

# DuPont™ NOMEX® Paper Type 926

## PRELIMINARY TECHNICAL DATA SHEET

### Product Description

DuPont™ NOMEX® Paper Type 926 is a strong, high-dielectric, thermally-stable paper which is specifically designed by DuPont for use as conductor insulation in liquid-immersed transformers. It is available in a 0.05 mm (2 mil) thickness. Type 926 is not appropriate for use as conductor insulation for dry type transformers.

### Electrical Properties

The typical electrical property values for NOMEX® Paper Type 926 in mineral oil are shown in **Table 1**. The AC rapid rise dielectric strength data of **Table 1** represent voltage stress levels withstood for 10 to 20 second time periods at a

frequency of 60 Hz. These values differ from long-term strength potential. The full wave impulse dielectric strength data of **Table 1** was generated on flat sheets, such as is 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 are not recommended for design purposes.

The electrical properties are enhanced in oil due to the excellent impregnability of NOMEX® Paper Type 926. Processing characteristics of this paper are similar to other papers used to insulate conductors in liquid-immersed transformers.

### Mechanical Properties

The typical mechanical property values for NOMEX® Paper Type 926 are shown in **Table 2**. Type 926 properties show little change after impregnation in mineral oil (**Table 3**).

### Thermal Properties

Since NOMEX® Paper Type 926 is recently developed, extensive aging work has not yet been completed. However, the thermal capability of NOMEX® papers and pressboards in liquid-immersed transformers has been well documented in industry publications. Additionally, a short duration, high-temperature test was conducted combining NOMEX® Paper Type 926 and mineral oil, aging for 2 weeks at 170°C, which showed no change in mechanical properties due to aging.

The thermal conductivity of NOMEX® Paper Type 926 in mineral oil is expected to be similar to papers used for wrapping conductors, based on testing for other NOMEX® papers and pressboards.

### Chemical Stability

NOMEX® papers and pressboards are compatible with transformer fluids, including mineral and silicone oils and other dielectric fluids such as esters.

**Table 1 — Typical Electrical Properties in Mineral Oil**

		1 layer	5 layers	10 layers	15 layers	Test Method
AC Rapid Rise Breakdown	kV/mm	70.6	58.2	60.2	50.8	IEC 60641-2 ASTM D149
	V/mil	1680	1820	1630	1570	
Full Wave Impulse Breakdown	kV/mm	144	167	155	138	IEC 60243-3* ASTM D3426
	V/mil	3700	4400	4100	3700	
Dielectric Constant at 60 Hz	23°C	2.94				ASTM D150
	90°C	3.00				
	130°C	3.10				
Dissipation Factor at 60 Hz	23°C	0.008				ASTM D150
	90°C	0.032				
	130°C	0.077				

Note: Thickness used to calculate kV/mm for IEC dielectric values based on modified thickness test (pressure foot 15.9 mm vs. 6.4 mm). IEC 60243 method reports median values, ASTM average values, so reported values are not metric conversion. They are different values.

\*Except both electrodes are 50 mm.



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**Table 2 — Typical Mechanical Properties**

Property	0.05 mm (2 mil) Type 926	Test Method
Thickness	0.057 mm	ASTM D374*
Basis Weight	40.1 g/m <sup>2</sup>	ASTM D646
Density	0.71 g/cc	
MD Tensile Strength	42.5 N/cm	ASTM D828
XD Tensile Strength	19.2 N/cm	
MD Elongation	9.80%	ASTM D828
XD Elongation	7.10%	
MD Initial Tear Strength**	11.8 N	ASTM D1004
XD Initial Tear Strength**	6.1 N	

\*Except 12.6 psi foot pressure is applied.

\*\*ASTM D1004 data presented for initial tear strength is listed in the direction of the sample per this standard. The tear is actually 90 degrees to the sample direction — hence for papers with a higher reported MD Initial Tear Strength, the paper will be tougher to tear in the cross direction.

**Table 3 — Impregnation Effect**

	0.05 mm Type 926 23°C, 50% RH	0.05 mm Type 926 Impreg. in Mineral Oil
MD Tensile Strength	42.5 N/cm	48.5 N/cm
XD Tensile Strength	19.2 N/cm	21.9 N/cm
MD Elongation	9.80%	5.00%
XD Elongation	7.10%	3.84%

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**Product safety information is available upon request**

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**Please note:** The properties in this data sheet are preliminary average values and should not be used as specification limits. This data only represents a small amount of material and will likely change with more data collection. Unless otherwise noted, all properties were measured in air under "standard" conditions (in equilibrium at 23°C, 50% relative humidity). Note that, like other products of papermaking technology, NOMEX® papers have somewhat different properties in the papermaking machine direction (MD) compared to the cross direction (XD). In some applications it may be necessary to orient the paper in the optimum direction to obtain its maximum potential performance.



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