

AUBURN PRODUCT NEWS

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Typical Properties (Technical Data)

5 MIL (125 μ 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 | 5 mil (125 μ 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) | % | 82 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 | 5000 | ASTM D-2176-89 |
| Tear Strength-propogating Elmendorf, N (lbf) | — | 0.58 (0.02) | ASTM D-1922-89 |
| Tear Strength, Initial (Graves), N (lbf) | — | 46.9 (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 ⁴ | 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 _m < 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 _g) | 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) | V/m kV/mm 303 240 205 154 | V/mil (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 ¹⁷ 1.5 x 10 ¹⁷ 1.4 x 10 ¹⁷ 1.0 x 10 ¹⁷ | | — | 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!

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[Cushions, Pads & Bumpers](#)
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[Adhesive Backed Gaskets](#)

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