AUBURN PRODUCT NEWS

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Typical Properties (Technical Data)

1 MIL (25*u*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 -462ºF (-269ºC) and as high as 752ºF (400ºC). 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 Propertles of Kapton® HN at 73°F (23°C)

Property	Unit	1 mil (25um)	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 @ 73ºF (23º) @ 392ºF (200ºC)	%	72 83	ASTM D-882-91 Method A
Tensile Modulus @ 73ºF (23ºC) @ 392ºF (200º)	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% @ 73ºF (23 C) @200ºF (392 C)	MPa (psi)	69 (10,000) 41 (6000)	ASTM D-882-91
Stress to produce 5% elong. @ 73ºF (23ºC) @200ºF (392ºC)	MPa (psi)	90 (13,000) 62 (9000)	ASTM D-882-92
Impact Strength @ 73ºF (23ºC)	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 seperation 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/ºC (11 ppm/ºF)	-14ºF to 38ºC (7º to 100ºF)	ASTM D-696-91
Coefficient of Thermal Conductivity W/m•K cal/cm•sec•ºC	0.12 2.87 x 10^4	296K 23ºC	ASTM F-433-77 (1987)
Specific Heat, J/g•K(cal/g•ºC)	1.09 (0.261)	—	Differential calorimetry
Heat Sealabilty	not heat sealable	—	—
Solder Float	Pass	—	IPC-TM-650, method 2.4.13A
Smoke Generation	D_m=<1	NBS smoke chamber	NFPA-258
Shrinkage, & 30 min at 150ºC 120 min at 400ºC	 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_g)	A second order transition occurs in Kapton between 360ºC (680ºF) and 410ºC (770ºF) 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 23ºC (73ºF), 50% Relative Humidity

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

**The data referenced in these tables are typical properties and are not intended for specification purposes.*
***Kapton® is a registered trademark of Dupont.*