Zytel® 70K20HSL NC010

NYLON RESIN

Common features of Zytel® nylon resin include mechanical and physical properties such as high mechanical strength, excellent balance of stiffness and toughness, good high temperature performance, good electrical and flammability properties, good abrasion and chemical resistance. In addition, Zytel® nylon resins are available in different modified and reinforced grades to create a wide range of products with tailored properties for specific processes and end-uses. Zytel® nylon resin, including most flame retardant grades, offer the ability to be coloured.

The good melt stability of Zytel® nylon 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 (-31kJ/g of base polymer) in appropriately equipped installations. For disposal, local regulations have to be observed.

Zytel® nylon resin typically is used in demanding applications in the automotive, furniture, domestic appliances, sporting goods and construction industry.

Zytel® 70K20HSL NC010 is a heat stabilised PA66 resin modified with 20% Kevlar aramid fiber for excellent wear resistance.

Product information

Resin Identification	PA66-RF20	ISO 1043
Part Marking Code	>PA66-RF20<	ISO 11469
ISO designation	ISO 16396-PA66,AF20,M1GHNR,S14-050	

Rheological properties

	dry/cond.		
Moulding shrinkage, parallel	0.9/0.7	%	ISO 294-4, 2577
Moulding shrinkage, normal	1.4/0.9	%	ISO 294-4, 2577
Moulding shrinkage, parallel, annealed	1.1/*	%	ISO 294-4
Moulding shrinkage, normal, annealed	1.5/*	%	ISO 294-4

Typical mechanical properties

	dry/cond.		
Tensile Modulus	5300/3500	MPa	ISO 527-1/-2
Stress at break	110/85	MPa	ISO 527-1/-2
Strain at break	5.2/7.2	%	ISO 527-1/-2
Flexural Modulus	4900/3300	MPa	ISO 178
Charpy impact strength, 23°C	50/65	kJ/m²	ISO 179/1eU
Charpy impact strength, -30°C	40/-	kJ/m²	ISO 179/1eU
Charpy notched impact strength, 23°C	6/9	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -30°C	5/-	kJ/m²	ISO 179/1eA
Izod notched impact strength, 23°C	5/7	kJ/m²	ISO 180/1A
Poisson's ratio	0.35/0.37	-	

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Tribological properties

	dry/cond.		
Coefficient of sliding friction, 1h against steel	0.55/-		ASTM 1894

Thermal properties

	dry/cond.		
Melting temperature, 10°C/min	263/*	°C	ISO 11357-1/-3
Glass transition temperature, 10°C/min	80/-	°C	ISO 11357-1/-2
Temp. of deflection under load, 1.8 MPa	222/*	°C	ISO 75-1/-2
Temp. of deflection under load, 0.45 MPa	255/*	°C	ISO 75-1/-2
Vicat softening temperature, 50°C/h, 50N	240/*	°C	ISO 306
Coeff. of linear therm. expansion, parallel	47/*	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal	75/*	E-6/K	ISO 11359-1/-2

Flammability

FMVSS Class	B	-	ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	<80	mm/min	ISO 3795 (FMVSS 302)

Electrical properties

	dry/cond.		
Dissipation factor, 100Hz	140/-	E-4	IEC 62631-2-1
Dissipation factor, 1MHz	140/-	E-4	IEC 62631-2-1
Volume resistivity	1E9/-	Ohm.m	IEC 62631-3-1
Surface resistivity	*/>1E15	Ohm	IEC 62631-3-2
Electric strength	23/-	kV/mm	IEC 60243-1

Other properties

	dry/cond.		
Humidity absorption, 2mm	2.7/*	%	Sim. to ISO 62
Water absorption, 2mm	6.8/*	%	Sim. to ISO 62
Density	1190/-	kg/m³	ISO 1183

VDA Properties

Emission of organic compounds	1.7	µgC/g	VDA 277

Injection

Drying Recommended	yes	
Drying Temperature	80	°C
Drying Time, Dehumidified Dryer	2 - 4	h
Processing Moisture Content	≤0.2	%
Melt Temperature Optimum	290	°C
Min. melt temperature	285	°C
Max. melt temperature	305	°C
Max. screw tangential speed	0.2	m/s
Mold Temperature Optimum	110	°C
Min. mould temperature	70	°C

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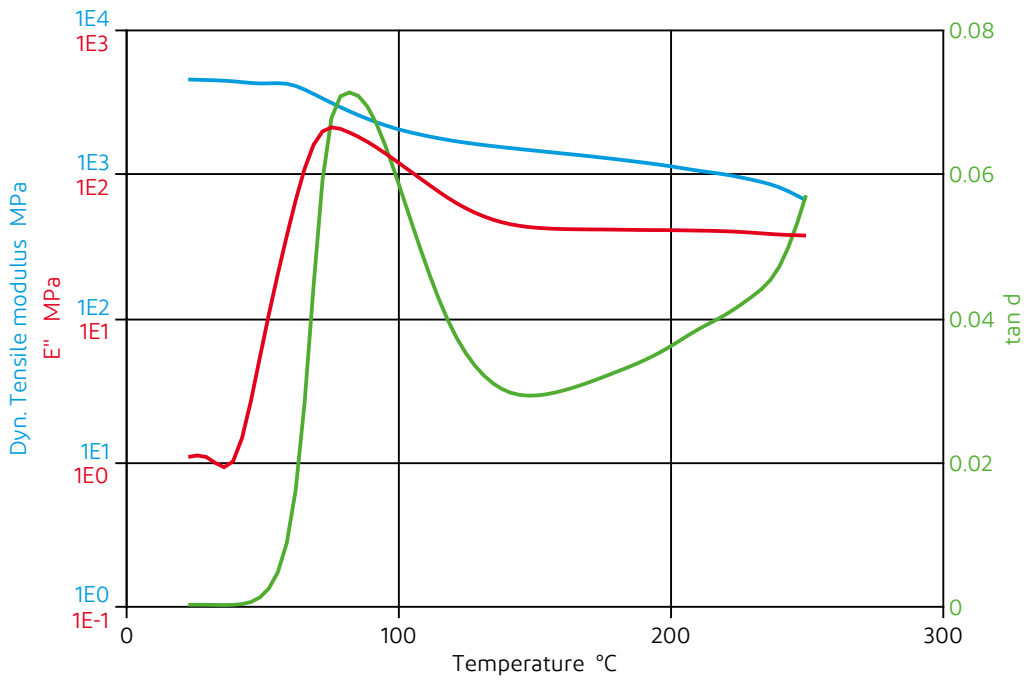
Max. mould temperature	120	°C
Hold pressure range	50 - 100	MPa
Hold pressure time	3	s/mm
Ejection temperature	210	°C

Characteristics

Additives	Release agent

Dynamic Tensile modulus-temperature (dry)



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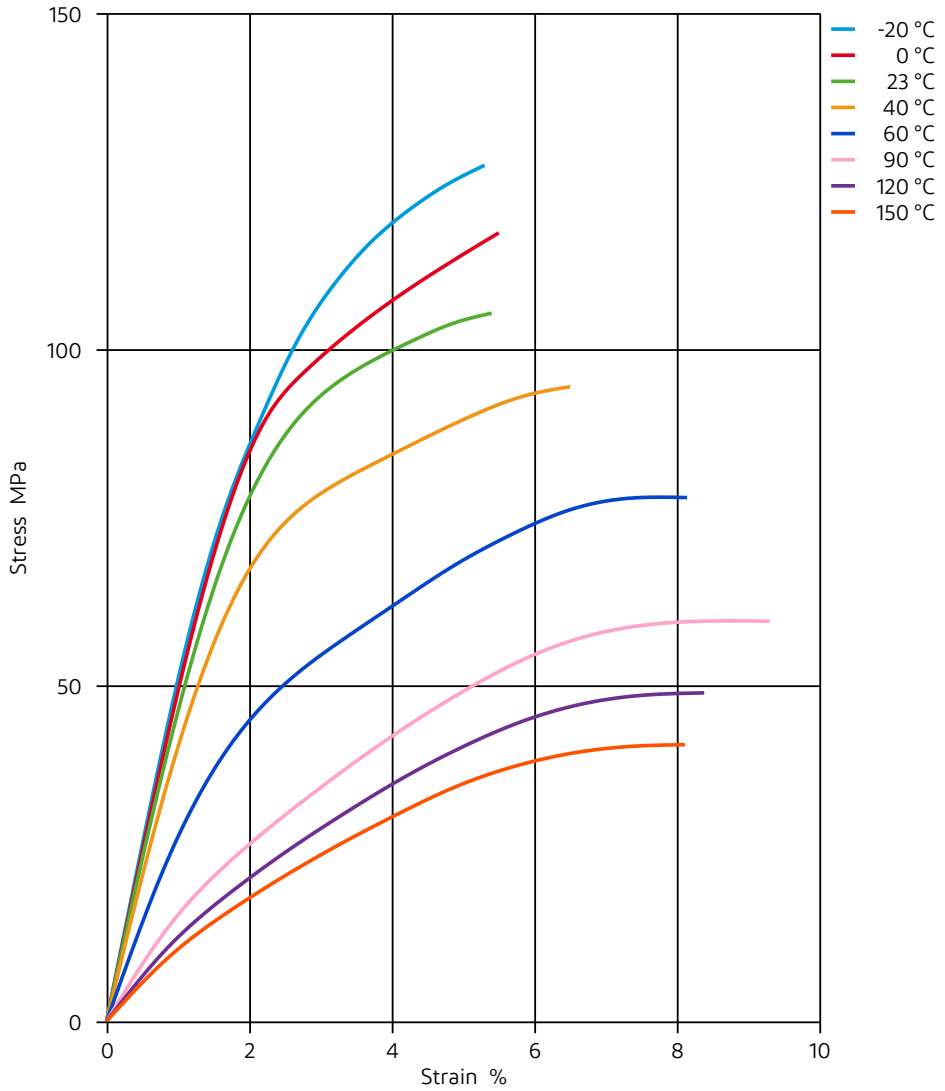
Stress-strain (dry)



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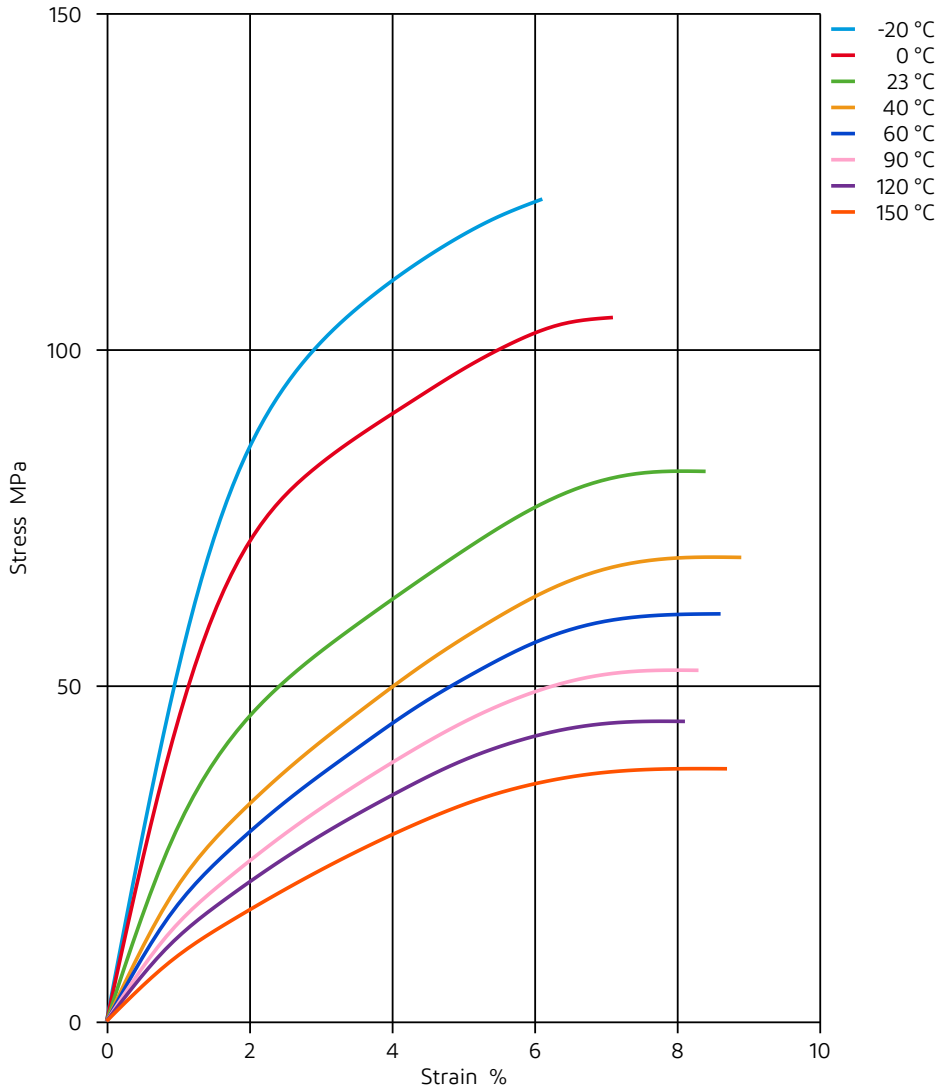
NYLON RESIN

Stress-strain (cond.)



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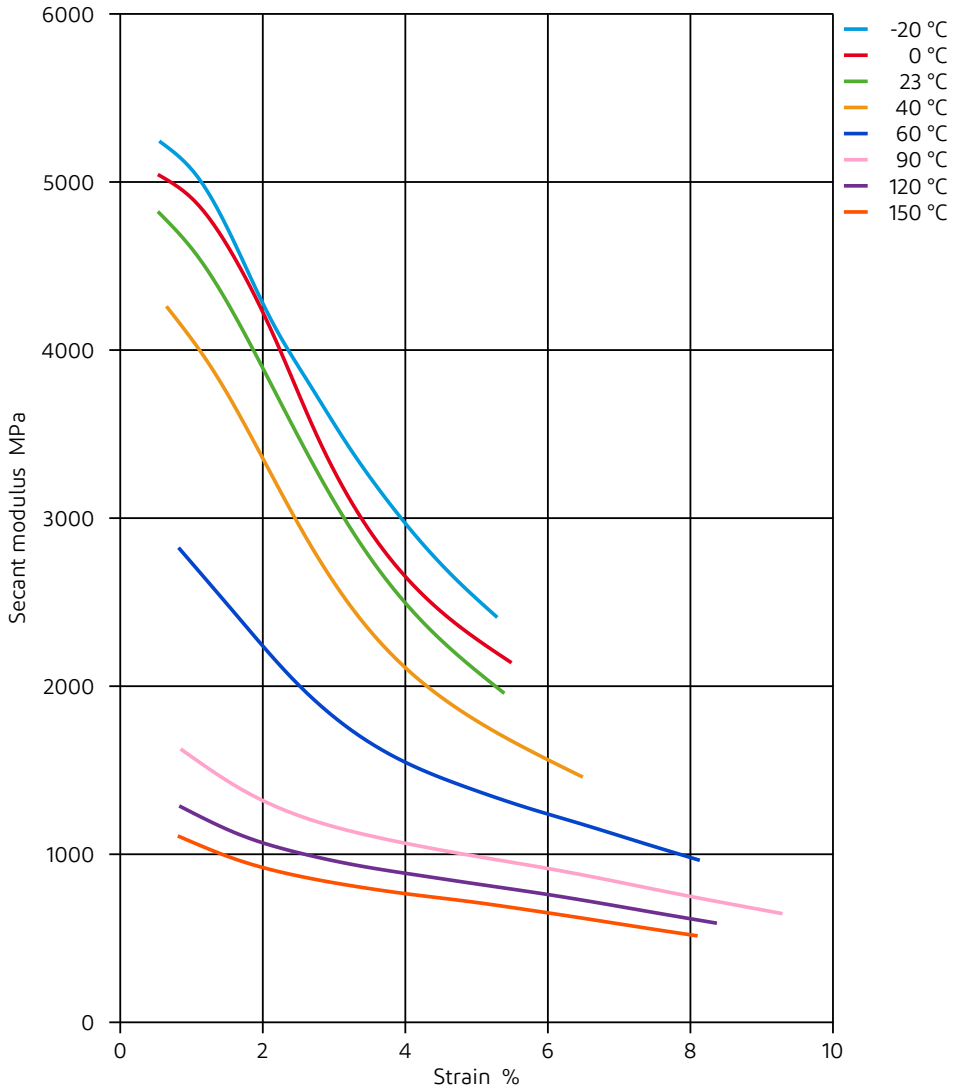
Secant modulus-strain (dry)



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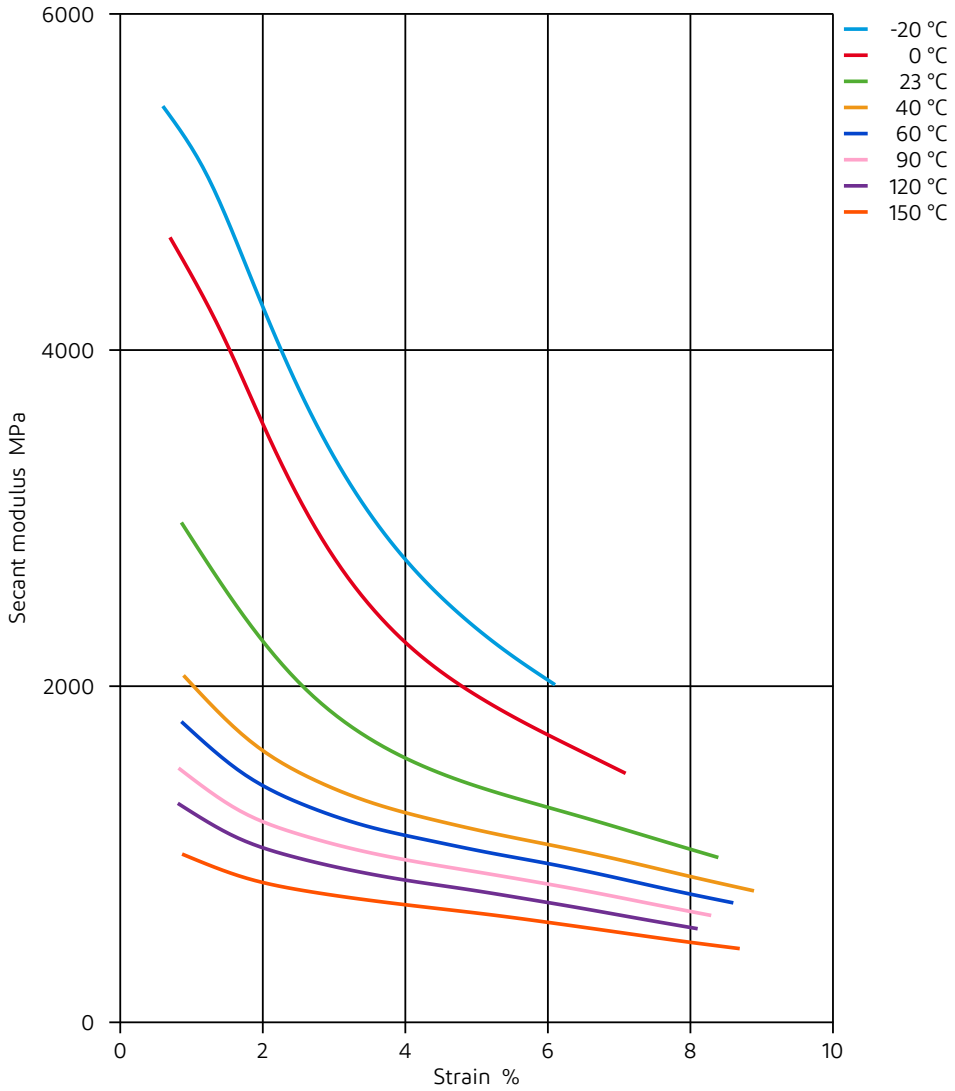
Secant modulus-strain (cond.)



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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).