

Overview of materials for Polyimide

Category : Polymer , Thermoplastic , Polyimide, Thermoplastic

Material Notes:

This property data is a summary of similar materials in the MatWeb database for the category "Polyimide". Each property range of values reported is minimum and maximum values of appropriate MatWeb entries. The comments report the average value, and number of data points used to calculate the average. The values are not necessarily typical of any specific grade, especially less common values and those that can be most affected by additives or processing methods.

Order this product through the following link:

http://www.lookpolymers.com/polymer_Overview-of-materials-for-Polyimide.php

| Physical Properties | Metric | English | Comments |
|------------------------------------|-----------------------------|--------------------------------------|---------------------------------------------|
| Density | 0.00545 - 1.88 g/cc | 0.000197 - 0.0679 lb/in ³ | Average value: 1.35 g/cc Grade Count:132 |
| Filler Content | 0.000 - 40.0 % | 0.000 - 40.0 % | Average value: 22.7 % Grade Count:29 |
| Water Absorption | 0.0500 - 1.86 % | 0.0500 - 1.86 % | Average value: 0.475 % Grade Count:84 |
| | 0.260 - 4.17 % | 0.260 - 4.17 % | Average value: 1.99 % Grade Count:16 |
| | @Temperature 80.0 - 80.0 °C | @Temperature 176 - 176 °F | |
| Water Absorption | 1.50 - 3.29 % | 1.50 - 3.29 % | Average value: 1.99 % Grade Count:9 |
| | @Temperature 80.0 - 80.0 °C | @Temperature 176 - 176 °F | |
| | 1.50 - 3.29 % | 1.50 - 3.29 % | Average value: 1.99 % Grade Count:9 |
| | @Time 86400 - 86400 sec | @Time 24.0 - 24.0 hour | |
| Moisture Absorption at Equilibrium | 0.000 - 2.20 % | 0.000 - 2.20 % | Average value: 0.401 % Grade Count:20 |
| Water Absorption at Saturation | 0.000 - 4.00 % | 0.000 - 4.00 % | Average value: 1.91 % Grade Count:20 |
| Viscosity | 3.00e+7 - 2.00e+8 cP | 3.00e+7 - 2.00e+8 cP | Average value: 1.15e+8 cP Grade Count:2 |
| | @Temperature 316 - 316 °C | @Temperature 601 - 601 °F | |
| Linear Mold Shrinkage | 0.000100 - 0.0140 cm/cm | 0.000100 - 0.0140 in/in | Average value: 0.00727 cm/cm Grade Count:51 |
| Melt Flow | 1.21 - 37.0 g/10 min | 1.21 - 37.0 g/10 min | Average value: 10.9 g/10 min Grade Count:31 |

| Mechanical Properties | Metric | English | Comments |
|-----------------------|-------------|-------------|-----------------------------------|
| Hardness, Rockwell E | 47.0 - 95.0 | 47.0 - 95.0 | Average value: 77.0 Grade Count:4 |

| Mechanical Properties | Metric | English | Comments |
|----------------------------|------------------------------------------------------|-----------------------------------------------------|-----------------------------------------|
| | 125 | 25 | Average value: 111 Grade Count: 13 |
| Hardness, Rockwell R | 123 - 129 | 123 - 129 | Average value: 126 Grade Count:9 |
| Hardness, Shore D | 65.0 - 92.0 | 65.0 - 92.0 | Average value: 85.7 Grade Count:35 |
| Tensile Strength, Ultimate | 0.0480 - 2070 MPa | 6.96 - 300000 psi | Average value: 139 MPa Grade Count:103 |
| | 43.0922 - 1241.06 MPa @Temperature -55.0 - 332 °C | 6250.01 - 180000 psi @Temperature -67.0 - 630 °F | Average value: 376 MPa Grade Count:14 |
| Tensile Strength, Yield | 15.0 - 230 MPa | 2180 - 33300 psi | Average value: 114 MPa Grade Count:48 |
| | 57.916 - 141.343 MPa @Temperature 149 - 149 °C | 8400.0 - 20500.0 psi @Temperature 300 - 300 °F | Average value: 112 MPa Grade Count:4 |
| Elongation at Break | 0.800 - 200 % | 0.800 - 200 % | Average value: 11.2 % Grade Count:114 |
| | 1.70 - 90.0 % @Temperature 150 - 150 °C | 1.70 - 90.0 % @Temperature 302 - 302 °F | Average value: 18.9 % Grade Count:11 |
| Elongation at Yield | 1.40 - 90.0 % | 1.40 - 90.0 % | Average value: 6.78 % Grade Count:58 |
| | 4.00 - 90.0 % @Temperature 149 - 149 °C | 4.00 - 90.0 % @Temperature 300 - 300 °F | Average value: 25.5 % Grade Count:4 |
| Modulus of Elasticity | 1.36 - 71.5 GPa | 197 - 10400 ksi | Average value: 7.82 GPa Grade Count:86 |
| | 16.1 - 150 GPa @Temperature -55.0 - 332 °C | 2340 - 21800 ksi @Temperature -67.0 - 630 °F | Average value: 69.2 GPa Grade Count:2 |
| Flexural Yield Strength | 24.8 - 1470 MPa | 3600 - 213000 psi | Average value: 179 MPa Grade Count:114 |
| | 88.0 - 889.424 MPa @Temperature 149 - 332 °C | 12800 - 129000 psi @Temperature 300 - 630 °F | Average value: 243 MPa Grade Count:17 |
| Flexural Modulus | 0.00240 - 111 GPa | 0.348 - 16100 ksi | Average value: 6.96 GPa Grade Count:109 |
| | 0.00260 - 103 GPa @Temperature 149 - 332 °C | 0.377 - 14900 ksi @Temperature 300 - 630 °F | Average value: 21.3 GPa Grade Count:18 |

| Compressive Yield Strength Mechanical Properties | 0.00217 - 115000 MPa Metric | 0.315 - 1.67e+7 psi English | Average value: 1580 MPa Grade Count:8 |
|-----------------------------------------------------|------------------------------------------------------------------------|----------------------------------------------------------------------------|---------------------------------------------------------|
| | 76.4919 - 69700 MPa @Temperature -55.0 - 332 °C | 11094.2 - 1.01e+7 psi @Temperature -67.0 - 630 °F | Average value: 9190 MPa Grade Count:10 |
| Compressive Modulus | 0.847 - 112 GPa | 123 - 16200 ksi | Average value: 6.87 GPa Grade Count:29 |
| Shear Strength | 12.0 - 117 MPa | 1740 - 17000 psi | Average value: 83.9 MPa Grade Count:8 |
| | 38.6106 - 78.5 MPa @Temperature 150 - 360 °C | 5600.01 - 11400 psi @Temperature 302 - 680 °F | Average value: 61.7 MPa Grade Count:6 |
| Izod Impact, Notched | 0.0700 - 3.20 J/cm | 0.131 - 5.99 ft-lb/in | Average value: 0.866 J/cm Grade Count:73 |
| Izod Impact, Unnotched | 2.14 - 5340 J/cm | 4.00 - 10000 ft-lb/in | Average value: 7.68 J/cm Grade Count:18 |
| Izod Impact, Notched (ISO) | 0.0430 - 27.0 kJ/m ² | 0.0205 - 12.8 ft-lb/in ² | Average value: 7.60 kJ/m ² Grade Count:27 |
| Charpy Impact Unnotched | 0.780 - 8.79 J/cm ² | 3.71 - 41.8 ft-lb/in ² | Average value: 3.08 J/cm ² Grade Count:28 |
| | 3.50 - 3.50 J/cm ² @Temperature -30.0 - - 30.0 °C | 16.7 - 16.7 ft-lb/in ² @Temperature -22.0 - - 22.0 °F | Average value: 3.50 J/cm ² Grade Count:1 |
| Charpy Impact, Notched | 0.150 - 2.40 J/cm ² | 0.714 - 11.4 ft-lb/in ² | Average value: 1.20 J/cm ² Grade Count:40 |
| | 1.00 - 1.00 J/cm ² @Temperature -30.0 - - 30.0 °C | 4.76 - 4.76 ft-lb/in ² @Temperature -22.0 - - 22.0 °F | Average value: 1.00 J/cm ² Grade Count:1 |
| Dart Drop, Total Energy | 8.00 - 20.0 J | 5.90 - 14.8 ft-lb | Average value: 14.9 J Grade Count:7 |
| Coefficient of Friction | 0.240 - 0.500 | 0.240 - 0.500 | Average value: 0.299 Grade Count:7 |
| Coefficient of Friction, Static | 0.270 - 0.350 | 0.270 - 0.350 | Average value: 0.307 Grade Count:3 |
| Limiting Pressure Velocity | 0.380 - 12.0 MPa- m/sec | 10800 - 343000 psi- ft/min | Average value: 3.62 MPa-m/sec Grade Count:6 |
| Compression Set | 12.5 - 98.0 % | 12.5 - 98.0 % | Average value: 45.1 % Grade Count:27 |

| Thermal Properties | Metric | English | Comments |
|--------------------|---------------------|-----------------------|-----------------------------------------------|
| CTE, linear | 5.40 - 63.0 µm/m-°C | 3.00 - 35.0 µin/in-°F | Average value: 37.7 µm/m-°C Grade Count:59 |
| | 6.00 - 144 µm/m-°C | 3.33 - 80.0 µin/in-°F | |

| Thermal Properties | Metric | English | Comments |
|---------------------------------|--------------------------------------------------|----------------------------------------------------|-------------------------------------------------------------------------|
| | @ Temperature 50.0 - 300 °C | @ Temperature 122 - 572 °F | Average value: 48.7 $\mu\text{m}/\text{m}\cdot\text{°C}$ Grade Count:24 |
| CTE, linear, Transverse to Flow | 6.00 - 55.0 $\mu\text{m}/\text{m}\cdot\text{°C}$ | 3.33 - 30.6 $\mu\text{in}/\text{in}\cdot\text{°F}$ | Average value: 47.4 $\mu\text{m}/\text{m}\cdot\text{°C}$ Grade Count:38 |
| | 36.0 - 70.0 $\mu\text{m}/\text{m}\cdot\text{°C}$ | 20.0 - 38.9 $\mu\text{in}/\text{in}\cdot\text{°F}$ | Average value: 51.9 $\mu\text{m}/\text{m}\cdot\text{°C}$ Grade Count:10 |
| | @ Temperature 50.0 - 300 °C | @ Temperature 122 - 572 °F | |

| Electrical Properties | Metric | English | Comments |
|----------------------------|-------------------------|-------------------------|-----------------------------------------------|
| Electrical Resistivity | 1e+05 - 1.00e+18 ohm-cm | 1e+05 - 1.00e+18 ohm-cm | Average value: 2.70e+17 ohm-cm Grade Count:24 |
| Surface Resistance | 1000 - 1.00e+18 ohm | 1000 - 1.00e+18 ohm | Average value: 4.11e+16 ohm Grade Count:31 |
| Dielectric Constant | 2.30 - 13.4 | 2.30 - 13.4 | Average value: 3.69 Grade Count:25 |
| Dielectric Strength | 7.32 - 248 kV/mm | 186 - 6290 kV/in | Average value: 43.7 kV/mm Grade Count:18 |
| Dissipation Factor | 0.000500 - 0.0100 | 0.000500 - 0.0100 | Average value: 0.00295 Grade Count:18 |
| Dielectric Loss Index | 0.00340 - 0.0106 | 0.00340 - 0.0106 | Average value: 0.00580 Grade Count:3 |
| Comparative Tracking Index | 100 - 175 V | 100 - 175 V | Average value: 133 V Grade Count:3 |

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