

# AUBURN PRODUCT NEWS

## Auburn Manufacturing Company

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## Typical Properties (Technical Data)

### 1 MIL (25 $\mu$ m) KAPTON "HN" FROM AUBURN

#### DESCRIPTION

Kapton® Type "HN" film from Dupont is a general-purpose polyimide film that has been used successfully in applications at temperatures as low as -462°F (-269°C) and as high as 752°F (400°C). Kapton® "HN", with a **UL94V-0 listing**, is an ideal choice for applications that require an all-polyimide film with an excellent balance of properties over a wide range of temperatures. Kapton® "HN" film is perfect for gaskets, seals, and insulators and is easy to diecut, punch, score, bend, fold, laminate, slit or affix with adhesive. *The UL file number for Kapton® is available upon request.*

#### Potential applications:

[Die Cut Gaskets](#)

[Cushions, Pads & Bumpers](#)

[Insulation Parts](#)

[Tapes & Roll Goods](#)

[Adhesive Backed Gaskets](#)

[Pressure Sensitive Tapes](#)

[UL-Rated Insulators](#)

[Heat Resistant Gasket Material](#)

#### PRODUCT SPECIFICATIONS

Kapton® "HN" is manufactured, slit and packaged according to the product specification listed in H-38479, Bulletin GS-96-7.

#### CUSTOM MANUFACTURING

Using precision tooling, whether steel rule die or machine tool, Auburn is capable of producing tight tolerance gaskets, seals or insulators from Kapton® "HN" film. Auburn's manufacturing processes with Kapton® include **diecutting, scoring, folding, bending, identification stamping, laminating, and tape slitting**. Kapton® "HN" film from Auburn is also available either plain or with a variety of pressure sensitive adhesives or transfer adhesives applied to one or both sides.

#### MATERIAL AVAILABILITY

Standard Log-Roll Widths: 12" to 36" wide

Standard Sheet Size: 36" x 24" or 36" x 36"

Die Cut Configurations: To Your Specs

Slit Rolls: 1/4" wide to Master-Log Width

#### Physical Properties of Kapton® HN at 73°F (23°C)

Property	Unit	1 mil (25 $\mu$ m)	Test Method
Ultimate Tensile Strength @ 73° F (23° C) @ 392° F ( 200° C)	psi (MPa)	33,500(231) 20,000(139)	ASTM D-882-91 Method A
Ultimate Elongation @ 73°F (23°) @ 392°F ( 200°C)	%	72 83	ASTM D-882-91 Method A
Tensile Modulus @ 73°F (23°C) @ 392°F ( 200°)	psi (GPa)	370,000(2.5) 290,000 (2.0)	ASTM D-882-91 Method A
Density	g/cc	1.42	ASTM D-1505-90
MIT Folding Endurance	Cycles	285,000	ASTM D-2176-89
Tear Strength-propogating Elmendorf, N (lbf)	—	0.07 (0.02)	ASTM D-1922-89
Tear Strength, Initial (Graves), N (lbf)	—	7.2 (1.6)	ASTM D-1004-90
Yield Point at 3% @ 73°F (23 C) @200°F (392 C)	MPa (psi)	69 (10,000) 41 (6000)	ASTM D-882-91
Stress to produce 5% elong. @ 73°F (23°C) @200°F (392°C)	MPa (psi)	90 (13,000) 62 (9000)	ASTM D-882-92
Impact Strength @ 73°F (23°C)	N•cm•(ftlb)	78 (0.58)	Dupont Pneumatic Impact Test
Coefficient of Friction, kinetic (film-to-film)	—	0.48	ASTM D-1894-90
Coefficient of Friction, static (film-to-film)	—	0.63	ASTM D-1894-90
Refractive Index (sodium D line)	—	1.70	ASTM D—542-90
Poisson's Ratio	—	0.34	Avg. three samples, Elongated at 5, 7, 10%
Low temperature flex life	—	pass	IPC-TM-650 Method 2.6.18

\*Specimen size 25 x 150 mm(1.6); jaw separation 100mm (4 in), jaw speed, 50mm/min(2in/min). Ultimate refers to the tensile strength and elongation measured at break.

# PROPERTIES OF KAPTON® “HN” CONTINUED...

## Thermal Properties of Kapton® HN Film

Thermal Property	Typical Value	Test Condition	Test Method
Melting Point	None	None	ASTM E-794-85 (1989)
Thermal Coefficient of Linear Expansion	20 ppm/°C (11 ppm/°F)	-14°F to 38°C (7° to 100°F)	ASTM D-696-91
Coefficient of Thermal Conductivity W/m•K cal/cm•sec•°C	0.12 2.87 x 10 <sup>4</sup>	296K 23°C	ASTM F-433-77 (1987)
Specific Heat, J/g•K(cal/g•°C)	1.09 (0.261)	—	Differential calorimetry
Heat Sealability	not heat sealable	—	—
Solder Float	Pass	—	IPC-TM-650, method 2.4.13A
Smoke Generation	D <sub>m</sub> =<1	NBS smoke chamber	NFPA-258
Shrinkage, & 30 min at 150°C 120 min at 400°C	0.17 1.25	—	IPC-TM-650 Method 2.2.4A ASTM D-5214-91
Limiting Oxygen Index, %	37-45	—	ASTM D-2863-87
Glass Transition Temperature (T <sub>g</sub> )	A second order transition occurs in Kapton between 360°C (680°F) and 410°C (770°F) and is assumed to be the glass transition temperature. Different measurement techniques produce different results within the above temperature range.		

## Typical Electrical Properties of Kapton® HN Film at 23°C (73°F), 50% Relative Humidity

Property Film Gauge	Typical Value		Test Condition	Test Method
<u>Dielectric Strength</u> 25 um (1 mil) 50 um (2 mil) 75 um (3 mil) 125 um (5 mil)	<u>V/m kV/mm</u> 303 240 205 154	<u>V/mil</u> (7700) (6100) (5200) (3900)	60 Hz 1/4 in electrodes 500 V/sec rise	ASTM D-149-91
<u>Dielectric Constant</u> 25 um (1 mil) 50 um (2 mil) 75 um (3 mil) 125 um (5 mil)	3.4 3.4 3.5 3.5		1 kHz	ASTM D-150-92
<u>Dielectric Factor</u> 25 um (1 mil) 50 um (2 mil) 75 um (3 mil) 125 um (5 mil)	0.0018 0.0020 0.0020 0.0026		1 kHz	ASTM D-150-92
<u>Volume Resistivity</u> 25 um (1 mil) 50 um (2 mil) 75 um (3 mil) 125 um (5 mil)	Ω•cm 1.5 x 10 <sup>17</sup> 1.5 x 10 <sup>17</sup> 1.4 x 10 <sup>17</sup> 1.0 x 10 <sup>17</sup>		—	ASTM D-257-91

\*The data referenced in these tables are typical properties and are not intended for specification purposes.

\*\*Kapton® is a registered trademark of Dupont.

**Auburn has more than 250 different gasket materials in stock for immediate delivery!**

### Consider Diecut Parts

[Gaskets and Seals](#)  
[Cushions, Pads & Bumpers](#)  
[Insulation Parts](#)  
[Adhesive Backed Gaskets](#)

### Insulating Film & Sheet

[Full Gasket Material List](#)  
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[Heat Resistant Gasket Material](#)  
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