

DuPont™ Crastin® SK603 NC010

THERMOPLASTIC POLYESTER RESIN

Product Information

Common features of Crastin® thermoplastic polyester resin include mechanical and physical properties such as stiffness and toughness, heat resistance, friction and wear resistance, excellent surface finishes and good colourability. Crastin® thermoplastic polyester resin has excellent electrical insulation characteristics and high arc-resistant grades are available. Many flame retardant grades have UL recognition (class V-0). Crastin® thermoplastic polyester resin typically has high chemical and heat ageing resistance.

The good melt stability of Crastin® thermoplastic polyester resin normally enables the recycling of properly handled production waste.

If recycling is not possible, DuPont recommends, as the preferred option, incineration with energy recovery (-24 kJ/g of base polymer) in appropriately equipped installations. For disposal, local regulations have to be observed.

Crastin® thermoplastic polyester resin typically is used in demanding applications in the electronics, electrical, automotive, mechanical engineering, chemical, domestic appliances and sporting goods industry.

Crastin® SK603 NC010 is a 20% glass fiber reinforced, lubricated polybutylene terephthalate resin for injection molding.

| General information | Value | Unit | Test Standard |
|--|----------|-------------------|-----------------|
| Resin Identification | PBT-GF20 | - | ISO 1043 |
| Part Marking Code | PBT-GF20 | - | ISO 11469 |
| Rheological properties | Value | Unit | Test Standard |
| Molding shrinkage, parallel | 0.3 | % | ISO 294-4, 2577 |
| Molding shrinkage, normal | 1.1 | % | ISO 294-4, 2577 |
| Mechanical properties | Value | Unit | Test Standard |
| Tensile Modulus | 7000 | MPa | ISO 527-1/-2 |
| Stress at break | 120 | MPa | ISO 527-1/-2 |
| Strain at break | 3.2 | % | ISO 527-1/-2 |
| Flexural Modulus | 6500 | MPa | ISO 178 |
| Flexural Strength | 180 | MPa | ISO 178 |
| Tensile creep modulus | | | ISO 899-1 |
| 1h | 7200 | MPa | |
| 1000h | 5600 | MPa | |
| Charpy impact strength | | | ISO 179/1eU |
| 73°F | 60 | kJ/m ² | |
| -22°F | 55 | kJ/m ² | |
| Charpy notched impact strength | | | ISO 179/1eA |
| 73°F | 8 | kJ/m ² | |
| -22°F | 9 | kJ/m ² | |
| Izod notched impact strength | | | ISO 180/1A |
| 73°F | 9 | kJ/m ² | |
| -22°F | 8 | kJ/m ² | |
| Izod impact strength | | | ISO 180/1U |
| 73°F | 60 | kJ/m ² | |
| -22°F | 60 | kJ/m ² | |
| Coefficient of sliding friction, 1h against itself | 0.08 | - | ASTM 1894 |
| Thermal properties | Value | Unit | Test Standard |
| Melting temperature, 18°F/min | 224 | °C | ISO 11357-1/-3 |
| Temp. of deflection under load | | | ISO 75-1/-2 |
| 260 psi | 204 | °C | |
| 65 psi | 220 | °C | |
| Vicat softening temperature, 90°F/h, 11 lbf | 210 | °C | ISO 306 |
| Coeff. of linear therm. expansion, parallel | 40 | E-6/K | ISO 11359-1/-2 |
| Coeff. of linear therm. expansion, normal | 100 | E-6/K | ISO 11359-1/-2 |
| Thermal conductivity of melt | 0.25 | W/(m K) | - |
| Spec. heat capacity of melt | 1860 | J/(kg K) | - |

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| | | | | |
|--------------------------------------|--------------|-------------------|----------------------|---------|
| RTI, electrical | | | | UL 746B |
| 30mil | 130 | °C | | |
| 60mil | 130 | °C | | |
| 120mil | 130 | °C | | |
| 240mil | 130 | °C | | |
| RTI, impact | | | | UL 746B |
| 30mil | 130 | °C | | |
| 60mil | 130 | °C | | |
| 120mil | 130 | °C | | |
| 240mil | 130 | °C | | |
| RTI, strength | | | | UL 746B |
| 30mil | 130 | °C | | |
| 60mil | 130 | °C | | |
| 120mil | 130 | °C | | |
| 240mil | 130 | °C | | |
| Flammability | Value | Unit | Test Standard | |
| Burning Behav. at 60mil nom. thickn. | HB | class | IEC 60695-11-10 | |
| Thickness tested | 1.5 | mm | IEC 60695-11-10 | |
| UL recognition | yes | - | UL 94 | |
| Burning Behav. at thickness h | HB | class | IEC 60695-11-10 | |
| Thickness tested | 0.75 | mm | IEC 60695-11-10 | |
| UL recognition | yes | - | UL 94 | |
| Oxygen index | 19 | % | ISO 4589-1/-2 | |
| Glow Wire Flammability Index, 120mil | 750 | °C | IEC 60695-2-1/2 | |
| Glow Wire Ignition Temperature | | | IEC 60695-2-1/3 | |
| 30mil | 750 | °C | | |
| 40mil | 750 | °C | | |
| 60mil | 750 | °C | | |
| 80mil | 750 | °C | | |
| 120mil | 750 | °C | | |
| FMVSS Class | B | - | ISO 3795 (FMVSS 302) | |
| Burning rate, Thickness 1 mm | 28 | mm/min | ISO 3795 (FMVSS 302) | |
| Electrical properties | Value | Unit | Test Standard | |
| Relative permittivity | | | IEC 60250 | |
| 100Hz | 4 | - | | |
| 1MHz | 3.6 | - | | |
| Dissipation factor | | | IEC 60250 | |
| 100Hz | 11.9 | E-4 | | |
| 1MHz | 190 | E-4 | | |
| Volume resistivity | >1E13 | Ohm*m | IEC 60093 | |
| Surface resistivity | 1E15 | Ohm | IEC 60093 | |
| Electric strength | 29 | kV/mm | IEC 60243-1 | |
| Comparative tracking index | 350 | - | IEC 60112 | |
| Electric Strength, 20s, 2mm | 17 | kV/mm | IEC 60243-1 | |
| Other properties | Value | Unit | Test Standard | |
| Humidity absorption, 80mil | 0.15 | % | Sim. to ISO 62 | |
| Water absorption, 80mil | 0.4 | % | Sim. to ISO 62 | |
| Density | 1450 | kg/m ³ | ISO 1183 | |
| Density of melt | 1260 | kg/m ³ | - | |
| VDA Properties | Value | Unit | Test Standard | |
| Emission of organic compounds | 140 | µgC/g | VDA 277 | |
| Odor test | 3 | class | VDA 270 | |
| Fogging, G-value (condensate) | 0.1 | mg | ISO 6452 | DS |

DS: Derived from similar grade

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| Injection | Value | Unit | Test Standard |
|---------------------------------|--------------------|------|---------------|
| Drying Recommended | yes | - | - |
| Drying Temperature | 120 | °C | - |
| Drying Time, Dehumidified Dryer | 2 - 4 | h | - |
| Processing Moisture Content | ≤0.04 | % | - |
| Melt Temperature Optimum | 250 | °C | - |
| Min. melt temperature | 240 | °C | - |
| Max. melt temperature | 260 | °C | - |
| Mold Temperature Optimum | 80 | °C | - |
| Min. mold temperature | 30 | °C | - |
| Max. mold temperature | 130 | °C | - |
| Hold pressure range | ≥60 | MPa | - |
| Hold pressure time | 3 | s/mm | - |
| Back pressure | As low as possible | | - |
| Ejection temperature | 170 | °C | - |

| Characteristics | | | |
|-----------------------|-----------------------------|---|--------------------------------|
| Processing | • Injection Molding | | |
| Delivery form | • Pellets | | |
| Additives | • Release agent | | |
| Regional Availability | • North America • Europe | • Asia Pacific • South and Central America | • Near East/Africa • Global |

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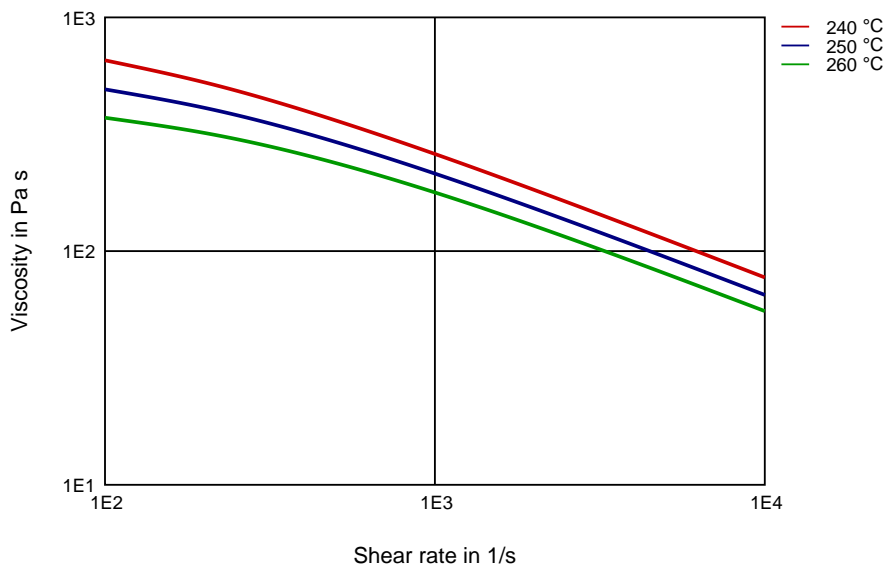


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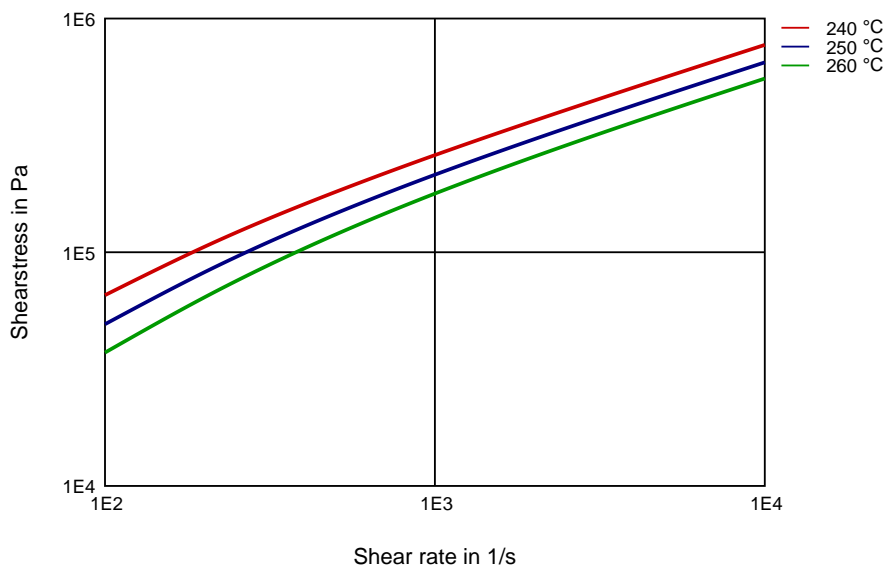
THERMOPLASTIC POLYESTER RESIN

Diagrams

Viscosity-shear rate



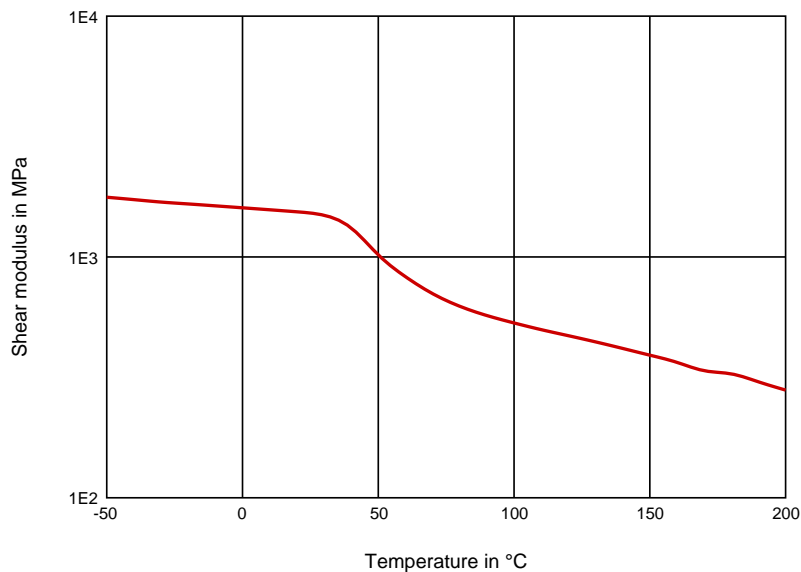
Shearstress-shear rate



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Dynamic Shear modulus-temperature



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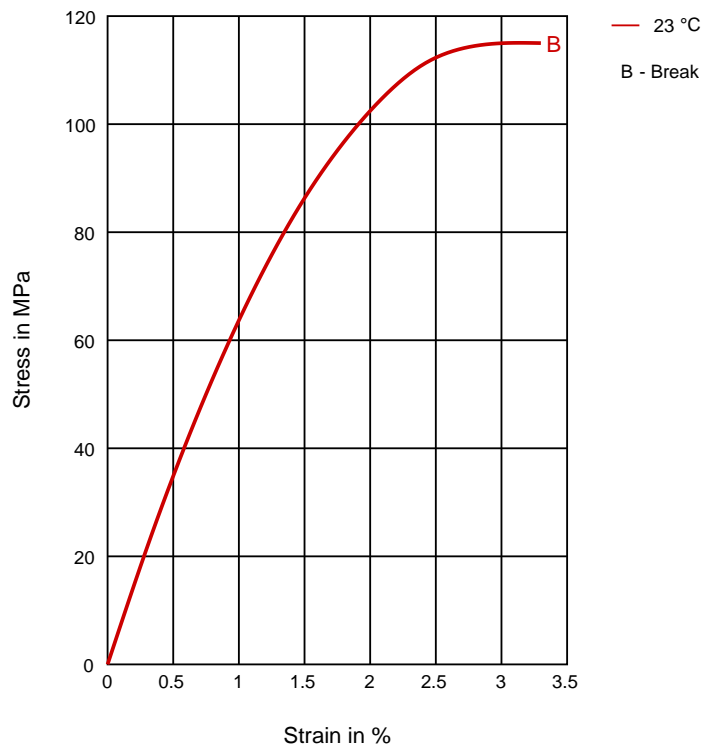
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THERMOPLASTIC POLYESTER RESIN

Stress-strain



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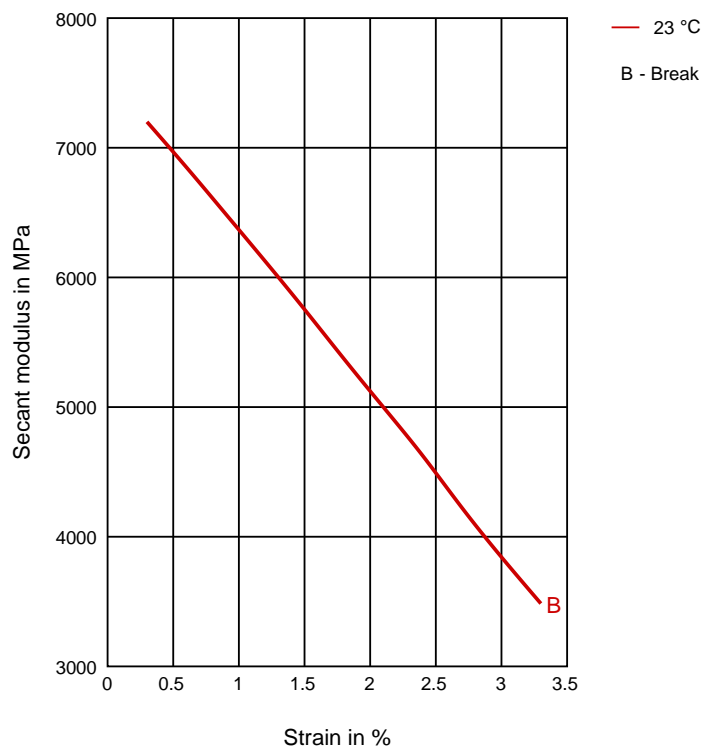


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Secant modulus-strain



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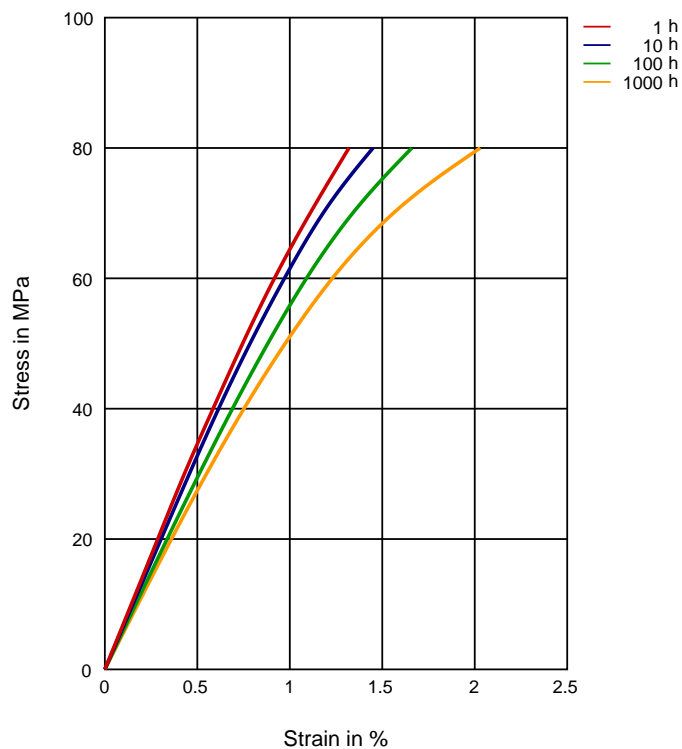


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THERMOPLASTIC POLYESTER RESIN

Stress-strain (isochronous) 23 °C



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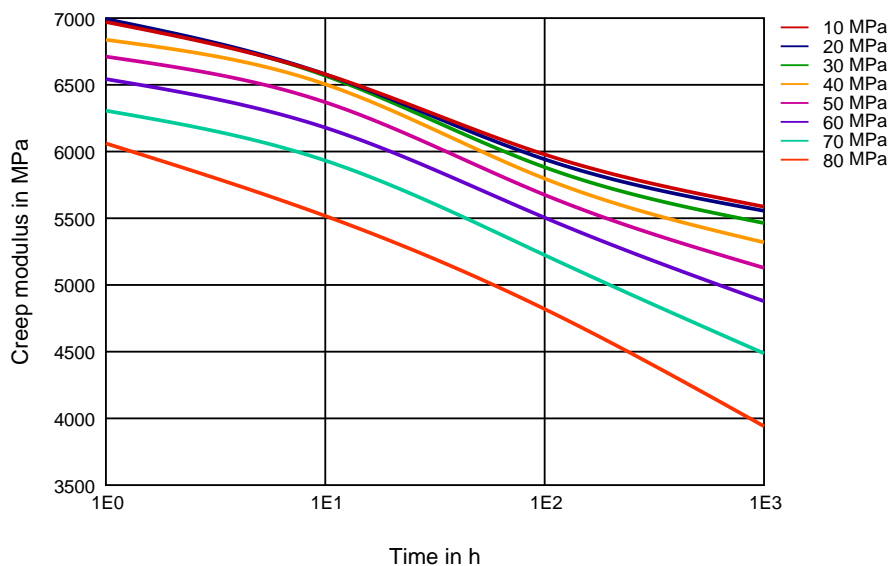
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Creep modulus-time 23 °C



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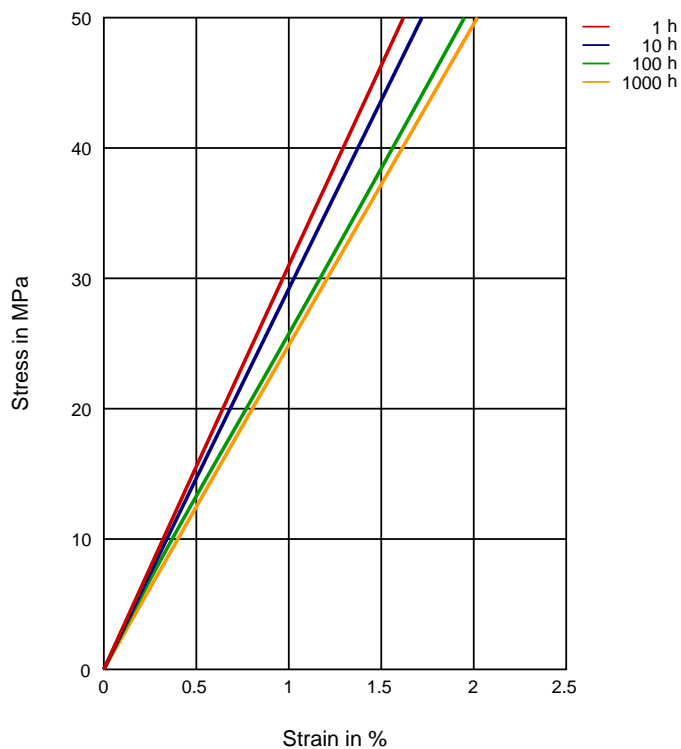
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THERMOPLASTIC POLYESTER RESIN

Stress-strain (isochronous) 60°C



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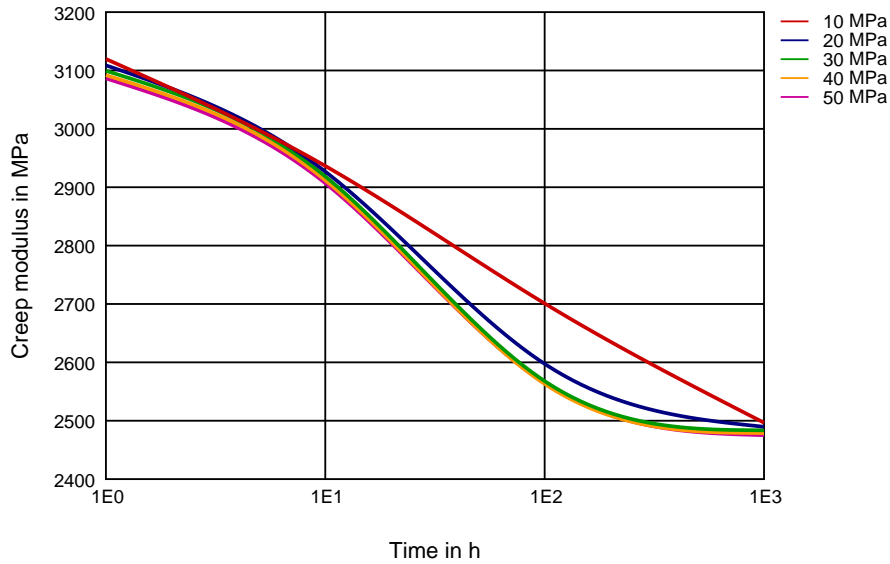


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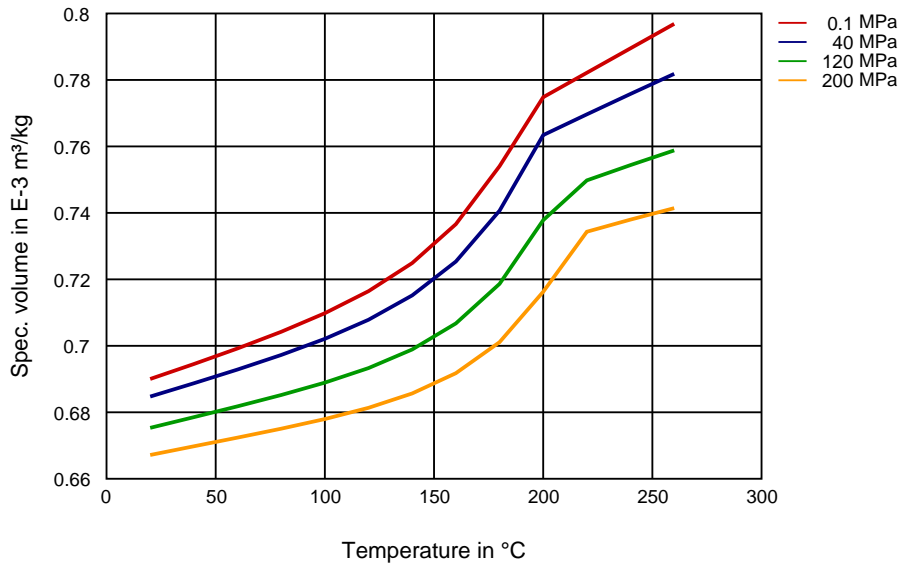
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Creep modulus-time 60 °C



Specific volume-temperature (pVT)



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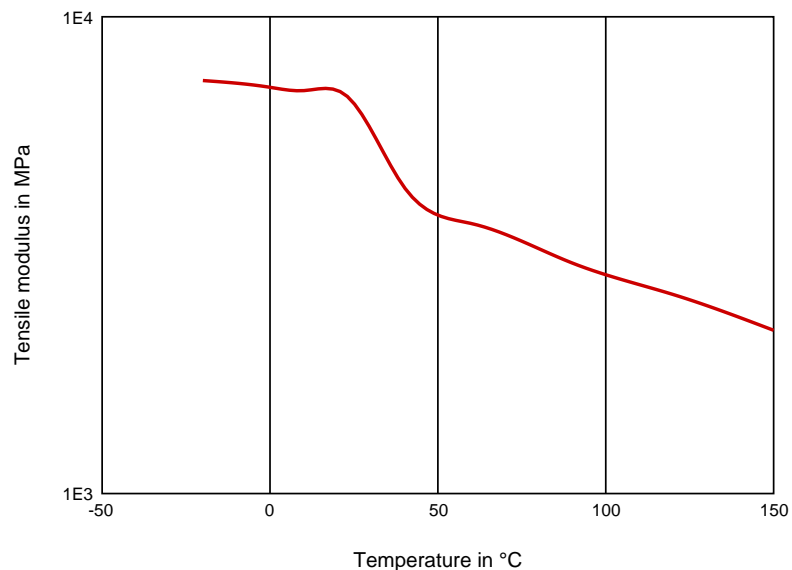
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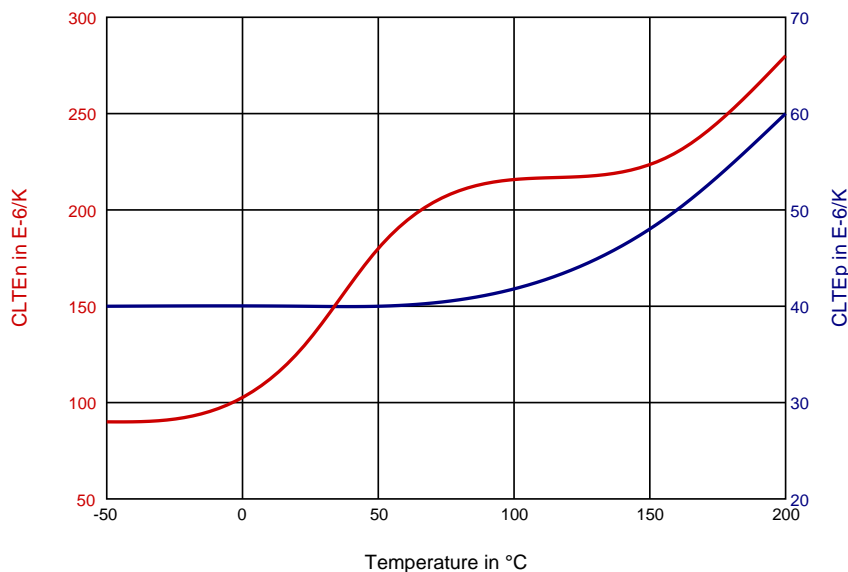
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Tensile modulus-temperature



Coeff. of linear thermal expansion, normal



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Chemical Media Resistance

Acids

- ✓ Acetic Acid (5% by mass) (23 °C)
- ✓ Citric Acid solution (10% by mass) (23 °C)
- ✓ Lactic Acid (10% by mass) (23 °C)
- ✗ Hydrochloric Acid (36% by mass) (23 °C)
- ✗ Nitric Acid (40% by mass) (23 °C)
- ✗ Sulfuric Acid (38% by mass) (23 °C)
- ✗ Sulfuric Acid (5% by mass) (23 °C)
- ✗ Chromic Acid solution (40% by mass) (23 °C)

Bases

- ✗ Sodium Hydroxide solution (35% by mass) (23 °C)
- ✓ Sodium Hydroxide solution (1% by mass) (23 °C)
- ✓ Ammonium Hydroxide solution (10% by mass) (23 °C)

Alcohols

- ✓ Isopropyl alcohol (23 °C)
- ✓ Methanol (23 °C)
- ✓ Ethanol (23 °C)

Hydrocarbons

- ✓ n-Hexane (23 °C)
- ✓ Toluene (23 °C)
- ✓ iso-Octane (23 °C)

Ketones

- ✓ Acetone (23 °C)

Ethers

- ✓ Diethyl ether (23 °C)

Mineral oils

- ✓ SAE 10W40 multigrade motor oil (23 °C)
- ✗ SAE 10W40 multigrade motor oil (130 °C)
- ✗ SAE 80/90 hypoid-gear oil (130 °C)
- ✓ Insulating Oil (23 °C)

Standard Fuels

- ✗ ISO 1817 Liquid 1 - E5 (60 °C)
- ✗ ISO 1817 Liquid 2 - M15E4 (60 °C)
- ✗ ISO 1817 Liquid 3 - M3E7 (60 °C)
- ✗ ISO 1817 Liquid 4 - M15 (60 °C)
- ✓ Standard fuel without alcohol (pref. ISO 1817 Liquid C) (23 °C)
- ✓ Standard fuel with alcohol (pref. ISO 1817 Liquid 4) (23 °C)

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- ✓ Diesel fuel (pref. ISO 1817 Liquid F) (23°C)
- ✓ Diesel fuel (pref. ISO 1817 Liquid F) (90°C)
- ✗ Diesel fuel (pref. ISO 1817 Liquid F) (>90°C)

Salt solutions

- ✓ Sodium Chloride solution (10% by mass) (23°C)
- ✓ Sodium Hypochlorite solution (10% by mass) (23°C)
- ✓ Sodium Carbonate solution (20% by mass) (23°C)
- ✓ Sodium Carbonate solution (2% by mass) (23°C)
- ✓ Zinc Chloride solution (50% by mass) (23°C)

Other

- ✓ Ethyl Acetate (23°C)
- ✗ Hydrogen peroxide (23°C)
- ✗ DOT No. 4 Brake fluid (130°C)
- ✗ Ethylene Glycol (50% by mass) in water (108°C)
- ✓ 1% nonylphenoxy-polyethyleneoxy ethanol in water (23°C)
- ✓ 50% Oleic acid + 50% Olive Oil (23°C)
- ✓ Water (23°C)
- ✗ Water (90°C)
- ✓ Phenol solution (5% by mass) (23°C)

Symbols used:

- ✓ possibly resistant

Defined as: Supplier has sufficient indication that contact with chemical can be potentially accepted under the intended use conditions and expected service life. Criteria for assessment have to be indicated (e.g. surface aspect, volume change, property change).

- ✗ not recommended - see explanation

Defined as: Not recommended for general use. However, short-term exposure under certain restricted conditions could be acceptable (e.g. fast cleaning with thorough rinsing, spills, wiping, vapor exposure).

Contact DuPont for Material Safety Data Sheet, general guides and/or additional information about ventilation, handling, purging, drying, etc. ISO Mechanical properties measured at 160 mil (Hytrel® measured at 80 mil), IEC Electrical properties measured at 80 mil, all ASTM properties measured at 120 mil, and test temperatures are 73°F unless otherwise stated.

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