Nomex® 411 phase isolation

Phase insulation Nomex® 411 (manufacturer Dupont) is an uncalendered insulation material of aramid fiber that has good electrical, mechanical and thermal properties. An insulation material recommended for electric motors, generators and dry transformers for applications up to 220°C where flexibility and good absorbency of impregnation varnishes are of prime importance.

Typical applications

Electrical insulation primarily as phase insulation in motors and generators but also used as insulation in dry transformers and other electrical apparatus where volume is pursued and high absorbency of impregnating varnishes up to saturation is required. A recommended insulation material for electrical applications from Class F (+155°C) to Class C (+220°C). Manufacturers of electric motors, generators, wind turbine generators, hybrid systems, etc., have succeeded in improving the performance of installations, systems and techniques with Nomex® materials.

Properties

- Approved for insulation Class C (+220°C).
- Compatible with virtually all types of impregnation varnishes based on polyimides, silicone, epoxy, polyester, acrylic, phenols, synthetic rubber, etc.
- Outstanding saturability of impregnating varnishes up to saturation.
- Very high flexibility.
- Good electrical properties.
- High resistance to chemicals and solvents.
- Outstanding permanent dielectric strength even when exposed for 6 days at 96 % relative humidity retains at least 85 % of its bone-dry dielectric strength, in sharp contrast to porous insulation materials.
- Self-extinguishing.
- Very good durability.
- Can be punched or cut.

Composition

Nomex® consists of aramid fibers (aromatic polyamide), a fiber with high temperature resistance. It is manufactured in much the same way as Nomex® 410. Nomex® 411 is in essence the same material but not densified through calendering.

Colour

Usually pale white.

Dimensions

Nomex® 411 is manufactured in thicknesses 130–580 µm. Can be slit to desired widths up to max 900 mm. Can be punched or cut to desired form or shape. In the case of die-cutting a die tool is required.

Packaging

- Standard packaging width ca 450 mm depending on item in rolls of ca 5 kg.
- Standard packaging width ca 900 mm depending on item in rolls of ca 30 kg.
- Other slit-to-width dimensions MOQ (minimum order quantity) in kg on request.

Article list

Item number	Type	Dimensions			Weight/roll ca (kg)
		Thickness (mm)	Width (mm)	Internal diam (mm)	
1111326	Nomex® 411 0.25×450 mm	0.25 +/–20%	450	76	5

Technical data

Nomex® 411 properties	Test method						Unit
Nominal thickness (ca)		130	180	250	380	580	µm
Mechanical properties							
Grade (mil)		5	7	10	15	23	
Typical thickness		140	200	260	430	660	µm
Thickness tolerance/weight ca*	TAPPI-411	20	20	20	20	20	+/–%
Weight/m^2 ca	ASTM D646	42	64	82	134	205	g/m^2
Density ca		0.30	0.31	0,.31	0.31	0.31	g/cm^3
Area/kg ca		23.8	15.6	12.2	7.5	4.9	m^2/kg
Tensile strength MD	ASTM D828	18	27	35	55	71	N/10 mm
Tensile strength XD	ASTM D828	9	14	20	33	47	N/10 mm
Elongation MD	ASTM D828	3.6	3.8	3.4	3.7	3.2	%
Elongation XD	ASTM D828	4.8	5.6	5.2	5.3	3.9	%
Shrinkage at +240°C MD		0.6	0.6	0.6	0.6	0.5	%
Shrinkage at +240°C XD		0.7	0.7	0.9	0.3	0.2	%
Thermal properties							
Electrical insulation class		F/220	F/220	F/220	F/220	F/220	class/°C
Flame returdant	UL94-VO	-	Yes	Yes	Yes	Yes	
Electrical properties							
Elektrisk genomslagshållfasthet**	ASTM D-149	9	9	9	9	9	kV (min)

*Thickness tolerance/weight ca data not from Dupont
** VAC fast voltage increase

How to contact BEVI
Contact details for all countries are continually updated on our website.
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B00119-2021-03 EN