Delrin® 500AF

ACETAL RESIN

Common features of Delrin® acetal resins include mechanical and physical properties such as high mechanical strength and rigidity, excellent fatigue and impact resistance, as well as resistance to moisture, gasoline, lubricants, solvents, and many other neutral chemicals. Delrin® acetal resins also have excellent dimensional stability and good electrical insulating characteristics. They are naturally resilient, self-lubricating, and available in a variety of colors and speciality grades.

Delrin® acetal resin typically is used in demanding applications in the automotive, domestic appliances, sports, industrial engineering, electronics, and consumer goods industries.

Delrin® 500AF is a medium viscosity acetal homopolymer containing 20% PTFE fibers. It is designed for applications requiring low wear and/or low friction against steel, itself, or other plastics.

Due to the color of the PTFE fibers, the natural color of this material is brown.

Product information

Resin Identification	POM-SF20	ISO 1043
Part Marking Code	>POM-SF20<	ISO 11469

Rheological properties

Melt mass-flow rate	5	g/10min	ISO 1133
Melt mass-flow rate, Temperature	190	°C	ISO 1133
Melt mass-flow rate, Load	2.16	kg	ISO 1133
Moulding shrinkage, parallel	2.0	%	ISO 294-4, 2577
Moulding shrinkage, normal	1.4	%	ISO 294-4, 2577

Typical mechanical properties

Tensile Modulus	2800	MPa	ISO 527-1/-2
Stress at break	50	MPa	ISO 527-1/-2
Strain at break	10	%	ISO 527-1/-2
Flexural Modulus	2500	MPa	ISO 178
Compressive strength	110	MPa	ISO 604
Charpy impact strength, 23°C	40	kJ/m²	ISO 179/1eU
Charpy impact strength, -30°C	35	kJ/m²	ISO 179/1eU
Charpy notched impact strength, 23°C	3	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -30°C	3	kJ/m²	ISO 179/1eA
Izod notched impact strength, 23°C	3	kJ/m²	ISO 180/1A
Hardness, Rockwell, M-scale	74		ISO 2039-2
Hardness, Rockwell, R-scale	119		ISO 2039-2
Poisson's ratio	0.37		

Thermal properties

Melting temperature, 10°C/min	178	°C	ISO 11357-1/-3
Temp. of deflection under load, 1.8 MPa	92	°C	ISO 75-1/-2
Temp. of deflection under load, 0.45 MPa	160	°C	ISO 75-1/-2
Coeff. of linear therm. expansion, parallel	110	E-6/K	ISO 11359-1/-2

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Coeff. of linear therm. expansion, normal	100	E-6/K	ISO 11359-1/-2
RTI, electrical, 1.5mm	105	°C	UL 746B
RTI, electrical, 3mm	105	°C	UL 746B
RTI, impact, 1.5mm	85	°C	UL 746B
RTI, impact, 3mm	85	°C	UL 746B
RTI, strength, 1.5mm	90	°C	UL 746B
RTI, strength, 3mm	90	°C	UL 746B
TGA curve	available		ISO 11359-1/-2

Flammability

Burning Behav. at 1.5mm 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	3	mm	IEC 60695-11-10
UL recognition	yes		UL 94
Glow Wire Flammability Index, 3mm	600	°C	IEC 60695-2-12
FMVSS Class	B		ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	<80	mm/min	ISO 3795 (FMVSS 302)

Electrical properties

Relative permittivity, 1MHz	3.1		IEC 62631-2-1
Dissipation factor, 1MHz	90	E-4	IEC 62631-2-1
Surface resistivity	>1E15	Ohm	IEC 62631-3-2
Comparative tracking index	600		IEC 60112

Other properties

Humidity absorption, 2mm	0.2	%	Sim. to ISO 62
Water absorption, 2mm	1	%	Sim. to ISO 62
Water absorption, Immersion 24h	0.25	%	Sim. to ISO 62
Density	1530	kg/m³	ISO 1183
Density of melt	1280	kg/m³	

Injection

Drying Recommended	yes	
Drying Temperature	80	°C
Drying Time, Dehumidified Dryer	2 - 4	h
Processing Moisture Content	≤0.2	%
Melt Temperature Optimum	215	°C
Min. melt temperature	210	°C
Max. melt temperature	220	°C
Max. screw tangential speed	0.3	m/s

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Mold Temperature Optimum	90	°C
Min. mould temperature	80	°C
Max. mould temperature	100	°C
Hold pressure range	80 - 100	MPa
Hold pressure time	8	s/mm
Annealing time, optional	30	min/mm
Annealing temperature	160	°C

Extrusion

Drying Temperature	75 - 85	°C
Drying Time, Dehumidified Dryer	2 - 4	h
Processing Moisture Content	≤0.2	%
Melt Temperature Optimum	200	°C
Melt Temperature Range	195 - 205	°C

Characteristics

Additives	Release agent

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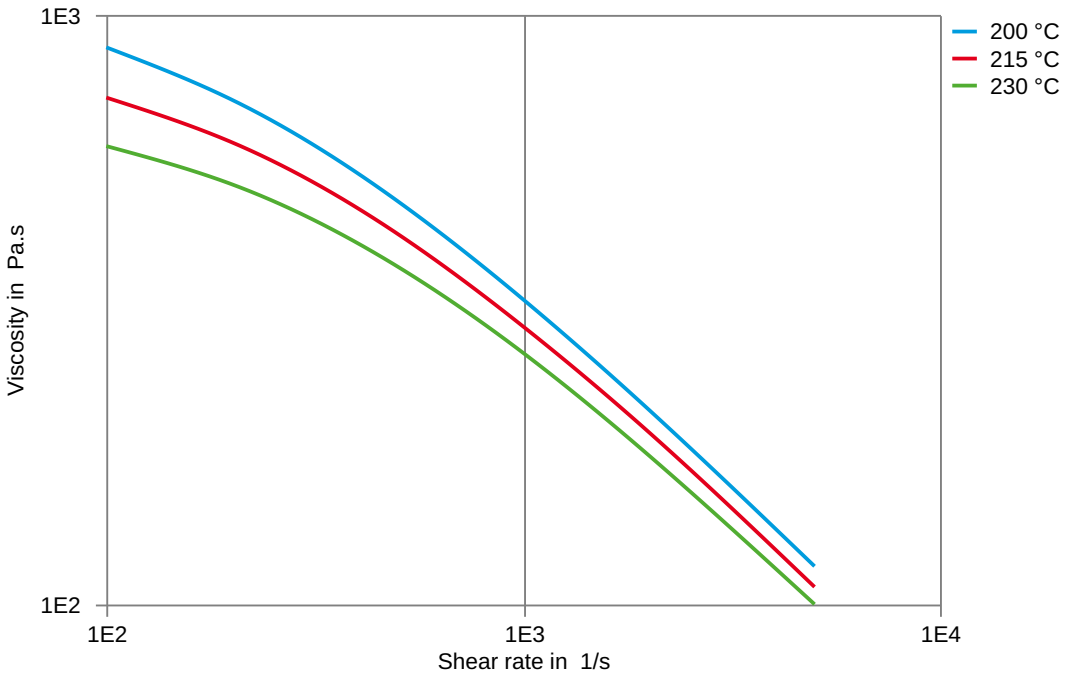
Viscosity-shear rate



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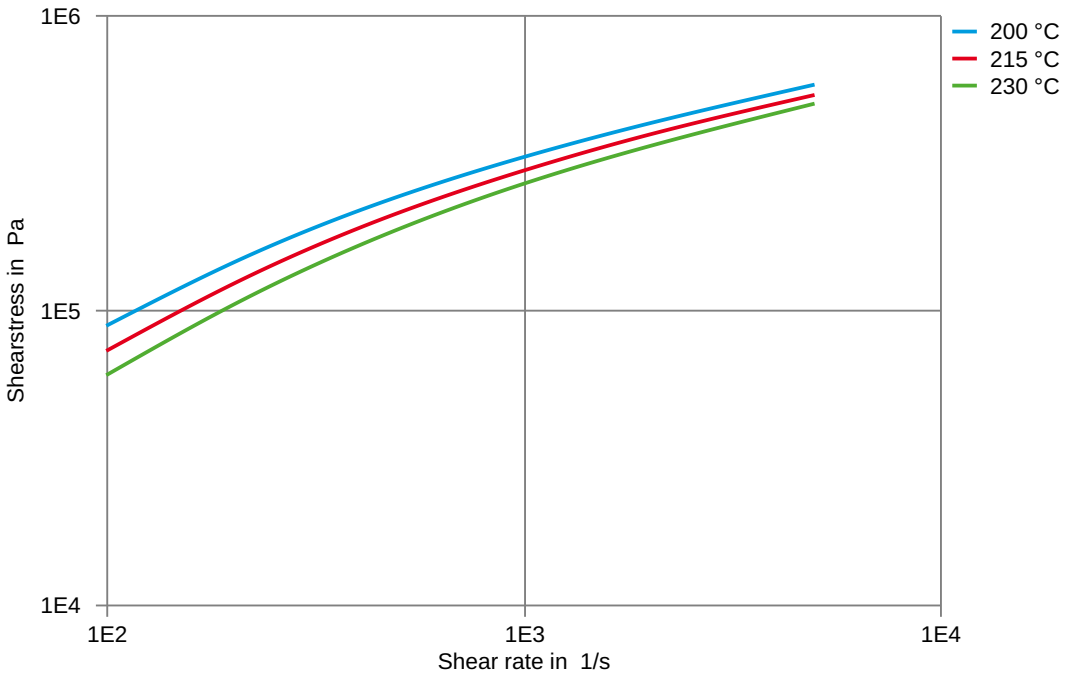
Shearstress-shear rate



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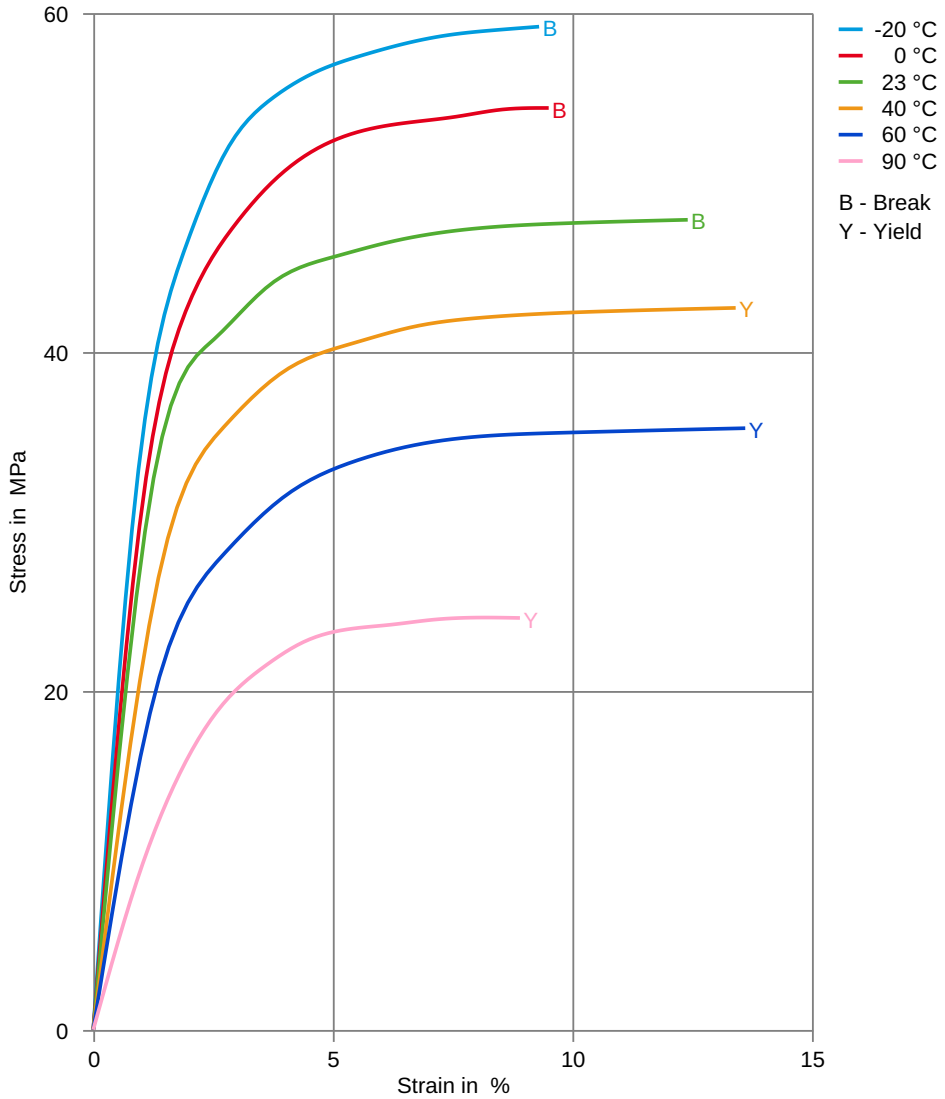
Stress-strain



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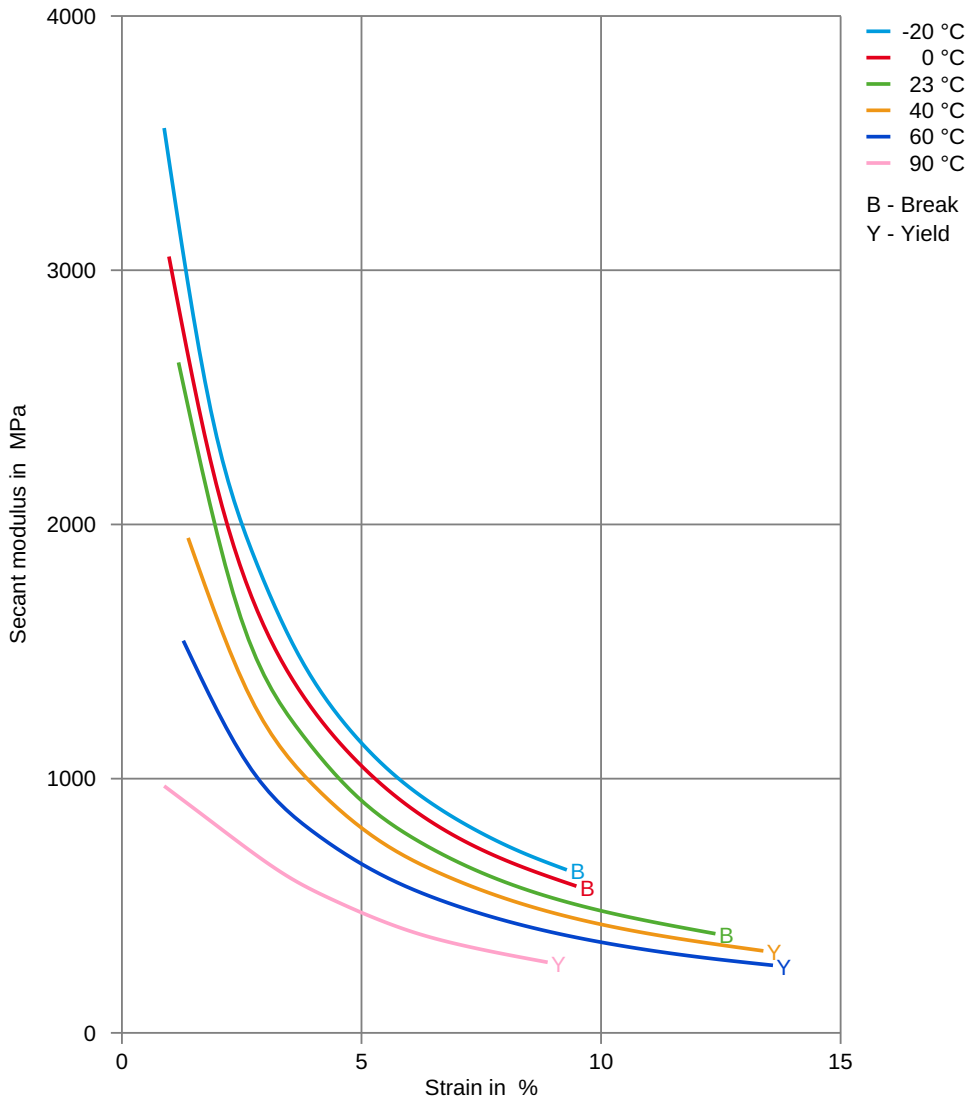
Secant modulus-strain



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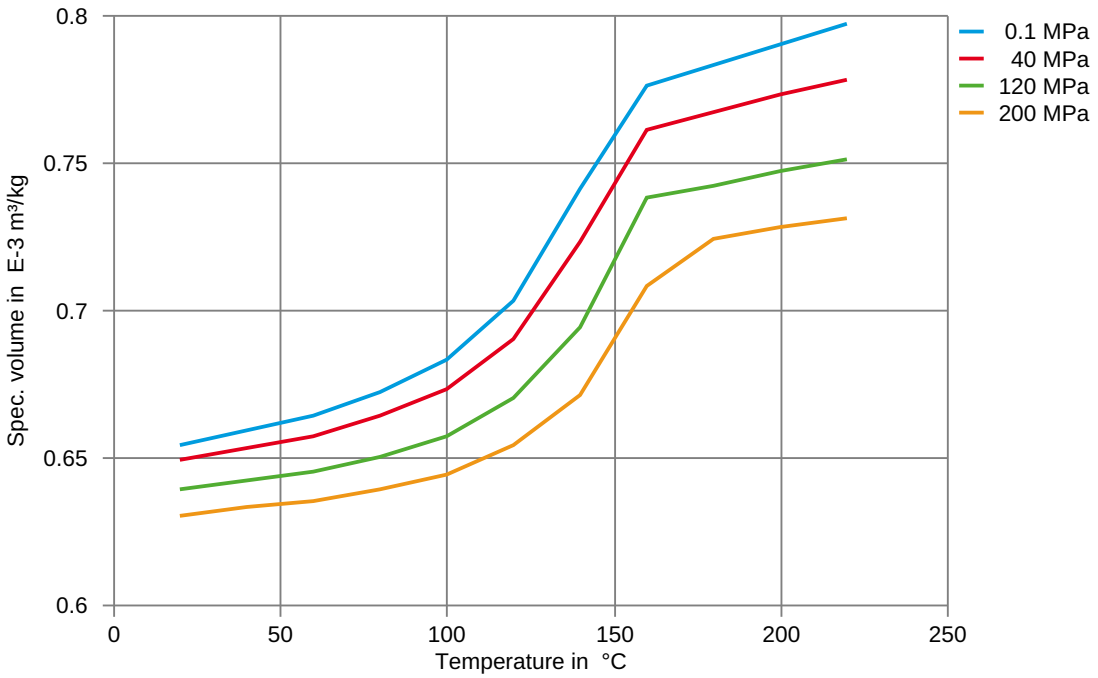
Specific volume-temperature (pvT)



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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).