.8	9.4	TAPPI-414

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Typical electrical properties	Unit of measure						Test method
Nominal thickness	µm	130	180	250	380	580	
Field intensity	kV/mm	9	9	9	9	9	ASTM D-149
Dielectric constant at 60 Hz		1.2	1.2	1.2	1.3	1.3	ASTM D-150
Loss factor at 60 Hz(x10^-3)		3	3	3	3	3	ASTM D-150