



**bürkert**  
FLUID CONTROL SYSTEMS



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## Chemical Resistance Chart

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## Introduction

When dealing with aggressive fluids the user is continuously faced with the problem of finding compatible materials.

In order to simplify the selection of suitable materials when using Bürkert products for aggressive fluids, the following tables provide useful information on the optimal choice of housing and gasket materials for a multitude of media.

Since corrosion performance is influenced by several factors, the information contained in this brochure should be treated only as a guide and is not necessarily valid for all operating conditions. Increased temperatures, higher concentrations, and the inadvertent ingress of water in originally pure chemicals can all lead to accelerated corrosion.

Dependent on the purity of the fluid as well as the compounding and nature of vulcanisation of the gasket materials, deviations can result which affect the suitability and durability of the plastics and elastomers.

The information quoted in this guide does not consider the effect of mechanical loading, which may also have a bearing on the material performance in the fluid. In cases of doubt when considering our products, we strongly recommend the prior testing of samples with various material combinations, in order to establish and check their suitability under the actual operating conditions of the application.

Where liquid food products are involved, the plastics and elastomers employed must normally conform with the local food and hygiene regulations. It is emphasized that these resistance tables are intended only as a guide and that no guarantees can be given in respect of the information contained in this publication.

## Structure and content of the chemical resistance charts

The following chemical resistance tables are divided into three categories. These are basic chemicals (chapter 2.2), liquid commercial products (chapter 2.3) and liquid food ingredients (chapter 2.4).

The resistance of these fluids is rated in detail for the elastomeric materials, plastics and metallic materials commonly used in Bürkert products. Rarely used materials such as CSM as well as aluminum are not described in the tables. Epoxy resin, which is commonly used in the construction of our products, but which is not mentioned, is resistant to most common chemicals.

Information regarding the chemical resistance of the unlisted materials is available on request, including chrome and nickel-plated parts.

Please see the overview in chapter 2.1 for additional information regarding general chemical resistance of seal and body materials. For the most commonly used chemical substances the chemical formula is added in the charts. The suffix "pure" means the technical pureness of the fluid, which in most cases exceeds 95% purity. As a rule, organic fluidic or gaseous media have this supplement. "Acetic acid - pure" means for example a 98% acetic acid. The suffix "aqueous" is mostly used for water miscible substances (such as Ethanol) but also for aqueous solutions of inorganic salts.

Due to the great number of possible concentrations, an average concentration is always assumed. Saturated aqueous solutions are described only if explicitly noted and the reference temperature for all statements is room temperature. At higher temperatures a reduced chemical resistance must be considered.

## Interpretation of Symbols

- + material is not affected or is slightly affected by the chemical: suitable
- various attack level depending on prevailing conditions: limited suitability
- material exhibits severe attack: unsuitable

If materials are rated as "limited suitability", the time of impact has to be considered. At a long period of impact these materials can be heavily attacked or even destroyed. Therefore these parts are rated as wear parts and are not included in the standard warranty conditions.

In many cases it is not possible to make a clear statement due to different service conditions. In these cases the rating should also be "limited suitability".

## References

All the information quoted in these resistance tables is based on industrial experience (for example "DECHEMA-Werkstoff-Tabelle", Germany or "DECHEMA Corrosion Handbook"), the data of our material and compound manufacturers and Bürkert's own stringent laboratory tests.

# Chemical resistance properties gasket and housing materials

## Overview

| Material                        | Designation | Chemical resistance  | Permissible temperatures       |                                 |   |
|---------------------------------|-------------|--|--------------------------------|---------------------------------|---|
|                                 |             |  | Neutral fluids long-term°C(°F) | Neutral fluids short-term°C(°F) | Aggressive fluids long-term°C(°F)                                 |
| Magnet encapsulation materials  |             |  |                                |                                 |   |
| Epoxy resin                     | EP          | Resistant to nearly all chemicals. Unsuitable for short-chain organic acids of high concentration and for strong oxidising substances. | -20 (-4) to +150 (+302)        |                                 |   |
| Polyamide                       | PA          | See plastic housing materials  |                                |                                 |   |
| Gasket and diaphragm materials  |             |  |                                |                                 |   |
| Ethylene propylene diene rubber | EPDM        | Good resistance to ozone and weathering. Particularly suitable for aggressive chemicals. Unsatisfactory for oils and fats.             | -30 (-22) to +130 (+266)       |                                 | Dependant on aggressive-ness of the fluid and on mechanical load. |
| Fluorine rubber                 | FKM         | Chemical properties superior to all other elastomers.  | 0 (+32) to +150 (+302)         | 0 (+32) to +200 (+392)          |   |
| Nitrile rubber                  | NBR         | Fairly resistant to oil and petrol. Unsatisfactory with oxidising fluids.  | -10 (+14) to +90 (+194)        | -10 (+14) to +120 (+248)        |   |
| Chloroprene rubber              | CR          | The chemical properties are very similar to those of PVC and are between those of NBR and EPDM.  | -10 (+14) to +100 (+212)       | -10 (+14) to +110 (+230)        |   |
| Perfluorinated elastomers       | FFKM        | Similar to PTFE (dependent on blend)   | +5 (+41) to +230 (+446)        | +5 (+41) to +230 (446)          |   |
| Polytetrafluoroethylene         | PTFE        | See plastic housing materials  |                                |                                 |   |
| Steel                           | 1.4112      |  | -20 (-4) to +450 (+842)        |                                 | -20 (-4) to +150 (+302)   |

| Material                               | Designation     | Chemical resistance  | Permissible temperatures       |                                 |                                   |
|--|-----------------|--|--------------------------------|---------------------------------|-----------------------------------|
|  |                 |  | Neutral fluids long-term°C(°F) | Neutral fluids short-term°C(°F) | Aggressive fluids long-term°C(°F) |
| Housing materials - Metal              |                 |  |                                |                                 |                                   |
| Stainless steel                        |                 | See resistance tables  | -20 (-4) to +400 (+752)        |                                 | -20 (-4) to +150 (+302)           |
|  | 1.4401          | Also 1.4404, 1.4408, 1.4409, 1.4401  |                                |                                 |                                   |
|  | 1.4571          | Also 1.4581  |                                |                                 |                                   |
|  | 1.4305          | Also 1.4301, 1.4303  |                                |                                 |                                   |
|  | 1.4105          | Also 1.4113  |                                |                                 |                                   |
| Grey cast iron                         | GG 25           | For neutral fluids   | -20 (-4) to +180 (+356)        |                                 |                                   |
| S.G. cast iron                         | GGG 40.3        | For neutral fluids   | -20 (-4) to +400 (+752)        |                                 |                                   |
| Cast steel                             | GS – C C22, C25 | For neutral fluids   | -20 (-4) to +400 (+752)        |                                 |                                   |
| Brass                                  | MS              | See resistance tables  | -20 (-4) to +250 (+482)        |                                 |                                   |
| Red bronze                             | RG              | See resistance tables  | -20 (-4) to +250 (+482)        |                                 |                                   |
| Housing materials - Plastic            |                 |  |                                |                                 |                                   |
| Polyvinyl chlorid rigid                | PVC PVC-HT      | Resistant to most acids and bases, salt solutions.   | 0 (+32) to +60 (+140)          | 0 (+32) to +60 (+140)           | 0 (+32) to +40 (+104)             |
|  |                 |  | 0 (+32) to +90 (+194)          | 0 (+32) to +110 (+230)          | 0 (+32) to +40 (+104)             |
| Polypropylene Polyethylene             | PP PE           | Resistant to organic solvents, aqueous solutions of acids, bases and salts. Unsuitable for concentrated, oxidising acids.            | 0 (+32) to +100 (+212)         |                                 | 0 (+32) to +60 (+140)             |
| Polyamide                              | PA              | Resistant to fats, oils, waxes, fuels, weak bases, aliphatic and aromatic hydrocarbons.  | 0 (+32) to +100 (+212)         |                                 | 0 (+32) to +60 (+140)             |
| Ethylene tetrafluoroethylene copolymer | ETFE            | Good resistance to many aggressive media (acids, aromatic hydrocarbons), not resistant against fuming nitric acid and sulphuric acid | -20 (-4) to +200 (+392)        | -20 (-4) to +260 (+500)         | -20 (-4) to +150(+302)            |
| Polytetrafluoroethylene                | PTFE            | Resistant to nearly all chemicals. Unsuitable for liquid sodium and fluorine compounds.  | -20 (-4) to +200 (+392)        | -20 (-4) to +260 (+500)         | -20 (-4) to +150(+302)            |
| Polyvinylidene fluoride                | PVDF            | Unsuitable for hot solvents as well as for ketones, esters, and strong bases.  | -20 (-4) to +100 (+212)        |                                 |                                   |
| Polyphenylene sulfide                  | PPS             | Resistant to dilute mineral acids, bases, aliphatic and aromatic hydrocarbons, oils, fats, water, and to hydrolysis.                 | to +200 (+392)                 | to +260 (+500)                  |                                   |
| Polyetheretherketone                   | PEEK            | Resistant to most chemicals. Unsuitable for concentrated sulfuric and nitric acid and certain chlorohydrocarbons.                    | -20 (-4) to +150 (+302)        | -20 (-4) to +170 (+338)         |                                   |

# Resistance in basic chemicals

| Name  | Formula  | NBR            | EPDM           | FKM            | FFKM           | CR             | PTFE | ETFE | PVC | PP | PA | PVDF | PPS | PEEK | MS             | RG | GG, GS | 1.4401/1.4571 | 1.4305/1.4104 |
|---|--|----------------|----------------|----------------|----------------|----------------|------|------|-----|----|----|------|-----|------|----------------|----|--------|---------------|---------------|
| Chemicals                                     |  |                |                |                |                |                |      |      |     |    |    |      |     |      |                |    |        |               |               |
| A   |  |                |                |                |                |                |      |      |     |    |    |      |     |      |                |    |        |               |               |
| Acetaldehyde – aqueous                        | CH <sub>3</sub> CHO  | -              | +              | O              | O              | O              | +    | +    | O   | +  | O  | O    | O   | +    | +              | +  | O      | +             | +             |
| Acetaldehyde – pure                           | CH <sub>3</sub> CHO  | -              | +              | -              | O              | -              | +    | +    | -   | O  | O  | O    | O   | +    | +              | +  | O      | +             | +             |
| Acetic acid – pure                            | CH <sub>3</sub> COOH   | -              | O              | -              | O              | -              | +    | +    | O   | -  | O  | +    | +   | +    | -              | -  | -      | O             | O             |
| Acetic anhydride – pure                       | CH <sub>3</sub> COOCOCH <sub>3</sub>                               | -              | O              | -              | O              | -              | +    | +    | -   | -  | -  | -    | +   | -    | -              | -  | O      | O             | O             |
| Acetoacetic ester (acid-free) – pure          | CH <sub>3</sub> COCH <sub>2</sub> COOC <sub>2</sub> H <sub>5</sub> | -              | -              | -              | +              | -              | +    | O    | -   | -  | +  | -    | +   | O    | O              | O  | O      | +             | +             |
| Acetone – pure                                | CH <sub>3</sub> COCH <sub>3</sub>                                  | -              | +              | -              | +              | -              | +    | +    | -   | O  | +  | -    | +   | +    | +              | +  | +      | +             | +             |
| Acetophenone – pure                           | C <sub>6</sub> H <sub>5</sub> COCH <sub>3</sub>                    | -              | -              | -              | +              | -              | +    | O    | -   | -  | +  | O    | O   | +    | +              | +  | +      | +             | +             |
| Acetylacetone – pure                          | CH <sub>3</sub> COCH <sub>2</sub> COCH <sub>3</sub>                | -              | -              | -              | +              | -              | +    | -    | -   | +  | -  | -    | -   | -    | -              | -  | O      | +             | +             |
| Acetylchloride – pure                         | CH <sub>3</sub> COCl   | -              | -              | -              | +              | -              | +    | +    | -   | -  | -  | +    | O   | O    | O              | O  | O      | O             | O             |
| Acetylene – technical                         | HCCH   | - <sup>1</sup> | + <sup>1</sup> | - <sup>1</sup> | + <sup>1</sup> | - <sup>1</sup> | +    | +    | O   | O  | +  | +    | +   | +    | + <sup>2</sup> | -  | +      | +             | +             |
| Acrylonitrile – pure                          | CH <sub>2</sub> CHCN   | -              | -              | -              | +              | -              | +    | +    | -   | +  | O  | O    | +   | +    | +              | +  | +      | +             | +             |
| Adipic acid – aqueous                         | HOOC(CH <sub>2</sub> ) <sub>4</sub> COOH                           | +              | +              | +              | +              | +              | +    | +    | +   | +  | +  | +    | +   | +    | +              | +  | +      | +             | +             |
| Albumin – pure                                |  | +              | +              | +              |                | +              | +    |      | +   | +  | +  |      |     |      | O              | O  | O      | +             | +             |
| Allyl alcohol – pure                          | CH <sub>2</sub> CHCH <sub>2</sub> OH                               | +              | +              | O              | +              | O              | +    | +    | -   | +  | +  | +    | +   | +    | +              | +  | +      | +             | +             |
| Alum (potassium aluminium sulphate) – aqueous | KAl(SO <sub>4</sub> ) <sub>2</sub> x 12 H <sub>2</sub> O           | +              | +              | +              | +              | +              | +    |      | +   | +  | +  | +    | +   | +    | -              | -  | -      | +             | O             |
| Aluminium acetate – aqueous                   | Al(OOCCH <sub>3</sub> ) <sub>3</sub>                               | O              | +              | +              | +              | +              | +    |      | O   | +  | +  | +    | +   |      | O              | O  | -      | +             | +             |
| Aluminium chloride – aqueous                  | AlCl <sub>3</sub>  | +              | +              | +              | +              | +              | +    | +    | +   | +  | O  | +    | +   | +    | O              | O  | O      | O             | O             |
| Aluminium fluoride – aqueous                  | AlF <sub>3</sub>   | +              | +              | +              | +              | +              | +    | +    | +   | +  | +  | +    | +   | +    | +              | +  | O      | -             | -             |

| Name   | Formula   | NBR | EPDM           | FKM | FFKM | CR | PTFE | ETFE | PVC | PP | PA | PVDF | PPS | PEEK | MS | RG | GG, GS | 1.4401/1.4571 | 1.4305/1.4104 |
|--|---|-----|----------------|-----|------|----|------|------|-----|----|----|------|-----|------|----|----|--------|---------------|---------------|
| Aluminium sulphate – aqueous                 | Al(SO <sub>4</sub> ) <sub>3</sub>                             | +   | +              | +   | +    | +  | +    | +    | +   | +  | O  | +    | +   | +    | -  | -  | -      | O             | O             |
| Aminoacetic acid (glycine) – aqueous         | NH <sub>2</sub> CH <sub>2</sub> COOH                          | O   | +              | +   |      | +  | +    |      | +   | +  | O  | +    | +   |      | O  | O  | O      | +             | +             |
| Ammonia (gaseous) – pure                     | NH <sub>3</sub>   | -   | +              | O   | O    | +  | +    | +    | +   | +  | O  | +    | O   | +    | -  | -  | +      | +             | +             |
| Ammonia (liquid) – pure                      | NH <sub>3</sub>   | -   | O <sup>3</sup> | O   | O    | +  | +    | +    | O   | O  | +  | -    | O   | +    | O  | O  | +      | +             | +             |
| Ammonia water (ammonia solution)             | NH <sub>4</sub> OH  | -   | +              | O   | O    | +  | +    | +    | O   | +  | O  | -    | O   | +    | -  | -  | +      | +             | +             |
| Ammonium acetate – aqueous                   | CH <sub>3</sub> COONH <sub>4</sub>                            | +   | +              | +   | +    | +  | +    | +    | +   | +  |    | +    | +   |      | O  | O  | O      | +             | +             |
| Ammonium carbonate – aqueous                 | (NH <sub>4</sub> ) <sub>2</sub> CO <sub>3</sub>               | +   | +              | +   | +    | +  | +    | +    | +   | +  | +  | +    | +   |      | -  | -  | O      | +             | +             |
| Ammonium chloride – aqueous                  | NH <sub>4</sub> Cl  | +   | +              | +   | +    | +  | +    | +    | +   | +  | +  | +    | +   | +    | O  | O  | O      | O             | O             |
| Ammonium citrate – aqueous                   |   | +   | +              | +   | +    | +  | +    |      | +   | +  | O  |      | +   |      | O  | O  | O      | +             | +             |
| Ammonium fluoride – aqueous                  | NH <sub>4</sub> F   | +   | +              | +   | O    | O  | +    | +    | +   | +  |    | +    | +   |      | O  | O  | O      | O             | O             |
| Ammonium fluosilicate – aqueous              |   | +   | +              | +   | +    | +  | +    |      | +   | +  | O  |      | +   |      | O  | O  | O      | +             | +             |
| Ammonium formate – aqueous                   | HNCOONH <sub>4</sub>  | +   | +              | +   | +    | +  | +    |      | +   | +  | +  |      | +   |      | O  | O  | O      | +             | +             |
| Ammonium hydroxide (ammonia water) – aqueous | NH <sub>4</sub> OH  | -   | +              | O   | O    | +  | +    | +    | O   | +  | O  | -    | O   | +    | -  | -  | +      | +             | +             |
| Ammonium nitrate – aqueous                   | NH <sub>4</sub> NO <sub>3</sub>                               | +   | +              | +   | +    | +  | +    | +    | +   | +  | +  | +    | +   | +    | -  | -  | O      | +             | +             |
| Ammonium oxalate – aqueous                   | NH <sub>4</sub> OOC <sub>2</sub> COONH <sub>4</sub>           | +   | +              | +   | +    | +  | +    | +    | +   | +  | O  |      |     |      | O  | O  | O      | +             | +             |
| Ammonium persulphate – aqueous               | (NH <sub>4</sub> ) <sub>2</sub> S <sub>2</sub> O <sub>8</sub> | -   | +              | +   | +    | O  | +    | +    | O   | +  | -  |      | +   |      | O  | O  | -      | O             | O             |
| Ammonium phosphate – aqueous                 | (NH <sub>4</sub> ) <sub>2</sub> HPO <sub>4</sub>              | +   | +              | +   | +    | +  | +    | +    | +   | +  | +  | +    | +   |      | O  | O  | +      | +             | +             |
| Ammonium sulphate – aqueous                  | (NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub>               | +   | +              | +   | +    | +  | +    | +    | +   | +  | O  | +    | +   | +    | -  | -  | O      | O             | O             |
| Ammonium sulphide – aqueous                  | (NH <sub>4</sub> ) <sub>2</sub> S                             | +   | +              | O   | +    | +  | +    | +    | +   | +  | +  | +    | +   |      | -  | -  | O      | +             | +             |
| Ammonium sulphite – aqueous                  | (NH <sub>4</sub> ) <sub>2</sub> SO <sub>3</sub>               | +   | +              | +   | +    | +  | +    | O    | +   | +  | +  |      | +   |      | -  | -  | O      | +             | O             |

# Resistance in basic chemicals

| Name                                   | Formula   | NBR | EPDM | FKM            | FFKM | CR | PTFE | ETFE | PVC | PP | PA | PVDF | PPS | PEEK | MS | RG | GG, GS | 1.4401/1.4571 | 1.4305/1.4104 |
|--|---|-----|------|----------------|------|----|------|------|-----|----|----|------|-----|------|----|----|--------|---------------|---------------|
| Ammonium thiocyanate – aqueous         | NH <sub>4</sub> NCS   | +   | +    | +              |      | +  | +    | +    | +   | +  | +  |      |     |      | -  | -  | O      | +             | +             |
| Amyl acetate – pure                    | CH <sub>3</sub> COO(CH <sub>2</sub> ) <sub>4</sub> CH <sub>3</sub>                | -   | O    | -              | +    | -  | +    | +    | -   | O  | +  | +    | +   | +    | +  | +  | O      | +             | +             |
| Amyl alcohol – pure                    | H <sub>3</sub> C(CH <sub>2</sub> ) <sub>4</sub> OH                                | +   | O    | +              | +    | +  | +    | +    | +   | +  | +  | +    | +   | +    | +  | +  | O      | +             | +             |
| Aniline hydrochloride – aqueous        | C <sub>6</sub> H <sub>5</sub> NH <sub>3</sub> Cl                                  | O   | +    | O <sup>5</sup> | +    | O  | +    | O    | O   | O  | -  | +    |     |      | -  | -  | -      | -             | -             |
| Aniline – pure                         | C <sub>6</sub> H <sub>5</sub> NH <sub>2</sub>                                     | -   | O    | O              | +    | -  | +    | +    | -   | O  | -  | +    | O   | +    | -  | -  | O      | +             | +             |
| Anisole (methoxybenzene) – pure        | C <sub>6</sub> H <sub>5</sub> OCH <sub>3</sub>                                    | O   | O    | -              | +    | -  | +    |      | -   | -  | +  |      | +   |      | +  | +  | +      | +             | +             |
| Anone (cyclohexanone) – pure           | C <sub>6</sub> H <sub>10</sub> O  | -   | -    | -              | +    | -  | +    | +    | -   | -  | +  | +    | +   | +    | O  | O  | O      | +             | +             |
| Anthracene oil – pure                  |   | -   | -    | -              | +    | -  | +    |      | -   | -  | +  |      |     |      | +  | +  | +      | +             | +             |
| Anthraquinone sulphonic acid – aqueous | C <sub>6</sub> H <sub>4</sub> COCOC <sub>6</sub> H <sub>4</sub> SO <sub>3</sub> H | O   | +    | +              | +    | +  | +    | O    | +   | +  | O  |      |     |      | O  | O  | O      | O             | O             |
| Antimony chloride – aqueous            | SbCl <sub>3</sub>   | O   | +    | + <sup>5</sup> | +    | +  | +    |      | +   | +  | -  | +    | +   | +    | O  | O  | O      | -             | -             |
| Aqua regia                             | HNO <sub>3</sub> + HCl  | -   | -    | -              | +    | -  | +    | O    | O   | -  | -  | -    | -   | -    | -  | -  | -      | -             | -             |
| Arabic acid – aqueous                  |   | +   | +    | +              | +    | +  | +    |      | +   | +  |    |      |     |      | -  | -  | -      | +             | +             |
| Argon – pure                           | Ar  | +   | +    | +              | +    | +  | +    | +    | +   | +  | +  | +    | +   | +    | +  | +  | +      | +             | +             |
| Arsenic acid – aqueous                 | H <sub>3</sub> AsO <sub>4</sub>   | +   | +    | +              | +    | +  | +    | O    | +   | +  | O  | +    |     |      | -  | O  | -      | +             | +             |
| Arsenic trichloride – aqueous          | AsCl <sub>3</sub>   | +   | +    | +              | +    | +  | +    |      | +   | +  | -  |      |     |      | -  | -  | O      | O             | O             |
| Arsenious acid – aqueous               | H <sub>3</sub> AsO <sub>3</sub>   | +   | +    | +              | +    | +  | +    |      | +   | +  |    |      |     |      | O  | O  | -      | +             | +             |
| Arylsilicate – aqueous                 |   | O   | O    | O              | +    | O  | +    |      |     |    |    |      |     |      | +  | +  | +      | +             | +             |
| Ascorbic acid – aqueous                | C <sub>6</sub> H <sub>8</sub> O <sub>6</sub>                                      | +   | +    | +              | +    | +  | +    |      | +   | +  |    |      | +   |      | -  | -  | -      |               |               |
| Aspartic acid – aqueous                | HOOCCHNH <sub>2</sub> CH <sub>2</sub> -COOH                                       | +   | +    | +              | +    | +  | +    |      | +   | +  | +  |      | +   |      | -  | -  | O      | +             | +             |

| Name  | Formula   | NBR | EPDM | FKM | FFKM | CR | PTFE | ETFE | PVC | PP | PA | PVDF | PPS | PEEK | MS | RG | GG, GS | 1.4401/1.4571 | 1.4305/1.4104 |
|---|---|-----|------|-----|------|----|------|------|-----|----|----|------|-----|------|----|----|--------|---------------|---------------|
| B   |   |     |      |     |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| Barium chlorate – aqueous                         | Ba(ClO <sub>3</sub> ) <sub>2</sub>  | +   | +    | +   | +    | +  | +    |      | +   | +  | -  |      | +   |      | +  | +  | O      | +             | +             |
| Barium chloride – aqueous                         | BaCl <sub>2</sub>   | +   | +    | +   | +    | +  | +    | +    | +   | +  | +  | +    | +   | +    | +  | +  | O      | +             | O             |
| Barium hydroxide – aqueous                        | Ba(OH) <sub>2</sub>   | +   | +    | +   | +    | +  | +    | +    | +   | +  | O  | +    | +   |      | +  | +  | +      | +             | +             |
| Barium sulphide and polysulfide – aqueous         | BaS   | +   | +    | +   | +    | +  | +    | +    | +   | +  | -  | +    | +   | +    | O  | O  | O      | +             | +             |
| Battery acid (sulphuric acid 20%)                 | H <sub>2</sub> SO <sub>4</sub>  | O   | +    | +   | +    | O  | +    | +    | +   | +  | -  | +    | +   | O    | -  | -  | -      | +             | O             |
| Benzaldehyde – aqueous                            | C <sub>6</sub> H <sub>5</sub> CHO   | O   | +    | +   | +    | -  | +    | +    | -   | +  | O  | O    | O   | +    | O  | O  | -      | +             |               |
| Benzene – pure                                    | C <sub>6</sub> H <sub>6</sub>   | -   | -    | -   | +    | -  | +    | O    | -   | -  | +  | O    | O   | +    | O  | O  | O      | +             | +             |
| Benzenesulfonic acid – aqueous                    | C <sub>6</sub> H <sub>5</sub> SO <sub>3</sub> H   | +   | +    | +   | +    | +  | +    | +    | +   | +  |    | +    | +   | -    | O  | O  | O      | +             | +             |
| Benzidine sulphonic acids – aqueous               | NH <sub>2</sub> C <sub>6</sub> H <sub>4</sub> C <sub>6</sub> H <sub>3</sub> -SO <sub>3</sub> HNH <sub>2</sub> | +   | +    | +   | +    | +  | +    |      | +   | +  | +  |      |     |      | +  | +  | +      | +             | +             |
| Benzine – pure                                    |   | O   | -    | +   | +    | +  | +    | +    | +   | +  | O  | +    | +   | +    | +  | +  | +      | +             | +             |
| Benzoic acid – aqueous                            | C <sub>6</sub> H <sub>5</sub> COOH  | +   | +    | +   | +    | +  | +    | +    | +   | +  | -  | +    |     | +    | O  | O  | O      | +             | +             |
| Benzyl alcohol – pure                             | C <sub>6</sub> H <sub>5</sub> CH <sub>2</sub> OH  | -   | +    | O   | +    | O  | +    | +    |     | +  | O  | +    |     | +    | +  | +  | O      | +             | +             |
| Bergamot oil                                      |   | -   | -    | -   |      | -  | +    |      | -   | -  | -  | +    |     |      | O  | O  | O      | +             | +             |
| Biogas (methane) – pure                           | CH <sub>4</sub>   | +   | -    | +   | +    | -  | +    | +    | O   | O  | +  | O    | +   | +    | +  | +  | +      | +             | +             |
| Bisulphite (sodium bisulphite) – aqueous          | NaHSO <sub>3</sub>  | O   | +    | +   | +    | +  | +    | +    | +   | +  | O  | +    | +   | +    | O  | O  | -      | +             | O             |
| Borax – aqueous                                   | N <sub>2</sub> B <sub>4</sub> O <sub>7</sub>  | +   | +    | +   | +    | +  | +    | +    | +   | +  | +  | +    | +   | +    | +  | +  | O      | +             | +             |
| Boron hydrofluoric acid (fluoroboric acid) – pure | HF <sub>4</sub>   | +   | +    | +   | O    | +  | +    | +    | +   | +  | -  | +    |     |      | -  | -  | -      | -             | -             |
| Boric acid – aqueous                              | H <sub>3</sub> BO <sub>3</sub>  | +   | +    | +   | +    | +  | +    | +    | +   | +  | -  | +    |     | O    | O  | O  | O      | O             | O             |
| Brine (cooling brine)                             |   | +   | +    | +   | +    | +  | +    | +    | +   | +  | +  | +    | +   | +    | O  | O  | -      | O             | O             |

# Resistance in basic chemicals

| Name  | Formula  | NBR | EPDM | FKM | FFKM | CR | PTFE | ETFE | PVC | PP | PA | PVDF | PPS | PEEK | MS | RG | GG, GS | 1.4401/1.4571 | 1.4305/1.4104 |
|---|--|-----|------|-----|------|----|------|------|-----|----|----|------|-----|------|----|----|--------|---------------|---------------|
| Bromine (liquid) – pure                           | Br <sub>2</sub>  | -   | -    | -   | +    | -  | +    | 0    | 0   | -  | -  | +    | -   | -    | -  | 0  | 0      | 0             | 0             |
| Butadiene – pure                                  | CH <sub>2</sub> (CH) <sub>2</sub> CH <sub>2</sub>  | 0   | 0    | 0   | +    | +  | +    | +    | +   | +  | +  | +    | +   | +    | +  | 0  | 0      | +             | +             |
| Butane (gaseous and liquid) – pure                | C <sub>4</sub> H <sub>10</sub>   | +   | -    | +   | +    | +  | +    | +    | 0   | 0  | +  | +    | +   | +    | 0  | 0  | 0      | +             | +             |
| Butanediol – aqueous (10%)                        | HO(CH <sub>2</sub> ) <sub>4</sub> OH   | +   | +    | 0   | 0    | 0  | +    | +    | 0   | 0  | +  | +    | +   | +    | +  | +  | +      | +             | +             |
| Butanol (butyl alcohol) – pure                    | C <sub>4</sub> H <sub>9</sub> OH   | 0   | +    | +   | +    | 0  | +    | +    | 0   | +  | +  | +    | +   | +    | +  | +  | 0      | +             | +             |
| Butoxyl (methoxybutyl acetate) – pure             | CH <sub>3</sub> OC <sub>4</sub> H <sub>9</sub> O <sub>2</sub> CCH <sub>3</sub>                                   | +   | 0    | 0   |      | +  | +    |      | -   | +  |    |      |     |      | 0  | 0  | 0      | +             | +             |
| Butyl acetate – pure                              | CH <sub>3</sub> (CH <sub>2</sub> ) <sub>3</sub> O <sub>2</sub> CCH <sub>3</sub>                                  | -   | +    | -   | +    | -  | +    | 0    | -   | -  | +  | +    | +   | +    | 0  | +  | 0      | +             | +             |
| Butyl alcohol (butanol) – pure                    | CH <sub>3</sub> (CH <sub>2</sub> ) <sub>3</sub> OH   | 0   | +    | +   | +    | 0  | +    | +    | 0   | +  | +  | +    | +   | +    | +  | +  | 0      | +             | +             |
| Butylbenzyl phthalate – aqueous                   |  | -   | -    | -   | +    | -  | +    |      | -   | 0  | +  |      | 0   |      | +  | +  | +      | +             | +             |
| Butylene (liquid) – pure                          | H <sub>3</sub> CCH <sub>2</sub> CHCH <sub>2</sub>  | +   | 0    | +   | +    | +  | +    | +    | +   | +  | +  | +    | +   | +    | +  | +  | 0      | +             | +             |
| Butyl phthalate – pure                            | C <sub>6</sub> H <sub>4</sub> (CO) <sub>2</sub> (O(CH <sub>2</sub> ) <sub>3</sub> CH <sub>2</sub> ) <sub>2</sub> | -   | -    | -   | +    | -  | +    |      | -   | 0  | +  |      | +   |      | +  | +  | 0      | +             | +             |
| Butynediol – pure                                 | HOCH <sub>2</sub> C <sub>2</sub> CH <sub>2</sub> OH  | 0   | 0    | 0   |      | 0  | +    |      | 0   | +  | +  |      | +   | +    | +  | +  | +      | 0             | +             |
| Butyric acid – aqueous                            | H <sub>3</sub> C(CH <sub>2</sub> ) <sub>2</sub> COOH   | 0   | 0    | 0   | 0    | 0  | +    | +    | 0   | -  | 0  | +    | +   | +    | 0  | 0  | -      | +             | 0             |
| C   |  |     |      |     |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| Calcium chloride – aqueous                        | CaCl <sub>2</sub>  | +   | +    | +   | +    | +  | +    | +    | 0   | +  | 0  | +    | +   | +    | -  | -  | 0      | 0             | 0             |
| Calciumhydrogensulphite – aqueous                 | Ca(HSO <sub>3</sub> ) <sub>2</sub>   | +   | +    | +   | +    | +  | +    | +    | +   | -  |    | +    | +   | -    | -  | -  | +      | 0             | 0             |
| Calcium hydroxide (lime water) – aqueous          | Ca(OH) <sub>2</sub>  | +   | +    | +   | +    | +  | +    | +    | +   | 0  | 0  | +    | +   | -    | -  | -  | +      | +             | +             |
| Calcium hypochlorite (chlorinated lime) – aqueous | Ca(OCl) <sub>2</sub>   | -   | +    | 0   | +    | 0  | +    | +    | 0   | +  | -  | +    | -   | +    | -  | -  | 0      | 0             | 0             |
| Calcium nitrate – aqueous                         | Ca(NO <sub>3</sub> ) <sub>2</sub>  | +   | +    | +   | +    | +  | +    | +    | +   | +  | +  | +    | +   | 0    | 0  | 0  | 0      | 0             | 0             |

| Name   | Formula   | NBR | EPDM | FKM | FFKM | CR | PTFE | ETFE | PVC | PP | PA | PVDF | PPS | PEEK | MS | RG | GG, GS | 1.4401/1.4571 | 1.4305/1.4104 |
|--|---|-----|------|-----|------|----|------|------|-----|----|----|------|-----|------|----|----|--------|---------------|---------------|
| Carbitol (2-(2-ethoxyethoxy)ethanol) – pure            | CH <sub>3</sub> CH <sub>2</sub> O(CH <sub>2</sub> ) <sub>2</sub> -O(CH <sub>2</sub> ) <sub>2</sub> OH | 0   | 0    | 0   | +    | 0  | +    | +    | +   |    | +  |      | +   |      | +  | +  | +      | +             | +             |
| Carbolineum (creosote; pesticide) – pure               |   | 0   | 0    | 0   | +    | 0  | +    |      | +   | -  | +  |      |     |      | +  | +  | +      | +             | +             |
| Carbolic acid (phenol) – aqueous                       | C <sub>6</sub> H <sub>5</sub> OH  | 0   | 0    | 0   | +    | 0  | +    | +    | +   | +  | -  | +    | +   | +    | 0  | 0  | 0      | +             | +             |
| Carbon dioxide (dry) – pure                            | CO <sub>2</sub>   | +   | 0    | +   | +    | 0  | +    | +    | +   | +  | +  | +    | +   | +    | +  | +  | +      | +             | +             |
| Carbon dioxide (humid)                                 | CO <sub>2</sub>   | +   | 0    | 0   | +    | 0  | +    | +    | 0   | 0  | 0  | +    | +   | +    | 0  | 0  | 0      | +             | +             |
| Carbon disulphide – pure                               | CS <sub>2</sub>   | -   | -    | +   | +    | -  | +    | +    | -   | +  | 0  | +    | +   |      | -  | -  | -      | +             | 0             |
| Carbonic acid – aqueous                                | H <sub>2</sub> CO <sub>3</sub>  | +   | +    | +   | +    | +  | +    | +    | 0   | +  | 0  | +    | +   | +    | 0  | 0  | 0      | +             | +             |
| Carbon monoxide – pure                                 | CO  | +   | +    | +   | +    | +  | +    | +    | +   | +  | +  | +    | +   | +    | +  | +  | +      | +             | +             |
| Carbon tetrachloride – pure                            | CCl <sub>4</sub>  | -   | -    | +   | 0    | -  | +    | +    | -   | -  | +  | +    | 0   | +    | 0  | 0  | -      | +             | +             |
| Caustic potash (potassium hydroxide) – aqueous         | KOH   | -   | +    | -   | +    | 0  | +    | +    | +   | +  | 0  | -    | 0   | +    | -  | -  | 0      | +             | +             |
| Cellosolve (glycol ethyl ether) – pure                 | HO(CH <sub>2</sub> ) <sub>2</sub> OCH <sub>2</sub> CH <sub>3</sub>                                    | -   | -    | -   | +    | -  | +    | +    | -   | -  | +  | +    | +   |      | +  | +  | +      | +             | +             |
| Champhor oil – pure                                    |   | +   | -    | +   | 0    | -  | +    |      | +   | -  |    |      | 0   |      | 0  | 0  | 0      | +             | +             |
| Chloral hydrate (chloral) – aqueous                    | CCl <sub>3</sub> CH(OH) <sub>2</sub>  | -   | 0    | 0   | +    | -  | +    | +    | -   | -  | -  | -    | 0   |      | 0  | 0  | 0      | 0             | 0             |
| Chloric acid – aqueous                                 | HClO <sub>3</sub>   | -   | 0    | -   | +    | -  | +    |      | +   | -  | -  | +    |     |      | -  | -  | -      | -             | -             |
| Chlorinated lime (calcium hypochlorite) – aqueous      | Ca(OCl) <sub>2</sub>  | -   | +    | 0   | +    | 0  | +    | +    | 0   | +  | -  | +    | +   | +    | -  | -  | 0      | 0             | 0             |
| Chlorine bleaching lye (sodium hypochlorite) – aqueous | NaOCl   | -   | +    | 0   | +    | -  | +    | +    | +   | 0  | -  | 0    | -   | +    | 0  | 0  | 0      | 0             | 0             |
| Chlorine dioxide – aqueous                             | ClO <sub>2</sub>  | -   | -    | 0   | +    | -  | +    | +    | +   | 0  | -  | 0    |     |      | -  | -  | 0      | 0             | 0             |
| Chlorine (gaseous) – dry                               | Cl <sub>2</sub>   | -   | -    | 0   | +    | 0  | +    | +    | 0   | -  | -  | +    | -   | +    | -  | -  | 0      | 0             | 0             |
| Chlorine (gaseous) – humid (chlorine water)            | Cl <sub>2</sub>   | -   | -    | 0   | 0    | -  | +    | +    | 0   | -  | -  | 0    | -   | -    | -  | -  | -      | -             | -             |







# Resistance in basic chemicals

| Name                                   | Formula   | NBR | EPDM | FKM | FFKM | CR | PTFE | ETFE | PVC | PP | PA | PVDF | PPS | PEEK | MS | RG | GG, GS | 1.4401/1.4571 | 1.4305/1.4104 |
|--|---|-----|------|-----|------|----|------|------|-----|----|----|------|-----|------|----|----|--------|---------------|---------------|
| Dimethylamine – pure                   | (CH <sub>3</sub> ) <sub>2</sub> NH  | -   | O    | -   | +    | -  | +    | +    | -   | O  | -  | -    | O   |      | O  | O  | O      | +             | +             |
| Dimethylformamide (DMF) – pure         | HCON(CH <sub>3</sub> ) <sub>2</sub>   | -   | -    | -   | +    | -  | +    | O    | -   | +  | -  | -    | O   | +    | O  | O  | O      | +             | +             |
| Dimethyl sulfoxide (DMSO) – pure       | (CH <sub>3</sub> ) <sub>2</sub> SO  |     |      |     | +    |    | +    |      |     |    |    | O    | +   | O    |    |    |        |               |               |
| Di-octyl-phthalate (DOP) – pure        | C <sub>6</sub> H <sub>4</sub> (COOC <sub>8</sub> H <sub>17</sub> ) <sub>2</sub> | -   | O    | O   | +    | -  | +    | +    | -   | +  | +  | O    | +   |      | +  | +  | +      | +             | +             |
| Dioxane – pure                         | C <sub>4</sub> H <sub>8</sub> O   | -   | O    | -   | +    | -  | +    | O    | -   | -  | +  | -    | +   |      | +  | +  | +      | +             | +             |
| Diphenyl + diphenyl oxide – pure       |   | -   | -    | -   | +    | -  | +    | +    | -   | -  | +  |      | +   |      | +  | +  | +      | +             | +             |
| Dissous gas (acetylene + acetone)      | C <sub>2</sub> H <sub>2</sub> + CH <sub>3</sub> COCH <sub>3</sub>               | -   | +    | -   |      | -  | +    | +    | -   | O  | +  |      | +   |      | +  |    | +      | +             | +             |
| <b>E</b>                               |   |     |      |     |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| Essential oils                         |   | -   | -    | -   | +    | -  | +    |      | -   | -  | -  |      | O   |      | O  | O  | O      | +             | +             |
| Ethane – pure                          | CH <sub>3</sub> CH <sub>3</sub>   | +   | -    | +   | +    | +  | +    | +    | -   | -  | +  | -    | +   | +    | +  | +  | +      | +             | +             |
| Ethanedioic acid – aqueous (saturated) | HOOC <sub>2</sub> COOH  | O   | +    | +   | +    | +  | +    | +    | +   | +  | -  | +    | +   | +    | -  | -  | -      | +             | O             |
| Ethanol (ethyl alcohol) – pure         | CH <sub>3</sub> CH <sub>2</sub> OH  | O   | +    | O   | +    | +  | +    | +    | O   | +  | O  | +    | +   | +    | +  | +  | +      | +             | +             |
| Ethanolamine – pure                    | NH <sub>2</sub> CH <sub>2</sub> CH <sub>2</sub> OH                              | O   | O    | -   | +    | O  | +    |      | O   | +  | +  | O    | O   |      | -  | -  | +      | +             | +             |
| Ether (diethyl ether) – pure           | CH <sub>3</sub> CH <sub>2</sub> OCH <sub>2</sub> CH <sub>3</sub>                | -   | -    | -   | +    | -  | +    | O    | -   | -  | +  | +    | +   | +    | +  | +  | +      | +             | +             |
| Ethyl acetate – pure                   | CH <sub>3</sub> CO <sub>2</sub> CH <sub>2</sub> CH <sub>3</sub>                 | -   | O    | -   | O    | -  | +    | O    | -   | -  | O  | O    | +   | +    | -  | +  | +      | +             | +             |
| Ethyl acrylate – pure                  | CH <sub>2</sub> CHCOOC <sub>2</sub> H <sub>5</sub>                              | -   | O    | -   | +    | -  | +    |      |     |    |    | O    | +   |      |    |    | +      | +             | +             |
| Ethyl alcohol (ethanol) – pure         | CH <sub>3</sub> CH <sub>2</sub> OH  | O   | +    | O   | +    | +  | +    | +    | O   | +  | O  | +    | +   | +    | +  | +  | +      | +             | +             |
| Ethyl alcohol + acetic acid            | CH <sub>3</sub> CH <sub>2</sub> OH+<br>CH <sub>3</sub> COOH                     | O   | +    | O   | +    | O  | +    | +    | O   | +  | -  | +    | +   | +    | O  | O  | O      | +             | +             |
| Ethyl alcohol – fermented mash         |   | +   | +    | +   | +    | +  | +    | +    | +   | +  | O  | +    | +   | +    | +  | +  | O      | +             | +             |
| Ethyl alcohol – methylated (spirit)    |   | O   | O    | O   | +    | O  | +    | +    | +   | +  | O  |      | +   | +    | O  | O  | +      | +             | +             |

| Name  | Formula   | NBR | EPDM | FKM | FFKM | CR | PTFE | ETFE | PVC | PP | PA | PVDF | PPS | PEEK | MS | RG | GG, GS | 1.4401/1.4571 | 1.4305/1.4104 |
|---|---|-----|------|-----|------|----|------|------|-----|----|----|------|-----|------|----|----|--------|---------------|---------------|
| Ethylbenzene – pure                               | C <sub>6</sub> H <sub>5</sub> CH <sub>2</sub> CH <sub>3</sub>   | -   | -    | O   | +    | -  | +    | O    | -   | -  | +  | +    | O   |      | +  | +  | +      | +             | +             |
| Ethyl chloride – pure                             | CH <sub>3</sub> CH <sub>2</sub> Cl                              | +   | +    | +   | +    | +  | +    | +    | -   | -  | +  | +    | O   |      | -  | -  | -      | +             | +             |
| Ethylene – pure                                   | CH <sub>2</sub> CH <sub>2</sub>                                 | +   | -    | +   | +    | -  | +    |      | +   | +  | +  | +    | +   | +    | +  | +  | +      | +             | +             |
| Ethylene bromide (anhydrous) – pure               | CH <sub>2</sub> CHBr  | -   | -    | -   | +    | -  | +    | +    | -   | -  | +  | +    | O   | -    | +  | +  | O      | +             | +             |
| Ethylene chlorohydrin (chloroethanol) – pure      | ClCH <sub>2</sub> CH <sub>2</sub> OH                            | -   | -    | O   | +    | -  | +    | +    | -   | +  | O  | +    | O   | O    | +  | +  | +      | +             | +             |
| Ethylene chloride (dichloroethane) – pure         | ClCH <sub>2</sub> CH <sub>2</sub> Cl                            | -   | -    | -   | +    | -  | +    | +    | -   | -  | +  | +    | O   | +    | -  | -  | -      | +             | -             |
| Ethylenediamine – pure                            | NH <sub>2</sub> CH <sub>2</sub> CH <sub>2</sub> NH <sub>2</sub> | O   | +    | O   | O    | +  | +    | +    | -   | +  | O  | +    | O   |      | -  | -  | O      | +             | O             |
| Ethylene glycol (glycol) – pure                   | HOCH <sub>2</sub> CH <sub>2</sub> OH                            | +   | +    | +   | +    | +  | +    | +    | +   | +  | O  | +    | +   | +    | O  | O  | O      | +             | +             |
| Ethylene oxide – pure                             | CH <sub>2</sub> CH <sub>2</sub> O                               | -   | -    | -   | O    | -  | +    | +    | -   | -  | +  |      |     |      | -  | -  | -      | +             | +             |
| Ethyl formate – pure                              | HCOOCH <sub>2</sub> CH <sub>3</sub>                             | -   | O    | -   | +    | -  | +    |      | -   | O  | +  | +    | +   |      | +  | +  | O      | +             | +             |
| Exhaust fumes – containing hydrogen fluoride      |   | +   | +    | +   | +    | +  | +    |      | +   | +  | O  | +    | -   | -    | O  | O  | O      | O             | O             |
| Exhaust fumes – containing carbon dioxide         |   | +   | +    | +   | +    | +  | +    |      | +   | +  | +  | +    | +   | +    | +  | +  | O      | +             | O             |
| Exhaust fumes – containing carbon monoxide        |   | +   | +    | +   | +    | +  | +    |      | +   | +  | +  | +    | +   | +    | +  | +  | +      | +             | +             |
| Exhaust fumes – containing nitrous gases          |   | O   | +    | +   | +    | +  | +    |      | +   | +  | -  | +    |     | +    | -  | -  | O      | +             | +             |
| Exhaust fumes – containing hydrochloric acid      |   | +   | +    | +   | +    | +  | +    |      | +   | +  | -  | +    | -   | O    | O  | O  | -      | O             | -             |
| Exhaust fumes – containing sulphur dioxide (dry)  |   | O   | +    | +   | +    | +  | +    |      | +   | +  | O  | +    | +   | +    | +  | +  | +      | +             | +             |
| Exhaust fumes – containing sulphuric acid (humid) |   | O   | +    | +   | +    | +  | +    |      | +   | +  | -  | +    | O   | -    | -  | -  | -      | +             | O             |
| Exhaust fumes – containing sulphur trioxide (dry) |   | O   | +    | +   | +    | +  | +    |      | +   | +  | +  | +    |     | +    | O  | O  | O      | +             | +             |

# Resistance in basic chemicals

| Name   | Formula  | NBR | EPDM | FKM | FFKM | CR | PTFE | ETFE | PVC | PP | PA | PVDF | PPS | PEEK | MS | RG | GG, GS | 1.4401/1.4571 | 1.4305/1.4104 |   |
|--|--|-----|------|-----|------|----|------|------|-----|----|----|------|-----|------|----|----|--------|---------------|---------------|---|
| <b>F</b>   |  |     |      |     |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |   |
| Fatty alcohols                                     |  | +   | O    | +   | +    | +  | +    | +    | +   | O  | +  | +    | +   | +    | +  | +  | O      | +             | O             |   |
| Fatty alcohol sulphates (sulphated fats) – aqueous |  | +   | O    | +   | +    | +  | +    | +    | +   | +  | O  | +    | +   | +    | +  | O  | O      | O             | +             | + |
| Ferric chloride – aqueous (saturated)              | FeCl <sub>3</sub>                                    | +   | +    | +   | +    | +  | +    | +    | +   | +  | -  | +    | +   | +    | -  | -  | -      | -             | -             |   |
| Fluorine (dry) – pure                              | F <sub>2</sub>                                       | -   | -    | O   | O    | -  | O    | O    | O   | -  | -  | -    | -   | -    | O  | O  | -      | +             | +             |   |
| Fluorine (humid) – pure                            | F <sub>2</sub>                                       | -   | -    | -   | -    | -  | +    | O    | O   | -  | -  | O    | -   | -    | -  | -  | -      | O             | O             |   |
| Fluoroboric acid (boron hydrofluoric acid)         | HF <sub>4</sub>                                      | +   | +    | +   | O    | +  | +    | +    | +   | +  | -  | +    | O   | -    | -  | -  | -      | -             | -             |   |
| Fluosilicic acid – aqueous                         | H <sub>2</sub> SiF <sub>6</sub>                      | O   | O    | O   | +    | O  | +    | +    | +   | +  | -  | +    | -   | -    | -  | -  | -      | O             | O             |   |
| Formaldehyde solution (formalin) – aqueous         | CH <sub>2</sub> O                                    | O   | O    | O   | +    | O  | +    | +    | +   | +  | +  | +    | O   | O    | -  | +  | -      | +             | +             |   |
| Formamide – pure                                   | HCONH <sub>2</sub>                                   | +   | +    | O   | O    | +  | +    | +    | +   | O  | O  | +    | O   | O    | O  | O  | O      | +             | O             |   |
| Formic acid – pure                                 | HCOOH  | -   | O    | -   | O    | O  | +    | +    | O   | O  | -  | O    | O   | O    | -  | -  | -      | +             | O             |   |
| Formic acid – aqueous                              | HCOOH  | -   | O    | O   | O    | O  | +    | +    | O   | O  | -  | O    | O   | +    | -  | -  | -      | +             | O             |   |
| Frigene 12 (R-12) – pure                           | CCl <sub>2</sub> F <sub>2</sub>                      | +   | -    | O   | O    | O  | +    | +    | O   | O  | +  | O    | O   | +    | +  | +  | +      | +             | +             |   |
| Frigene 13 (R-13) – pure                           | CClF <sub>3</sub>                                    | +   | -    | O   | O    | +  | +    | +    | -   | -  | -  | +    | +   | +    | +  | +  | O      | +             | +             |   |
| Frigene 13 B 1 (R-13B1; halon 1301) – pure         | CBrF <sub>3</sub>                                    | +   | -    | O   | +    | +  | +    | +    | -   | -  | +  | O    | +   | +    | +  | +  | +      | +             | +             |   |
| Frigene 22 (R-22) – pure                           | CHClF <sub>2</sub>                                   | -   | -    | -   | O    | -  | +    | +    | -   | -  | +  | -    | +   | +    | +  | +  | +      | +             | +             |   |
| Frigene 23 (R-23) – pure                           | CHF <sub>3</sub>                                     | +   | -    | O   | -    | +  | +    | +    | -   | -  | +  | O    | +   | +    | +  | +  | O      | +             | +             |   |
| Frigene 113 (R-113) – pure                         | Cl <sub>2</sub> FC <sub>2</sub> CF <sub>2</sub>      | +   | -    | -   | -    | +  | +    | O    | -   | -  | +  | +    | O   | +    | +  | +  | +      | +             | +             |   |
| Frigene 502 (R-502) – pure                         | C <sub>2</sub> F <sub>5</sub> Cl+CHF <sub>2</sub> Cl | -   | -    | -   | O    | O  | +    | +    | +   | O  | +  | O    | +   | +    | +  | +  | +      | +             | +             |   |

| Name  | Formula  | NBR | EPDM | FKM            | FFKM | CR | PTFE | ETFE | PVC | PP | PA | PVDF | PPS | PEEK | MS | RG | GG, GS | 1.4401/1.4571 | 1.4305/1.4104 |
|---|--|-----|------|----------------|------|----|------|------|-----|----|----|------|-----|------|----|----|--------|---------------|---------------|
| Frigene substitute HFCKW 123 (R-123) – pure   | F <sub>3</sub> CCHCl <sub>2</sub>                                  | -   | -    | -              | -    | -  | +    | +    | +   | +  | +  | +    | +   | +    | +  | +  | +      | +             | +             |
| Frigene substitute HFCKW 134a (R-134a) – pure | F <sub>3</sub> CCH <sub>2</sub> F                                  | -   | -    | -              | -    | -  | +    | +    | +   | +  | +  | +    | +   | +    | +  | +  | +      | +             | +             |
| <b>G</b>                                      |  |     |      |                |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| Glycerine – aqueous                           | HOCH <sub>2</sub> CH(OH)-CH <sub>2</sub> OH                        | +   | +    | +              | +    | +  | +    | +    | O   | O  | +  | +    | +   | +    | O  | O  | O      | +             | O             |
| Glycerine – pure                              | HOCH <sub>2</sub> CH(OH)-CH <sub>2</sub> OH                        | O   | +    | +              | +    | O  | +    | +    | O   | O  | +  | +    | +   | +    | O  | O  | O      | +             | O             |
| Glycol – aqueous                              | HOCH <sub>2</sub> CH <sub>2</sub> OH                               | +   | +    | +              | +    | +  | +    | +    | +   | +  | O  | +    | +   | +    | O  | O  | O      | +             | +             |
| Glycol ethyl ether (cellosolve) – pure        | HO(CH <sub>2</sub> ) <sub>2</sub> OCH <sub>2</sub> CH <sub>3</sub> | -   | -    | -              | +    | -  | +    | +    | -   | -  | +  | +    | +   | +    | +  | +  | +      | +             | +             |
| Glycolic acid – aqueous                       | HOCH <sub>2</sub> COOH   | +   | +    | +              | +    | +  | +    | +    | +   | +  | -  | +    | +   | +    | O  | O  | O      | O             | O             |
| <b>H</b>                                      |  |     |      |                |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| Helium – pure                                 | He   | +   | +    | +              | +    | +  | +    | +    | +   | +  | +  | +    | +   | +    | O  | O  | O      | +             | +             |
| Heptane, hexane (benzine) – pure              |  | +   | -    | +              | +    | O  | +    | +    | +   | O  | +  | +    | +   | +    | +  | +  | +      | +             | +             |
| Hexamethylene tetramine (Urotropin) – aqueous | C <sub>6</sub> H <sub>12</sub> N <sub>4</sub>                      | +   | +    | +              | +    | +  | +    | +    | +   | +  | +  | +    | +   | O    | O  | O  | O      | +             | +             |
| Humic acids                                   |  | +   | +    | +              | +    | +  | +    | +    | +   | +  | -  | +    | +   | +    | +  | +  | +      | +             | +             |
| Hydrazine hydrate – aqueous                   | NH <sub>2</sub> NH <sub>2</sub> * 2H <sub>2</sub> O                | -   | +    | +              | +    | -  | +    | +    | +   | -  | O  | +    | +   | +    | -  | -  | -      | -             | O             |
| Hydrobromid acid – aqueous                    | HBr  | -   | +    | +              | +    | O  | +    | +    | +   | +  | -  | +    | -   | -    | -  | -  | -      | O             | -             |
| Hydrochloric acid – aqueous (36%)             | HCl  | -   | O    | + <sup>5</sup> | +    | -  | +    | +    | +   | +  | -  | +    | -   | O    | -  | -  | -      | O             | O             |
| Hydrocyanic acid – aqueous                    | HCN  | O   | O    | +              | +    | +  | +    | +    | +   | +  | -  | +    | +   | +    | +  | +  | +      | +             | O             |
| Hydrofluoric acid – aqueous                   | HF   | -   | -    | -              | -    | -  | +    | +    | O   | O  | -  | +    | -   | -    | -  | -  | -      | O             | -             |
| Hydrogen chloride gas – pure                  | HCl  | O   | +    | +              | +    | O  | +    | +    | +   | +  | -  | +    | -   | +    | -  | -  | -      | +             | O             |

# Resistance in basic chemicals

| Name                                      | Formula  | NBR | EPDM | FKM            | FFKM | CR | PTFE | ETFE | PVC | PP | PA | PVDF | PPS | PEEK | MS | RG | GG, GS | 1.4401/1.4571 | 1.4305/1.4104 |
|---|--|-----|------|----------------|------|----|------|------|-----|----|----|------|-----|------|----|----|--------|---------------|---------------|
| Hydrogen peroxide 0.5%                    | H <sub>2</sub> O <sub>2</sub>  | O   | +    | +              | +    | +  | +    | +    | -   | -  | +  | +    | O   | +    | -  | -  | -      | +             | O             |
| Hydrogen peroxide 30%                     | H <sub>2</sub> O <sub>2</sub>  | -   | O    | + <sup>5</sup> | +    | -  | +    | +    | -   | -  | -  | +    | O   | +    | -  | -  | -      | O             | -             |
| Hydrogen – pure                           | H <sub>2</sub>   | +   | +    | +              | +    | +  | +    | +    | +   | +  | +  | +    | +   | +    | +  | +  | +      | +             | +             |
| Hydrogen sulphide – aqueous               | H <sub>2</sub> S   | O   | +    | -              | O    | O  | +    | +    | O   | O  | -  | +    | O   | +    | O  | O  | O      | +             | +             |
| Hydroquinone – aqueous                    | C <sub>6</sub> H <sub>4</sub> (OH) <sub>2</sub>  | +   | +    | +              | +    | O  | +    |      | +   | +  | -  | +    | O   |      |    |    | O      | O             | +             |
| Hydroxylamine sulphate – aqueous          | (NH <sub>2</sub> OH) <sub>2</sub> SO <sub>4</sub>  | +   | +    | +              | +    | O  | +    |      | +   | +  | +  |      |     |      | -  | -  | +      | +             | +             |
| I   |  |     |      |                |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| Illuminating gas (town gas, grid gas)     |  | +   | +    | +              | +    | +  | +    | +    | +   |    | +  | +    |     |      | +  | +  | +      | +             | +             |
| Inert gases – pure                        |  | +   | +    | +              | +    | +  | +    | +    | +   | +  | +  | +    | +   | +    | O  | O  | O      | O             | +             |
| Iodine + potassium iodine – aqueous       | I <sub>2</sub> + KI  | O   | O    | O              | +    | O  | +    |      | O   | O  | -  | +    | -   | O    | -  | -  | O      | O             | O             |
| Iron sulphate – aqueous                   | FeSO <sub>4</sub>  | +   | +    | +              | +    | +  | +    | +    | +   | +  | +  | +    | +   | O    | O  | -  | +      | +             | +             |
| Isobutanol – pure                         | (CH <sub>3</sub> ) <sub>2</sub> CHCH <sub>2</sub> OH   | O   | +    | +              | +    | +  | +    | +    | -   | +  | +  | +    | +   | +    | +  | +  | +      | +             | +             |
| Isooctane – pure                          | CH <sub>3</sub> C(CH <sub>2</sub> ) <sub>2</sub> CH <sub>2</sub> CH<br>(CH <sub>3</sub> )CH <sub>3</sub> | +   | -    | +              | +    | +  | +    | +    | +   | +  | +  | +    | +   | +    | +  | +  | +      | +             | +             |
| Isopropanol (2-propanol) – pure           | CH <sub>3</sub> CH(OH)CH <sub>3</sub>  | O   | +    | +              | +    | +  | +    | +    | +   | +  | O  | +    | +   | +    | +  | +  | +      | +             | +             |
| K   |  |     |      |                |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| Kerosene (petroleum benzene)              |  | +   | -    | +              | +    | +  | +    | +    | +   | O  | +  | +    | +   | +    | +  | +  | O      | +             | +             |
| L   |  |     |      |                |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| Lactic acid – aqueous                     | HOOCCH(OH)CH <sub>3</sub>  | O   | O    | + <sup>5</sup> | +    | +  | +    | +    | O   | +  | O  | +    | +   | +    | O  | O  | O      | O             | O             |
| Laughing gas (dinitrogen monoxide) – pure | N <sub>2</sub> O   | +   | +    | +              | +    | +  | +    | +    | +   | +  | +  | +    | +   | +    | +  | +  | +      | +             | +             |

| Name  | Formula   | NBR | EPDM | FKM | FFKM | CR | PTFE | ETFE | PVC | PP | PA | PVDF | PPS | PEEK | MS | RG | GG, GS | 1.4401/1.4571 | 1.4305/1.4104 |
|---|---|-----|------|-----|------|----|------|------|-----|----|----|------|-----|------|----|----|--------|---------------|---------------|
| Lead acetate – aqueous                      | Pb(CH <sub>3</sub> COO) <sub>2</sub>              | O   | +    | +   | +    | +  | +    | +    | +   | +  | +  | +    | +   | +    | O  | O  | -      | +             | +             |
| Lead nitrate – aqueous                      | Pb(NO <sub>3</sub> ) <sub>2</sub>                 | +   | +    | +   | +    | +  | +    | +    | +   | +  |    |      | +   |      | -  | -  | O      | +             | +             |
| Lead tetraethyl (tetraethyl lead) – pure    | Pb(CH <sub>2</sub> CH <sub>3</sub> ) <sub>4</sub> | O   | O    | +   | +    | O  | +    | +    | +   | +  | +  | +    |     |      | O  | O  | +      | +             | +             |
| Light petroleum, petroleum spirit           |   | +   | -    | +   | +    | +  | +    | +    | +   | O  | +  | +    | +   | +    | +  | +  | O      | +             | +             |
| Linoleic acid – pure                        | C <sub>18</sub> H <sub>32</sub> O                 | O   | -    | O   | +    | -  | +    |      | +   | -  |    | +    | +   |      | O  | O  | O      | +             | O             |
| Liquid ammonia (ammonia solution) – aqueous | NH <sub>4</sub> OH                                | -   | +    | -   | +    | +  | +    | +    | +   | -  | +  | +    | O   | +    | -  | -  | +      | +             | +             |
| Lithium chloride – aqueous                  | LiCl  | +   | +    | +   | +    | O  | +    | +    | +   | +  | O  | +    | +   |      | O  | O  | O      | O             | O             |
| M   |   |     |      |     |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| Magnesium chloride – aqueous                | MgCl <sub>2</sub>                                 | +   | +    | +   | +    | +  | +    | +    | +   | +  | O  | +    | +   | +    | O  | O  | O      | O             | O             |
| Magnesium sulphate – aqueous                | MgSO <sub>4</sub>                                 | +   | +    | +   | +    | +  | +    | +    | O   | O  | O  | +    | +   | +    | +  | +  | -      | +             | +             |
| Maleic acid – aqueous                       | HOOCCHCHCOOH                                      | +   | +    | +   | +    | +  | +    | +    | +   | +  | O  | +    | +   | +    | O  | O  | O      | +             | O             |
| Malic acid – aqueous                        | HOOCCH <sub>2</sub> CHOH-COOH                     | +   | +    | +   | +    | +  | +    |      | +   | +  | +  | +    | +   |      | -  | -  | -      | +             | +             |
| Manganese chloride – aqueous                | MnCl <sub>2</sub>                                 | +   | +    | +   | +    | +  | +    |      | +   | +  | +  |      | +   |      | O  | O  | O      | O             | O             |
| Manganese sulphate – aqueous                | MnSO <sub>4</sub>                                 | +   | +    | +   | +    | +  | +    |      | +   | +  | +  | +    | +   |      | O  | +  | O      | +             | O             |
| Mercaptane                                  |   | -   | -    | O   | +    | -  | +    |      | +   |    | +  | O    |     |      | O  | O  | -      | +             | +             |
| Mercury – pure                              | Hg  | +   | +    | +   | +    | +  | +    | +    | +   | +  | +  | +    | +   | +    | -  | -  | +      | O             | +             |
| Mercury chloride – aqueous                  | HgCl <sub>2</sub>                                 | +   | +    | +   | +    | +  | +    |      | O   | +  | -  | +    | +   | +    | -  | -  | -      | O             | O             |
| Mercury salts – aqueous                     |   | +   | +    | +   | +    | +  | +    | +    | +   | +  | -  | +    | +   | +    | -  | -  | -      | +             | +             |
| Methane – pure                              | CH <sub>4</sub>                                   | +   | -    | +   | +    | -  | +    | +    | O   | O  | +  | O    | +   | +    | +  | +  | +      | +             | +             |

## Resistance in basic chemicals

| Name   | Formula   | NBR | EPDM | FKM            | FFKM | CR | PTFE | ETFE | PVC | PP | PA | PVDF | PPS | PEEK | MS | RG | GG, GS | 1.4401/1.4571 | 1.4305/1.4104 |
|--|---|-----|------|----------------|------|----|------|------|-----|----|----|------|-----|------|----|----|--------|---------------|---------------|
| Methanol (methyl alcohol) – pure                         | CH <sub>3</sub> OH  | -   | +    | -              | +    | +  | +    | +    | +   | 0  | 0  | 0    | +   | +    | 0  | 0  | 0      | +             | 0             |
| Methoxybutanol – pure                                    | CH <sub>3</sub> O(CH <sub>2</sub> ) <sub>3</sub> CH <sub>2</sub> OH | +   | +    | +              | +    | 0  | +    |      | +   | +  |    |      | +   |      | +  | +  | +      | +             | +             |
| Methyl acetate – pure                                    | CH <sub>3</sub> COOCH <sub>3</sub>                                  | -   | 0    | -              | +    | -  | +    | 0    | -   | +  | +  | 0    | +   | +    | 0  | +  | 0      | 0             | 0             |
| Methyl alcohol (methanol) – pure                         | CH <sub>3</sub> OH  | -   | +    | -              | +    | +  | +    | +    | +   | 0  | 0  | 0    | +   | +    | 0  | 0  | 0      | +             | 0             |
| Methylamine – aqueous                                    | CH <sub>3</sub> NH <sub>2</sub>                                     | -   | 0    | 0              | -    | 0  | +    | +    | 0   | +  | 0  | -    | 0   | +    | -  | -  | 0      | 0             | 0             |
| Methyl chloride (chloromethane) – pure                   | CH <sub>3</sub> Cl  | -   | -    | +              | +    | -  | +    | +    | -   | -  | 0  | -    | 0   | +    | +  | +  | -      | +             | +             |
| Methylene chloride (dichloromethane) – pure              | CH <sub>2</sub> Cl <sub>2</sub>                                     | -   | -    | 0              | +    | -  | +    | 0    | -   | -  | -  | -    | 0   | 0    | +  | +  | -      | +             | +             |
| Methyl ethyl ketone (2-butanon) – pure                   | CH <sub>3</sub> COCH <sub>2</sub> CH <sub>3</sub>                   | -   | 0    | -              | +    | -  | +    | +    | -   | -  | 0  | -    | 0   | 0    | +  | +  | 0      | +             | +             |
| Mine gas (methane)                                       | CH <sub>4</sub>   | +   | -    | +              | +    | -  | +    | +    | +   | +  | +  | +    | +   | +    | +  | +  | +      | +             | +             |
| Monosodium glutamate – aqueous                           | C <sub>5</sub> H <sub>8</sub> NNaO <sub>4</sub>                     | +   | +    | +              | +    | +  | +    | +    | +   | +  |    |      |     |      |    |    | 0      | +             | +             |
| Morpholine – pure  | C <sub>4</sub> H <sub>9</sub> NO                                    | -   | 0    | 0              | 0    | 0  | +    | +    | -   | +  |    | +    | 0   |      | +  | +  | +      | +             | +             |
| N  |   |     |      |                |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| Natural gas  |   | +   | -    | +              | +    | +  | +    | +    | 0   | 0  | +  | +    | +   | +    | 0  | 0  | 0      | +             | +             |
| Nickel sulphate – aqueous                                | NiSO <sub>4</sub>   | +   | +    | +              | +    | +  | +    | +    | +   | +  | +  | +    | +   | +    | -  | 0  | -      | 0             | 0             |
| Nitrogen oxides (nitrous fumes)                          | NO, NO <sub>2</sub> , N <sub>2</sub> O <sub>3</sub> ...             | -   | -    | -              | 0    | -  | +    | 0    | -   | -  | -  | 0    | 0   | +    | -  | -  | -      | 0             | -             |
| Nitrogen – pure  | N <sub>2</sub>  | +   | +    | +              | +    | +  | +    | +    | +   | +  | +  | +    | +   | +    | +  | +  | +      | +             | +             |
| Nitrous oxide (laughing gas, dinitrogen monoxide) – pure | N <sub>2</sub> O  | +   | +    | +              | +    | +  | +    | +    | +   | +  | +  | +    | +   | +    | +  | +  | +      | +             | +             |
| Nitric acid – aqueous (40%)                              | HNO <sub>3</sub>  | -   | -    | + <sup>5</sup> | +    | -  | +    | 0    | 0   | 0  | -  | +    | -   | 0    | -  | -  | -      | +             | -             |
| Nitrobenzene – pure                                      | C <sub>6</sub> H <sub>5</sub> NO <sub>2</sub>                       | -   | -    | 0              | +    | -  | +    | +    | -   | 0  | -  | 0    | 0   | 0    | +  | +  | 0      | +             | +             |

| Name  | Formula  | NBR | EPDM | FKM            | FFKM | CR | PTFE | ETFE | PVC | PP | PA | PVDF | PPS            | PEEK | MS | RG | GG, GS | 1.4401/1.4571 | 1.4305/1.4104 |
|---|--|-----|------|----------------|------|----|------|------|-----|----|----|------|----------------|------|----|----|--------|---------------|---------------|
| Nitrobenzoic acids – aqueous                    | C <sub>7</sub> H <sub>5</sub> NO <sub>4</sub>                      | +   | +    | +              | +    | +  | +    |      | +   | +  | +  |      | +              |      | +  | +  | 0      | +             | +             |
| Nitrous fumes (nitrogen oxides) (humid and dry) | (NO, NO <sub>2</sub> , N <sub>2</sub> O <sub>4</sub> )             | -   | 0    | -              | 0    | -  | +    |      | 0   | 0  | -  | 0    |                | +    | -  | -  | -      | +             | +             |
| Nitrotoluenes (o-, m-, p) – pure                | C <sub>6</sub> H <sub>4</sub> (NO <sub>2</sub> )(CH <sub>3</sub> ) | 0   | -    | 0              | 0    | -  | +    |      | -   | +  | -  | +    | 0              | 0    | +  | +  | +      | +             | +             |
| O   |  |     |      |                |      |    |      |      |     |    |    |      |                |      |    |    |        |               |               |
| Oleum (fuming sulphuric acid) – pure            | H <sub>2</sub> SO <sub>4</sub>                                     | -   | -    | 0              | +    | -  | +    | +    | 0   | 0  | -  | -    | 0              | -    | -  | -  | 0      | +             | 0             |
| Oxygen – pure                                   | O <sub>2</sub>   | 0   | 0    | + <sup>6</sup> | +    | 0  | +    | +    | 0   | -  | +  | -    | + <sup>6</sup> | +    | +  | +  | -      | +             | +             |
| Ozone (humid and dry)                           | O <sub>3</sub>   | -   | 0    | 0              | 0    | -  | +    | +    | +   | -  | -  | +    | -              | 0    | 0  | 0  | 0      | +             | +             |
| P   |  |     |      |                |      |    |      |      |     |    |    |      |                |      |    |    |        |               |               |
| Paraffin oil (mineral oil)                      |  | +   | -    | +              | +    | 0  | +    | +    | 0   | +  | +  | +    | +              | +    | +  | +  | +      | +             | +             |
| Peracetic acid – aqueous (6%)                   | CH <sub>3</sub> CO <sub>3</sub> H                                  | -   | 0    | -              | +    |    | +    |      | +   |    | -  | 0    | -              | -    | -  | -  | -      | +             | +             |
| Perchloroethylene (tetrachloroethylene) – pure  | Cl <sub>2</sub> CCCl <sub>2</sub>                                  | -   | -    | 0              | 0    | -  | +    | +    | -   | -  | 0  | +    | 0              | +    | 0  | 0  | 0      | +             | +             |
| Peroxomonosulphuric acid – aqueous              | H <sub>2</sub> SO <sub>5</sub>                                     | -   | -    | -              |      | -  | +    |      | +   | -  | -  |      |                |      | -  | -  | -      | -             | -             |
| Phenol (hydroxybenzene) – aqueous               | C <sub>6</sub> H <sub>5</sub> OH                                   | 0   | 0    | 0              | +    | 0  | +    | +    | +   | +  | -  | 0    | +              | 0    | 0  | 0  | 0      | +             | +             |
| Phosgene (carbonyl chloride) [liquid] – pure    | COCl <sub>2</sub>  |     | -    | 0              | +    | -  | +    |      | 0   | 0  | 0  |      |                |      | +  | +  | +      | +             | +             |
| Phosgene (carbonylchloride) [gaseous] – pure    | COCl <sub>2</sub>  |     | -    | +              | +    | -  | +    | +    | +   | -  | 0  | +    |                |      | +  | +  | +      | +             | +             |
| Phosphoric acid – aqueous                       | H <sub>3</sub> PO <sub>4</sub>                                     | 0   | 0    | +              | +    | -  | +    | +    | +   | +  | -  | +    | +              | +    | -  | -  | -      | +             | -             |
| Phosphorus chlorides – pure                     | PCl <sub>2</sub> , PCl <sub>3</sub> , PCl <sub>5</sub>             | -   | -    | 0              | +    | -  | +    | +    | -   | +  | -  | +    |                | +    |    | 0  | 0      | 0             | 0             |
| Picric acid (trinitrophenol) – pure             | C <sub>6</sub> H <sub>2</sub> (OH)(NO <sub>2</sub> ) <sub>3</sub>  | 0   | -    | 0              | +    | -  | +    | +    | -   | +  |    | +    |                | +    | +  | +  | +      | +             | +             |



# Resistance in basic chemicals

| Name   | Formula  | NBR | EPDM | FKM | FFKM | CR | PTFE | ETFE | PVC | PP | PA | PVDF | PPS | PEEK | MS | RG | GG, GS | 1.4401/1.4571 | 1.4305/1.4104 |
|--|--|-----|------|-----|------|----|------|------|-----|----|----|------|-----|------|----|----|--------|---------------|---------------|
| Sodium bicarbonate (sodium hydrogen carbonate) – aqueous | NaHCO <sub>3</sub>                                 | +   | +    | +   | +    | +  | +    | +    | +   | +  | +  | +    | +   | +    | O  | +  | O      | +             | +             |
| Sodium bisulphate (sodium hydrogen sulphate) – aqueous   | NaHSO <sub>4</sub>                                 | +   | +    | +   | +    | +  | +    | +    | +   | +  | +  | +    |     |      | O  | O  | O      | O             | O             |
| Sodium bisulphite (sodium hydrogen sulphide) – aqueous   | NaHSO <sub>3</sub>                                 | O   | +    | +   | +    | +  | +    | +    | +   | +  | +  | +    |     | +    | O  | O  | -      | +             | O             |
| Sodium bromate – aqueous                                 | NaBrO <sub>3</sub>                                 | +   | +    | +   | +    | +  | +    | +    | +   | +  | O  | +    | +   | +    | -  | O  | O      | +             | O             |
| Sodium bromide – aqueous                                 | NaBr   | +   | +    | +   | +    | +  | +    | +    | +   | +  | -  | +    | +   | +    | O  | O  | O      | O             | O             |
| Sodium carbonate (soda) – aqueous                        | Na <sub>2</sub> CO <sub>3</sub>                    | +   | +    | +   | +    | O  | +    | +    | +   | +  | +  | O    | +   | +    | O  | O  | O      | +             | +             |
| Sodium chlorate – aqueous                                | NaClO <sub>3</sub>                                 | O   | O    | O   | +    | O  | +    | +    | +   | +  | O  | +    | -   | +    | O  | O  | O      | O             | O             |
| Sodium chloride (table salt) – aqueous                   | NaCl   | +   | +    | +   | +    | +  | +    | +    | +   | +  | +  | +    | +   | +    | -  | O  | -      | O             | O             |
| Sodium chlorite – aqueous                                | NaClO <sub>2</sub>                                 | -   | O    | O   | +    | -  | +    | +    | O   | O  | -  | +    |     |      | O  | O  | -      | O             | -             |
| Sodium chloroacetate – aqueous                           | NaCH <sub>2</sub> ClCOO                            | +   | +    | +   | +    | +  | +    |      | +   | +  |    |      |     |      | O  | +  | O      | +             | +             |
| Sodium chromate – aqueous                                | NaCrO <sub>4</sub>                                 | O   | +    | O   | +    | O  | +    | +    | +   | +  | -  | +    | +   | O    | +  | +  | O      | O             | O             |
| Sodium cyanide – aqueous                                 | NaCN   | +   | +    | +   | +    | +  | +    | +    | +   | +  | +  | +    |     | +    | -  | -  | O      | +             | +             |
| Sodium dodecylbenzenesulfonate – aqueous                 | C <sub>18</sub> H <sub>29</sub> NaO <sub>3</sub> S | +   | +    | +   |      | +  | +    |      | +   | O  | +  |      |     |      | O  | O  | O      | +             | +             |
| Sodium fluoride – aqueous                                | NaF  | +   | +    | +   | +    | +  | +    | +    | +   | +  | +  | +    |     |      | +  | +  | O      | +             | O             |
| Sodium hydrogen carbonate (sodium bicarbonate) – aqueous | NaHCO <sub>3</sub>                                 | +   | +    | +   | +    | +  | +    | +    | +   | +  | +  | +    | +   | +    | O  | +  | O      | +             | +             |
| Sodium hydroxide (soda lye) – aqueous                    | NaOH   | -   | +    | -   | +    | +  | +    | O    | +   | +  | +  | -    | O   | O    | -  | -  | O      | O             | O             |
| Sodium hypochlorite (chlorine bleaching lye) – aqueous   | NaOCl  | -   | O    | +   | +    | -  | +    | +    | +   | O  | -  | O    | -   | +    | O  | O  | O      | O             | O             |
| Sodium iodide – aqueous                                  | NaI  | +   | +    | +   | +    | +  | +    | +    | O   | +  |    | +    | O   |      | O  | O  | O      | O             | O             |
| Sodium mercaptobenzothiazole – pure                      | C <sub>7</sub> H <sub>5</sub> NS <sub>2</sub>      | O   | O    | +   | +    | O  | +    |      | +   | +  |    |      |     |      | +  | +  | +      | +             | +             |

| Name  | Formula  | NBR | EPDM | FKM | FFKM | CR | PTFE | ETFE | PVC | PP | PA | PVDF | PPS | PEEK | MS | RG | GG, GS | 1.4401/1.4571 | 1.4305/1.4104 |
|---|--|-----|------|-----|------|----|------|------|-----|----|----|------|-----|------|----|----|--------|---------------|---------------|
| Sodium metabisulphite (sodium disulphite) – aqueous | Na <sub>2</sub> S <sub>2</sub> O <sub>5</sub>                | O   | +    | +   |      | +  | +    | +    | +   | +  | +  |      |     |      | O  | O  | -      | +             | O             |
| Sodium nitrate – aqueous                            | NaNO <sub>3</sub>  | +   | +    | +   | +    | +  | +    | +    | O   | O  | +  | +    | +   | +    | -  | -  | -      | +             | -             |
| Sodium nitrite – aqueous                            | NaNO <sub>2</sub>  | +   | +    | +   | +    | +  | +    | +    | +   | +  | +  | +    |     | +    | +  | +  | +      | +             | +             |
| Sodium pentachlorophenolate – aqueous               | C <sub>6</sub> Cl <sub>5</sub> NaO                           | +   | +    | +   |      | +  | +    |      | +   | +  | +  |      |     |      | +  | +  | O      | +             | +             |
| Sodium perborate – aqueous                          | NaBO <sub>3</sub> * nH <sub>2</sub> O                        | O   | +    | +   | +    | +  | +    | +    | +   | +  |    | +    | -   |      | O  | O  | O      | +             | +             |
| Sodium peroxodisulphate – aqueous                   | Na <sub>2</sub> S <sub>2</sub> O <sub>8</sub>                | O   | +    | +   | +    | +  | +    |      | +   | +  | -  | +    | -   |      | -  | -  | -      | +             | O             |
| Sodium phosphate – aqueous                          | Na <sub>3</sub> PO <sub>4</sub>                              | +   | +    | +   | +    | +  | +    | +    | +   | +  | +  | +    |     |      | O  | O  | O      | O             | O             |
| Sodium propionate – aqueous                         | CH <sub>3</sub> CH <sub>2</sub> COONa                        | +   | +    | +   |      | +  | +    |      | +   | +  | +  | +    |     |      | +  | +  | +      | +             | +             |
| Sodium silicate (soluble glass) – aqueous           |  | +   | +    | +   | +    | +  | +    | +    | +   | +  | +  | +    | +   | +    | O  | O  | +      | +             | +             |
| Sodium stannate – aqueous                           | Na <sub>2</sub> SnO <sub>3</sub>                             | +   | +    | +   | +    | +  | +    |      | +   | +  | O  |      |     |      | O  | O  | +      | +             | +             |
| Sodium sulphate – aqueous                           | Na <sub>2</sub> SO <sub>4</sub>                              | +   | +    | +   | +    | +  | +    | +    | +   | +  | +  | +    | +   | +    | -  | -  | -      | +             | +             |
| Sodium sulphide – aqueous                           | Na <sub>2</sub> S  | +   | +    | +   | +    | +  | +    | +    | +   | +  | +  | O    | +   | +    | O  | -  | O      | +             | +             |
| Sodium sulphite – aqueous                           | Na <sub>2</sub> SO <sub>3</sub>                              | +   | +    | +   | +    | +  | +    | +    | O   | +  | +  | +    |     | +    | O  | +  | O      | +             | O             |
| Sodium tartrate – aqueous                           | C <sub>4</sub> H <sub>4</sub> O <sub>6</sub> Na <sub>2</sub> | +   | +    | +   | +    | +  | +    | +    | +   | +  | +  |      |     |      | +  | +  | O      | +             | +             |
| Sodium thiosulphate – aqueous                       | Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>                | +   | +    | +   | +    | +  | +    | +    | +   | +  | +  | +    | +   |      | O  | -  | O      | O             | O             |
| Sodium zincate – aqueous                            | Na <sub>2</sub> [Zn(OH) <sub>4</sub> ]                       | O   | +    | +   |      | +  | +    |      |     |    |    |      |     |      |    |    | +      | +             | +             |
| Starch solution – aqueous                           |  | +   | +    | +   | +    | +  | +    | +    | +   | +  | +  | +    | +   | +    | O  | O  | O      | +             | +             |
| Stearic acid – pure                                 | C <sub>18</sub> H <sub>37</sub> COOH                         | +   | +    | +   | +    | +  | +    | +    | +   | +  | +  | +    | +   |      | O  | +  | -      | +             | +             |
| Styrene – pure                                      | C <sub>6</sub> H <sub>5</sub> CHCH <sub>2</sub>              | -   | -    | O   | +    | -  | +    | +    | -   | O  | +  | +    |     | +    | O  | O  | O      | +             | +             |

# Resistance in basic chemicals

| Name   | Formula  | NBR | EPDM | FKM | FFKM | CR | PTFE | ETFE | PVC | PP | PA | PVDF | PPS | PEEK | MS | RG | GG, GS | 1.4401/1.4571 | 1.4305/1.4104 |
|--|--|-----|------|-----|------|----|------|------|-----|----|----|------|-----|------|----|----|--------|---------------|---------------|
| Succinic acid – aqueous                        | HOOCCH <sub>2</sub> CH <sub>2</sub> COOH                             | +   | +    | +   | +    | +  | +    |      | +   | +  |    | +    | +   |      | +  | +  | O      | +             | +             |
| Sulphur chloride – pure                        | S <sub>2</sub> Cl <sub>2</sub> , SCl <sub>2</sub> , SCl <sub>4</sub> | -   | -    | +   | +    | -  | +    | +    | -   | -  | -  | +    |     | +    | O  | O  | O      | +             | -             |
| Sulphur dioxide (liquid) – pure                | SO <sub>2</sub>  | -   | +    | +   | +    | -  | +    | +    | -   | -  | -  | +    | +   | +    | +  | +  | +      | +             | +             |
| Sulphur dioxide (gas, humid)                   | SO <sub>2</sub>  | -   | +    | +   | +    | -  | +    | +    | O   | O  | O  | +    | O   | +    | -  | -  | -      | +             | O             |
| Sulphur dioxide (gas, dry) – pure              | SO <sub>2</sub>  | -   | +    | +   | +    | -  | +    | +    | O   | O  | O  | +    | +   | +    | O  | O  | O      | +             | O             |
| Sulphur hexafluoride – pure                    | SF <sub>6</sub>  | O   | +    | O   | O    | +  | +    |      | +   | +  |    | +    |     | +    | +  | +  | +      | +             | +             |
| Sulphuric acid – concentrated (96%)            | H <sub>2</sub> SO <sub>4</sub>                                       | -   | -    | O   | +    | -  | +    | +    | O   | O  | -  | +    | O   | -    | -  | -  | -      | -             | -             |
| Sulphuric acid – aqueous (30%)                 | H <sub>2</sub> SO <sub>4</sub>                                       | O   | +    | +   | +    | O  | +    | +    | O   | +  | -  | +    | O   | O    | -  | -  | -      | -             | -             |
| Sulphurous acid – aqueous                      | H <sub>2</sub> SO <sub>3</sub>                                       | -   | +    | +   | +    | +  | +    | +    | +   | +  | -  | +    | O   | +    | -  | -  | -      | +             | -             |
| <b>T</b>                                       |  |     |      |     |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| Table salt (sodium chloride) – aqueous         | NaCl   | +   | +    | +   | +    | +  | +    | +    | +   | +  | +  | +    | +   | +    | -  | O  | -      | O             | O             |
| Tall oil (liquid colophonium)                  |  | O   | O    | O   |      | O  | +    |      | +   | +  | +  | +    |     |      | -  | -  | -      | +             | O             |
| Tannic acid (tannin) – aqueous                 |  | +   | +    | +   | +    | +  | +    | +    | +   | +  | +  | +    | +   | +    | O  | O  | O      | +             | +             |
| Tar oil (carbolineum)                          |  | O   | O    | O   | +    | O  | +    |      | +   | -  | +  |      |     |      | +  | +  | +      | +             | +             |
| Tartaric acid – aqueous                        | C <sub>4</sub> H <sub>6</sub> O <sub>6</sub>                         | +   | +    | +   | +    | +  | +    | +    | +   | +  | O  | +    | +   | +    | -  | -  | -      | +             | +             |
| Tetrachloroethylene (perchloroethylene) – pure | Cl <sub>2</sub> CCCl <sub>2</sub>                                    | -   | -    | O   | O    | -  | +    | +    | -   | -  | O  | +    | O   | +    | O  | O  | O      | +             | +             |
| Tetraethyl lead (lead tetraethyl) – pure       | Pb(CH <sub>2</sub> CH <sub>3</sub> ) <sub>4</sub>                    | O   | O    | +   | +    | O  | +    | +    | +   | +  | +  | +    | O   | +    | O  | O  | +      | +             | +             |
| Tetrahydrofuran – pure                         | C <sub>4</sub> H <sub>8</sub> O                                      | -   | -    | -   | +    | -  | +    | +    | -   | -  | +  | -    | O   | +    |    |    |        | +             | +             |
| Tetrahydronaphthalene (tetralin) – pure        | C <sub>10</sub> H <sub>12</sub>                                      | -   | -    | +   | +    | -  | +    | +    | -   | -  | +  |      | O   |      | +  | +  | +      | +             | +             |
| Thiophene – pure                               | C <sub>4</sub> H <sub>4</sub> S                                      | -   | -    | -   | +    | -  | +    |      | -   | O  |    |      |     |      | O  | O  | O      | +             | +             |

| Name                                   | Formula   | NBR | EPDM | FKM            | FFKM | CR | PTFE | ETFE | PVC | PP | PA | PVDF | PPS | PEEK | MS | RG | GG, GS | 1.4401/1.4571 | 1.4305/1.4104 |
|--|---|-----|------|----------------|------|----|------|------|-----|----|----|------|-----|------|----|----|--------|---------------|---------------|
| Tin chlorides – aqueous                | SnCl <sub>2</sub> , SnCl <sub>4</sub>               | +   | +    | +              | +    | +  | +    | +    | +   | +  | O  | +    | +   | +    | -  | -  | O      | O             | -             |
| Toluene – pure                         | C <sub>6</sub> H <sub>5</sub> CH <sub>3</sub>       | -   | -    | O              | +    | -  | +    | +    | -   | -  | +  | O    | O   | +    | +  | +  | +      | +             | +             |
| Tributyl phosphate – pure              | (C <sub>4</sub> H <sub>9</sub> ) <sub>3</sub> PO    | -   | -    | -              | O    | -  | +    | +    | -   | -  |    | -    | +   |      | +  | +  | -      | +             | +             |
| Trichloroacetic acid – aqueous         | Cl <sub>3</sub> CCOOH                               | O   | O    | -              | O    | O  | +    | +    | +   | O  | -  | O    | +   |      | -  | -  | -      | -             | -             |
| Trichloroethylene – pure               | C <sub>2</sub> HCl <sub>3</sub>                     | -   | -    | O              | O    | -  | +    | +    | -   | -  | -  | +    | O   | +    | -  | -  | -      | +             | +             |
| Trichloromethane (chloroform) – pure   | CHCl <sub>3</sub>                                   | -   | -    | +              | +    | -  | +    | O    | -   | -  | -  | +    | O   | +    | +  | +  | +      | -             | +             |
| Tricresylphosphate – pure              | C <sub>21</sub> H <sub>21</sub> O <sub>4</sub> P    | -   | -    | -              | +    | -  | +    |      | -   | O  | +  | -    | +   |      | O  | O  | O      | +             | +             |
| Triethanolamine – pure                 | (CH <sub>2</sub> CH <sub>2</sub> OH) <sub>3</sub> N | -   | -    | -              | +    | +  | +    | +    | -   | +  | O  | +    |     |      | O  | O  | O      | +             | +             |
| <b>U</b>                               |   |     |      |                |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| Uranium hexafluoride – pure            | UF <sub>6</sub>                                     | +   | +    | +              | O    | +  | +    |      | +   | +  | -  |      |     |      |    |    |        | -             | +             |
| Urea – aqueous                         | NH <sub>2</sub> CONH <sub>2</sub>                   | +   | +    | +              | +    | +  | +    | +    | +   | +  | +  | +    | +   | +    | O  | O  | O      | O             | O             |
| <b>V</b>                               |   |     |      |                |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| Vinyl acetate – pure                   | CH <sub>2</sub> CHOOCH <sub>2</sub> CH <sub>3</sub> | +   | +    | +              | +    | +  | +    | +    | -   | +  |    | O    | +   |      | O  | O  | O      | +             | +             |
| Vinyl chloride – pure                  | CH <sub>2</sub> CHCl                                | -   | O    | +              | +    | -  | +    | +    | -   | O  | +  | +    | O   |      | -  | -  | O      | O             | O             |
| <b>W</b>                               |   |     |      |                |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| Water – distilled                      | H <sub>2</sub> O                                    | +   | +    | +              | +    | +  | +    | +    | +   | +  | +  | +    | O   | +    | O  | +  | -      | +             | O             |
| Water (seawater)                       | H <sub>2</sub> O                                    | +   | +    | +              | +    | +  | +    | +    | +   | +  | +  | +    | +   | +    | O  | O  | O      | O             | O             |
| Water vapour (130 °C)                  | H <sub>2</sub> O                                    | O   | +    | + <sup>5</sup> | +    | O  | +    | +    | -   | -  | -  | +    | O   | +    | O  | +  | +      | +             | +             |
| White spirit (Shellsol D) – pure       |   | O   | -    | O              | +    | O  | +    |      | O   | O  | +  | +    | +   | +    | +  | +  | +      | +             | +             |
| Wood tar, wood-oil (impregnating oils) |   | -   | -    | -              | +    | -  | +    |      | O   | -  |    | +    |     | +    | +  | +  | O      | +             | +             |



## Resistance in basic chemicals

| Name                    | Formula   | NBR | EPDM | FKM | FFKM | CR | PTFE | ETFE | PVC | PP | PA | PVDF | PPS | PEEK | MS | RG | GG, GS | 1.4401/1.4571 | 1.4305/1.4104 |
|-------------------------|---|-----|------|-----|------|----|------|------|-----|----|----|------|-----|------|----|----|--------|---------------|---------------|
| <b>X</b>                |   |     |      |     |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| Xenon – pure            | Xe  | +   | +    | +   | +    | +  | +    | +    | +   | +  | +  | +    | +   | +    | +  | +  | +      | +             | +             |
| Xylene – pure           | C <sub>6</sub> H <sub>4</sub> (CH <sub>3</sub> ) <sub>2</sub> | -   | -    | O   | +    | -  | +    | +    | -   | -  | +  | O    | O   | +    | +  | +  | +      | +             | +             |
| <b>Y</b>                |   |     |      |     |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| Yeast – aqueous         |   | +   | +    | +   | +    | +  | +    | +    | +   | +  | +  |      |     | +    | O  | O  | O      | +             | +             |
| <b>Z</b>                |   |     |      |     |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| Zinc chloride – aqueous | ZnCl <sub>2</sub>   | +   | +    | +   | +    | +  | +    | +    | +   | +  | -  | +    | +   | +    | -  | -  | -      | O             | -             |
| Zinc sulphate – aqueous | ZnSO <sub>4</sub>   | +   | +    | +   | +    | +  | +    | +    | +   | +  |    | +    | +   | +    | -  | -  | -      | +             | -             |

## Resistance in commercial products

| Name                                | NBR | EPDM | FKM | FFKM | CR | PTFE | ETFE | PVC | PP | PA | PVDF | PPS | PEEK | MS | RG | GG, GS | 1.4401/1.4571 | 1.4305/1.4104 |
|-------------------------------------|-----|------|-----|------|----|------|------|-----|----|----|------|-----|------|----|----|--------|---------------|---------------|
| <b>Commercial products</b>          |     |      |     |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| <b>A</b>                            |     |      |     |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| Acronal dispersions (polyacrylates) | -   | +    | +   |      | +  | +    |      | -   | +  | O  |      | +   |      | O  | O  | O      | +             | +             |
| Acronal solutions                   | -   | O    | -   |      | -  | +    |      | -   | O  | O  |      | +   |      | O  | O  | O      | +             | +             |
| Anise oil                           | O   |      |     |      | -  | +    |      | -   | -  | +  |      | O   |      | +  | +  | O      | +             | +             |
| Antifrogen-N                        | +   | +    | +   |      | +  | +    |      | +   | +  | +  |      | O   |      | O  | O  | O      | +             | +             |
| ASTM fuel A                         | O   | -    | O   | +    | O  | +    |      | +   | O  | +  |      |     |      | +  | +  | +      | +             | +             |
| ASTM fuel B                         | O   | -    | O   | +    | -  | +    |      | O   | O  | +  |      |     |      | +  | +  | +      | +             | +             |
| ASTM fuel C                         | O   | -    | O   | +    | -  | +    |      | O   | O  | +  |      | +   |      | +  | +  | +      | +             | +             |
| ASTM oil IRM 901                    | +   | -    | +   | +    | +  | +    |      | +   | O  | +  |      |     |      | +  | +  | +      | +             | +             |
| ASTM oil IRM 902                    | O   | -    | +   | +    | +  | +    |      | +   | O  | +  |      |     |      | +  | +  | +      | +             | +             |
| ASTM oil IRM 903                    | O   | -    | O   | +    | +  | +    |      | +   | O  | +  |      | +   |      | +  | +  | +      | +             | +             |
| ATE brake fluid                     | -   | +    | -   | +    | O  | +    |      | O   | O  | +  |      | +   | +    | O  | O  | +      | +             | +             |
| <b>B</b>                            |     |      |     |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| Beeswax                             | +   | +    | +   |      | +  | +    |      | +   | +  | -  |      | +   |      | +  | +  | O      | +             | +             |
| Bleaching lye (sodium hypochlorite) | -   | O    | +   | +    | -  | +    | +    | +   | O  | -  | -    | -   | +    | O  | O  | O      | O             | O             |
| Biodiesel (fatty acid methyl ester) | O   | -    | +   | +    | O  | +    | +    | +   | O  | O  | +    | +   | +    | -  | -  | -      | +             | +             |
| Bone oil                            | O   | -    | +   | +    | O  | +    |      | O   | +  | +  |      | +   |      | +  | +  | +      | +             | +             |
| Brake fluid (ATE brake fluids)      | -   | +    | -   | +    | O  | +    |      | O   | O  | +  |      | +   | +    | O  | O  | +      | +             | +             |

# Resistance in commercial products

| Name                                     | NBR | EPDM | FKM | FFKM | CR | PTFE | ETFE | PVC | PP | PA | PVDF | PPS | PEEK | MS | FG | GG, GS | 1.4401/1.4571 | 1.4305/1.4104 |   |
|--|-----|------|-----|------|----|------|------|-----|----|----|------|-----|------|----|----|--------|---------------|---------------|---|
| <b>C</b>                                 |     |      |     |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |   |
| Car antifreeze                           | O   | +    | +   | +    | +  | +    |      | +   | +  |    | +    | O   | +    | +  | O  | +      |               |               |   |
| Cellulose lacquers                       | -   | O    | -   | +    | -  | +    |      | -   | O  | +  |      | +   |      |    | O  | O      | O             | +             | + |
| Chlophene (chlorodiphenyl)               | +   | O    | +   |      | -  | +    |      | -   | +  |    |      |     |      | +  | +  | O      | +             | +             |   |
| Coconut oil                              | O   | -    | O   | +    | O  | +    | +    | O   | O  | +  | +    | +   | +    | O  | O  | O      | +             | +             |   |
| Cotton seed oil                          | O   | -    | +   | +    | O  | +    |      | +   | -  |    | +    | +   |      | +  | +  |        | +             | +             |   |
| Cyclanone (fatty alcohol sulfonate)      | +   | +    | +   |      | +  | +    |      | +   | +  | +  |      |     |      |    |    | O      | +             | +             |   |
| <b>D</b>                                 |     |      |     |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |   |
| Desmodur T                               | -   | -    | +   |      | -  | +    |      |     |    |    |      |     |      | +  | +  | +      | +             | +             |   |
| Desmophen                                | +   | +    | +   |      | +  | +    |      |     |    |    |      |     |      |    |    | +      | +             | +             |   |
| Detergent (synth. laundry detergent)     | O   | +    | O   | +    | +  | +    |      | +   | O  | O  | +    | +   |      | O  | O  | O      | +             | +             |   |
| Dextrin – aqueous                        | +   | +    | +   | +    | +  | +    | +    | +   | +  | +  | +    | +   |      | +  | +  | +      | +             | +             |   |
| Diesel oil – pure                        | O   | -    | +   | +    | -  | +    | +    | O   | O  | +  | +    | +   | +    | +  | +  | +      | +             | +             |   |
| Drilling oils (cutting oils)             | O   | -    | O   | +    | O  | +    |      | +   | O  | O  |      |     |      | +  | +  | +      | +             | +             |   |
| Dyeworks wetting agent (Nekal BX)        | +   | +    | +   |      | +  | +    |      | +   | +  |    |      |     |      | O  | O  | O      | +             | +             |   |
| <b>E</b>                                 |     |      |     |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |   |
| Engine oils (mineral oils, machine oils) | +   | -    | +   | +    | O  | +    |      | O   | +  | +  | +    | +   | +    | +  | +  | +      | +             | +             |   |
| <b>F</b>                                 |     |      |     |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |   |
| Fish liver oil                           | O   | O    | +   | +    | +  | +    |      | +   | +  |    |      | +   |      | O  | O  | O      | +             | +             |   |
| Fruit tree carbolineum (carbolineum)     | O   | O    | O   | +    | O  | +    |      | +   | -  | +  |      | O   |      | +  | +  | +      | +             | +             |   |

| Name  | NBR | EPDM | FKM | FFKM | CR | PTFE | ETFE | PVC | PP | PA | PVDF | PPS | PEEK | MS | FG | GG, GS | 1.4401/1.4571 | 1.4305/1.4104 |
|---|-----|------|-----|------|----|------|------|-----|----|----|------|-----|------|----|----|--------|---------------|---------------|
| Fuel oils   | O   | -    | +   | +    | O  | +    |      | O   | O  | +  | +    | +   |      | +  | +  | +      | +             | +             |
| <b>G</b>  |     |      |     |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| Gelatine – aqueous                                  | +   | +    | +   | +    | +  | +    |      | +   | +  | +  | +    |     | +    | O  | O  | O      | +             | +             |
| Greases, fatty oils                                 | O   | -    | O   | +    | O  | +    | +    | O   | O  | +  | +    | +   | +    | O  | O  | O      | +             | +             |
| <b>H</b>  |     |      |     |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| Hair shampoo  | O   | O    | O   |      | O  | +    |      | +   | O  | +  |      | +   |      | O  | O  | O      | +             | +             |
| Hydraulic fluids – chlorinated hydrocarbons         | -   | O    | +   |      | -  | +    |      |     |    | +  |      |     |      | -  | O  | O      | +             |               |
| Hydraulic fluids – mineral oil based (H, H-L, H-LP) | O   | -    | O   | +    | O  | +    |      | +   | +  | +  |      | +   |      | +  | +  | +      | +             | +             |
| Hydraulic fluids – phosphoric acid ester (HSD)      | -   | O    | -   | +    | -  | +    |      | -   | -  | +  |      | +   |      | +  | +  | +      | +             | +             |
| Hydraulic fluid – polyglykol water (HSC)            | +   | +    | +   | +    | O  | +    |      | +   | +  | +  |      |     |      | +  | +  | +      | +             | +             |
| Hydraulic fluids – water in oil (HSB)               | O   | -    | +   | +    | O  | +    |      | +   | +  | +  |      | +   |      | +  | +  | +      | +             | +             |
| Hydraulic fluids – water-oil emulsions (HSA)        | O   | -    | +   | +    | O  | +    |      | +   | +  | +  |      | +   |      | +  | +  | +      | +             | +             |
| <b>I</b>  |     |      |     |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| Impregnating oils (wood tar)                        | -   | -    | -   | +    | -  | +    |      | O   | -  |    |      | +   |      | +  | +  | O      | +             | +             |
| Iodine tincture                                     | O   | O    | O   | O    | O  | +    |      | -   | O  | -  | +    |     | O    | O  | O  | O      | O             | O             |
| <b>L</b>  |     |      |     |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| Linseed oil   | O   | -    | O   | +    | O  | +    |      | O   | O  | +  | +    | +   | +    | O  | O  | O      | +             | +             |
| Lubricating oils (mineral oils)                     | +   | -    | +   | +    | O  | +    | +    | O   | +  | +  | +    | +   | +    | +  | +  | +      | +             | +             |
| Lysol   | -   | -    | O   | +    | -  | +    |      | O   | O  | -  | O    | +   | +    | +  | +  | +      | O             | +             |

## Resistance in commercial products

| Name  | NBR | EPDM | FKM | FFKM | CR | PTFE | ETFE | PVC | PP | PA | PVDF | PPS | PEEK | MS | RG | GG, GS | 1.4401/1.4571 | 1.4305/1.4104 |
|---|-----|------|-----|------|----|------|------|-----|----|----|------|-----|------|----|----|--------|---------------|---------------|
| <b>M</b>  |     |      |     |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| Machine oil (cf. paraffin oils, mineral oils, engine oils)              | +   | -    | +   | +    | O  | +    |      | O   | +  | +  | +    | +   | +    | +  | +  | +      | +             | +             |
| Mersoles (alkane sulfonic acid chlorides)                               | +   | O    | +   |      | +  | +    |      | +   | O  |    |      |     |      | O  | O  | O      | O             | O             |
| Mineral oils (paraffin oils, engine oil) – free from aromatic compounds | +   | -    | +   | +    | O  | +    |      | O   | +  | +  | +    | +   | +    | +  | +  | +      | +             | +             |
| Molasses, molasses-based flavour  | +   | +    | +   | +    | +  | +    | +    | +   | +  | +  | +    | +   | +    | O  | O  | O      | +             | +             |
| <b>N</b>  |     |      |     |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| Nekal BX (dyeworks wetting agent) – aqueous                             | +   | +    | +   | O    | +  | +    |      | +   | +  |    |      | O   |      | O  | O  | O      | +             | +             |
| Nickel baths  | +   | +    | +   |      | +  | +    |      | +   | +  | +  |      |     |      | -  | -  | -      | +             | O             |
| <b>P</b>  |     |      |     |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| Paraffin oil (mineral oil)  | +   | -    | +   | +    | O  | +    | +    | O   | +  | +  | +    | +   | +    | +  | +  | +      | +             | +             |
| Pesticides (carbolineum)  | O   | O    | O   | +    | O  | +    |      | +   | -  | +  |      | O   |      | +  | +  | +      | +             | +             |
| Petroleum – pure  | +   | -    | +   | +    | O  | +    |      | +   | +  | +  | +    | +   | +    | +  | +  | +      | +             | +             |
| Petroleum benzole spirit (premium grade petrol-ethanol mixture)         | -   | -    | O   | +    | -  | +    | +    | -   | -  | O  |      | +   | +    | O  | O  | +      | +             | +             |
| Photograph emulsions, developers, fixing baths                          | O   | O    | O   | +    | O  | +    |      | +   | +  |    | +    | O   |      |    |    |        |               |               |
| Pine needle oil (spruce needle oil)                                     | O   | -    | +   | +    | -  | +    |      | O   | +  |    |      | O   |      | O  | O  |        | +             | +             |
| <b>S</b>  |     |      |     |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| Skydrol 500 (hydraulic fluid)   | -   | +    | O   | +    | -  | +    |      | -   |    | O  |      | +   | +    | -  | O  | O      | +             | +             |
| Skydrol 7000 (hydraulic fluid)  | -   | +    | -   | +    | -  | +    |      | -   |    | O  |      |     |      | -  | O  | O      | +             | +             |
| Soap solution – aqueous   | O   | O    | O   | +    | O  | +    | +    | O   | O  | O  | +    | +   |      | O  | +  | O      | +             | +             |
| Soda (sodium carbonate) – aqueous                                       | +   | +    | +   | +    | O  | +    | +    | +   | +  | +  | O    | +   | +    | O  | O  | O      | +             | +             |

| Name   | NBR | EPDM | FKM | FFKM | CR | PTFE | ETFE | PVC | PP | PA | PVDF | PPS | PEEK | MS | RG | GG, GS | 1.4401/1.4571 | 1.4305/1.4104 |
|--|-----|------|-----|------|----|------|------|-----|----|----|------|-----|------|----|----|--------|---------------|---------------|
| <b>Soluble glass (sodium silicates)</b>            |     |      |     |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| Soluble glass (sodium silicates)                   | +   | +    | +   | +    | +  | +    | +    | +   | +  | +  | +    | +   | +    | O  | O  | +      | +             | +             |
| <b>Spindle oils (mineral oils)</b>                 |     |      |     |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| Spindle oils (mineral oils)                        | +   | -    | +   | +    | O  | +    | +    | O   | +  | +  | +    | +   | +    | +  | +  | +      | +             | +             |
| <b>Spruce needle oil</b>                           |     |      |     |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| Spruce needle oil                                  | O   | -    | +   | +    | -  | +    |      | O   | +  |    |      | O   |      | O  | O  |        | +             | +             |
| <b>T</b>   |     |      |     |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| <b>Table salt (sodium chloride)</b>                |     |      |     |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| Table salt (sodium chloride)                       | +   | +    | +   | +    | +  | +    | +    | +   | +  | +  | +    | +   | +    | -  | O  | -      | O             | O             |
| <b>Transformer oil</b>                             |     |      |     |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| Transformer oil                                    | +   | -    | +   | +    | O  | +    |      | O   | O  | +  | +    | +   | +    | +  | +  | +      | +             | +             |
| <b>Turpentine (turpentine oil) – pure</b>          |     |      |     |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| Turpentine (turpentine oil) – pure                 | O   | -    | O   | +    | -  | +    |      | O   | -  | +  | +    | +   | +    | O  | O  | +      | +             | +             |
| <b>Turpentine substitute (white spirit) – pure</b> |     |      |     |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| Turpentine substitute (white spirit) – pure        | O   | -    | O   | +    | O  | +    |      | O   | O  | +  | +    | +   | +    | +  | +  | +      | +             | +             |
| <b>U</b>   |     |      |     |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| <b>UV paint</b>                                    |     |      |     |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| UV paint   | -   | +    | -   |      | -  | +    |      |     |    |    |      |     |      |    |    |        |               |               |
| <b>V</b>   |     |      |     |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| <b>Varnishes</b>                                   |     |      |     |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| Varnishes  | O   | -    | +   | +    | +  | +    |      | +   | -  | +  |      | +   |      | +  | +  | O      | +             | +             |
| <b>Vinegar (grape vinegar)</b>                     |     |      |     |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| Vinegar (grape vinegar)                            | -   | +    | -   | +    | +  | +    | +    | +   | +  | -  | +    | +   | +    | -  | -  | O      | +             | +             |

# Resistance in liquid foods and beverages

| Name                           | NBR | EPDM | FKM | FFKM | CR | PTFE | ETFE | PVC | PP | PA | PVDF | PPS | PEEK | MS | RG | GG, GS | 1.4401/1.4571 | 1.4305/1.4104 |
|--------------------------------|-----|------|-----|------|----|------|------|-----|----|----|------|-----|------|----|----|--------|---------------|---------------|
| <b>Foodstuff</b>               |     |      |     |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| <b>A</b>                       |     |      |     |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| Apple juice, apple sauce       |     |      |     |      | +  |      | +    | +   | +  |    |      |     | +    | -  |    |        | +             | +             |
| Apricot juice                  |     |      |     |      | +  |      |      |     |    |    |      |     |      | +  | +  |        | +             | +             |
| <b>B</b>                       |     |      |     |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| Beer                           | +   | +    | +   |      | +  | +    | +    | +   | +  | +  | +    | +   | +    | +  | +  | -      | +             | +             |
| Butter                         | +   | +    | +   |      | +  | +    | +    | +   | +  | +  | +    | +   |      | -  | -  | -      | +             | +             |
| Buttermilk                     | +   | +    | +   |      | +  | +    | +    | +   | O  | -  |      | +   |      | O  | O  | -      | +             | +             |
| <b>C</b>                       |     |      |     |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| Cider                          | +   | +    | +   |      |    | +    |      | +   | +  | +  | +    | +   |      |    |    | -      | +             | +             |
| Corn oil                       | O   | -    | O   | +    | O  | +    | +    | O   | O  | +  | +    | +   | +    | O  | O  | O      | +             | +             |
| <b>E</b>                       |     |      |     |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| Edible oil                     | O   | -    | O   | +    | O  | +    | +    | O   | O  | +  | +    | +   | +    | O  | O  | O      | +             | +             |
| <b>F</b>                       |     |      |     |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| Fruit juices                   | O   | O    | O   |      | O  | +    |      | O   | O  | O  |      |     | +    | -  | -  | -      | +             | +             |
| Food fats and oils             | O   | -    | O   | +    | O  | +    | +    | O   | O  | +  | +    | +   | +    | O  | O  | O      | +             | +             |
| <b>G</b>                       |     |      |     |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| Grape vinegar (acetic acid 5%) | -   | O    | -   | O    | -  | +    | +    | O   | O  | O  | +    | +   | +    | -  | O  | O      | O             | O             |
| <b>L</b>                       |     |      |     |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| Lemon juice                    | O   | +    | +   |      | +  | +    |      | +   | +  | +  |      |     | +    | O  | O  | -      | +             | O             |

| Name                                     | NBR | EPDM | FKM | FFKM | CR | PTFE | ETFE | PVC | PP | PA | PVDF | PPS | PEEK | MS | RG | GG, GS | 1.4401/1.4571 | 1.4305/1.4104 |
|--|-----|------|-----|------|----|------|------|-----|----|----|------|-----|------|----|----|--------|---------------|---------------|
| <b>M</b>                                 |     |      |     |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| Milk                                     | +   | +    | +   |      | +  | +    |      | +   | +  | +  | +    | +   | +    | O  | +  | -      | +             | +             |
| Mineral water                            | +   | +    | +   | +    | +  | +    | +    | +   | +  | +  | +    | +   | +    | O  | O  | O      | O             | O             |
| <b>O</b>                                 |     |      |     |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| Olive oil                                | O   | -    | O   | +    | O  | +    | +    | O   | O  | +  | +    | +   | +    | O  | O  | O      | +             | +             |
| Orange juice                             |     |      |     |      |    | +    |      | +   |    |    |      |     |      |    |    |        |               | +             |
| <b>P</b>                                 |     |      |     |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| Pineapple juice                          |     |      |     |      |    | -    | +    | +   |    |    |      |     |      | -  | -  | -      | +             | +             |
| <b>R</b>                                 |     |      |     |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| Rape seed oil                            | O   | -    | O   | +    | O  | +    | +    | O   | O  | +  | +    | +   | +    | O  | O  | O      | +             | +             |
| <b>S</b>                                 |     |      |     |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| Saccharine (sweetener)                   | +   | +    | +   |      | +  | +    |      | +   | +  |    |      | O   |      | +  | +  | O      | +             | +             |
| Soybean oil                              | O   | -    | O   | +    | O  | +    | +    | O   | O  | +  | +    | +   | +    | O  | O  | O      | +             | +             |
| Spirits (dependent on their ingredients) | O   | O    | O   |      | O  | +    |      | +   | +  |    | +    | +   | +    | -  | -  | O      | +             | +             |
| Sugar solutions                          | +   | +    | +   |      | +  | +    |      | +   | +  | +  | +    | +   | +    | +  | +  | O      | +             | +             |
| <b>W</b>                                 |     |      |     |      |    |      |      |     |    |    |      |     |      |    |    |        |               |               |
| Wines                                    | +   | +    | +   |      | +  | +    | +    | +   | +  | -  | +    | +   | +    | -  | -  | -      | +             | +             |

<sup>1</sup> Technical acetylene contains solvents like alkanes, dimethyl formamide or acetone. Bürkert generally does not know what solvent lack is used in the gas suppliers acetylene. The chemical resistance of the gasket materials has to be proved according to the german specification DIN 9539.

<sup>2</sup> Brass with up to 58% Cu.

<sup>3</sup> Diffuses through EPDM; attacks epoxy materials.

<sup>4</sup> Acid resistant FKM compound.

<sup>5</sup> Hydrogen can lead to an embrittlement of metals.

<sup>6</sup> Most of the polymer materials get damaged by ozone. Therefore the resistances have to be put into perspective.

<sup>7</sup> Under pressure permitted according to the BAM (Federal Institute for Materials Research and Testing).

## Bürkert – Close to You

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