

DuPont™ Nomex® 450 Aramid Staple Fiber

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

Material Notes:

A natural staple fiber. It has higher crystallinity and strength than Type 455 and 462 fibers, and is sold as a 100% meta-aramid staple in various cut lengths. It is used in applications requiring high tensile properties, as well as chemical and thermal stability, such as in hot gas filtration fabrics, sewing threads, zipper tapes and firefighters turnout facing fabrics. It is also used in its natural color for knit products such as balaclavas and underwear. Although dyeable, it is less dyeable than the Type 455 and 462 staple products, and is not available as a dye merged staple.

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. Uses for staple, yarn, and spunlaced fabrics include apparel fabrics to protect against flash fire and electric arcs exposure; firefighter garments; fabrics and spun yarns for filtration applications; insulation in fire resistant thermal protective apparel; rubber reinforcement; and in transportation textiles such as airline carpeting. 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. The fiber's low stiffness and high elongation give it textile-like characteristics which allow processing on conventional textile equipment. 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-450-Aramid-Staple-Fiber.php

Physical Properties	Metric	English	Comments
Density	1.37 g/cc	0.0495 lb/in³	
Water Absorption	8.2 %	8.2 %	As shipped; Typical moisture levels on fiber as shipped. Equilibrium moisture levels are dependent on humidity and processing conditions.
Moisture Absorption at Equilibrium	4.5 %	4.5 %	Billed (Commercial, ASTM)

Mechanical Properties	Metric	English	Comments
Tensile Strength, Ultimate	349 MPa	50600 psi	Calculated from tenacity
Elongation at Break	22 %	22 %	Filament yarn tested at 3 TPI, 10" gauge length and 60%/minute extension rate. DuPont Test Method 12002.
Tenacity	0.256 N/tex	2.90 g/denier	Straight test - filament yarn tested at 3 TPI, 10 inch gauge length and 60%/min extension rate. DuPont Test Method 12002

Thermal Properties	Metric	English	Comments
CTE, linear	18.0 $\mu\text{m}/\text{m}\cdot^{\circ}\text{C}$	10.0 $\mu\text{in}/\text{in}\cdot^{\circ}\text{F}$	
	@Temperature 20.0 $^{\circ}\text{C}$	@Temperature 68.0 $^{\circ}\text{F}$	
Specific Heat Capacity	0.300 J/g- $^{\circ}\text{C}$	0.0717 BTU/lb- $^{\circ}\text{F}$	A Instruments Model 2920 modulated DSC, ASTM TM E1269.
Shrinkage	$\leq 4.00\%$	$\leq 4.00\%$	in water
	@Temperature 100 $^{\circ}\text{C}$	@Temperature 212 $^{\circ}\text{F}$	

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