## Customer information regarding material resistance in compressed air preparation

### Polycarbonate reservoirs for filter regulators, filters, and lubricators

Polycarbonate is the longest known and most processed material in the world for reservoirs of compressed air maintenance units. The high pressure and temperature resistances, as well as good compatibility with the normally used media such as water, oils and greases are some of its advantages.

The only “weakness” of this plastic is its susceptibility to media that can be referred to collectively using the term “solvents”. From this range, the materials relevant to the use of compressed air preparation units are summarized here:

| | |
|---|---|
| Detergents:<br>(usually from outside) | Trichloroethylene,<br>perchloroethylene,<br><br>benzene, super/regular gasoline |
| Solvents:<br>(from outside/inside) | Acetone,<br>paint thinners,<br>alcohols, esters |
| Other media: | Synthetic oils, drilling oil, high-alloyed oils (car engines), certain compressor oils, anti-freeze, brake fluid, ammonia, different bonding and sealing agents, plasticizers, coolants, lubricants |

Everywhere the presence of these media cannot be avoided, such as in paint booths, gluing machines, vulcanization plants, etc., the use of metal reservoirs is required.

Problematic is the use of solvents not only in immediate contact with the reservoir, but also in its immediate vicinity. For example, trichlorethylene vapors from the compressor’s intake air can cause crack formation in the polycarbonate reservoir. Only clean the reservoirs using a slightly damp cloth. Only use water to do this and, if necessary, a mild detergent without chemical additives.

If a lubricator is used, please only use suitable pneumatic oils, e.g. AVENTICS pneumatic oil, order no. 8982000010 – 1L.

In most cases, the use of (pneumatic) oils with additives, for example antifreeze, results in damage to or destruction of the reservoirs and must thus be avoided. Alternatively, we recommend the use of metal reservoirs.

Polycarbonate can react to permanent UV-light irradiation and weathering. The degree of sensitivity depends to a large extent on the intensity and duration of irradiation and the weathering conditions.

**NOTE:**

This information should only be considered guideline values. The true chemical compatibility should only be determined on the component under operating conditions.

## Chemical compatibility

This overview shows the chemical resistance of plates made of LEXAN polycarbonate. The chemical compatibility of thermoplastics such as LEXAN depends on the contact time, temperature, and load (external loads to which the application is subjected).

Chemical contact can result in discoloration, softening, swelling strain, crack or fracture formation, or loss of the properties of the thermoplastic material.

The listed chemicals were assessed for LEXAN using very strict testing methods.

This test encompasses contact with chemicals under previously defined conditions, including temperature (20°C and 80°C) and tension (0.5% and 1% elongation), over a period of seven days.

## Index of the performance symbols

See footnotes.

### Acids, mineral-

| | |
|---|---|
| Boric acid | + |
| Hydrogen chloride 20% | + |
| Hydrogen chloride 25% | – |
| Hydrogen fluoride 25% | + |
| Nitric acid 70% | – |
| Perchloric acid | – |
| Phosphorus pentoxide, dry | + |
| Phosphoric acid 1% | + |
| Phosphoric acid 10% | – |
| Phosphorous pentachloride | + |
| Sulfuric acid 50% | + |
| Sulfuric acid 70% | – |
| Sulfurous acid 5% | – |

### Acides, organic

| | |
|---|---|
| Acetic anhydride | – |
| Formic acid concentrate | – |
| Gallic acid | + |
| Maleic acid | + |
| Thioglycolic acid | – |
| Hydrochloric acid 20% | + |
| Hydrochloric acid 25% | – |
| Oleic acid | + |
| Palmitic acid | + |
| Phenolsulfonic acid | – |
| Phenoxyacetic acid | + |
| Phthalic anhydride | + |
| Salicylic acid | + |
| Tannin | + |
| Tannin 20% | – |
| Thioacetic acid | + |
| Trichloroethanoic acid | – |
| Sulfamic acid 5% | 0 |

### Alcohol

| | |
|---|---|
| Allyl alcohol | – |
| Amyl alcohol | – |
| Butoxyethanol | – |
| Chloroethanol 2 | – |
| 1-Decanol | – |

– Bad, not recommended, results in failure or major degradation.
0 Very good, limited effect established, only for short contact times at low temperatures or if property losses are critical.
+ Good, no performance restrictions established with regard to duration, temperature, and load as per testing procedure of contact times set by GE Plastics.

| | |
|---|---|
| 1-Dodecanol | – |
| Ethanol | – |
| Ethylene glycol 100% | – |
| Ethylene glycol 60% | + |
| Furfuryl alcohol | – |
| Glycerol | + |
| 1-Heptanol | – |
| Isobutanol | 0 |
| Methanol | – |
| 1-Nonanol | – |
| 1-Octanol | + |
| Oxydiethanol 2.2 | + |
| Phenethyl alcohol | – |
| Polyalkylene glycol | – |
| Polyethylene glycol | + |
| Propylene glycol | – |
| Sorbitol | + |
| Thiodiglycol 5% | – |
| Triethylene glycol | + |
| Tripropylene glycol | – |

## Aldehyde

| | |
|---|---|
| Ethanal | – |
| Butanal | – |
| Formaldehyde 37% | + |
| Formol | + |
| Propanal | – |

## Amide

| | |
|---|---|
| Dimethylformamide | – |

## Amine

| | |
|---|---|
| Aniline | – |
| Diphenylamine | – |
| Methylaniline N | – |
| Methylenedianiline | – |
| Phenylhydrazine | – |
| Pyridin | – |
| Triethanolamine | + |
| Hydroxylamine | + |

## Base

| | |
|---|---|
| Aluminum hydroxide powder | + |
| Ammonia concentrate | – |
| Ammonium hydroxide 0.13% | – |
| Calcium hydroxide | – |
| Potassium hydroxide 10% | – |
| Sodium hydroxide, dry | + |
| Sodium hydroxide 10% | – |
| Sodium tholamat | + |

## Ester

| | |
|---|---|
| Benzyl benzoate | – |
| Butyl Cellosolve acetate | – |
| Butyl stearate | – |
| Cellulose aceto butyrate | – |
| Cellulose acetate | – |
| Cellulose propionate | – |
| Dibutyl phthalate | – |
| Didecyl carbonate | – |
| Diisooctyl phthalate | – |
| Diisononyl phthalate | + |
| Dioctyl phthalate | – |
| Dioctyl sebacate | – |
| Ditridecyl carbonate | – |
| Ditridecyl phthalate | – |
| Ethyl bromoacetate | + |
| Ethyl butyrate | – |
| Ethyl cellosolve 5% | – |
| Ethyl chloracetate | – |
| Ethyl cyanoacetate | – |
| Ethyl lactate | – |
| Ethyl salicylate | – |
| Isopropyl myristate | – |
| Methyl acetate | + |
| Methyl salicylate | – |
| Methyl benzoate | – |
| Triacetin | – |
| Tributoxyethyl phosphate | – |
| Tributyl cellulose phosphate | – |
| 2-Dodecyl phenyl carbonate | + |

## Ether

| | |
|---|---|
| Ether | – |
| Ethyl cellosolve 5% | – |

| | |
|---|---|
| – | Bad, not recommended, results in failure or major degradation. |
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| | |
|---|---|
| Methyl cellosolve | – |
| Polyalkylene glycol | – |
| Polyethylene glycol | + |
| Polyethylene sulfide | – |
| Propylene oxide | – |

## Gaseous

| | |
|---|---|
| Ammonia concentrate | – |
| Bromine | – |
| Chloracetophenone | – |
| Chlorine | – |
| Iodine | – |
| Isobutane | – |
| Methane | – |
| Oxygen | + |
| Ozone 2% | – |
| Propylene | + |

## Gaseous

| | |
|---|---|
| Sulfur dioxide | – |
| Sulfur hexafluoride | – |

## Alkyl halides

| | |
|---|---|
| Dibromacetylene | – |
| Tetrabromoacetylene | – |
| Bromochloromethane | – |
| Carbon tetrachloride | – |
| Chloroethanol 2 | – |
| Chlorobenzene | – |
| Chlorobutane | – |
| Chloroform | – |
| Dibromoethane | – |
| Dichloroethane | – |
| Dichloro hydroxybenzene | + |
| Methylene chloride | – |
| Ethyl bromoacetate | + |

## Ketone

| | |
|---|---|
| Methyl ethyl ketone | – |

## Metal and metal oxide

| | |
|---|---|
| Aluminum oxide | + |
| Arsenic trioxide | – |
| Calcium oxide paste | – |
| Copper(I) oxide | + |
| Metallic mercury | – |

## Phenol

| | |
|---|---|
| Allyl-4-methoxyphenol | – |
| Cresol | – |
| P-Phenylphenol | – |
| Pentachlorophenol | – |
| Phenolsulfonic acid | – |
| Phenol 5% | – |
| Phenoxy acid- | + |

## Salt, anorganic

| | |
|---|---|
| Ammonium aluminum sulfate | – |
| Aluminum chloride | – |
| Aluminum fluoride | + |
| Aluminum potassium sulfate | – |
| Sodium aluminum sulfate | + |
| Ammonium bicarbonate | + |
| Ammonium bromide | + |
| Ammonium carbonate | – |
| Ammonium dichromate | + |
| Ammonium persulfate | + |
| Arsenic trioxide | – |
| Barium carbonate | + |
| Barium chloride | + |
| Barium sulfate | + |
| Calcium carbonate paste | – |
| Calcium chloride | + |
| Calcium sulfate | + |
| Caesium bromide | + |
| Copper (II) chloride 5% | + |
| Iron(II) chloride | – |
| Ammonium iron(III) sulfate | + |
| Iron (III) chloride, saturated | + |
| Iron (III) nitrate | – |
| Iron (III) sulfate | + |
| Lithium bromide | + |
| Lithium hydroxide powder | + |

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| | |
|---|---|
| Magnesium bromide | + |
| Magnesium chloride | + |
| Magnesium nitrate | + |

## Salt, anorganic

| | |
|---|---|
| Magnesium sulfate | + |
| Mercury(I) nitrate | + |
| Mercury(II) chloride | – |
| Monoammonium phosphate | + |
| Nickel nitrate | + |
| Potassium bicarbonate, dry | + |
| Potassium bisulfate | + |
| Potassium bromate | + |
| Potassium bromide | + |
| Potassium carbonate | + |
| Potassium chlorate | + |
| Potassium chloride, saturated | – |
| Potassium chloride 15% | + |
| Chromium potassium sulfate | – |
| Potassium cyanide powder | + |
| Potassium dichromate (IV) | + |
| Potassium iodide | + |
| Potassium nitrate | + |
| Potassium permanganate | – |
| Potassium persulfate | + |
| Potassium sulfate | + |
| Silver chloride, saturated | – |
| Silver nitrate | + |
| Sodium bicarbonate, saturated | 0 |
| Sodium bicarbonate 13% | – |
| Sodium bisulfite | + |
| Sodium bromate | + |
| Sodium bromide | + |
| Sodium carbonate | + |
| Sodium carbonate solvent | – |
| Sodium chlorate | + |
| Sodium lauryl ether sulfate | 0 |
| Sodium ferrocyanide | + |
| Sodium fluoride | + |
| Sodium hypochlorite 6% | + |
| Sodium hypochlorite 15% | – |
| Sodium nitrate 10% | – |
| Sodium perborate | + |
| Sodium phosphate | + |
| Sodium silicate | + |
| Sodium sulfide | – |
| Sodium sulfite | + |
| Strontium bromide | + |
| Tin(II) chloride | + |
| Tin(IV) chloride | + |
| Titanium tetrachloride | + |
| Trinatrium phosphate 5% | – |
| Zinc bromide | + |
| Zinc carbonate | + |
| Zinc chloride | – |
| Zinc oxide | – |
| Zinc sulfate | + |

## Salt, organic

| | |
|---|---|
| Aluminum acetate | + |
| Ammonium acetate | – |
| Ammonium oxalate | + |
| Aniline sulfate | + |
| Potassium acetate 30% | – |
| Quinine sulfate | – |
| Sodium acetate 30% | – |
| DL-valine bromide | + |

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