

DuPont™ Nomex® E56 Paper, 10 mil Nominal Thickness

Category : Other Engineering Material , Composite Fibers , Polymer , Film , Thermoset , Aramid

Material Notes:

Nomex® Type E56 is designed for cost critical uses which require lesser amounts of mechanical and electrical strength than other Nomex® grades. It is thermally similar to Nomex® Type 410 but as a medium density paper, its properties are between Types 410 and 411. Nomex® Type E56 is designed for use as layer insulation within transformers and as phase insulation in hand-wound motors. It can also be used as electrical and thermal barriers in appliance and electronic equipment applications. General NOMEX Information: Nomex® is a family of aromatic polyamide (aramid) fibers. This family consists of staple fibers, continuous filament yarns, paper, and spunlaced fabrics. The paper is produced from two forms of the aramid polymer. Small fibrous binder particles (fibrils) derived directly from the polymer under high shear conditions are mixed with short fibers (floc) which are cut to length from a fiber filament. The floc and fibrils are combined in a water based slurry from which a continuous sheet is produced on a specialized papermaking machine. This initial paper (as in Type 411) is low density and has poor properties. Subsequent densification and internal bonding is achieved by high temperature calendaring. The resulting paper is mechanically strong and has good electrical properties. Some uses for paper product include insulation in electric motors and transformers, wire wrapping, and honeycombed strength members in many aircraft. Nomex® brand fibers are inherently flame resistant: the flame resistance is a polymer property and does not diminish with the life of the fiber. Nomex® meta-aramid, poly(meta-phenyleneisophthalamide), is prepared from meta-phenylenediamine and isophthaloyl chloride in an amide solvent. It is a long chain polyamide in which at least 85% of the amide linkages are attached directly to two aromatic rings. The meta oriented phenylene forms bends in the polymer chain, reducing chain rigidity as compared to the para orientation in the chemically similar Kevlar® chain. This flexible polymer chain gives Nomex® more textile-like qualities while retaining high temperature properties similar to Kevlar®. Information provided by DuPont.

Order this product through the following link:

http://www.lookpolymers.com/polymer_DuPont-Nomex-E56-Paper-10-mil-Nominal-Thickness.php

| Physical Properties | Metric | English | Comments |
|---------------------|-------------|---------------|--------------------|
| Bulk Density | 0.670 g/cc | 0.0242 lb/in³ | |
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| Thickness | 254 microns | 10.0 mil | Nominal |
| | 254 microns | 10.0 mil | Typical; ASTM D374 |

| Mechanical Properties | Metric | English | Comments |
|------------------------------------|----------|-------------|--|
| Film Elongation at Break, MD | 10.6 % | 10.6 % | ASTM D828 |
| Film Elongation at Break, TD | 13.4 % | 13.4 % | ASTM D828 |
| Tear Strength, Total | 25.0 N | 5.62 lb (f) | Initial in TD; ASTM D1004 |
| | 51.0 N | 11.5 lb (f) | Initial in MD; ASTM D1004 |
| Film Tensile Strength at Break, MD | 59.8 MPa | 8670 psi | Calculated from mfr's report of 152 N/cm per ASTM D828 and the |

| Mechanical Properties | Metric | English | typical thickness Comments |
|------------------------------------|----------|----------|---|
| Film Tensile Strength at Break, TD | 30.3 MPa | 4390 psi | Calculated from mfr's report of 77 N/cm per ASTM D828 and the typical thickness |

| Thermal Properties | Metric | English | Comments |
|----------------------------------|-------------------------------------|--|------------------------|
| Thermal Conductivity | 0.0830 W/m-K @Temperature 150 °C | 0.576 BTU-in/hr-ft ² -°F @Temperature 302 °F | |
| Maximum Service Temperature, Air | 220 °C | 428 °F | 220°C insulation by UL |

| Electrical Properties | Metric | English | Comments |
|-----------------------|----------------------------|----------------------------|-------------------------------|
| Dielectric Constant | 2.2 @Frequency 60 Hz | 2.2 @Frequency 60 Hz | ASTM D150 |
| Dielectric Strength | 19.0 kV/mm | 483 kV/in | AC Rapid Rise; ASTM D149 |
| | 35.4 kV/mm | 899 kV/in | Full-wave Impulse; ASTM D3426 |
| Dissipation Factor | 0.0050 @Frequency 60 Hz | 0.0050 @Frequency 60 Hz | ASTM D150 |

Contact Songhan Plastic Technology Co.,Ltd.

Website : www.lookpolymers.com

Email : sales@lookpolymers.com

Tel : +86 021-51131842

Mobile : +86 13061808058

Skype : lookpolymers

Address : United North Road 215,Fengxian District, Shanghai City,China