

DuPont™ Nomex® 926

Technical data sheet

DUPONT
Nomex

Nomex® 926 paper is a strong, high density, high dielectric, and thermally stable meta-aramid paper that is specifically designed for use as conductor insulation in liquid-immersed distribution and power transformers. This product is sold as a “splice-free” insulation which means that there are no films or tapes in the rolls – only continuous, uninterrupted material. Nomex® 926 paper is suitable for liquid-immersed transformers with high-temperature insulation systems through thermal class 180 (class H), including systems with natural and synthetic esters.

Nomex® 926 paper is not suitable for dry-type applications and is currently available in a 0.05 mm (2 mil) thickness.

Electrical Properties

The typical electrical property values for Nomex® 926 paper are shown in Tables I and II. The AC Rapid Rise dielectric strength data of Table I represents voltage stress levels withstood for 10 to 20 second time periods at operating frequencies of 50-60 Hz.

The full wave impulse dielectric strength data shown in Table I were generated on flat sheets, such as those used in layer and barrier applications. The geometry of the system has an effect on the actual impulse strength values of the material. The dielectric strength data are typical values and not recommended for design purposes.

The dielectric strength properties in insulating liquids are very good due to the excellent impregnability of Nomex® 926. Studies have shown that the strength values are very similar when tested in mineral oil or representative ester liquid. Processing characteristics of this paper are similar to other papers used to insulate conductors in liquid immersed transformers.

Table I. Typical Electrical Properties of DuPont™ Nomex® 926 on Flat Sheets in Mineral Oil

Property	1 layer	5 layers	10 layers	15 layers	Test Method
AC Rapid Rise Breakdown					
kV/mm	66	65	64	62	ASTM D149
V/mil	1680	1650	1630	1570	
Full Wave Impulse Breakdown					
kV/mm	146	157	161	146	ASTM D3426
V/mil	3700	4000	4100	3700	

Table II. Typical Low Voltage Electrical Properties of DuPont™ Nomex® 926 in Mineral Oil

Property	@ 23°C	@ 90°C	@ 130°C	Test Method
Dielectric Constant	2.94	3.00	3.10	ASTM D150
Dissipation Factor	0.008	0.032	0.077	ASTM D150

Mechanical Properties

The typical mechanical property values of Nomex® 926 paper are shown in Table III.

Nomex® 926 offers exceptional resistance to shrinkage and compression and is ideal for high load stresses such as high-speed winding due to its superior mechanical properties.

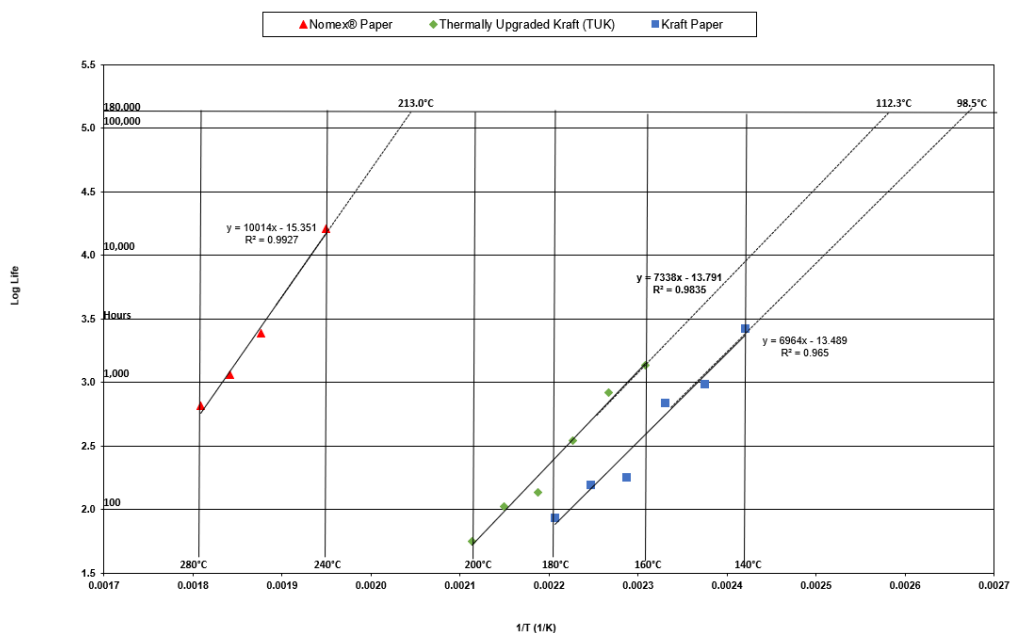
Table III. Typical Mechanical Properties of DuPont™ Nomex® 926

Property	Typical value	Test method
Nominal Thickness, mm mil	0.057 2.12	ASTM D3741 ¹
Basis Weight, g/m ²	40.0	ASTM D646
Density, g/cm ³	0.071	ASTM D646
Tensile Strength, N/cm MD XD	42.0 17.0	ASTM D828
Elongation, % MD XD	10.8 6.5	ASTM D828
Initial Tear Strength, N MD XD	12.4 5.8	ASTM D1004 ²
Shrinkage @ 300°C, % MD XD	1.23 0.01	

MD = machine direction; XD = cross direction; ¹ Except 12.6 psi foot pressure is applied; ² Data presented for initial tear strength is listed in the direction of the sample, per ASTM D1004. The tear is actually 90 degrees to the sample of the direction; therefore, for papers with a higher reported machine direction initial tear strength, the paper will be tougher to tear in the cross direction.

Thermal Properties

The thermal capability of Nomex® brand papers and pressboards in liquid immersed transformers has been well documented in industry publications. Studies have shown that Nomex® 926 has aging characteristics similar to other Nomex® papers and can be used in class 180 (class H) systems, which is the highest thermal class for liquid immersed transformers recognized by international standards. Results from this work from testing in mineral oil presented in Figure I show thermal index (TI) for Nomex® paper extrapolated above 210 °C at 180,000 hours.

Figure I – Dual Temperature Aging of Insulation Materials in Mineral Oil

Chemical Compatibility

Nomex® papers are fully compatible with transformer fluids. Additionally, Nomex® papers and pressboards are compatible with virtually all classes of electrical varnishes and adhesives (polyimides, silicones, epoxies, polyesters, acrylics, phenolics, synthetic rubbers, etc.), as well as with other components of electrical equipment.

Visit ei.nomex.com to learn more

Product safety information is available upon request. This information corresponds to our current knowledge on the subject. It is offered solely to provide possible suggestions for your own experimentation. It is not intended, however, to substitute for any testing you may need to conduct to determine for yourself the suitability of our products for your particular purposes. This information may be subject to revision as new knowledge and experience become available. Since we cannot anticipate all variations in actual end-use conditions, DUPONT MAKES NO WARRANTIES AND ASSUMES NO LIABILITY IN CONNECTION WITH ANY USE OF THIS INFORMATION. Nothing in this publication is to be considered as a license to operate under or a recommendation to infringe any patent right. DuPont™, the DuPont Oval Logo, and all trademarks and service marks denoted with ™, SM or ® are owned by affiliates of DuPont de Nemours, Inc. unless otherwise noted. © 2000 DuPont. All rights reserved. (01/23).