Celanese
The chemistry inside innovation™

# Crastin® LW9320 NC010

## 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® LW9320 NC010 is a 20% glass fiber reinforced polybutylene terephthalate blend for injection moulding. It has improved surface aesthetics, excellent dimensional stability and low warpage characteristics.

## Product information

| | | |
|---|---|---|
| Resin Identification | PBT+SAN-GF20 | ISO 1043 |
| Part Marking Code | >PBT+SAN-GF20< | ISO 11469 |

## Rheological properties

| | | | |
|---|---|---|---|
| Melt volume-flow rate | 15 | $cm^3/10min$ | ISO 1133 |
| Temperature | 250 | °C | |
| Load | 5 | kg | |
| Viscosity number | 120 | $cm^3/g$ | ISO 307, 1157, 1628 |
| Moulding shrinkage, parallel | 0.4 | % | ISO 294-4, 2577 |
| Moulding shrinkage, normal | 0.7 | % | ISO 294-4, 2577 |
| Postmoulding shrinkage, normal, 48h at 80°C | 0.2 | % | ISO 294-4 |
| Postmoulding shrinkage, parallel, 48h at 80°C | 0.1 | % | ISO 294-4 |

## Typical mechanical properties

| | | | |
|---|---|---|---|
| Tensile Modulus | 7500 | MPa | ISO 527-1/-2 |
| Stress at break, 5mm/min | 120 | MPa | ISO 527-1/-2 |
| Strain at break, 5mm/min | 2.5 | % | ISO 527-1/-2 |
| Flexural Modulus | 6500 | MPa | ISO 178 |
| Flexural Strength | 170 | MPa | ISO 178 |
| Charpy impact strength, 23°C | 50 | $kJ/m^2$ | ISO 179/1eU |
| Charpy impact strength, -30°C | 45 | $kJ/m^2$ | ISO 179/1eU |
| Charpy notched impact strength, 23°C | 8.5 | $kJ/m^2$ | ISO 179/1eA |
| Charpy notched impact strength, -30°C | 8 | $kJ/m^2$ | ISO 179/1eA |
| Izod notched impact strength, 23°C | 7 | $kJ/m^2$ | ISO 180/1A |
| Izod notched impact strength, -30°C | 7 | $kJ/m^2$ | ISO 180/1A |
| Izod notched impact strength, -40°C | 7 | $kJ/m^2$ | ISO 180/1A |
| Izod impact strength, 23°C | 45 | $kJ/m^2$ | ISO 180/1U |

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| | | | |
|---|---|---|---|
| Izod impact strength, -40 °C | 45 | kJ/m² | ISO 180/1U |
| Poisson's ratio | 0.34 | | |

## Thermal properties

| | | | |
|---|---|---|---|
| Melting temperature, 10 °C/min | 220 | °C | ISO 11357-1/-3 |
| Glass transition temperature, 10 °C/min | 110 | °C | ISO 11357-1/-3 |
| Temp. of deflection under load, 1.8 MPa | 175 | °C | ISO 75-1/-2 |
| Ball pressure test | 190 | °C | IEC 60695-10-2 |
| Coeff. of linear therm. expansion, parallel | 30 | 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 | 0.24 | W/(m K) | Internal |
| Spec. heat capacity of melt | 1900 | J/(kg K) | Internal |
| RTI, electrical, 0.75mm | 130 | °C | UL 746B |
| RTI, electrical, 1.5mm | 130 | °C | UL 746B |
| RTI, electrical, 3mm | 130 | °C | UL 746B |
| RTI, impact, 0.75mm | 125 | °C | UL 746B |
| RTI, impact, 1.5mm | 125 | °C | UL 746B |
| RTI, impact, 3mm | 130 | °C | UL 746B |
| RTI, strength, 0.75mm | 130 | °C | UL 746B |
| RTI, strength, 1.5mm | 130 | °C | UL 746B |
| RTI, strength, 3mm | 130 | °C | UL 746B |
| TGA curve | available | | ISO 11359-1/-2 |

## Flammability

| | | | |
|---|---|---|---|
| Burning Behav. at 1.5mm nom. thickn. | HB | class | UL 94 |
| Thickness tested | 1.5 | mm | UL 94 |
| UL recognition | yes | | UL 94 |
| Burning Behav. at thickness h | HB | class | UL 94 |
| Thickness tested | 0.75 | mm | UL 94 |
| UL recognition | yes | | UL 94 |
| FMVSS Class | B | | ISO 3795 (FMVSS 302) |
| Burning rate, Thickness 1 mm | 31 | mm/min | ISO 3795 (FMVSS 302) |

## Electrical properties

| | | | |
|---|---|---|---|
| Comparative tracking index | 500 | | IEC 60112 |

## Other properties

| | | | |
|---|---|---|---|
| Humidity absorption, 2mm | 0.3 | % | Sim. to ISO 62 |
| Density | 1340 | kg/m³ | ISO 1183 |
| Density of melt | 1170 | kg/m³ | Internal |

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## VDA Properties

| | | | |
|---|---|---|---|
| Emission of organic compounds | 130 | µgC/g | VDA 277 |
| Odour | 3.5 | class | VDA 270 |

## 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 | Internal |
| Min. melt temperature | 240 | °C | |
| Max. melt temperature | 260 | °C | |
| Mold Temperature Optimum | 80 | °C | |
| Min. mould temperature | 30 | °C | |
| Max. mould temperature | 130 | °C | |
| Hold pressure range | ≥60 | MPa | |
| Hold pressure time | 3 | s/mm | |
| Back pressure | As low as possible | MPa | |
| Ejection temperature | 170 | °C | Internal |

## Characteristics

| | |
|---|---|
| Additives | Release agent |

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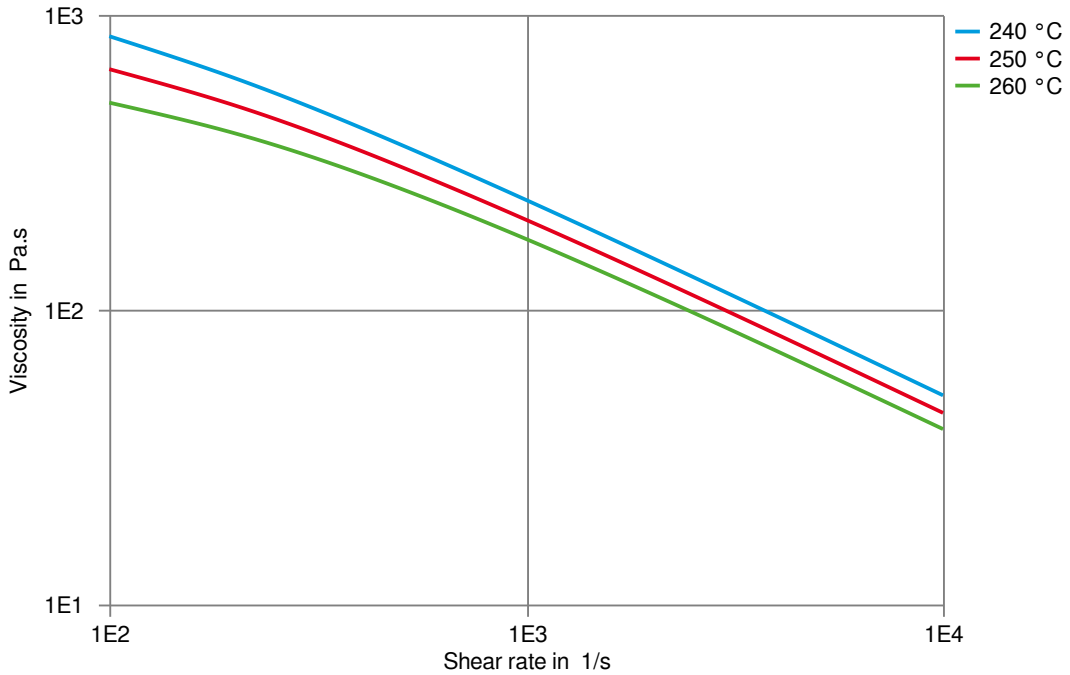
## Viscosity-shear rate



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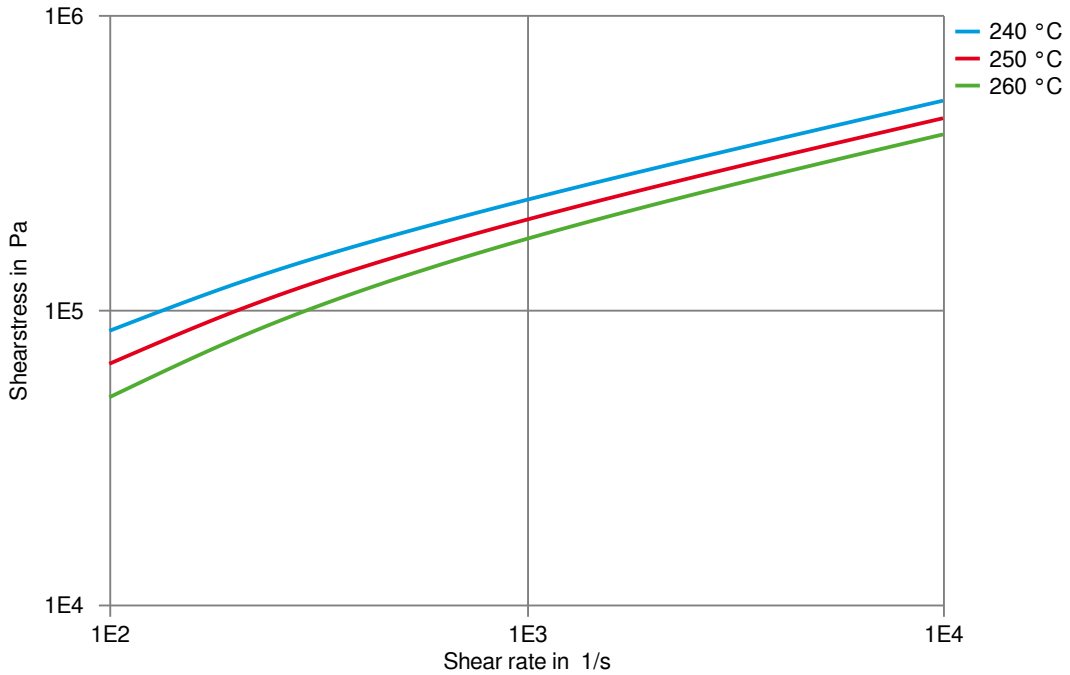
THERMOPLASTIC POLYESTER RESIN

## Shearstress-shear rate



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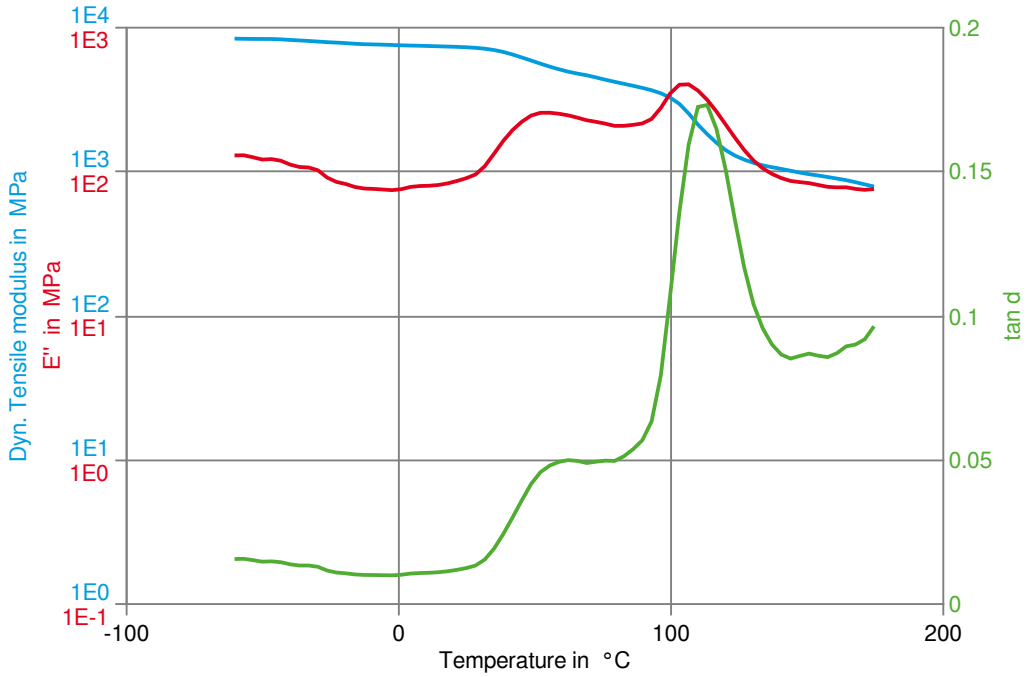
## Dynamic Tensile modulus-temperature



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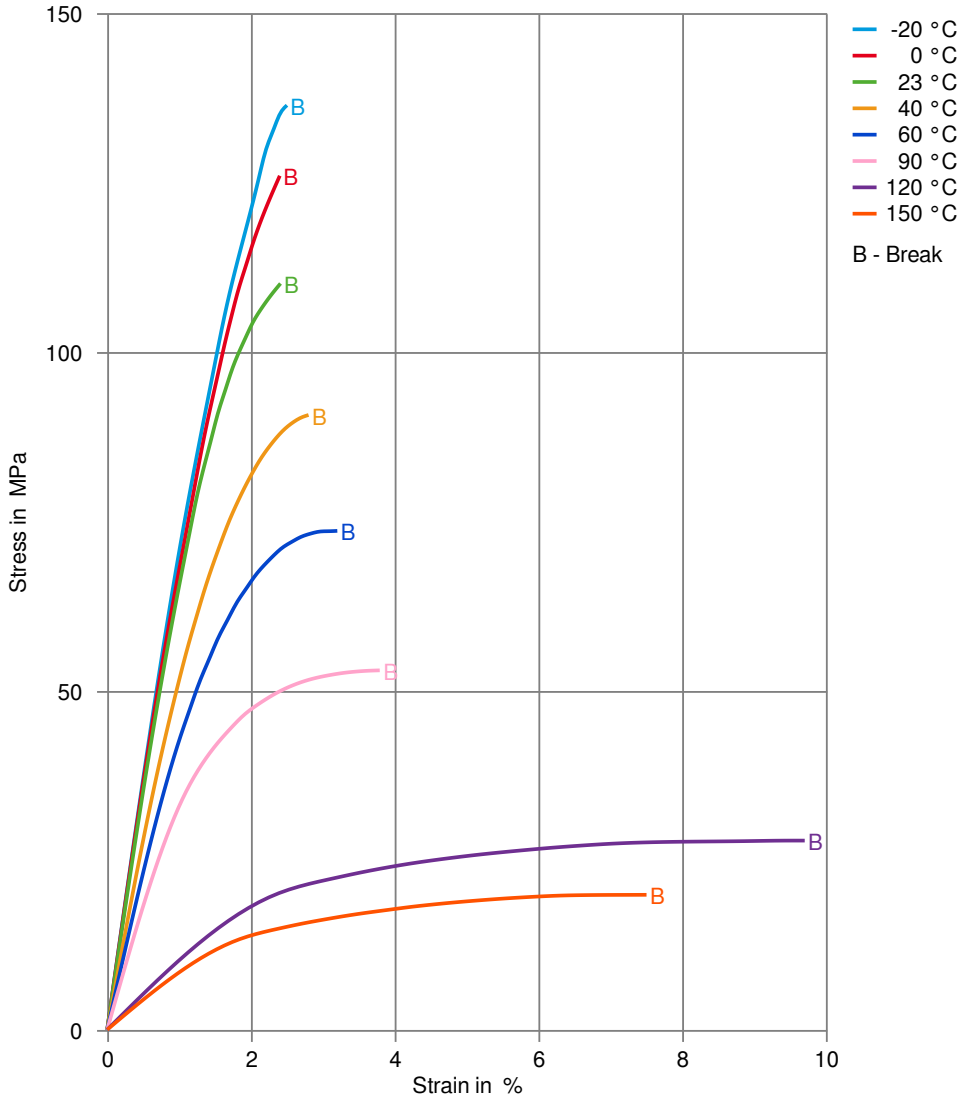
## Stress-strain



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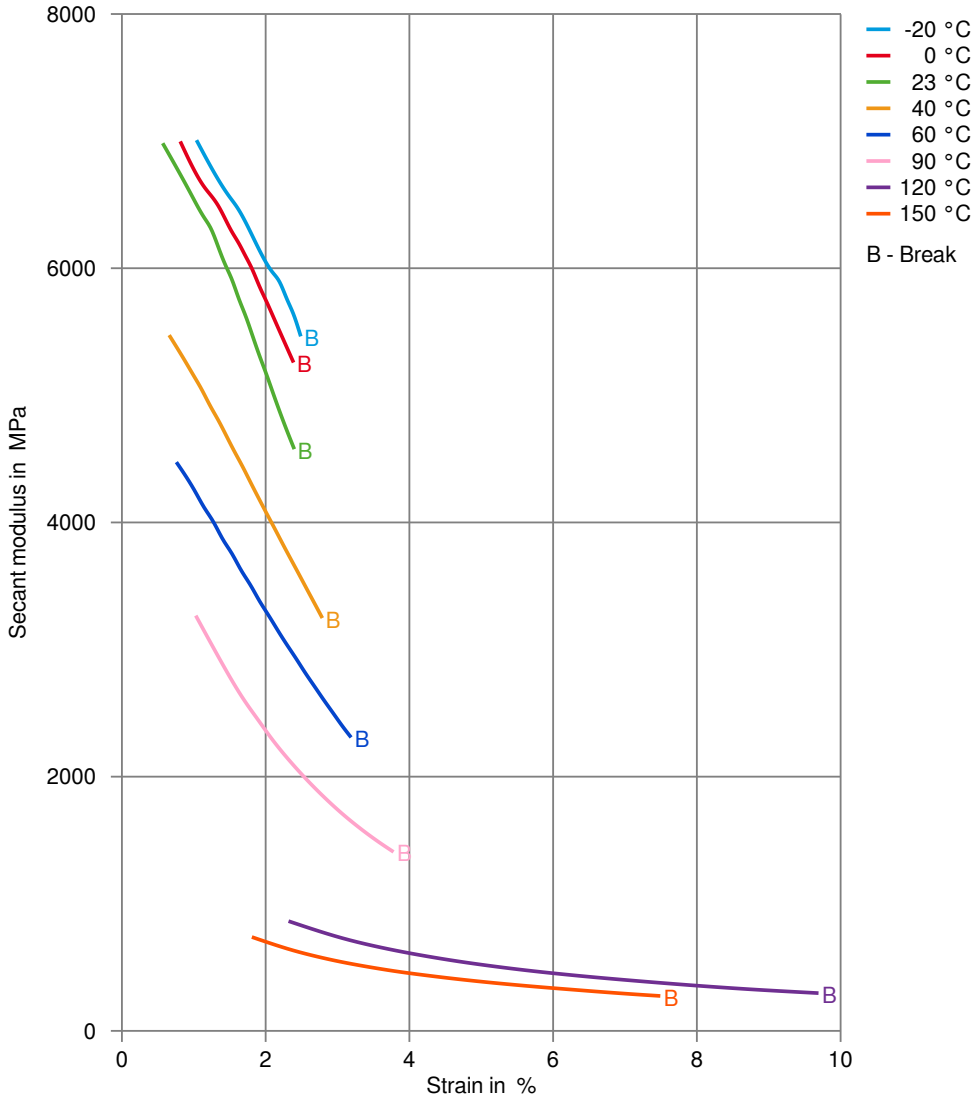
THERMOPLASTIC POLYESTER RESIN

## Secant modulus-strain



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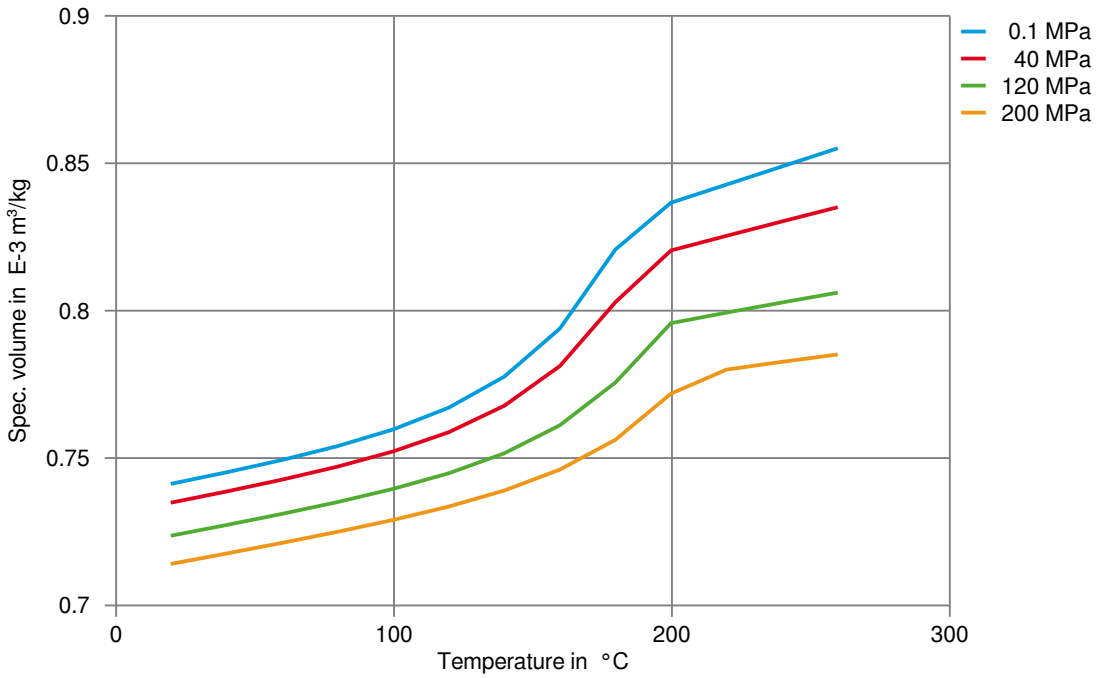
## Specific volume-temperature (pvT)



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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
- ✔ 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

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## 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).