

## DuPont™ Nomex® E56 Paper, 7 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 (fibrids) 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 fibrids 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-7-mil-Nominal-Thickness.php](http://www.lookpolymers.com/polymer_DuPont-Nomex-E56-Paper-7-mil-Nominal-Thickness.php)

Physical Properties	Metric	English	Comments
Bulk Density	0.680 g/cc	0.0246 lb/in <sup>3</sup>	
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Thickness	175 microns	6.90 mil	Typical; ASTM D374
	178 microns	7.00 mil	Nominal

Mechanical Properties	Metric	English	Comments
Film Elongation at Break, MD	10.8 %	10.8 %	ASTM D828
Film Elongation at Break, TD	12 %	12 %	ASTM D828
Tear Strength, Total	17.0 N	3.82 lb (f)	Initial in TD; ASTM D1004
	38.0 N	8.54 lb (f)	Initial in MD; ASTM D1004
Film Tensile Strength at Break, MD	63.9 MPa	9270 psi	Calculated from mfr's report of 112 N/cm per ASTM D828 and the

Mechanical Properties	Metric	English	typical thickness Comments
Film Tensile Strength at Break, TD	28.0 MPa	4060 psi	Calculated from mfr's report of 49 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 <sup>2</sup> -°F @Temperature 302 °F	measured on 10 mil sample
Maximum Service Temperature, Air	220 °C	428 °F	220°C insulation by UL

Electrical Properties	Metric	English	Comments
Dielectric Constant	2.1 @Frequency 60 Hz	2.1 @Frequency 60 Hz	ASTM D150
Dielectric Strength	18.0 kV/mm	457 kV/in	AC Rapid Rise; ASTM D149
	36.4 kV/mm	925 kV/in	Full-wave Impulse; ASTM D3426
Dissipation Factor	0.0060 @Frequency 60 Hz	0.0060 @Frequency 60 Hz	ASTM D150

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