Technical Data Sheet

Chemical resistance of Grilon, Grilamid, Grilamid TR, Grivory GV and Grivory HTV

Plastics play a key role, both in industry and in everyday life. It is, however, extremely important that a specific plastic, unaffected by the environment surrounding it, is chosen for each application.

Generally speaking, polyamides are very resistant to all types of chemicals. Apart from concentrated acids, very few reagents attack polyamides.

The following table showing the chemical resistance of Grilamid, Grilamid TR, Grivory GV and Grilon offers guidance on the choice of polyamides for particular end uses.

EMS-GRIVORY

The following table gives an indication of the chemical resistance of Grilon (polyamide 6 and 66), Grilamid (polyamide 12), Grilamid TR (transparent polyamide 12), Grivory GV (partially aromatic polyamide) and Grivory HTV (Polyphthalan 1). The chemical resistance was established by exposing test samples 1 mm thick, to each of the chemicals for a period of 12 months at room temperature. The results are valid both for unreinforced and for glass fibre reinforced products.

Key:

●●● Resistant. Negligible, reversible or no changes in mass and dimensions. Example: Grilon unaffected by aqueous and alcoholic media.

●● Limited resistance. Considerable dimensional changes, and possibly irreversible changes in properties after prolonged contact. Consultation advisable before use.

● Not resistant. May be used under certain conditions (brief contact).

○ Soluble or attacked after brief contact.

* signifies data valid for all concentrations

Certain additives, particularly plasticizers, may be dissolved out into the medium. Absorption of the medium is generally sufficient, however, to compensate for any resultant loss in flexibility.

The data regarding chemical resistance refers to stress-free products. Stresses in parts of Grilamid TR can lead to cracking when coming into contact with specific solvents.
Particular information can be found in the section «Environmental Stress Cracking».

Environmental Stress Cracking of Grilamid TR

Amorphous thermoplastics such as Grilamid TR can develop stress cracking when exposed to certain media. Components are more likely to develop stress cracking symptoms when they are subjected to external stresses, or when, through unsuitable processing, they have high internal stresses.

Grilamid TR 55, Grilamid TR 70 LX and Grilamid TR 90 are not resistant to the following chemicals and stress cracking may occur: Benzyl alcohol, butanol, butylene glycol, ethanol, isopropanol, methanol, phenyl ethyl alcohol, propanol.

Grilamid TR 55 and Grilamid TR 70 LZ have limited (short term) chemical resistance to the following chemicals but stress cracking may occur under conditions of high internal or external stress: Acetone, amyl acetate, benzaldehyde, butyl acetate, cyclohexanone, diethyl ether, etheric oils, ethyl acetate, isopropanol 80%, methyl ethyl ketone, phenyl ethyl alcohol, pyridine, tetrahydrofuran.

Grilamid TR 90 has limited (short term) resistance to the following chemicals, but stress cracking may occur in: amyl acetate, benzaldehyde, butyl acetate, cyclohexanone, etheric oils, phenyl ethyl alcohol, pyridine.

The chemical resistance is dependant both on the temperature and the stress condition of the finished component. The suitability of any material for a specific application must be confirmed by a practical test.

Medium	**Chemical formula**	**Concentration**	**Resistance**				
			Grilon	Grilamid	Grilamid TR	Grivory GV	Grivory HTV
Acetaldehyde	$CH_3—CHO$	40 % aq. soln.	●●	●●●	●●	●●	●●
Acetamide	$CH_3—CO—NH_2$	50 % aq. soln.	●●●	●●●	●●●	●●●	●●●
Acetic acid	CH_3COOH	10 % aq. soln.	●	●●	●●	●	●●
Acetic acid	CH_3COOH	40 % aq. soln.	○	●	●	○	●
Acetic acid	CH_3COOH	technically pure	○	●	○	○	●
Acetic anhydride	$CH_3–CO–O–OC–CH_3$	technically pure	○	●●	●	●	○
Acetone	$CH_3—CO—CH_3$	technically pure	●●●	●●●	●	●●	●●●
Allyl alcohol	$H_2C=CH–CH_2–OH$	technically pure	●●	●	○	●●	●●
Aluminium salts	—	*, aq. soln.	●●●	●●●	●●●	●●●	●●●
Alums	$K_2SO_4—Al_2(SO_4)_3 \cdot 12\ H_2O$	*, aq. soln.	●●	●●●	●●●	●●	●●●
Ammonia	NH_3	10 % aq. soln.	●●●	●●●	●●●	●●●	●●●
Ammonia	NH_3	*, gaseous	●●●	●●●	●●●	●●●	●●●
Ammonium chloride	NH_4Cl	10 % aq. soln.	●●●	●●●	●●●	●●●	●●●
Ammonium salts	—	*, technically pure	●●	●●●	●●	●●	●●●
Amyl acetate	$CH_3(CH_2)_4—OOCCH_3$	technically pure	●●●	●●	●●●	●●●	●●●
Amyl alcohol	$CH_3(CH_2)_3—CH_2—OH$	technically pure	●●●	●●●	○	●●●	●●●
Aniline	$C_6H_5–NH_2$	technically pure	●●	●●	○	●●	●●

Medium	Chemical formula	Concentration	Resistance				
			Grilon	Grilamid	Grilamid TR	Grivory GV	Grivory HTV
Anisole	$C_6H_5—O—CH_3$	technically pure	●●●	●●●	●●●	●●●	●●●
Aqua regia	HNO_3 + HCl	technically pure	○	○	○	○	○
Aspirin	—	technically pure	●●●	●●●	●●●	●●●	●●●
Attar of roses (Rose oil)	—	technically pure	●●●	●●●	●	●●●	●●●
Barium salts	—	*, aq. soln.	●●●	●●●	●●●	●●●	●●●
Battery acid	H_2SO4	36 % aq. soln.	●	●●	●●	●	●
Beer	—	commercial grade	●●●	●●●	●●●	●●●	●●●
Benzaldehyde	C_6H_5CHO	technically pure	●	●●	●	●	●
Benzoic acid	$C_6H_5—COOH$	*, aq. soln.	●●	●●	●●	●●	●●
Benzene	C_6H_6	technically pure	●●●	●●●	●●●	●●●	●●●
Benzyl alcohol	$C_6H_5—CH_2OH$	technically pure	●	●	●	●	●
Bitumen	—	commercial grade	●●●	●●●	●●●	●●●	●●●
Borax	$Na_2B_4O_7$	*, aq. soln.	●●●	●●●	●●●	●●●	●●●
Boric acid	H_3BO_3	10 % aq. soln.	●●	●●●	●●	●●	●●
Brake fluid (DOT 4)	—	commercial grade	●●●	●●●	●●●	●●●	●●●
Brandy	—	commercial grade	●●●	●●●	●●	●●●	●●●
Bromine	Br_2	*	●	●	○	●	●
Butane	C_4H_{10}	technically pure	●●●	●●●	●●●	●●●	●●●
Butanol	C_4H_9OH	technically pure	●●●	●●●	○	●●	●●●
Butter	—	commercial grade	●●●	●●●	●●●	●●●	●●●
Butter milk	—	commercial grade	●●●	●●●	●●●	●●●	●●●
Butyl acetate	$CH_3COOCH_2CH_2CH_2CH_3$	technically pure	●●●	●●●	●●●	●●●	●●●
Butyric acid	$CH_3CH_2CH_2—COOH$	technically pure	●●	●●●	●●	●●	●●
Butylene glycol	$HO—CH_2CH_2CH_2CH_2—OH$	technically pure	●●	●●●	○	●●	●●
Calcium chloride	$CaCl_2$	10 % aq. soln.	●●●	●●●	●●●	●●●	●●●
Calcium chloride	$CaCl_2$	20 % alcoholic soln.	○	●	○	●	●
Camphor	—	technically pure	●●●	●●●	●●●	●●●	●●●
Carbon disulphide	CS_2	100 %	●●●	●●●	●●●	●●●	●●●
Carbon tetrachloride	CCl_4	technically pure	●●●	●●	●●●	●●●	●●●
Caustic soda	NaOH	40 % aq. soln.	●●●	●●●	●●●	●●●	●●●
Chlorinated lime	$Ca(ClO)_2$	*, aq. soln.	○	○	○	○	○
Chlorine	Cl_2	technically pure	○	○	○	○	○
Chlorine gas	Cl_2	< 5 %, gaseous	●	●●	●	●●	●●
Chlorine water	—	< 5 %, aq. soln.	●	●●	●	●●	●●
Chloroacetic acid	$ClCH_2COOH$	10 %, technically pure	○	○	○	○	○
Chlorobenzene	$C_6H_5—Cl$	technically pure	●●●	●	●●	●●●	●●●
Chlorobrommethane	CH_2ClBr	technically pure	●●	●●	●	●●	●●
Chloroform	$CHCl_3$	technically pure	●	●	●	●	●
Chromic acid	H_2CrO_4	10 % aq. soln.	○	●	●	○	○
Chromic acid	H_2CrO_4	1 % aq. soln.	●	●●	●	●	●
Chromic/sulphuric acid	H_2SO_4/CrO_3	*, aq. soln.	○	○	○	○	○
Chromium salts	—	*, aq. soln.	●●●	●●●	●●	●●●	●●●
Coca-Cola	—	commercial grade	●●●	●●●	●●●	●●●	●●●
Cocoa	—	commercial grade	●●●	●●●	●●●	●●●	●●●
Coffee	—	commercial grade	●●●	●●●	●●●	●●●	●●●
Copper salts	—	10 % aq. soln.	●●●	●●●	●●	●●●	●●●
Cresol	$H_3C–C_6H_4–OH$	technically pure	○	○	○	○	○

Medium	Chemical formula	Concentration	Resistance				
			Grilon	Grilamid	Grilamid TR	Grivory GV	Grivory HTV
Cyclohexane	C_6H_{12}	technically pure	●●●	●●●	●●●	●●●	●●●
Cyclohexanol	$C_6H_{11}OH$	technically pure	●●●	●●●	●	●●●	●●●
Cyclohexanone	$C_6H_{10}O$	technically pure	●●●	●●●	●●●	●●●	●●●
Decalin	$C_{10}H_{18}$	technically pure	●●●	●●●	●●●	●●●	●●●
Dibutyl phthalate	$C_6H_4-(COOC_4H_9)_2$	technically pure	●●●	●●●	●●●	●●●	●●●
Diesel	—	commercial grade	●●●	●●●	●●●	●●●	●●●
Diesel oil	—	commercial grade	●●●	●●●	●●●	●●●	●●●
Diethyl ether	$CH_3-CH_2-O-CH_2-CH_3$	technically pure	●●●	●●●	●●●	●●●	●●●
Dimethyl formamide	$HCON-(CH_3)_2$	technically pure	●●●	●●	○	●●	●●●
Dioctyl phthalate	$C_6H_4-(COOC_8H_{17})_2$	technically pure	●●●	●●●	●●●	●●●	●●●
Dioxane	$C_4H_8O_2$	technically pure	●●●	●●●	●●	●●●	●●●
Edible fats and oils	—	commercial grade	●●●	●●●	●●●	●●●	●●●
Ethanol	CH_3CH_2OH	technically pure	●●●	●●●	○	●●●	●●●
Ether	$CH_3CH_2-O-CH_2CH_3$	technically pure	●●●	●●●	●●●	●●●	●●●
Ethyl acetate	$CH_3COOCH_2CH_3$	technically pure	●●●	●●●	●●●	●●●	●●●
Ethylene chloride	$ClCH_2-CH_2Cl$	technically pure	●●●	●●	●	●●	●●●
FAM B	—	technically pure	●●●	●●	○	●●	●●●
Formaldehyde (Formalin)	HCHO	40 % aq. soln.	●	●●	●●	●	●●
Formamide	$HCONH_2$	technically pure	●●	●●	●●	●●	●●
Formic acid	HCOOH	10 % aq. soln.	●	●	●●	●	●●
Formic acid	HCOOH	40 % aq. soln.	○	●	●	●	●
Formic acid	HCOOH	85 % aq. soln.	○	●	○	○	○
Freon	partially halogenized	commercial grade	●	●	●	●	●
	fully halogenized	commercial grade	●●●	●●●	●●●	●●●	●●●
Freon 12	CF_2Cl_2	technically pure	●●●	●●●	●●●	●●●	●●●
Freon 22	CHF_2Cl	technically pure	●	●	●	●	●
Fruit juices	—	commercial grade	●●●	●●●	●●●	●●●	●●●
Fuel C	free from lead	technically pure	●●●	●●●	●●●	●●●	●●●
Fuel oil	—	technically pure	●●●	●●●	●●●	●●●	●●●
Furfurol	C_4H_3O-CHO	technically pure	●●	●●	●●	●●	●●
Glycerine	$C_3H_8O_3$	technically pure	●●●	●●●	●●●	●●●	●●●
Glycol	$HO-CH_2CH_2-OH$	technically pure	●●●	●●●	●●●	●●●	●●●
Heptane	C_7H_{16}	technically pure	●●●	●●●	●●●	●●●	●●●
Hexane	C_6H_{14}	technically pure	●●●	●●●	●●●	●●●	●●●
Hydraulic fluid	—	commercial grade	●●●	●●●	●●●	●●●	●●●
Hydrochloric acid	HCl	10 % aq. soln.	○	●	●●	○	○
Hydrochloric acid	HCl	1 % aq. soln.	●	●●	●●●	●	●
Hydrogen fluoride	HF	40 % aq. soln.	○	○	○	○	○
Hydrogen peroxide	H_2O_2	30 % aq. soln.	○	○	○	○	○
Hydrogen peroxide	H_2O_2	10 % aq. soln.	●	●●	●●	●	●
Hydrogen peroxide	H_2O_2	2 % aq. soln.	●	●●	●●	●	●●
Hydrogen sulphide	H_2S	< 5 %, gaseous	●●●	●●●	●●●	●●●	●●●
Ink	—	commercial grade	●●●	●●●	●●●	●●●	●●●
Iodine tincture	J_2	*, alcoholic soln.	○	○	○	○	○
Iron salts	—	20 % aq. soln. neut.	●●●	●●●	●●	●●●	●●●
Iron salts	—	20 % aq. soln. acid.	○	●	●	●	●
Isooctane	$(CH_3)_3C-CH_2CH(CH_3)_2$	technically pure	●●●	●●●	●●●	●●●	●●●

Medium	Chemical formula	Concentration	Resistance				
			Grilon	Grilamid	Grilamid TR	Grivory GV	Grivory HTV
Isopropyl alcohol	$(CH_3)_3$–CHOH	technically pure	●●●	●●	○	●●	●●●
Lactic acid	$CH_3CH(OH)$–COOH	90 % aq. soln.	○	●●	●	○	○
Lactic acid	$CH_3CH(OH)$–COOH	50 % aq. soln.	●	●●	●●	●	●
Lactic acid	$CH_3CH(OH)$–COOH	5 % aq. soln.	●●	●●●	●●●	●●	●●
Lanolin	—	commercial grade	●●●	●●●	●●●	●●●	●●●
Lead salts	—	technically pure	●●●	●●●	●●●	●●●	●●●
Lemon juice	—	*, commercial grade	●●	●●	●●●	●●	●●
Linseed oil	—	commercial grade	●●●	●●●	●●●	●●●	●●●
Liqueurs	—	commercial grade	●●●	●●●	●●	●●●	●●●
Lubrications oils, greases, soaps	—	commercial grade	●●●	●●●	●●●	●●●	●●●
Magnesium hydroxide	$Mg(OH)_2$	10 % aq. soln.	●●●	●●●	●●●	●●●	●●●
Magnesium salts	—	10 % aq. soln.	●●●	●●●	●●●	●●●	●●●
Mercury	Hg	technically pure	●●●	●●●	●●●	●●●	●●●
Mercury salts	—	*, aq. soln., neutral	●●●	●●●	●●	●●●	●●●
Methanol	CH_3OH	technically pure	●●●	●●	○	●●	●●●
Methylene chloride	CH_2Cl_2	technically pure	●●	●	●	●●	●●
Methylethyl ketone	$CH_3—CO—CH_2—CH_3$	technically pure	●●●	●●●	●	●●●	●●●
Milk	—	commercial grade	●●●	●●●	●●●	●●●	●●●
Mineral oils	—	commercial grade	●●●	●●●	●●●	●●●	●●●
Motor fuels	—	commercial grade	●●●	●●●	●●●	●●●	●●●
Naphthalene	$C_{10}H_8$	technically pure	●●●	●●●	●●●	●●●	●●●
Nickel salts	—	*, aq. soln.	●●●	●●●	●●●	●●●	●●●
Nitric acid	HNO_3	*, aq. soln.	○	○	●	○	○
Nitrobenzene	$C_6H_5NO_2$	technically pure	●●	●●	●●	●●	●●
Nitromethane	CH_3NO_2	technically pure	●●●	●●●	●●●	●●●	●●●
Octane	C_8H_{18}	technically pure	●●●	●●●	●●●	●●●	●●●
Oil (No. 3 ASTM)	—	commercial grade	●●●	●●●	●●●	●●●	●●●
Oil of lavendar	—	commercial grade	●●●	●●●	●	●●●	●●●
Oil of pine needle	—	technically pure	●●●	●●●	●●●	●●●	●●●
Oil of turpentine	—	technically pure	●●●	●●●	●●●	●●●	●●●
Oleic acid	—	technically pure	●●●	●●●	●●●	●●●	●●●
Oleum	$H_2SO_4 + SO_3$	technically pure	○	○	○	○	○
Olive oil	—	commercial grade	●●●	●●●	●●●	●●●	●●●
Oxalic acid	HOOC—COOH	10 % aq. soln.	●●	●●●	●●●	●●	●●
Ozone	O_3	*, gaseous	●	●	●	●	●
Ozone	O_3	< 1 ppm, gaseous	●●●	●●●	●●●	●●●	●●●
Paraffin oil	—	technically pure	●●●	●●●	●●●	●●●	●●●
Peanut oil	—	commercial grade	●●●	●●●	●●●	●●●	●●●
Peppermint oil	—	technically pure	●●	●●	●●	●●	●●
Perchlorethylene	$Cl_2C=CCl_2$	technically pure	●●●	●●●	●●●	●●●	●●●
Petrol (unleaded, Esso)	—	commercial grade	●●●	●●●	●●●	●●●	●●●
Petroleum	—	technically pure	●●●	●●●	●●●	●●●	●●●
Petroleum ether	—	technically pure	●●●	●●●	●●●	●●●	●●●
Phenol	C_6H_5OH	*, aq. soln.	●	●	●	●	●
Phenylethyl alcohol	$H_3C—CH(C_6H_5)—OH$	technically pure	●●	●	●	●	●●
Phosphoric acid	H_3PO_4	50 % aq. soln.	●	●	●	●	●

Medium	Chemical formula	Concentration	Resistance				
			Grilon	Grilamid	Grilamid TR	Grivory GV	Grivory HTV
Phosphoric acid	H_3PO_4	10 % aq. soln.	●	●●	●●	●	●
Plasticizers (phthalates, phosphates)	—	commercial grade	●●●	●●●	●●●	●●●	●●●
Potash	K_2CO_3	*, aq. soln.	●●●	●●●	●●●	●●●	●●●
Potassium bromide	KBr	10 % aq. soln.	●●●	●●●	●●●	●●●	●●●
Potassium chlorate	$KClO_3$	7 % aq. soln.	●	●●	●●	●	●
Potassium hydroxide	KOH	50 % aq. soln.	●●●	●●●	●●●	●●●	●●●
Potassium iodide	KJ	10 % aq. soln.	●●●	●●●	●●●	●●●	●●●
Potassium nitrate	KNO_3	10 % aq. soln.	●●●	●●●	●●●	●●●	●●●
Potassium permanganate	$KMnO_4$	1 % aq. soln.	○	○	○	○	○
Potassium sulphate	K_2SO_4	10 % aq. soln.	●●●	●●●	●●●	●●●	●●●
Propane	C_3H_8	technically pure	●●●	●●●	●●●	●●●	●●●
Propanol	C_3H_7OH	technically pure	●●●	●●	○	●●	●●●
Pyridine	C_5H_5N	technically pure	●●●	●●●	●●	●●●	●●●
Pyrocatechol	$HO—C_6H_4—OH$	6 % aq. soln.	●	●●	○	●	●
Resorcinol	$HO—C_6H_4—OH$	technically pure	○	○	○	○	○
Resorcinol	$HO—C_6H_4—OH$	*, alcoholic soln.	○	○	○	○	○
Rum	—	commercial grade	●●●	●●●	●●	●●●	●●●
Salicylic acid	$HO—C_6H_4—COOH$	technically pure	●●●	●●●	●●●	●●●	●●●
Silicone oils	—	technically pure	●●●	●●●	●●●	●●●	●●●
Silver salts	—	*, aq. soln.	●●●	●●●	●●●	●●●	●●●
Soap solution	—	10 % aq. soln.	●●●	●●●	●●●	●●●	●●●
Sodium bicarbonate	$NaHCO_3$	*, aq. soln.	●●●	●●●	●●●	●●●	●●●
Sodium bisulphite	$NaHSO_3$	10 % aq. soln.	●●●	●●●	●●●	●●●	●●●
Sodium bromide	NaBr	10 % aq. soln.	●●	●●●	●●●	●●	●●●
Sodium carbonate	Na_2CO_3	10 % aq. soln.	●●●	●●●	●●●	●●●	●●●
Sodium chloride	NaCl	*, aq. soln.	●●●	●●●	●●●	●●●	●●●
Sodium chlorite	$NaClO_2$	5 % aq. soln.	●	●	●	●	●
Sodium hydroxide	NaOH	40 % aq. soln.	●●●	●●●	●●●	●●●	●●●
Sodium hypochlorite	NaOCl	5 % aq. soln.	●	●●	●	●	●
Sodium nitrate	$NaNO_3$	10 % aq. soln.	●●●	●●●	●●●	●●●	●●●
Sodium nitrite	$NaNO_2$	5 % aq. soln.	●	●●	●	●	●
Sodium perborate	—	5 % aq. soln.	●●	●●●	●●	●●	●●
Sodium phosphate	Na_3PO_4	10 % aq. soln.	●●●	●●●	●●●	●●●	●●●
Sodium sulphate	Na_2SO_4	10 % aq. soln.	●●●	●●●	●●●	●●●	●●●
Sodium sulphide	Na_2S	10 % aq. soln.	●●●	●●●	●●●	●●●	●●●
Sodium sulphite	Na_2SO_3	10 % aq. soln.	●●●	●●●	●●●	●●●	●●●
Sodium thiosulphite	$Na_2S_2O_3$	10 % aq. soln.	●●●	●●●	●●●	●●●	●●●
Soya oil	—	commercial grade	●●●	●●●	●●●	●●●	●●●
Starch	—	*, aq. soln.	●●●	●●●	●●●	●●●	●●●
Styrene	$C_6H_5–CH=CH_2$	technically pure	●●●	●●●	●●●	●●●	●●●
Sugar	$C_6H_{12}O_6$	*, aq. soln.	●●●	●●●	●●●	●●●	●●●
Sulphur	S	technically pure	●●●	●●●	●●●	●●●	●●●
Sulphur dioxide	SO_2	< 5 %	●	●●	●●	●	●●
Sulphuric acid	H_2SO_4	technically pure	○	●	●	○	○
Sulphuric acid	H_2SO_4	36 % aq. soln.	●	●●	●●	●	●
Sulphuric acid	H_2SO_4	10 % aq. soln.	●	●●	●●	●	●

Medium	**Chemical formula**	**Concentration**	**Resistance**				
			Grilon	Grilamid	Grilamid TR	Grivory GV	Grivory HTV
Sulphuric acid	H_2SO_4	2 % aq. soln.	●	●●	●●●	●	●
Table salt	NaCl	*, aq. soln.	●●●	●●●	●●●	●●●	●●●
Tallow	—	commercial grade	●●●	●●●	●●●	●●●	●●●
Tar	—	technically pure	●●●	●●●	●●●	●●●	●●●
Tartaric acid	HOOC–CH(OH)–CH(OH)–COOH	technically pure	●●●	●●●	●●●	●●●	●●●
Tea	—	commercial grade	●●●	●●●	●●●	●●●	●●●
Tetrahydrofuran	C_4H_8O	technically pure	●●●	●●●	●●	●●●	●●●
Tetralin	$C_{10}H_{12}$	technically pure	●●●	●●●	●●●	●●●	●●●
Thionyl chloride	$SOCl_2$	technically pure	○	○	○	○	○
Toluene	$C_6H_5—CH_3$	technically pure	●●●	●●●	●●●	●●●	●●●
Trichlorethylene	$Cl_2C=CHCl$	technically pure	●●	●●	●●	●●	●●
Urea	$H_2N–CO–NH_2$	20 % aq. soln.	●●●	●●●	●●	●●●	●●●
Vaseline	—	commercial grade	●●●	●●●	●●●	●●●	●●●
Vinegar	CH_3COOH	commercial grade	●●	●●●	●●●	●●	●●
Water	H_2O	technically pure	●●●	●●●	●●●	●●●	●●●
Water glass	—	*, aq. soln.	●●●	●●●	●●●	●●●	●●●
Wax	—	commercial grade	●●●	●●●	●●●	●●●	●●●
Wine	—	commercial grade	●●●	●●●	●●●	●●●	●●●
Xylene	$H_3C—C_6H_4—CH_3$	technically pure	●●●	●●●	●●●	●●●	●●●
Zinc chloride	$ZnCl_2$	10 % aq. soln.	●●	●●●	●●●	●●●	●●●

The recommendations and data given are based on our experience to date. No liability can be assumed in connection with their usage and processing.

Domat/Ems, June 2001

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