

## DuPont™ Nomex® 462 (NOMEX IIIA) Aramid Staple Fiber

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

### Material Notes:

Type 462 staple of NOMEX is a blend of NOMEX and KEVLAR brand fibers and P-140, a proprietary static dissipative fiber. When converted to fabric it is known commercially as NOMEX IIIA and is used for thermal protective apparel. It offers all the features of Type 455 staple plus a higher level of static dissipation in fabric form. The P-140 fiber dissipates static generated from fabric-to-fabric and fabric-to-surface rubbing, minimizes the contribution of clothing to static hazards and reduces apparent electric field strength and nuisance static. The staple is dye mergeable and can be package dyed as yarn for use in knit goods or sewing threads, or piece dyed as fabric for civilian protective apparel. Except for the static dissipative properties of NOMEX IIIA, all other properties are essentially the same for NOMEX III.

**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-462-NOMEX-IIIA-Aramid-Staple-Fiber.php](http://www.lookpolymers.com/polymer_DuPont-Nomex-462-NOMEX-IIIA-Aramid-Staple-Fiber.php)

Physical Properties	Metric	English	Comments
Water Absorption	8.3 %	8.3 %	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	310 MPa	45000 psi	Calculated from tenacity
Elongation at Break	21 %	21 %	Filament yarn tested at 3 TPI, 10" gauge length and 60%/minute extension rate. DuPont Test Method 12002.
Tenacity	0.229 N/tex	2.60 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	0.260 J/g- $^{\circ}\text{C}$	0.0621 BTU/lb- $^{\circ}\text{F}$	A Instruments Model 2920 modulated DSC, ASTM TM E1269.
Shrinkage	0.500 %	0.500 %	in water
	@Temperature 100 $^{\circ}\text{C}$	@Temperature 212 $^{\circ}\text{F}$	

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