



## KAPTON POLYIMIDE FILM

*Kapton Polyimide film (manufacturer DuPont) is an insulation material with extremely good thermal, mechanical, chemical and electrical properties. Kapton is recommended for applications which require a polyimide film with very many stable properties covering a wide temperature range.*

- Manufactured in thicknesses 7.5 - 125  $\mu\text{m}$
- Usually supplied in widths up to ca 914 mm, slit widths, cut, punched and die-cut parts
- Finds use in applications from as low as -269°C to +400°C with satisfactory results
- The standard grade is Type HN, but other film variants are also manufactured.

## PRODUCT INFORMATION

Kapton Polyimide film (manufacturer DuPont) is an insulation material with extremely good thermal, mechanical, chemical and electrical properties. Various different types of Kapton are manufactured of which Type HN is the standard. Other commonplace variants of Kapton are Types FN, HPP-ST, CR and FCR.

### Typical applications

Electric motors • Generators • Transformers • Mechanical components • Electronic components • Most types of electrical equipment and apparatus • Fiberoptic cables • Insulation tubes • Interlays.

### Properties

- Extremely good thermal properties in both low and high temperatures. The material is suitable for applications from -269°C to + 400°C with good results
- Extremely good mechanical properties
- Extremely good electrical properties
- Extremely good chemical properties
- Kapton HN has an excellent balance of properties over a very wide temperature range

### Composition

- Kapton is a polyimide polymer of imide monomers that can withstand very high temperatures. Kapton is produced from the condensation of pyromellitic dianhydride and 4,4'-oxydianiline that is an ether derivative of aniline. For more information on the various types of Kapton Type HN made, see technical data
- Kapton HN, standard variant of Kapton film
- Kapton FN is Kapton HN film coated on one or both sides with Teflon FEP fluorocarbon resin for applications where heat sealability is required.
- Kapton HPP-ST is the same as Kapton HN film but with far superior properties as regards dimensional stability and adhesion.

- Kapton CR is a type of Kapton developed specifically to withstand the damaging effects of "corona".
- Kapton FCR is Kapton CR coated on one or both sides with Teflon FEP fluoropolymer (see Kapton FN).

### Colour

- Usually brownish

### Dimensions

- Kapton HN is manufactured in thicknesses 7.5 – 125  $\mu\text{m}$  (standard type of Kapton)
- Our standard width is usually 914 mm
- Can be slit to desired widths up to ca 1320 mm
- Can be punched or cut to desired form or shape. In the case of die-cutting a die tool is required (tools available at low costs)

### Packaging

- Standard packaging width ca 914 mm, MOQ in kg on request
- Other slit-to-width dimensions on MOQ in kg on request
- Punched and die-cut items: volume MOQ by agreement (with die tool or cut)

*Product information for which Carbex bears no responsibility is provided by the manufacturer.*





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### Technical data

#### Kapton HN

Kapton complies with ASTM D-5213--07, a specification for "Polymeric resin films" for electric insulation and dielectric applications.

The properties stated in this data sheet are typical values unless otherwise stated

Properties	Test method	Value	Value	Value	Value	Value	Value	Unit mm
<b>Kapton XXXHN</b>		30	50	100	200	300	500	
<b>Nominal thickness (ca)</b>		7.5	12.7	25	50	75	125	µm
<b>Mechanical</b>								
Grade (mil)		0.3	0.5	1	2	3	5	
Thickness max		unspec	8.9	21.6	44.5	69.1	118	µm
Thickness min		unspec	16.5	2.2	57.2	83.3	136	µm
Weight/m <sup>2</sup> max		unspec	14	32.7	66.9	101.9	169.5	g/m <sup>2</sup>
Weight/m <sup>2</sup> min		unspec	26	39.7	77.9	115.4	192.5	g/m <sup>2</sup>
Density ca		unspec	1.42	1.42	1.42	1.42	1.42	g/cm <sup>3</sup>
ca Area / kg		unspec	55.7	27.9	13.9	9.2	5.5	m <sup>2</sup> /kg
Tensile strength +23°C	ASTM D882-91, metod A	unspec	138 (min)	231	231	231	231	N/mm <sup>2</sup>
Tensile strength + 200°C	ASTM D882-91, metod A	unspec	unspec	139	139	139	139	N/mm <sup>2</sup>
Elongation +23°C	ASTM D882-91, metod A	unspec	35 (min)	72	82	82	82	%
Elongation +200°C	ASTM D882-91, metod A	unspec	unspec	83	83	83	83	%
MIT Folding Endurance test	ASTM D-2176-89	unspec	unspec	285.000	55.000	6.000	5.000	Number of cycles
Shrinkage at +200°C		unspec	unspec	0.3	0.35	0.35	0.35	% (max)
Moisture absorption (24h at +23°C)		unspec	4,0	4,0	4,0	4,0	4,0	% (max)
<b>Thermal</b>								
Electrical insulation class (UL E39505)		unspec	C / 240	C / 240	C / 240	C / 240	C / 240	class /°C
Mechanical temp.class		unspec	200	200	200	200	200	°C
Flammability	UL94 - VO	-	Ja	Ja	Ja	Ja	Ja	
<b>Electrical</b>								
Dielectric strength	ASTM D-149-97	unspec	118	236	197	177	118	kV/mm

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