



PHASE INSULATION NOMEX 411

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.

- Thickness range 130 – 580 µm
- Available in widths up to ca 900 mm, cut and trimmed widths and punched parts available on request
- Approved for insulation class C (+220°C)
- Very good dielectric and mechanical properties and high resistance to chemicals and solvents
- Self-extinguishing properties
- Very high flexibility and absorbency for impregnating varnishes

PRODUCT INFORMATION

Phase insulation Nomex 411 from DuPont is an uncalendered insulation material of aramid fiber that offers superior formability and outstanding saturability of impregnating varnishes and resins. The material also has good electrical, mechanical and thermal properties

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. Manufactured in much the same way as paper, 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. 900mm
- Can be punched or cut to desired form or shape. In the case of die-cutting a die tool is required (tools available at low costs)

Packaging

- Standard packaging width ca 450 mm depending on item in rolls of ca 5 kg* (see item list)
- Standard packaging width ca 900 mm depending on item in rolls of ca 30 kg* (see item list)
- Other slit-to-width dimensions MOQ in kg on request
- Punched/Die-cut items: MOQ amount by agreement (With die tool or cut)
- * Other weights on request

Product information for which Carbex bears no responsibility is provided by the manufacturer.



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Item Number	Type	Dimensions			Weight ca (kg)/roll	Weight g/m ² (nom.)	Length ca (m)/roll	Stock item (usually)
		Thickness (mm)/tol.	Width (ca mm)	Internal diam (mm)				
030710013	Nomex 411 0.13 x 457 mm	0.13 +/-20%	457	76	5	42	260	
030710018	Nomex 411 0.18 x 457 mm	0.18 +/- 20%	457	76	5	64	171	
030710038	Nomex 411 0.38 x 457 mm	0.38 +/- 20%	457	76	5	134	81	
030719013	Nomex 411 0.13 x 914 mm	0.13 +/- 20%	914	76	30	42	780	

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Technical data

Nomex 411

The properties in this data sheet are typical values, or average values and should not be used as specification limits. Unless otherwise noted, all properties were measured in air under standard conditions at 23°C, 50% relative humidity.

Properties	Test method	Value	Value	Value	Value	Value	Unit mm
Nomex 411							
Nominal thickness (ca)		130	180	250	380	580	µm
Mechanical							
Grade (mil)		5	7	10	15	23	
Typical thickness	TAPPI-411	140	200	260	430	660	µm
Thickness tolerance/ weight ca*		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
ca Area / kg		23.8	15.6	12.2	7.5	4.9	m ² /kg
Tensile strength MD	ASTM D828	18	27	35	55	71	N/10mm
Tensile strength XD	ASTM D828	9	14	20	33	47	N/10mm
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							
Electrical insulation Class		C / 220	C / 220	C / 220	C / 220	C / 220	klass /°C
Flame retardant	UL94 - VO	-	Ja	Ja	Ja	Ja	

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