

THERMOPLASTIC POLYESTER RESIN

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, we recommend, 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® SK602 NC010 is a 15% glass fiber reinforced, lubricated polybutylene terephthalate resin for injection moulding.

Product information

| Resin Identification | PBT-GF15 | ISO 1043 |
|----------------------|------------|-----------|
| Part Marking Code | >PBT-GF15< | ISO 11469 |

Rheological properties

| Melt volume-flow rate | 16 | cm ³ /10min | ISO 1133 |
|---|------|------------------------|-----------------|
| Temperature | 250 | °C | |
| Load | 2.16 | kg | |
| Melt mass-flow rate | 19 | g/10min | ISO 1133 |
| Melt mass-flow rate, Temperature | 250 | °C | |
| Melt mass-flow rate, Load | 2.16 | kg | |
| Viscosity number | 105 | cm ³ /g | ISO 307, 1628 |
| Moulding shrinkage, parallel | 0.4 | % | ISO 294-4, 2577 |
| Moulding shrinkage, normal | 1.1 | % | ISO 294-4, 2577 |
| Postmoulding shrinkage, normal, 48h at 80°C | 0.3 | % | ISO 294-4 |
| Postmoulding shrinkage, parallel, 48h at 80°C | 0.15 | % | ISO 294-4 |
| | | | |

Typical mechanical properties

| · · · | | | |
|---------------------------------------|------|---------|--------------|
| Tensile modulus | 5800 |) MPa | ISO 527-1/-2 |
| Tensile stress at break, 5mm/min | 109 |) MPa | ISO 527-1/-2 |
| Tensile strain at break, 5mm/min | 3.5 | 5 % | ISO 527-1/-2 |
| Flexural modulus | 5200 |) MPa | ISO 178 |
| Flexural strength | 160 |) MPa | ISO 178 |
| Tensile creep modulus, 1h | 5300 |) MPa | ISO 899-1 |
| Tensile creep modulus, 1000h | 4300 |) MPa | ISO 899-1 |
| Charpy impact strength, 23°C | 45 | 5 kJ/m² | ISO 179/1eU |
| Charpy impact strength, -30°C | 45 | 5 kJ/m² | ISO 179/1eU |
| Charpy impact strength, -40°C | 40 |) kJ/m² | ISO 179/1eU |
| Charpy notched impact strength, 23°C | 7 | 7 kJ/m² | ISO 179/1eA |
| Charpy notched impact strength, -30°C | 7 | 7 kJ/m² | ISO 179/1eA |
| Charpy notched impact strength, -40°C | 7 | 7 kJ/m² | ISO 179/1eA |
| Izod notched impact strength, 23°C | 6.5 | 5 kJ/m² | ISO 180/1A |
| Izod notched impact strength, -30°C | 6.0 |) kJ/m² | ISO 180/1A |
| | | | |

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| Izod notched impact strength, -40°C Izod impact strength, 23°C Izod impact strength, -30°C Izod impact strength, -40°C Poisson's ratio | 50 50 | kJ/m² kJ/m² kJ/m² kJ/m² | ISO 180/1A ISO 180/1U ISO 180/1U ISO 180/1U |
|--|------------|----------------------------------|--|
| Thermal properties | | | |
| Melting temperature, 10°C/min | 225 | °C | ISO 11357-1/-3 |
| Glass transition temperature, 10°C/min | 55 | °C | ISO 11357-1/-3 |
| Temperature of deflection under load, 1.8 MPa | 200 | | ISO 75-1/-2 |
| Temperature of deflection under load, 0.45 MPa | 220 | | ISO 75-1/-2 |
| Vicat softening temperature, 50°C/h 50N | 205 | | ISO 306 |
| Coefficient of linear thermal expansion | 50 | E-6/K | ISO 11359-1/-2 |
| (CLTE), parallel | | | |
| Coefficient of linear thermal expansion (CLTE), normal | 110 | E-6/K | ISO 11359-1/-2 |
| Thermal conductivity of melt | 0.24 | W/(m K) | ISO 22007-2 |
| Specific heat capacity of melt | 1900 | J/(kg K) | ISO 22007-4 |
| RTI, electrical, 0.75mm | 130 | | UL 746B |
| RTI, electrical, 1.5mm | 130 | | UL 746B |
| RTI, electrical, 3.0mm | 130 | | UL 746B |
| RTI, electrical, 6mm | 130 | | UL 746B |
| RTI, impact, 0.75mm | 115 | | UL 746B |
| RTI, impact, 1.5mm | 115 | | UL 746B |
| RTI, impact, 3.0mm | 115 | | UL 746B |
| RTI, impact, 6mm | 115 | | UL 746B |
| RTI, strength, 0.75mm | 120 | | UL 746B |
| RTI, strength, 1.5mm | 120 | | UL 746B |
| RTI, strength, 3.0mm | 120 120 | | UL 746B UL 746B |
| RTI, strength, 6mm TGA curve | available | -0 | ISO 11359-1/-2 |
| T CA CUIVE | avallable | | 130 11339-1/-2 |
| Flammability | | | |
| Burning Behav. at 1.5mm nom. thickn. | | class | IEC 60695-11-10 |
| Thickness tested | 1.5 | mm | IEC 60695-11-10 |
| UL recognition | yes | | UL 94 |
| Burning Behav. at thickness h | | 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, 3.0mm | 750 | | IEC 60695-2-12 |
| Glow Wire Ignition Temperature, 0.75mm | 750 | | IEC 60695-2-13 |
| Glow Wire Ignition Temperature, 1.0mm | 750 750 | | IEC 60695-2-13 |
| Glow Wire Ignition Temperature, 1.5mm | 750 750 | | IEC 60695-2-13 |
| Glow Wire Ignition Temperature, 2.0mm | 750 725 | | IEC 60695-2-13 IEC 60695-2-13 |
| Glow Wire Ignition Temperature, 3.0mm FMVSS Class | 725 B | C | ISO 3795 (FMVSS 302) |
| I IVIVOO CIASS | В | | 130 31 33 (FIVIV 33 302) |

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30 mm/min

ISO 3795 (FMVSS 302)

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Burning rate, Thickness 1 mm



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Electrical properties

| Relative permittivity, 100Hz | 3.8 | | IEC 62631-2-1 |
|------------------------------------|-------|-------|---------------|
| Relative permittivity, 1MHz | 3.5 | | IEC 62631-2-1 |
| Dissipation factor, 100Hz | 7 | E-4 | IEC 62631-2-1 |
| Dissipation factor, 1MHz | 200 | E-4 | IEC 62631-2-1 |
| Volume resistivity | >1E13 | Ohm.m | IEC 62631-3-1 |
| Surface resistivity | 1E15 | Ohm | IEC 62631-3-2 |
| Electric strength | 27 | kV/mm | IEC 60243-1 |
| Comparative tracking index | 350 | | IEC 60112 |
| Electric Strength, Short Time, 2mm | 17 | kV/mm | IEC 60243-1 |

Physical/Other properties

| Humidity absorption, 2mm | 0.17 % | Sim. to ISO 62 |
|--------------------------|------------------------|----------------|
| Water absorption, 2mm | 0.42 % | Sim. to ISO 62 |
| Density | 1410 kg/m³ | ISO 1183 |
| Density of melt | 1220 kg/m ³ | |

VDA properties

| Odour | 3 class | VDA 270 |
|-------------------------------|---------|----------|
| Fogging, G-value (condensate) | 0.1 mg | ISO 6452 |

Injection

| 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. mould temperature | 60 | °C |
| Max. mould temperature | 130 | °C |
| Hold pressure range | ≥60 | MPa |
| Hold pressure time | 3 | s/mm |
| Back pressure | As low as | MPa |
| | possible | |
| Ejection temperature | 185 | °C |

Characteristics

Processing Injection Moulding

Delivery form Pellets

Additives Release agent

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Automotive

OEM STANDARD ADDITIONAL INFORMATION

 BMW
 GS93016-PBT-GF15

 Bosch
 N28 BN07-GF003

 Hyundai
 MS941-03 Type F-3

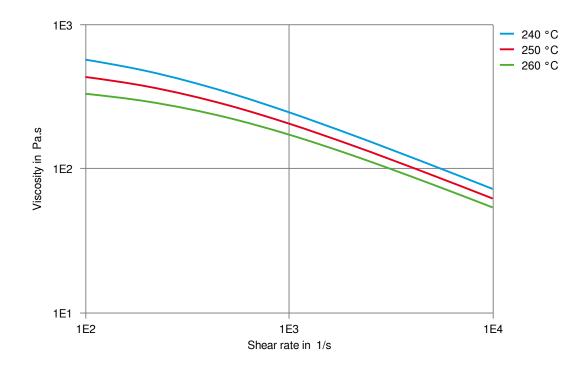
Mercedes-Benz DBL5404.19 PBT+ASA-GF15

Renault FRM, No Spec, Special Part Approval, See

Your CE Account Manager.

Stellantis - Chrysler MS.50103 / CPN-4076 Natural

Viscosity-shear rate

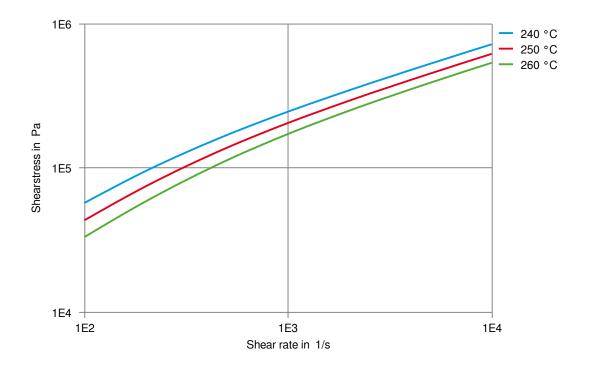


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Shearstress-shear rate

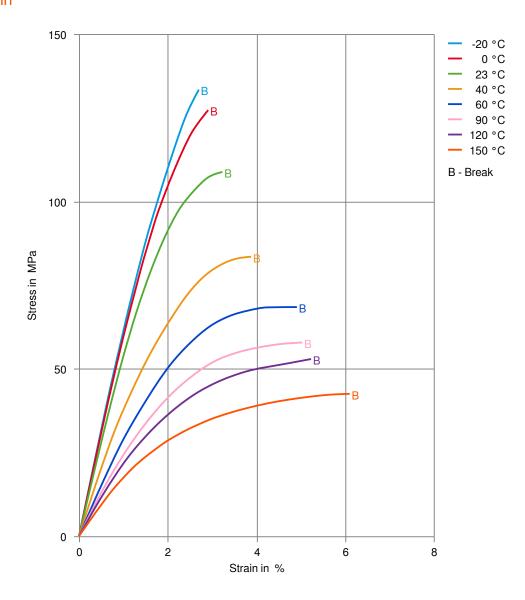


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Stress-strain

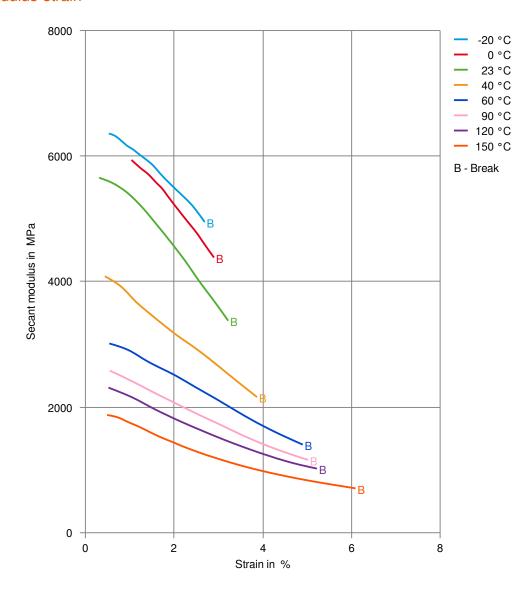


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Secant modulus-strain

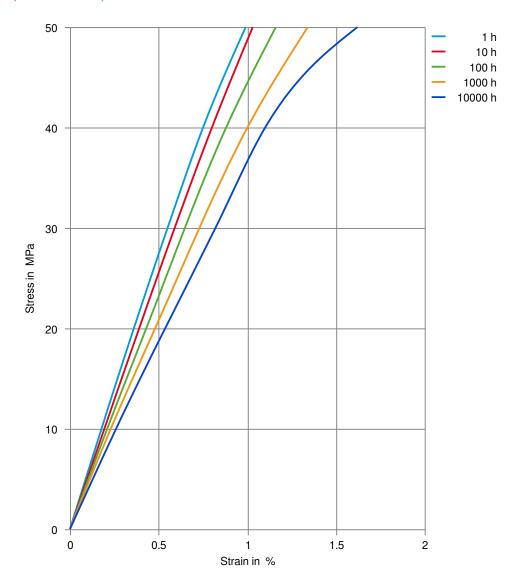


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Stress-strain (isochronous) 23°C

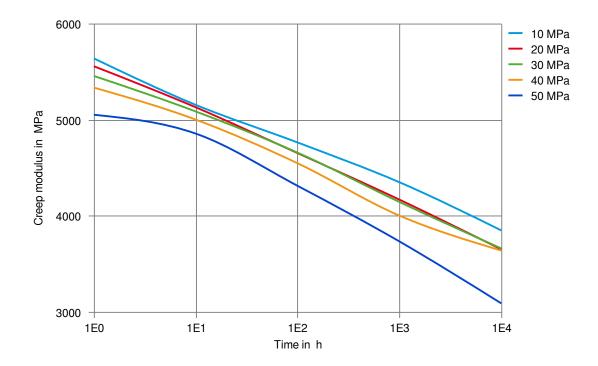


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Creep modulus-time 23°C

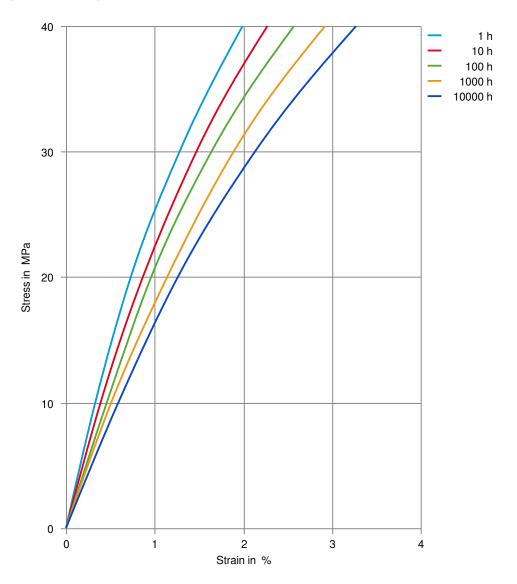


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Stress-strain (isochronous) 60°C

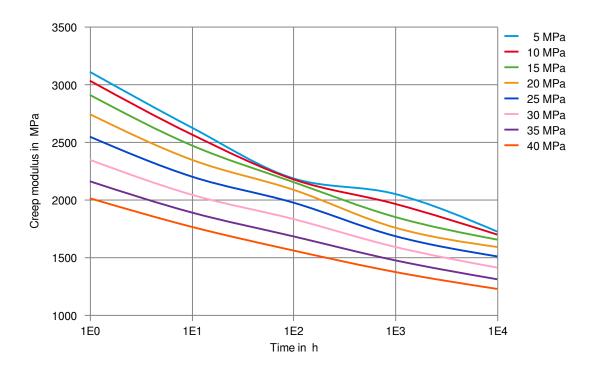


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Creep modulus-time 60°C



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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
- X Hydrochloric Acid (36% by mass), 23°C
- X Nitric Acid (40% by mass), 23°C
- X Sulfuric Acid (38% by mass), 23°C
- X Sulfuric Acid (5% by mass), 23°C
- X Chromic Acid solution (40% by mass), 23°C

Bases

- X 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
- X SAE 10W40 multigrade motor oil, 130°C
- X SAE 80/90 hypoid-gear oil, 130 °C
- ✓ Insulating Oil, 23°C

Standard Fuels

- X ISO 1817 Liquid 1 E5, 60°C
- ★ ISO 1817 Liquid 2 M15E4, 60°C
- X ISO 1817 Liquid 3 M3E7, 60°C
- X 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
- ✓ 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

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- ✓ 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
- X Hydrogen peroxide, 23°C
- X 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
- X 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).

x 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).

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