
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 at 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 transformer 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

Unalendered, aromatic polyamide-fibrid-flock composition.

| 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/m ² | 42 | 64 | 82 | 134 | 205 | ASTM D-646 |
| Density | g/cm ³ | 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 |

The information on this data sheet is based on the information provided by our supplier. It does not represent any specification or agreements regarding conditions or properties. The indicated values are standard values. Deviations from those values due to production and application cannot be excluded. The information on this data sheet is addressed to experts who use it at their own discretion and at their own risk. We do not guarantee results, or accept liability for the indicated specifications or for results obtained based on the specifications. Please contact us for more detailed information. Non-toxic and toxic substances are listed on the safety data sheet.
Updated 10/18

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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 |

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