DuPont™ Kapton® JP

POLYIMIDE FILM FOR FORMING

Technical Data Sheet

The Kapton® JP family of polyimide films has been designed to give optimum forming characteristics. JP films have higher elongations at elevated temperatures while maintaining the combination of excellent physical, electrical, and mechanical properties inherent in Kapton® HN and HA. JP polymer properties enable drawing deeper parts at lower tempertaures and shorter cycle times. After forming, parts exhibit excellent shape retention and minimum shrinkage. Property comparisons are shown in **Table 1** and **Figures 1 and 2**.

Applications

Parts may be formed from JP film that were previously difficult or impossible to form with Kapton® HN and HA.

- Diaphragms for automotive and heating and ventilating sensors and switches
- Speaker cones, domes, spiders and surrounds
- Other applications including appliances, electronics, and aerospace

Certification

Kapton® JP meets ASTM D-5213 (type 1, item A).

Custom Thicknesses May Include

Kapton® Grade	mil	µm
100JP	1	25
200JP	2	50
300JP	3	75
500JP	5	125

Maximum width: 48 in

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Table 1
Typical Properties of Kapton® JP Polyimide Film vs. Kapton® 500 HA

Property	100JP	200JP	300JP	500JP	500HA	Test Method
Physical						
Ultimate Tensile Strength, kpsi at 23°C (73°F) at 200°C (392°F)	28.8 14.7	30.5 16.2	31.4 15.3	28.5 14.1	25.0 14.9	ASTM D-882
Yield Point at 3%, kpsi at 23°C (73°F) at 200°C (392°F)	10.9 5.5	10.6 5.6	11.4 4.6	10 4.2	9.5 4.8	ASTM D-882
Stress to Produce 5% Elongation, kpsi at 23°C (73°F) at 200°C (392°F)	14.7 7.2	14.4 7.3	15.1 6.9	13.9 6.3	15.0 6.8	ASTM D-882
Ultimate Elongation, % at 23°C (73°F) at 200°C (392°F)	120 142	99 148	115 155	120 170	115 126	ASTM D-882
Tensile Modulus, kpsi at 23°C (73°F) at 200°C (392°F)	425 205	410 220	405 188	375 173	400 204	ASTM D-882
Density, g/cc or g/mL	1.4	1.4	1.4	1.4	1.42	ASTM D-882
Yield, ft_2/lb	137.8	68.9	45.9	27.6	27	
Thermal						
Coefficient of Linear Exp., ppm/°C	41	41	41	41	47	ASTM D-696
Specific Heat, J/g K	1.21	1.19	1.23	1.28	1.26	Diff. Calor.
Glass Transition Temp. (Tg), °C	300	300	300	300	420	Diff. Calor
Dimensional Stability, MD/TD at 400°C (752°F) at 250°C (482°F)	-- 0.18/0.13	-- 0.30/0.24	2.34/1.89 0.24/0.20	2.78/2.10 0.31/0.22	2.66/2.22 0.28/0.16	ASTM D-5214
Electrical						
Dielectric Strength, V/mil	6870	5500	4300	3500	3500	ASTM D-149
Dielectric Constant, 50% RH, 1 kHz at 25°C (77°F)	3.34	3.44	3.46	3.46	3.40	ASTM D-150
Dissipation Factor	0.0013	0.0011	0.0018	0.0019	0.0025	ASTM D-150
Chemical						
Moisture Absorption, % 24 hr in boiling water	1.5	1.8	1.9	2.1	3.3	ASTM D-570

Forming Information

Kapton® JP films can be thermoformed using high temperature forming technology developed by DuPont. JP films can be formed at temperatures approximately 280-300C (535-570F) lower than those needed to form conventional Kapton® films such as HN and HA.

Guidelines for forming JP film include:

- forming temperature of 280-300°C (535-570°F)
- 50-200 psi pressure
- annealing of the part

Parts formed using optimum forming conditions have shrinkage of <4% after 8 hour exposure to temperatures up to 260°C (500°F).

DuPont can provide additional forming information for specific applications if requested. DuPont has also established a list of experienced forming partners to provide parts to customers.

Figure 1. Elongation of Kapton® JP films as a function of temperature

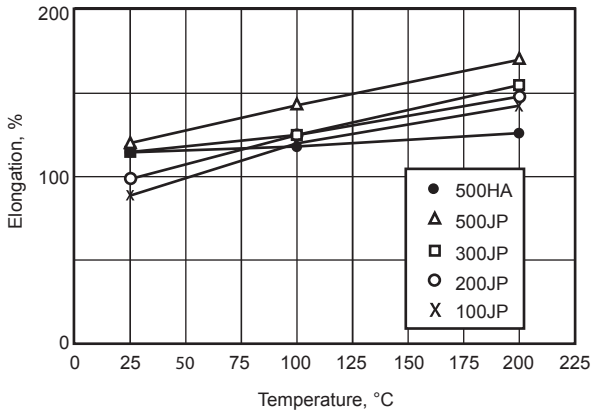
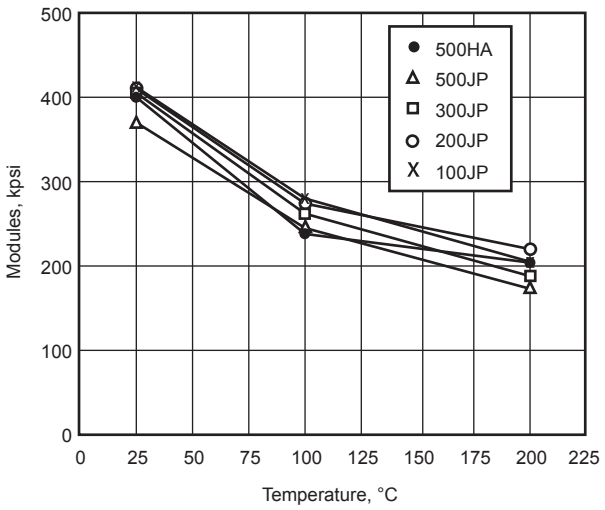


Figure 2. Modulus of Kapton® JP Films as a function of temperature



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