

CAMPUS® Datasheet

Ultramid® A3X2G5 - PA66-GF25 FR
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Product Texts

Glass fibre reinforced injection moulding grade with improved flame retardance based on red phosphorus, giving outstanding mechanical and electrical properties for components requiring high stiffness

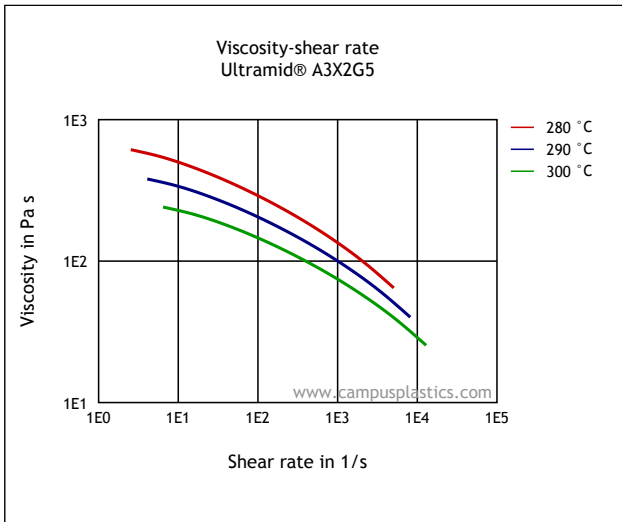
Rheological properties	dry / cond	Unit	Test Standard
Melt volume-flow rate, MVR	30 / *	cm ³ /10min	ISO 1133
Temperature	275 / *	°C	ISO 1133
Load	5 / *	kg	ISO 1133
Molding shrinkage, parallel	0.4 / *	%	ISO 294-4, 2577
Molding shrinkage, normal	1.0 / *	%	ISO 294-4, 2577
Mechanical properties	dry / cond	Unit	Test Standard
Tensile modulus	8000 / 6000	MPa	ISO 527-1/-2
Stress at break	140 / 100	MPa	ISO 527-1/-2
Strain at break	3 / 4.5	%	ISO 527-1/-2
Tensile creep modulus, 1000h	* / 3500	MPa	ISO 899-1
Charpy impact strength, +23°C	65 / 70	kJ/m ²	ISO 179/1eU
Charpy impact strength, -30°C	60 / 65	kJ/m ²	ISO 179/1eU
Charpy notched impact strength, +23°C	13 / 17	kJ/m ²	ISO 179/1eA
Thermal properties	dry / cond	Unit	Test Standard
Melting temperature, 10°C/min	260 / *	°C	ISO 11357-1/-3
Temp. of deflection under load, 1.80 MPa	250 / *	°C	ISO 75-1/-2
Temp. of deflection under load, 0.45 MPa	250 / *	°C	ISO 75-1/-2
Coeff. of linear therm. expansion, parallel	30 / *	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal	70 / *	E-6/K	ISO 11359-1/-2
Burning Behav. at 1.5 mm nom. thickn.	V-0 / *	class	IEC 60695-11-10
Thickness tested (1.5)	1.6 / *	mm	IEC 60695-11-10
Yellow Card available	Yes / *	-	-
Burning Behav. at thickness h	V-0 / *	class	IEC 60695-11-10
Thickness tested (h)	0.8 / *	mm	IEC 60695-11-10
Yellow Card available	Yes / *	-	-
Burning Behav. 5V at thickness h	5VA / *	class	IEC 60695-11-20
Thickness tested	3.0 / *	mm	IEC 60695-11-20
Yellow Card available	Yes / *	-	-
Oxygen index	27 / *	%	ISO 4589-1/-2
Electrical properties	dry / cond	Unit	Test Standard
Relative permittivity, 1MHz	3.7 / 5	-	IEC 60250
Dissipation factor, 1MHz	200 / 1000	E-4	IEC 60250
Volume resistivity	1E13 / 1E10	Ohm*m	IEC 60093
Surface resistivity	* / 1E10	Ohm	IEC 60093
Electric strength	33 / 30	kV/mm	IEC 60243-1
Comparative tracking index	- / 550	-	IEC 60112
Other properties	dry / cond	Unit	Test Standard
Water absorption	6 / *	%	Sim. to ISO 62
Humidity absorption	1.4 / *	%	Sim. to ISO 62
Density	1340 / -	kg/m ³	ISO 1183

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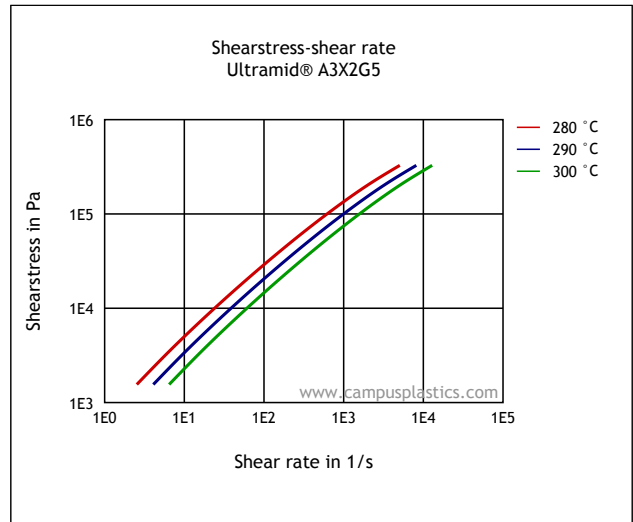
Material specific properties	dry / cond	Unit	Test Standard
Viscosity number	140 / *	cm ³ /g	ISO 307, 1157, 1628
Rheological calculation properties	Value	Unit	Test Standard
Ejection temperature	195	°C	-
Test specimen production	Value	Unit	Test Standard
Injection Molding, melt temperature	290	°C	ISO 294
Injection Molding, mold temperature	80	°C	ISO 10724
Injection Molding, injection velocity	200	mm/s	ISO 294

Diagrams

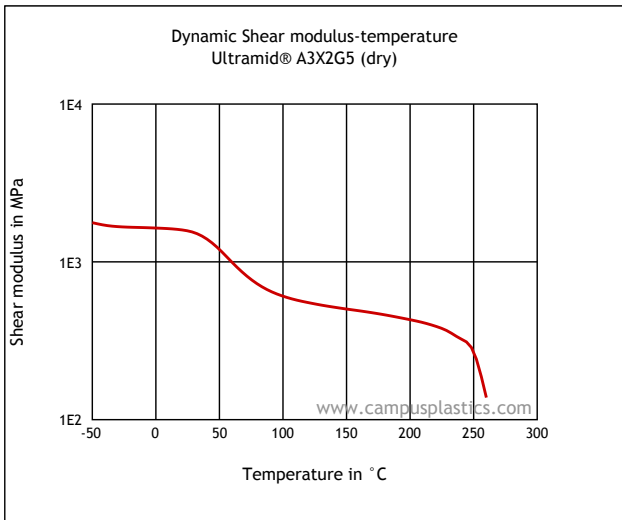
Viscosity-shear rate



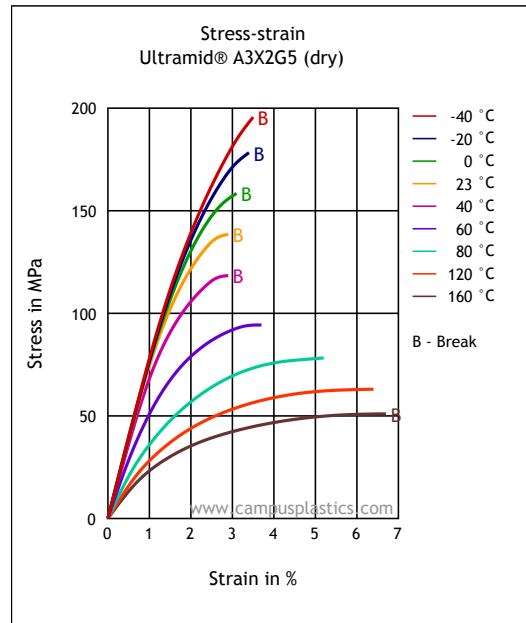
Shearstress-shear rate



Dynamic Shear modulus-temperature

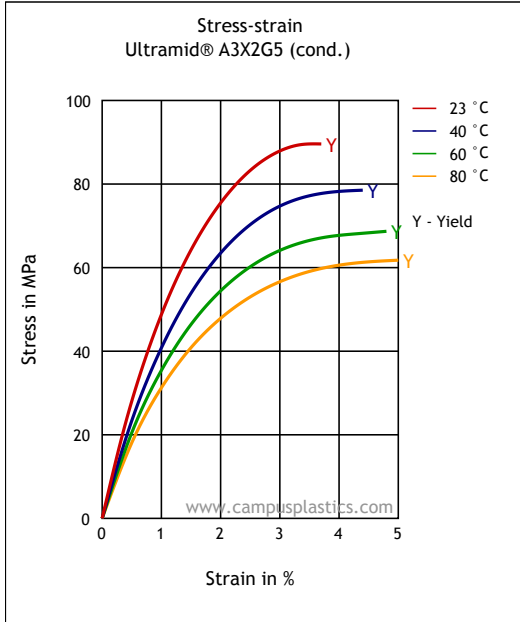


Stress-strain

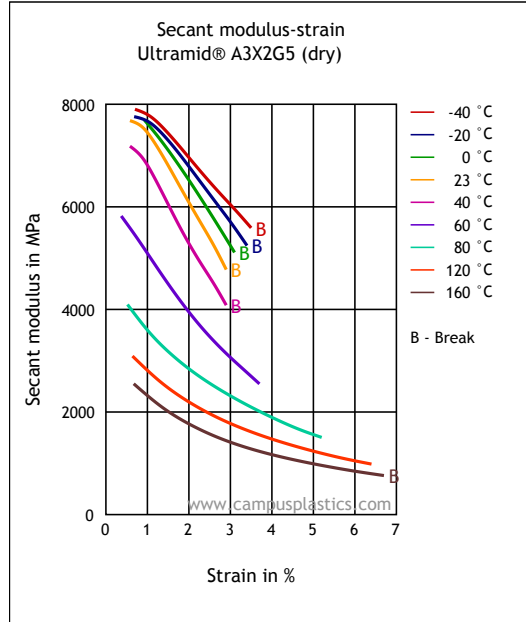


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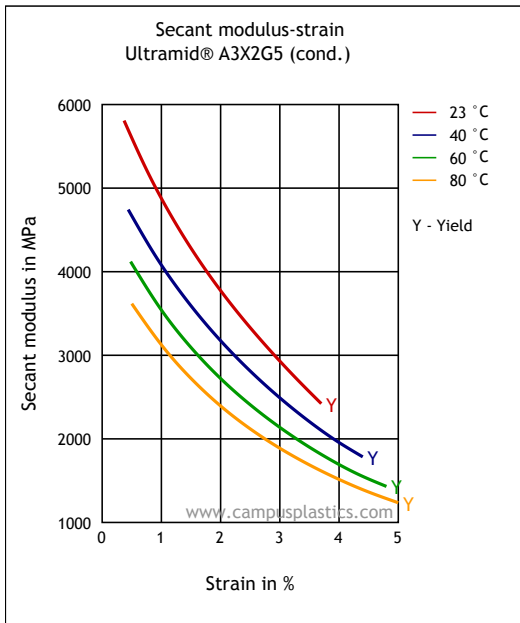
Stress-strain



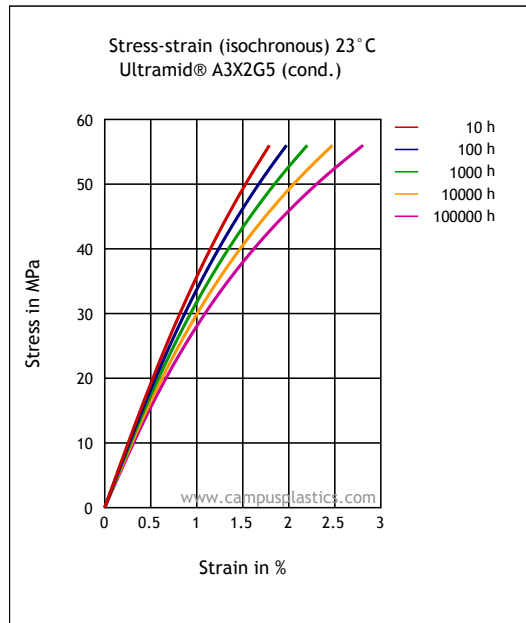
Secant modulus-strain



Secant modulus-strain

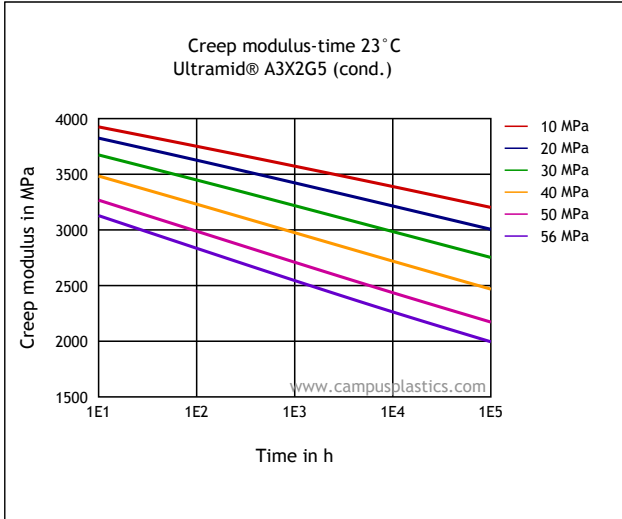


Stress-strain (isochronous) 23 °C

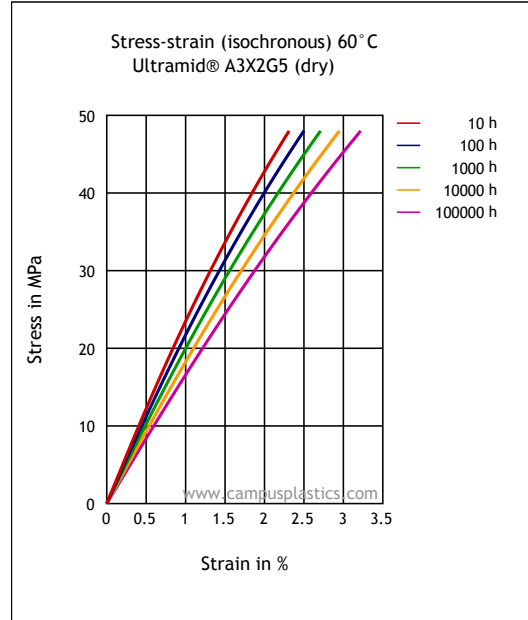


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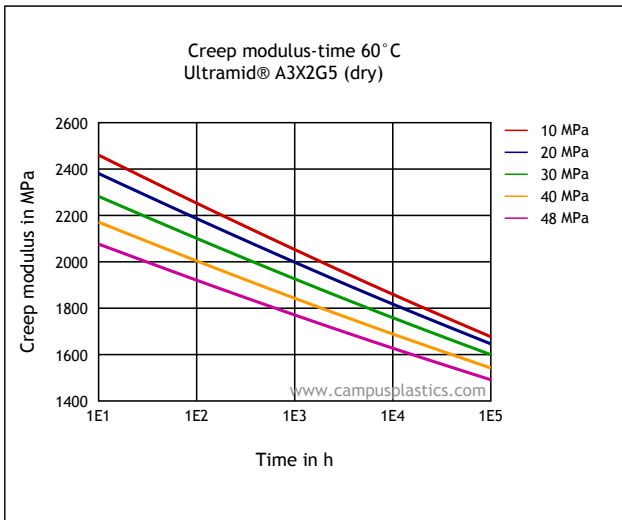
Creep modulus-time 23 °C



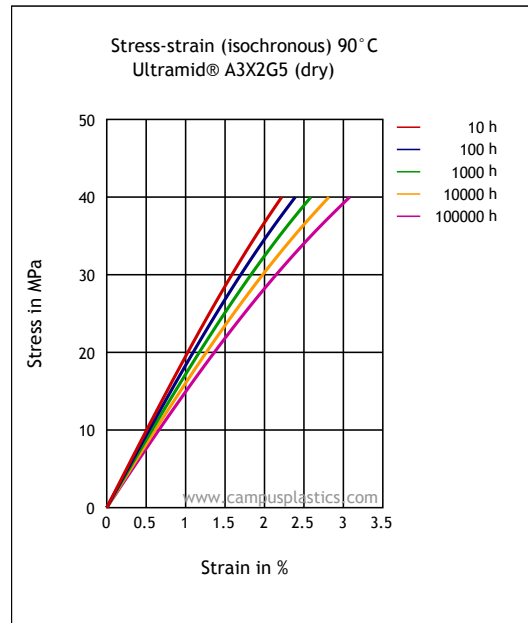
Stress-strain (isochronous) 60 °C



Creep modulus-time 60 °C

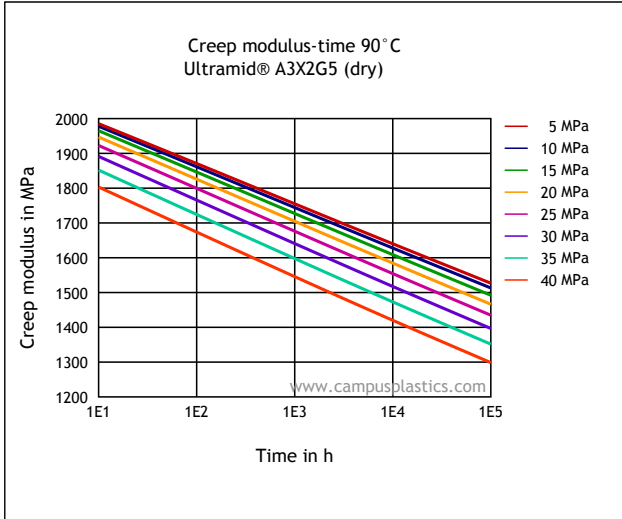


Stress-strain (isochronous) 90 °C

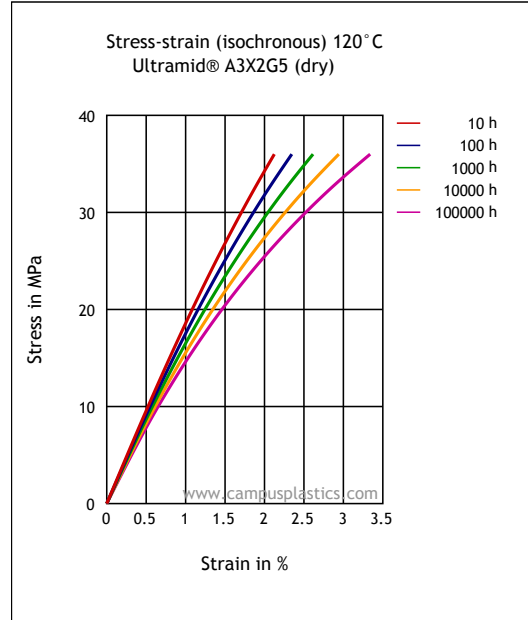


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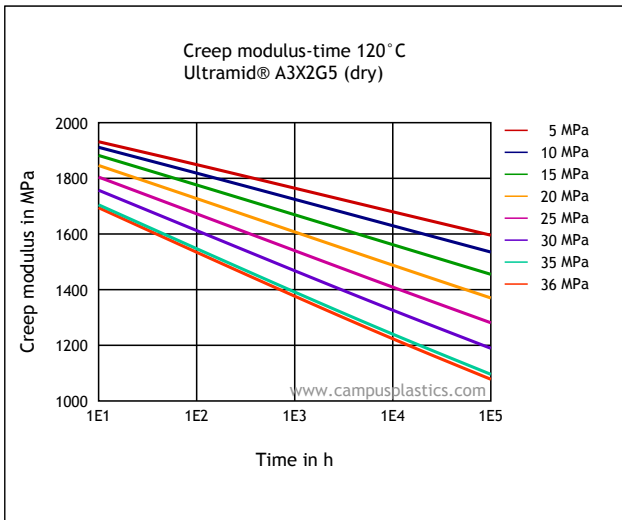
Creep modulus-time 90 °C



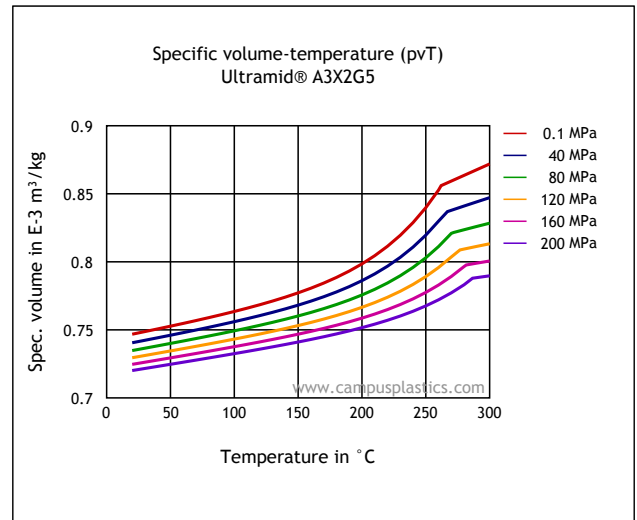
Stress-strain (isochronous) 120 °C



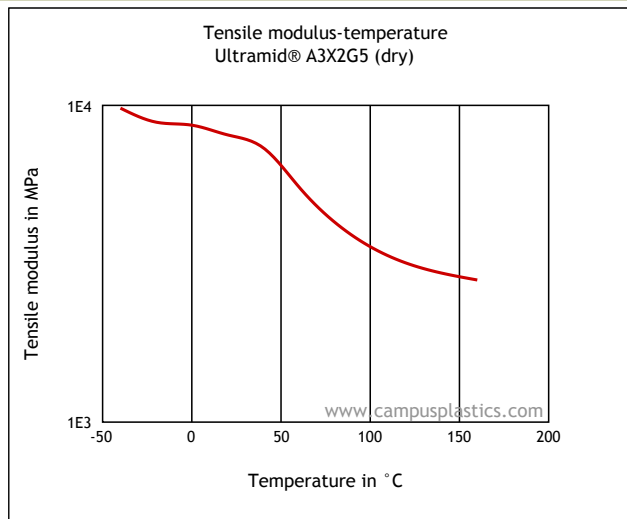
Creep modulus-time 120 °C



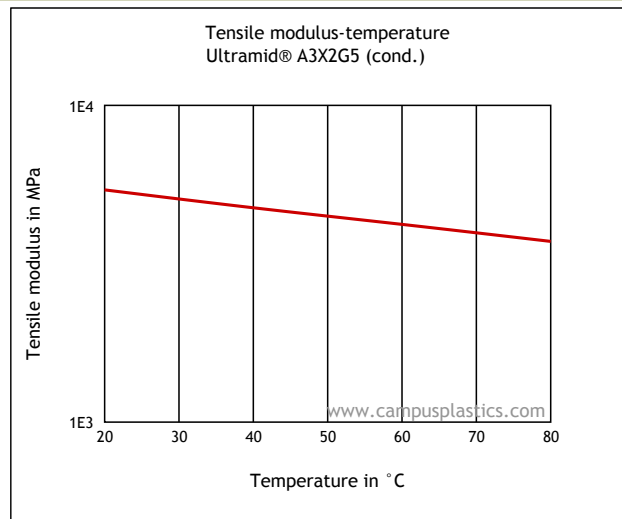
Specific volume-temperature (pvT)



Tensile modulus-temperature



Tensile modulus-temperature



Characteristics

Processing

Injection Molding

Delivery form

Pellets

Additives

Release agent

Special Characteristics

Heat stabilized or stable to heat

Regional Availability

North America, Europe, Asia Pacific, South and Central America, Near East/Africa

Other text information

Injection molding

PREPROCESSING

Pre/Post-processing, max. allowed water content: .15 %
Pre/Post-processing, Pre-drying, Temperature: 80 - 100 °C
Pre/Post-processing, Pre-drying, Time: 4 h

PROCESSING

injection molding, Melt temperature, range: 280 - 300 °C
injection molding, Melt temperature, recommended: 290 °C
injection molding, Mold temperature, range: 60 - 90 °C
injection molding, Mold temperature, recommended: 80 °C
injection molding, Dwell time, thermoplastics: 10 min

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)




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Bases

-  Sodium Hydroxide solution (35% by mass) (23 °C)
-  Sodium Hydroxide solution (1% 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)






Standard Fuels

-  Diesel fuel (pref. ISO 1817 Liquid F) (23 °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)
-  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)
-  Water (23 °C)

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