

## Chemical resistance

### Polyamide resistance to chemicals

CELANYL®/FRIANYL® - polyamides have a very good resistance to many substances, the resistance to motor oils and fuels is particularly noteworthy. This makes polyamides ideal for automotive and engine construction.

The following table provides information about the resistance of CELANYL®/FRIANYL® polyamides to various working materials. The information in the table relates to unreinforced and unmodified PA. Unless otherwise stated, the information on resistance at room temperature applies.

CELANYL®/FRIANYL® - polyamides are modified or reinforced with different materials for the respective customer requirements. These modifiers affect the chem. Resistance of the polyamide.

Reinforcement with fiberglass reduces the resistance to bases due to the instability of the glass to alkalis.

Elastomer modifications can improve the acid resistance of our polyamides.

If you cannot find your working materials in the table or if you use a modified polyamide, please ask our Product specialists about the resistance to the desired materials.

Explanation of symbols: (-) not resistant, (0) partly resistant, (+) resistant		Reagent	A (PA66)	B (PA6)
Formic acid	40 % aqueous solution		-	-
Ammonia	10 % aqueous solution		+	+
Amyl alcohol			+	+
Ethyl acetate			+	+
Ethyl ether			+	+
Bathroom cleaning			+0	+0
Benzaldehyde			0	0
Petrol			+	+
Benzene			+	+
Bitumen			0	0
Bleach	Aqueous solution (12.5% effective chlorine)		-	-
Boric acid	10 % aqueous solution		0	0
Brackish water			+	+
Brake fluid	HYDRAULAN®-Brand (BASF) DOT- 3,4, FMVSS-116 SAE-J-1703, DIN 53521		+	+
			0	0
			-	-
Butyl alcohol			0	+
Calcium chloride	Aqueous solution sat.		+	+
Camphor			+	+
Caprolactam	50 % aqueous solution Melted, technical purity > 120 °C		+	+
			-	-
Chloramine	diluted solution		-	0
Chloroform			-	0
Citric acid	Concentrated Aqueous solution 10 %		0	0
			+	+
Decalin			+	+
Disinfection	Active chlorine diluted solution Aldehyde diluted solution		+0	+0
			+	+

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		<b>Reagent</b>	<b>A (PA66)</b>	<b>B (PA6)</b>
Explanation of symbols: (-) not resistant, (0) partly resistant, (+) resistant				
Disinfection	Alcohols diluted solution		+	+
	Quaternary ammonium or phosphonium diluted solution		+	+
	Phenols diluted solution		+0	+0
	Boil it out		+	+
	Soda 0.5% aqueous		+	+
	HDH (hot air/steam/h)		+	+
	VDV (fractional vacuum availability)		+	+
	Steam. Cycle. Author		+	+
	Rays 2.5 mrad, duration 6		+	+
Ferric chloride	Aqueous solution neutral 10 %		+	+
	Aqueous solution acidic 10 %		-	-
Softening agent	Aqueous solution 10 %		+	+
Developer solution	(1:5, pH 11)		+	+
Acetic acid	5 % aqueous solution		+	+
	40 % aqueous solution		+	+
Ethanol			0	0
Hydrofluoric acid	40 % aqueous solution		-	-
Formaldehyde	30 % aqueous solution		0	0
	Aqueous solution technical purity		+	+
Fruit juices			+	+
Gas sterilization (din58 948, parts 1-4)			+	+
Drinks alcohol.			+	+
Glycol			0	0
Glysantine	40 % aqueous solution		+	+
Glycerin			+	+
Hand, spray cleaning			+	+
Heating oil			+	+
Hexane			+	+
Hydraulic fluids	Hydraulic oils H and HL (DIN 51 524)		+	+
	HLP (DIN 51 525)		+	+
	Flame retardant B113 80°C (DIN 51 502)		+	+
	e.g. Acrylic phosphate ester base			
Iodine tincture alcohol.			-	-
Potassium hydroxide	50 % aqueous solution		+	+
	10 % aqueous solution		+	+
Fuels	Normal petrol DIN 53 521, 85°C		+	+
	Super petrol DIN 53 521.85°C		+	+
	DIN 51 600, VTL 9130-008, 85°C		+	+
	Isooctane/Toluene 70:30		-	-
	FAM test fuels DIN 51 604.55°C (5% ethanol)		+	+
	M 15 (super/methanol 85:15), 55°C		+	+
	<i>Diesel fuel DIN 51 601, 85°C VTL 9140-001, -002, -003</i>		+	+
	<i>ASTM-0975 No.1-D, 2-D, 3-D</i>			

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Fuels	Aircraft turbine fuel, 85°C F40 (VTL 9130-006), F42 (VTL 9130-007), MIL-F 5616 (JR1) Jet propulsion fuel, 85°C (Kerosene) IP-A, 1B, 4, 5, 6, RJ-1 High performance fuel, 85°C (Decalin, per-hydrofluorane) DIN 53 521, 120°C		+	+
Coolants	DIN 53 521, 120°C		0	0
Methyl alcohol			0	0
Methylene chloride			-	0
Milk			+	+
Lactic acid	10% aqueous solution		0	0
Menar (Argan) oils			+	+
Mortar, cement, lime			+	+
Motor oils			+	+
Naphthalene			+	+
Caustic soda	Aqueous solution 10% Aqueous solution 10%, 80°C Aqueous solution 50%		+	+
Ozone	Technical purity Diluted in air 20ppm, 35°C		0-	0-
Perfumes			0	0
Perchloroethylene			0	0
Petroleum ether	Technical purity, 80°C		+	+
Petroleum	Technical purity, 80°C		+	+
Peppermint oil			+	+
Phenol	Aqueous solution		-	-
Phosphoric acid			-	-
Propanol			0	0
Mercury	Metal		-	-
Nitric acid	Aqueous solution 2%		-	-
Hydrochloric acid	Aqueous solution 2%		-	-
Molds (mtl-t.18404)			+	+
Lubricating oils	Lubricating oils without HD- or ER-additives (ASTM-standard oil) Lubricating oils, engine oils HD, Hydraulic oils, insulating oils, transformer oils, special oils: BA, BB, BC, C, CG, DA, Gm, KA, KC, N, TD-L, TD, TW, VN, VB, VC, X, XA, ZS, ZA, ZB, ZC, ZD, F, FS, H, J, L, R, S, U, W, XB, XS (DIN 51 501, 2, 3, 6, 7, 8, 10, 11, 13, 15, 17) Control gear oil (DIN 51 509, 12) Hypoid gear oil, 110°C (with EP-additives), 120°C		0 +        + + -	0 +        + + -
Lubricating greases	Anti-friction bearing greases DIN 51 825, 110°C		+	+

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Lubricating greases	Base lubricating oils – metal soaps - additives, base ester oils, diester oils, phosphate ester, synthetic oils, 110°C Base polyphenol ester, 110°C Base Silicone oils, 110°C		+0	+0
Sulfuric acid			-	-
Sweat (din 54 020)			+	+
Edible fats	Edible oils		+	+
Tar			0	0
Ink			+	+
Toluene			+	+
Trichloroethane,	45 °C		+	+
Vaseline			+	+
Wax			+	+
Detergents (heavy duty detergent)	Diluted solution, 80°C		+0	+0
Water	Water (river, lake, sea, drinking, condensation, boiler, feed, chlorinated) Wastewater (pH L2) and wastewater with shock chlorine Steam		+ +0 + 0-	+ +0 + 0-
Hydrogen peroxide			0	0
Tartaric acid			0	0
Xylene			0	0

NOTICE TO USERS: Properties of molded parts can be influenced by a wide variety of factors including, but not limited to, material selection, additives, part and mold design, processing conditions and environmental exposure. The information given above indicates how a certain problem could possibly be resolved. Any determination of the suitability of a particular material, process, part and mold design for any use contemplated by the user is the sole responsibility of the user. The user must, prior to using this information or incorporating any Celanese resin in any product offered for sale, evaluate thoroughly the performance of prototype parts made from the intended resin under the harshest conditions to be encountered in the contemplated end use in order to assure itself of the applicability of such information and fitness of the resin and design for such contemplated end use. This information is based on our present state of knowledge regarding this particular application and should not be construed as a promise or guarantee of specific properties of our products. All technical information and services of Celanese are intended for use by persons having skill and experience in the use of such information or service, at their own risk. Unless provided otherwise, values shown are based on testing of laboratory test specimens and represent data that fall within the normal range of properties for the indicated material. These values alone do not represent a sufficient basis for any part or mold design. Colorants or other additives may cause significant variations in data values. We strongly recommend that users seek and adhere to the manufacturer's current instructions for handling each material they use, and to entrust the handling of such material to adequately trained personnel only. The products mentioned herein are not intended for use in medical or dental implants. Any existing intellectual property rights must be observed. Pertaining to property data generation only, values shown are based on testing of laboratory test specimen and represent data that fall within the normal range of properties for the indicated material. These values are not intended for use in establishing maximum, minimum, or ranges of values for specification purposes. Any determination of the suitability of the material for any use contemplated by the user and the manner of such use is the sole responsibility of the user, who must assure himself that the material as subsequently processed meets the needs of the particular product or use.