

# Zytel® 73G15HSL BK363

## 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, we recommend, 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® 73G15HSL BK363 is a 15% glass fiber reinforced, heat stabilised, black polyamide 6 resin for injection moulding.

### Product information

Resin Identification	PA6-GF15	ISO 1043
Part Marking Code	>PA6-GF15<	ISO 11469
ISO designation	ISO 16396-PA6,GF15,M1CGHL1R,S14-060	

### Rheological properties

	dry/cond.		
Viscosity number	145 / *	cm <sup>3</sup> /g	ISO 307, 1628
Moulding shrinkage, parallel	0.3 / -	%	ISO 294-4, 2577
Moulding shrinkage, normal	0.8 / -	%	ISO 294-4, 2577

### Typical mechanical properties

	dry/cond.		
Tensile modulus	6500 / 4000	MPa	ISO 527-1/-2
Tensile stress at break, 5mm/min	130 / 80	MPa	ISO 527-1/-2
Tensile strain at break, 5mm/min	2.3 / 10	%	ISO 527-1/-2
Flexural modulus	5600 / 3100	MPa	ISO 178
Flexural strength	190 / 90	MPa	ISO 178
Charpy impact strength, 23 °C	40 / 70	kJ/m <sup>2</sup>	ISO 179/1eU
Charpy impact strength, -30 °C	40 / 40	kJ/m <sup>2</sup>	ISO 179/1eU
Charpy notched impact strength, 23 °C	6 / 7	kJ/m <sup>2</sup>	ISO 179/1eA
Charpy notched impact strength, -30 °C	5 / 7	kJ/m <sup>2</sup>	ISO 179/1eA
Izod impact strength, 23 °C	6 / 7	kJ/m <sup>2</sup>	ISO 180/1U
Ball indentation hardness, H 961/30	210 / 123	MPa	ISO 2039-1
Poisson's ratio	0.35 / 0.36		

### Thermal properties

	dry/cond.		
Melting temperature, 10 °C/min	221 / *	°C	ISO 11357-1/-3
Glass transition temperature, 10 °C/min	55 / 15	°C	ISO 11357-1/-3
Temperature of deflection under load, 1.8 MPa	204 / *	°C	ISO 75-1/-2
Temperature of deflection under load, 0.45 MPa	220 / *	°C	ISO 75-1/-2
Vicat softening temperature, 50 °C/h 50N	215 / *	°C	ISO 306
Coeff. of linear therm. expansion, parallel, -40-23 °C	35 / *	E-6/K	ISO 11359-1/-2

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Coefficient of linear thermal expansion (CLTE), parallel	16 / *	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, parallel, 55-160 °C	15 / *	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal, -40-23 °C	78 / *	E-6/K	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE), normal	90 / *	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal, 55-160 °C	100 / *	E-6/K	ISO 11359-1/-2
Thermal conductivity of melt	0.2	W/(m K)	ISO 22007-2
RTI, electrical, 1.5mm	65	°C	UL 746B
RTI, impact, 1.5mm	65	°C	UL 746B
RTI, strength, 1.5mm	65 / *	°C	UL 746B

### Flammability

	dry/cond.		
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
Oxygen index	21 / *	%	ISO 4589-1/-2
Glow Wire Flammability Index, 1.0mm	725 / -	°C	IEC 60695-2-12
Glow Wire Flammability Index, 2.0mm	725 / -	°C	IEC 60695-2-12
Glow Wire Flammability Index, 3.0mm	725 / -	°C	IEC 60695-2-12
Glow Wire Ignition Temperature, 1.0mm	725 / -	°C	IEC 60695-2-13
Glow Wire Ignition Temperature, 2.0mm	725 / -	°C	IEC 60695-2-13
Glow Wire Ignition Temperature, 3.0mm	725 / -	°C	IEC 60695-2-13
FMVSS Class	B		ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	21	mm/min	ISO 3795 (FMVSS 302)

### Electrical properties

	dry/cond.		
Electric strength	21.5 / -	kV/mm	IEC 60243-1

### Physical/Other properties

	dry/cond.		
Humidity absorption, 2mm	2.5 / *	%	Sim. to ISO 62
Water absorption, 2mm	7.6 / *	%	Sim. to ISO 62
Density	1250 / -	kg/m <sup>3</sup>	ISO 1183

### VDA Properties

	dry/cond.		
Weather stability delta E	1.9		DIN 53236
Weather stability grey scale	4		ISO 105-A02
Emission of organic compounds	8.5	µgC/g	VDA 277
Odour	4	class	VDA 270
Fogging, G-value (condensate)	0 / *	mg	ISO 6452

### Injection

Drying Recommended	yes
Drying Temperature	80 °C
Drying Time, Dehumidified Dryer	2 - 4 h
Processing Moisture Content	≤0.2 %
Melt Temperature Optimum	270 °C

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Min. melt temperature	260 °C
Max. melt temperature	280 °C
Screw tangential speed	≤0.2 m/s
Mold Temperature Optimum	100 °C
Min. mould temperature	70 °C
Max. mould temperature	120 °C
Hold pressure range	50 - 100 MPa
Hold pressure time	3 s/mm

## Characteristics

Processing	Injection Moulding
Delivery form	Pellets
Additives	Release agent
Special characteristics	Heat stabilised or stable to heat

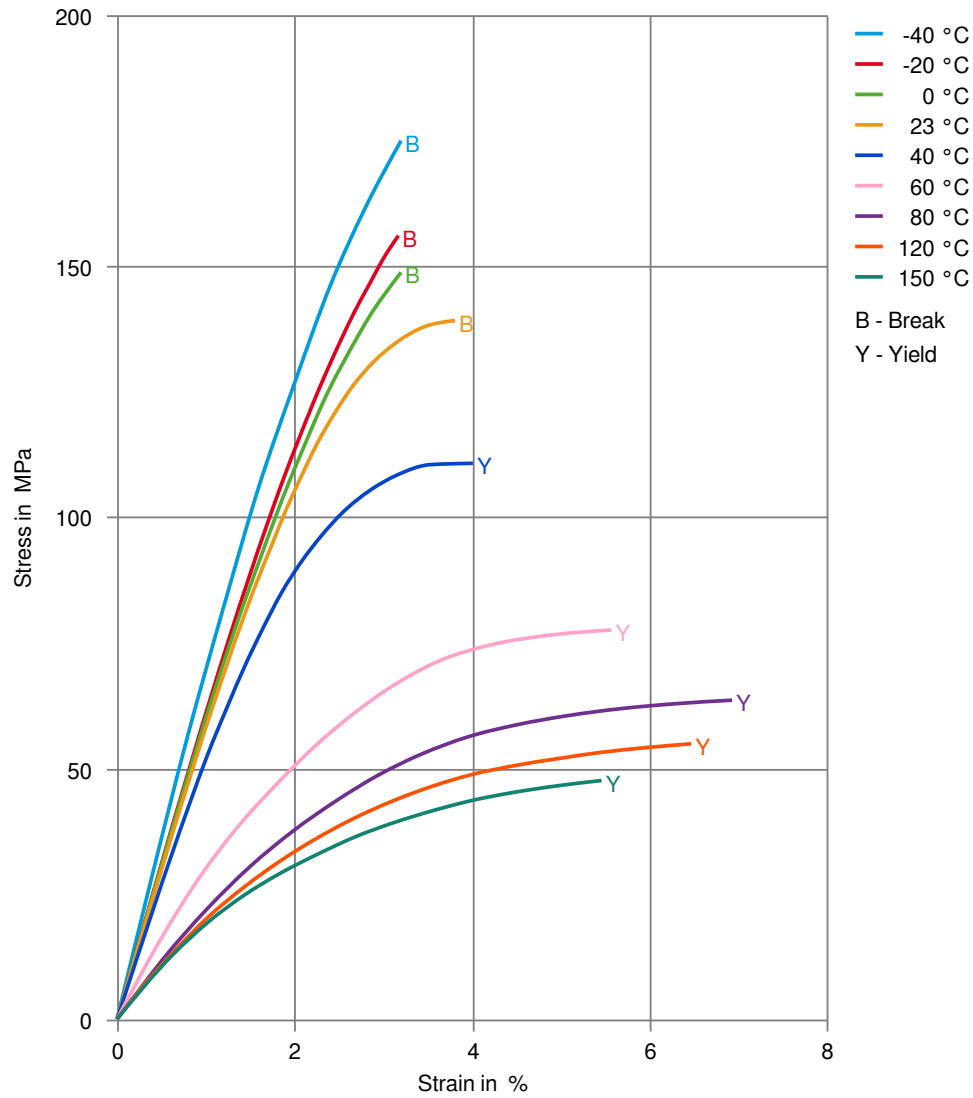
## Automotive

OEM	STANDARD	ADDITIONAL INFORMATION
BMW	GS93016-PA6-GF15	(Heat Aging Resistant)
General Motors	GMW3029P-PA6-GF15H	Black
Hyundai	MS941-03 Type D-2	
Mercedes-Benz	DBL5408.24 PA6 GF15	
Mercedes-Benz	DBL5410.00 PA6 GF15	
VW Group	VW 50125 PA6-004	
VW Group	VW 50134 PA6-3-A	

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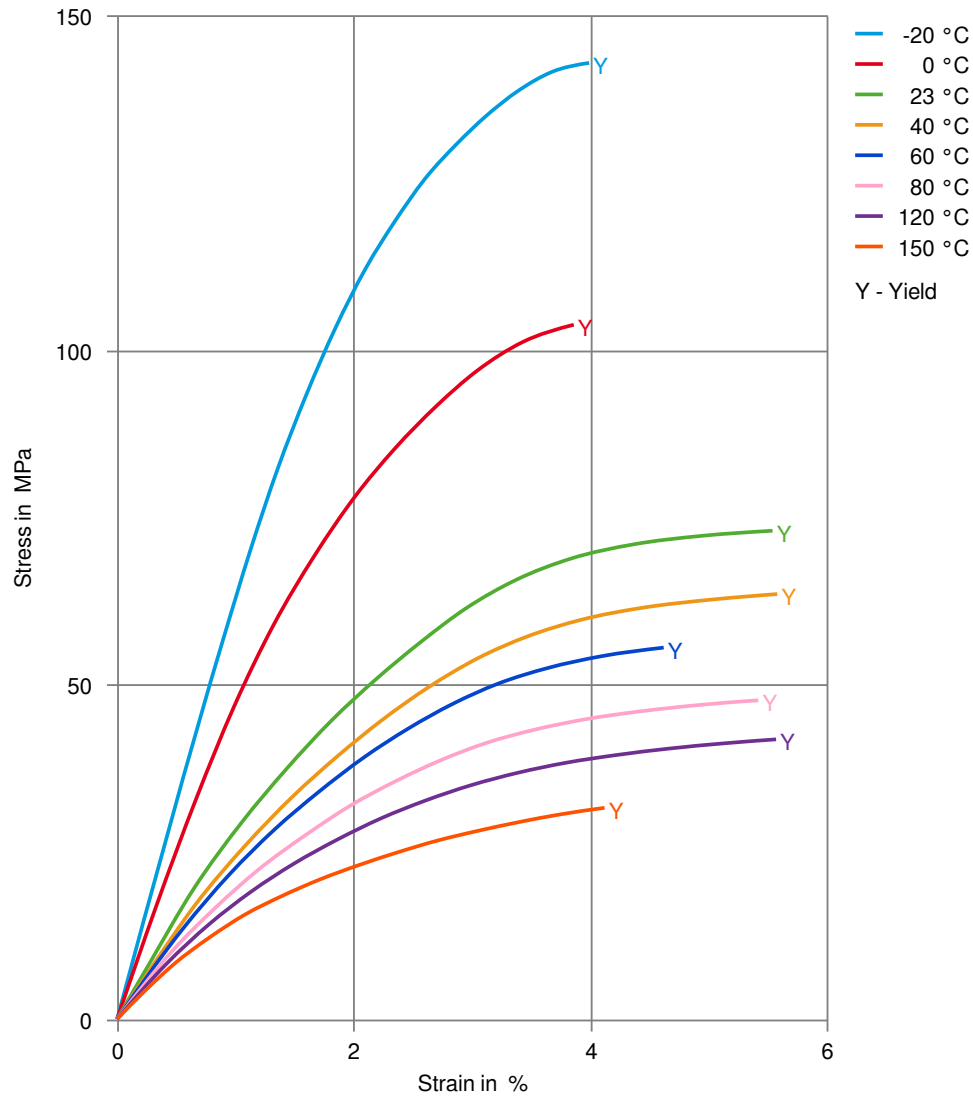
Stress-strain (dry)



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NYLON RESIN

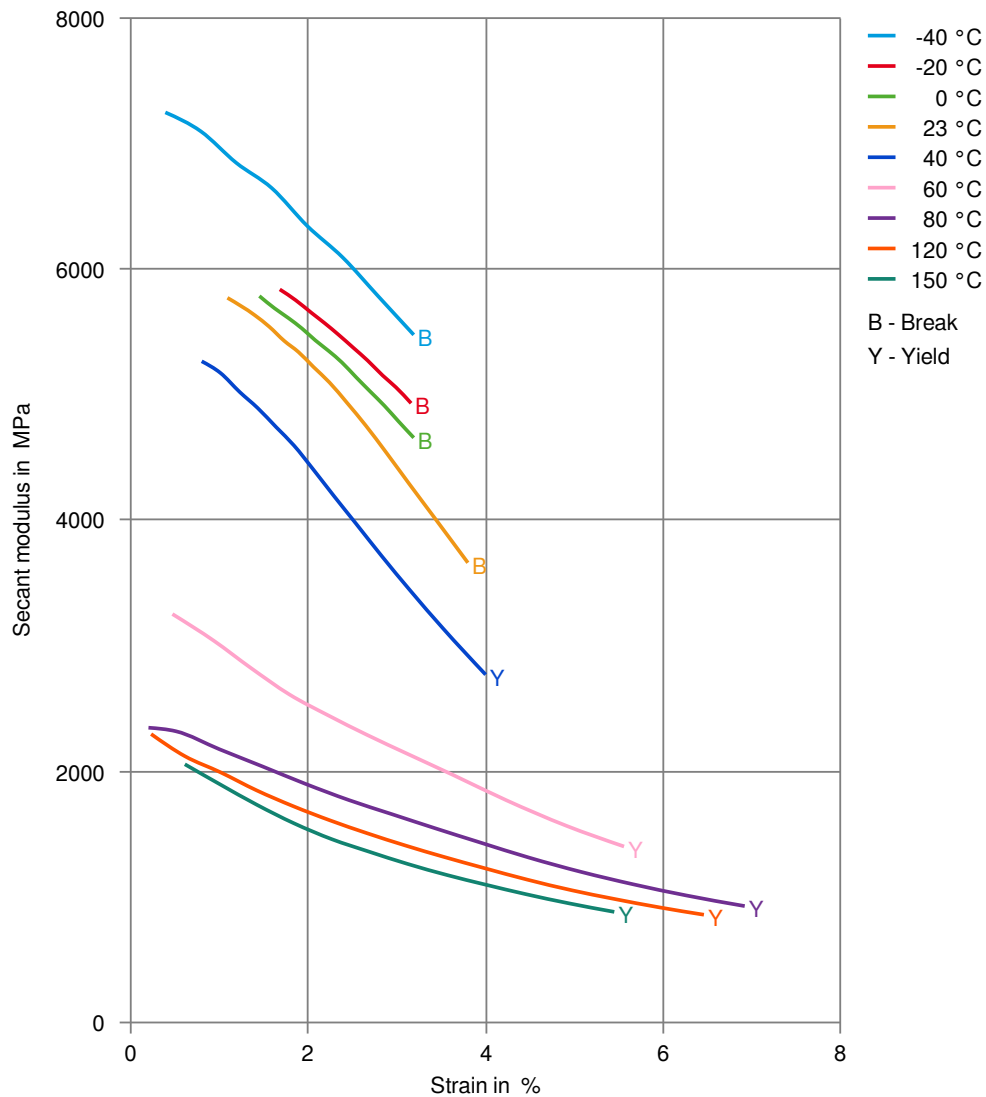
Stress-strain (cond.)



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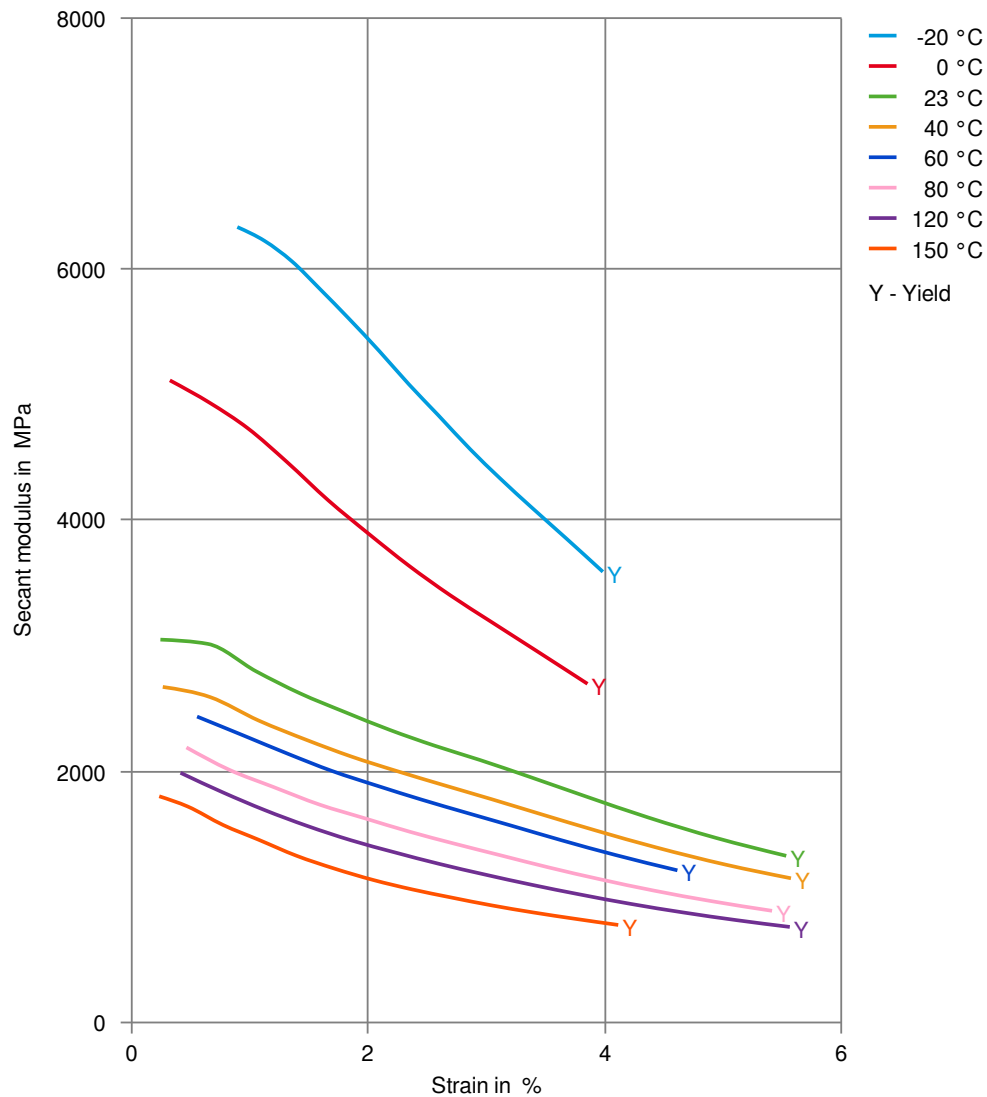
Secant modulus-strain (dry)



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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

#### 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
- ✗ 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).