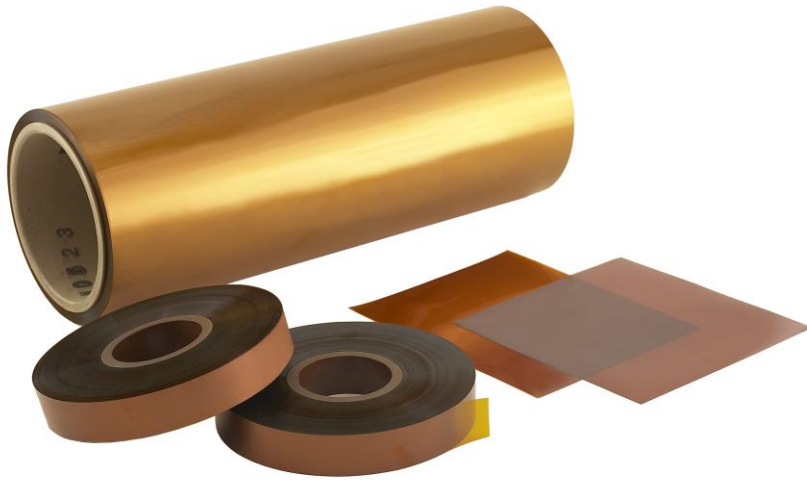


NORTON® Polyimide Film



Norton® TL Series Polyimide Film for High Stability

High Dimensional Stability Polyimide Films can be used in many applications that require low shrinkage at high temperatures such as gaskets, sensors, and other electrical/electronic devices. These TL films offer the same high performance as our TH Series product but with the added benefits of lower Co-efficient of thermal expansion (CTE) and lower heat shrinkage at high temperatures. As with TH Series, our TL Series Polyimide films fully meet the requirements of ASTM D5213 Class A Type I. Our TL Series PI Films have a V-0 Flammability rating and 260°C Electrical RTI from UL (file **E231847**)

Norton® Polyimide Films are produced employing a world-class process in a Clean Room environment that makes them dimensionally stable and inherently isotropic, meeting exacting tolerances, physically strong and electrical sound in widths up to 1570mm.

Availability

This product is currently available in both 12 microns (1/2 mil) and 25 microns (1 mil) at a maximum width of 1570mm with continuous lengths up to 1500 meters. We provide world-class slitting and packaging of films down to 6mm wide

For more information contact our customer service office or e-mail to:

norton-pi@saint-gobain.com

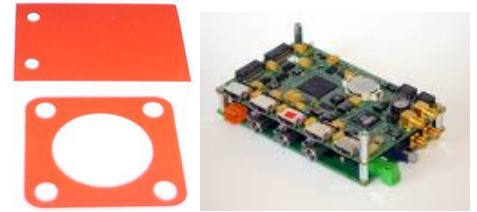
Or visit our website:

www.norton-pi.com

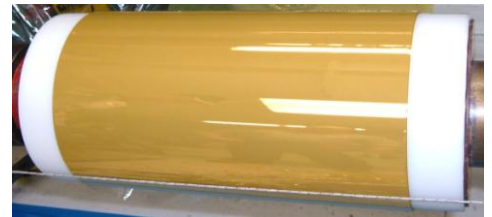
TL Series PI Films

Feature/Benefits:

- High Stability Polyimide Film
- Suitable electrical or electronics gaskets and sensors
- Very High Temperature Usage (UL RTI of 260°C for electrical)
- Lower CTE (~16 ppm/°C) more suited to copper
- Higher Tensile Modulus
- High Dimensional Stability (<0.05% Shrink)



TPL Series Polyimide used for electrical and electronic gaskets and sensors




Continuous lengths up to 3000 meters for shortened set up times and greater efficiencies



Manufactured in a Class 1,000 Clean Room

NORTON® Polyimide Film

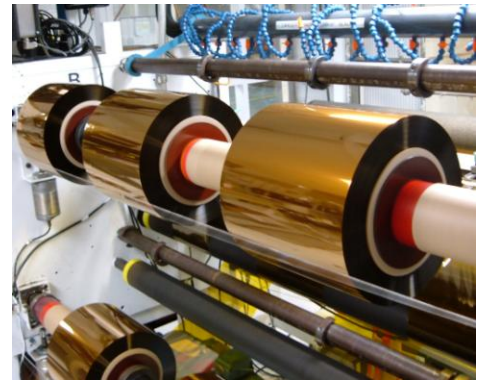
Norton® Polyimide Film: TL Series High Dimensional Stability

Properties	Item	Units	Norton® Polyimide Films		Test Condition	Test Method	
			TL-012 12µm	TL-025 25µm			
Mechanical	Tensile Strength	Kgf/mm ²	32	32	20°C	ASTM D882	
	Elongation	%	80	80	20°C	ASTM D882	
	Young's Modulus	Kgf/mm ²	430	430	20°C	ASTM D882	
Electrical		Dielectric Breakdown	V/µm	300	280	60 Hz, 20°C	ASTM D149
		Dielectric Constant	-	3.3	3.3	1MHz, 20°C	ASTM D150
		Dissipation Factor	-	0.005	0.005	1MHz, 20°C	ASTM D150
		Volume Resistivity	Ω. cm	>10 ¹⁶	>10 ¹⁶	500V, 20°C	ASTM D257
		Surface Resistance	Ω	>10 ¹⁶	>10 ¹⁶	500V, 20°C	ASTM D257
Thermal	Coefficient of Thermal Expansion	ppm/°C	16	16	100~200°C	ASTM D696	
	Heat Shrinkage	%	0.04	0.04	200°C 2hr	ASTM D5213-04	
	Tg (Glass Transition)	°C	>380	>380		DSC,TMA	
Physical	Moisture Absorption	%	2.3	2.3	20°C, 24hr Immersion	ASTM D570	
	Density	g/cc	1.46	1.46	20°C	ASTM D1505	
	Yield	m ² /kg	56	28	20°C		

Slitting and Packaging

Materials can be provided in flat pads, universal traverse, wound, or with our StablEdge™ Technology. Width Tolerances on slit materials will be held to 0.4mm

The Standard Core will be 76mm ID cardboard with an option of 152mm ID cardboard on larger rolls. Roll cores will be of sufficient strength to prevent collapsing from handling. Roll lengths dependent upon the width of the product and can be customized. Consult customer service for details.



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Limited Warranty: For a period of 6 months from the date of first sale, Saint-Gobain Performance Plastics Corporation warrants this product to be free from defects in materials and workmanship. Our only obligation will be to replace any portion proving defective, or at our option, to refund the purchase price thereof. User assumes all other risk, if any, including the risk of injury, loss or damage, direct or consequential, arising out of use, misuse or inability to use, this product. THIS WARRANTY IS IN LIEU OF THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR PARTICULAR PURPOSE, AND ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. No deviation is authorized.

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