# Insulating Films

**Part Number - 43-77-9G/1000**

**Thermalfilm Polyimide Plastic Films**

RoHS Compliant

Thermalfilm and Thermalfilm MT are low cost polymide plastic insulating films designed to be an improved replacement for mica. These insulators have a distinctive amber color and can be easily recognised and assembled on a production line

Thermalfilm MT, made from high performance Kapton MT material, provides thermal conductivity nearly 2-5 times greater than standard Thermalfilm.

Both insulators have an extremely high resistance to flow or thin out under high compressive stresses, particularly at elevated temperatures.

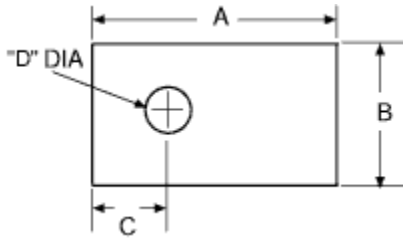
Excellent physical, mechanical and electrical properties remain nearly constant over a wide range of temperatures and frequencies. They are radiation resistant, have no melting points, and have no known organic solvents.

The polymide plastic film is UL listed as a component in UL's publication "Component - Plastic Material" dated September 18, 1969. The UL card number is E39505R, Guide QMFZ2 filed by E.I. du Pont de Nemours & Co., Inc. Thermalfilm is rated 94 V-O.

Notes:

- Thermalfilm MT part numbers begin with "46".
- Insulator thickness is .05mm +/- 0.006mm (0.002" +/- 0.00025") unless otherwise specified.
- Dimensional tolerances are +/- .38mm(0.015"), hole diameters are +/- .25mm (0.010") and angularity is +/- 1 1/2° unless otherwise specified.

## For TO-220



| Part Number | RoHS | A | B | C | D |
|---|---|---|---|---|---|
| 43-77-9G/1000 (TO-220) | RoHS ✓ Compliant | 18.42 (0.725) | 13.21 (0.520) | 4.32 (0.170) | 2.92 (0.115) |

# Thermalfilm / Thermalfilm MT

| Property | Electrical -Typical Value @ 25°C | | Test Method |
|---|---|---|---|
| | Thermalfilm | Thermalfilm MT | |
| Dielectric Strength | 03mm (1 -mil) 275.6 x $10^3$ volts/mm (7,000 volts/mil) | 177.2 x $10^3$ volts/mm (4500 volts/mm) | ASTM D149-64 |
| Dielectric Constant | 3.5 | 4.3 | ASTM D150-64T |
| Dissipation Factor | 0.002 | 0.002 | ASTM D150-64T |
| Volume Resistivity | $10^{17}$ ohm-cm | $10^{17}$ ohm-cm | ASTM D257-61 |
| Surface Resistivity | $10^{16}$ ohms | $10^{16}$ ohms | ASTM D257-61 |
| Corona Start Voltage .025mm (1 -mil) | 465 volts | 465 volts | ASTM D1868-61T |
| Insulation Resistance | 100.00 megohm mfds. | 100.00 megohm mfds. | Based on 0.05 mfd wound capacitor using 0.25mm (1 -mil) Film |
| **PHYSICAL** | | | |
| Ultimate Tensile Strength (MD) | 1.72 x $10^8$ Pa (25,000 psi) | 103 MPa (1500 psi) | ASTM D882-64T |
| Bursting Strength Test (Mullen) | 3.10 x $10^5$ Pa (45 psi) | 0.31 MPa (45 psi) | ASTM 0774-63 |
| Tear Strength - Initial | 27,559 gm/mm (700 gm/mil) | 35,433 gm/mm (900 gm/mil) | ASTM D1004-61 |
| Density | 1.42 gm/$cm^3$ (88.7 lb/$ft^3$) | 1.78 gm/$cm^3$ (111.1 lb/$ft^3$) | ASTM D1505-63T |
| Folding Endurance(MIT) | >10,000 cycles | >10,000 cycles | ASTM D2176-63T |
| **THERMAL** | | | |
| Melting Point | None | None | |
| Zero Strength Temperature | 815°C (1499°F) | 815°C (1499°F) | Hot Bar (Du Pont Test) |
| Cut Through Temperature | 435°C (815°F) 525°C (977°F) | 435°C (815°F) 525°C (977°F) | Weighted Probe on Heated Film (Du Pont Test) |
| Service Temperature | -260°C to 240°C) (-464°F to 464°F) | -260°C to 240°C) (-464°F to 464°F) | |
| Thermal Conductivity | 0.156Wm/K (0.09 BTU/hr-ft-°F) | 0.379Wm/K (0.219 BTU/hr-ft-°F) | Model TC-1000 Twin Heatmeter Comparitive Tester |
| Flammability | V-0, UL "E" card E39505 | V-0, UL "E" card E39505 | UL 94 |