

General Information

Product Description

Hytrel® 4056 is a low modulus Hytrel® grade with nominal durometer hardness of 40D. It contains a non-discoloring stabilizer. It is recommended for extrusion and compounding.

General

| | | | |
|-------------------------------|--|--|---|
| Material Status | • Commercial: Active | | |
| Additive | • Antioxidant | • Heat Stabilizer | |
| Features | • Barrier Resin • Food Contact Acceptable • Good Adhesion • Good Creep Resistance | • Heat Stabilized • High Energy Absorption • Low Hardness • Low Temperature Flexibility | • Low Temperature Impact Resistance • Noise Damping • Resilient |
| Uses | • Adhesives • Cable Jacketing • Cast Film • Coating Applications | • Compounding • Filaments • Film • Hose | • Sheet • Tubing • Wire & Cable Applications |
| RoHS Compliance | • Contact Manufacturer | | |
| Appearance | • Light Beige | | |
| Processing Method | • Cast Film • Casting • Extrusion | • Extrusion Coating • Filament Extrusion • Injection Molding | • Profile Extrusion • Sheet Extrusion |
| Multi-Point Data | • Isochronous Stress vs. Strain (ISO 11403-1) | • Isothermal Stress vs. Strain (ISO 11403-1) | • Viscosity vs. Shear Rate (ISO 11403-2) |
| Part Marking Code (ISO 11469) | • >TPC-ET< | | |
| Resin ID (ISO 1043) | • TPC-ET | | |

ASTM and ISO Properties ¹

| Physical | Nominal Value | Unit | Test Method |
|--|---------------|------------------------|-------------|
| Specific Gravity | 1.17 | g/cm ³ | ASTM D792 |
| Density | 1.16 | g/cm ³ | ISO 1183 |
| Melt Mass-Flow Rate (MFR) (190°C/2.16 kg) | 5.3 | g/10 min | ASTM D1238 |
| Melt Mass-Flow Rate (MFR) (190°C/2.16 kg) | 5.6 | g/10 min | ISO 1133 |
| Melt Volume-Flow Rate (MVR) (190°C/2.16 kg) | 5.00 | cm ³ /10min | ISO 1133 |
| Molding Shrinkage - Flow | 0.50 | % | ASTM D955 |
| Molding Shrinkage | | | ISO 294-4 |
| Across Flow: 2.00 mm | 0.40 | % | |
| Flow: 2.00 mm | 0.20 | % | |
| Water Absorption (23°C, 24 hr) | 0.60 | % | ASTM D570 |
| Water Absorption (23°C, 24 hr) | 0.60 | % | ISO 62 |
| Water Absorption (Saturation, 23°C) | 0.70 | % | ISO 62 |
| Water Absorption (Equilibrium, 23°C, 50% RH) | 0.20 | % | ISO 62 |
| Mechanical | Nominal Value | Unit | Test Method |
| Tensile Modulus (23°C) | 58.0 | MPa | ISO 527-2 |

Hytrel® 4056

DuPont Performance Polymers - Thermoplastic Copolyester Elastomer

| Mechanical | Nominal Value | Unit | Test Method |
|--|---------------|-------------------|---------------|
| Tensile Strength | | | ASTM D638 |
| 5.0% Strain, 23°C | 2.40 | MPa | |
| 10% Strain, 23°C | 3.60 | MPa | |
| Tensile Strength (Break, 23°C) | 21.0 | MPa | ASTM D638 |
| Tensile Stress (Break, 23°C) | 25.0 | MPa | ISO 527-2/1BA |
| Tensile Stress | | | ISO 527-2/1BA |
| 10% Strain: 23°C | 4.50 | MPa | |
| 5% Strain: 23°C | 2.40 | MPa | |
| Tensile Stress (50% Strain, 23°C) | 8.00 | MPa | ISO 527-2/1BA |
| Tensile Elongation (Break, 23°C) | 700 | % | ASTM D638 |
| Tensile Strain (Break, 23°C) | 400 | % | ISO 527-2/1BA |
| Nominal Tensile Strain at Break (23°C) | 500 | % | ISO 527-2/1BA |
| Tensile Creep Modulus (1 hr) | 54.0 | MPa | ISO 899-1 |
| Tensile Creep Modulus (1000 hr) | 40.0 | MPa | ISO 899-1 |
| Flexural Modulus | | | ASTM D790 |
| -40°C | 155 | MPa | |
| 23°C | 62.0 | MPa | |
| 100°C | 27.0 | MPa | |
| Flexural Modulus | | | ISO 178 |
| -40°C | 155 | MPa | |
| 23°C | 64.0 | MPa | |
| 100°C | 27.0 | MPa | |
| Impact | Nominal Value | Unit | Test Method |
| Charpy Notched Impact Strength | | | ISO 179/1eA |
| -40°C | No Break | | |
| -30°C | No Break | | |
| 23°C | No Break | | |
| Charpy Unnotched Impact Strength | | | ISO 179/1eU |
| -30°C | No Break | | |
| 23°C | No Break | | |
| Notched Izod Impact | | | ASTM D256 |
| -40°C | No Break | | |
| 23°C | No Break | | |
| Notched Izod Impact Strength | | | ISO 180/1A |
| -40°C | No Break | | |
| 23°C | No Break | | |
| Tensile Impact Strength (23°C) | 230 | kJ/m ² | ISO 8256 |
| Hardness | Nominal Value | Unit | Test Method |
| Durometer Hardness (Shore D) | 40 | | ASTM D2240 |
| Shore Hardness | | | ISO 868 |
| Shore D | 43 | | |
| Shore D, 15 sec | 39 | | |
| Thermal | Nominal Value | Unit | Test Method |
| Deflection Temperature Under Load | | | ASTM D648 |
| 0.45 MPa, Unannealed | 54.0 | °C | |
| Heat Deflection Temperature (0.45 MPa, Unannealed) | 50.0 | °C | ISO 75-2/B |
| Brittleness Temperature | -90.0 | °C | ISO 974 |
| Glass Transition Temperature | -50.0 | °C | ISO 11357-2 |

Hytrel® 4056

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| Thermal | Nominal Value | Unit | Test Method |
|--|---------------|----------|----------------------|
| Melting Temperature | 150 | °C | ASTM D3418 |
| Melting Temperature ² | 150 | °C | ISO 11357-3 |
| CLTE - Flow | | | ASTM E831 |
| -40 to 23°C | 0.00020 | cm/cm/°C | |
| 23 to 55°C | 0.00013 | cm/cm/°C | |
| 55 to 85°C | 0.00010 | cm/cm/°C | |
| CLTE - Flow | | | ISO 11359-2 |
| -40 to 23°C | 0.00020 | cm/cm/°C | |
| 23 to 55°C | 0.00013 | cm/cm/°C | |
| 55 to 85°C | 0.00010 | cm/cm/°C | |
| CLTE - Transverse | | | ASTM E831 |
| -40 to 23°C | 0.00018 | cm/cm/°C | |
| 23 to 55°C | 0.00016 | cm/cm/°C | |
| 55 to 85°C | 0.00016 | cm/cm/°C | |
| CLTE - Transverse | | | ISO 11359-2 |
| -40 to 23°C | 0.00018 | cm/cm/°C | |
| 23 to 55°C | 0.00016 | cm/cm/°C | |
| 55 to 85°C | 0.00016 | cm/cm/°C | |
| Electrical | Nominal Value | Unit | Test Method |
| Surface Resistivity | 2.0E+14 | ohm | IEC 60093 |
| Volume Resistivity | 7.0E+12 | ohm·cm | IEC 60093 |
| Dielectric Strength ³ (23°C, 1.91 mm) | 16 | kV/mm | ASTM D149 |
| Dielectric Constant | | | ASTM D150 |
| 23°C, 1.91 mm, 100 Hz | 5.20 | | |
| 23°C, 1.91 mm, 1 kHz | 5.10 | | |
| 23°C, 1.91 mm, 1 MHz | 4.60 | | |
| Relative Permittivity | | | IEC 60250 |
| 23°C, 100 Hz | 5.20 | | |
| 23°C, 1 MHz | 4.70 | | |
| Dissipation Factor | | | ASTM D150 |
| 23°C, 1.91 mm, 100 Hz | 0.0050 | | |
| 23°C, 1.91 mm, 1 kHz | 0.0080 | | |
| 23°C, 1.91 mm, 1 MHz | 0.060 | | |
| Dissipation Factor | | | IEC 60250 |
| 23°C, 100 Hz | 0.011 | | |
| 23°C, 1 MHz | 0.053 | | |
| Comparative Tracking Index | > 600 | V | IEC 60112 |
| Electric Strength (23°C) | 18 | kV/mm | IEC 60243-1 |
| Flammability | Nominal Value | Unit | Test Method |
| Flame Rating - UL (1.50 mm) | HB | | UL 94 |
| Flammability Classification (1.50 mm) | HB | | IEC 60695-11-10, -20 |
| Oxygen Index | 20 | % | ISO 4589-2 |
| UL | Nominal Value | Unit | Test Method |
| RTI Str (1.50 mm) | 50.0 | °C | UL 746 |
| RTI Imp (1.50 mm) | 50.0 | °C | UL 746 |
| RTI Elec (1.50 mm) | 50.0 | °C | UL 746 |

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Processing Information

| Injection | Nominal Value | Unit |
|---|----------------------|-------------|
| Drying Temperature | 80.0 | °C |
| Drying Time | 2.0 to 3.0 | hr |
| Suggested Max Moisture | < 0.080 | % |
| Processing (Melt) Temp | 170 to 190 | °C |
| Melt Temperature, Optimum - Injection Molding | 180 | °C |
| Mold Temperature | 30.0 to 40.0 | °C |
| Mold Temperature, Optimum - Injection Molding | 40 | °C |
| Drying Recommended | Yes | |

| Extrusion | Nominal Value | Unit |
|-------------------------------------|----------------------|-------------|
| Drying Temperature | 80.0 | °C |
| Drying Time | 2.0 to 3.0 | hr |
| Suggested Max Moisture | < 0.050 | % |
| Melt Temperature | 165 to 185 | °C |
| Extrusion Melt Temperature, Optimum | 180 | °C |

Notes

¹ Typical properties: these are not to be construed as specifications.

² 10°C/min

³ Method A (Short-Time)