BASF Flooring Systems

Chemical Resistance Charts

BASF
The Chemical Company

Evaluation and Testing Procedure for MASTERTOP® Polymer-Based Flooring Systems

The floor sample is placed in a sealed container half filled with the test chemical(s). Evaluation of the effects on the properties of the test specimen, both in the liquid and vapour phases, are undertaken at defined time periods. No concentration changes can occur with this test regime, and the procedure demonstrates changes under constant exposure and in vapour phases.

This procedure more closely approximates actual exposure conditions of flooring subject to chemical spills.

Interpreting the Tables

The following factors are vital to the selection process, when considering a suitably chemically resistant flooring material:

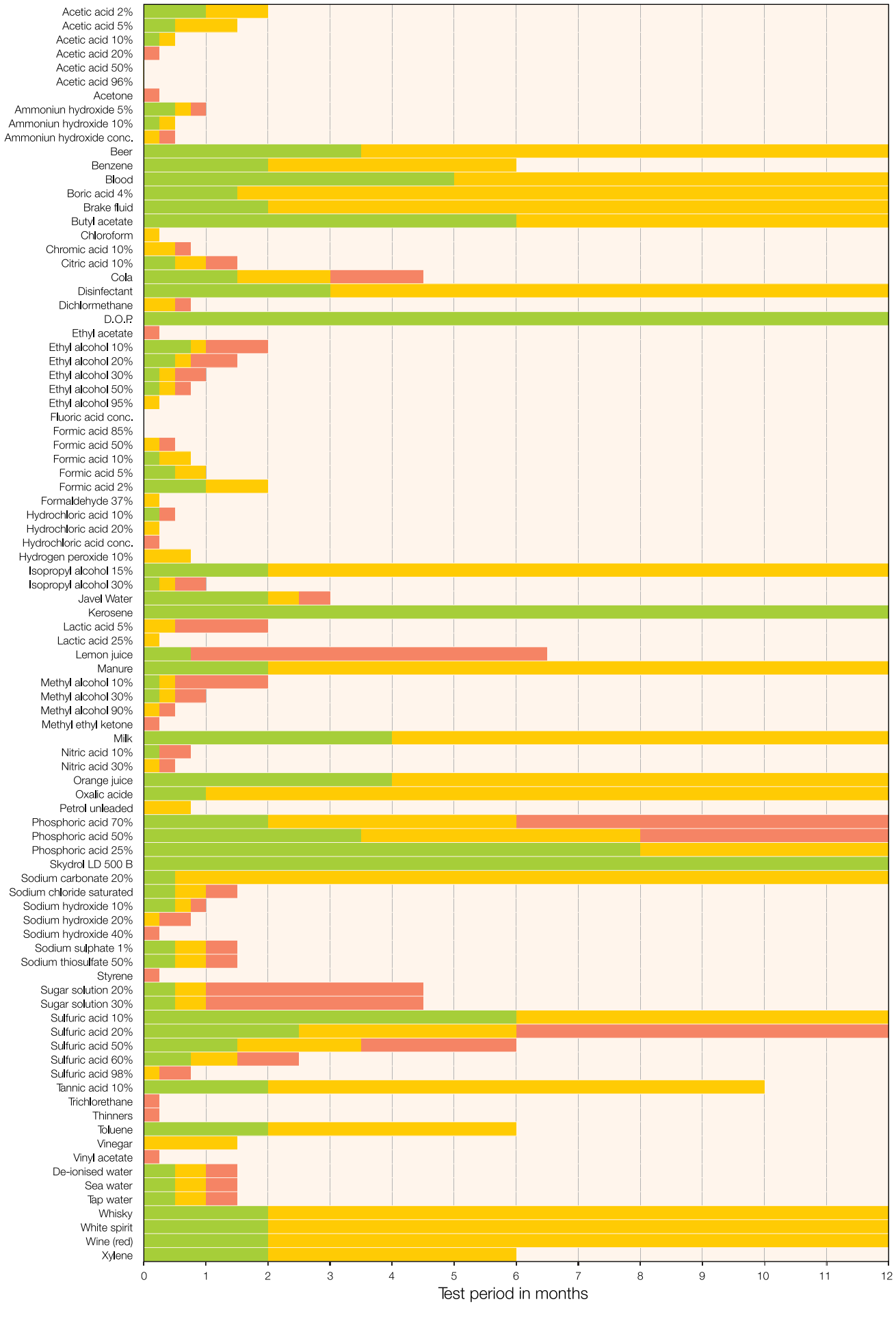
- **a)** Correct name of the chemical(s) likely to be spilled
- **b)** Concentration(s)
- **c)** Composition of blends or mixes of chemicals
- **d)** Nature and length of time of exposure
- **e)** Frequency of exposure
  (e.g. accidental, occasional, repetitive or continuous)
- **f)** Temperature(s)
- **g)** Type of surface to be coated
  (e.g. floor, containment area, drainage channel, sump, etc.)

Comparing this data enables the Tables to be interpreted correctly and thus easing the selection of the optimum chemically resistant coating.

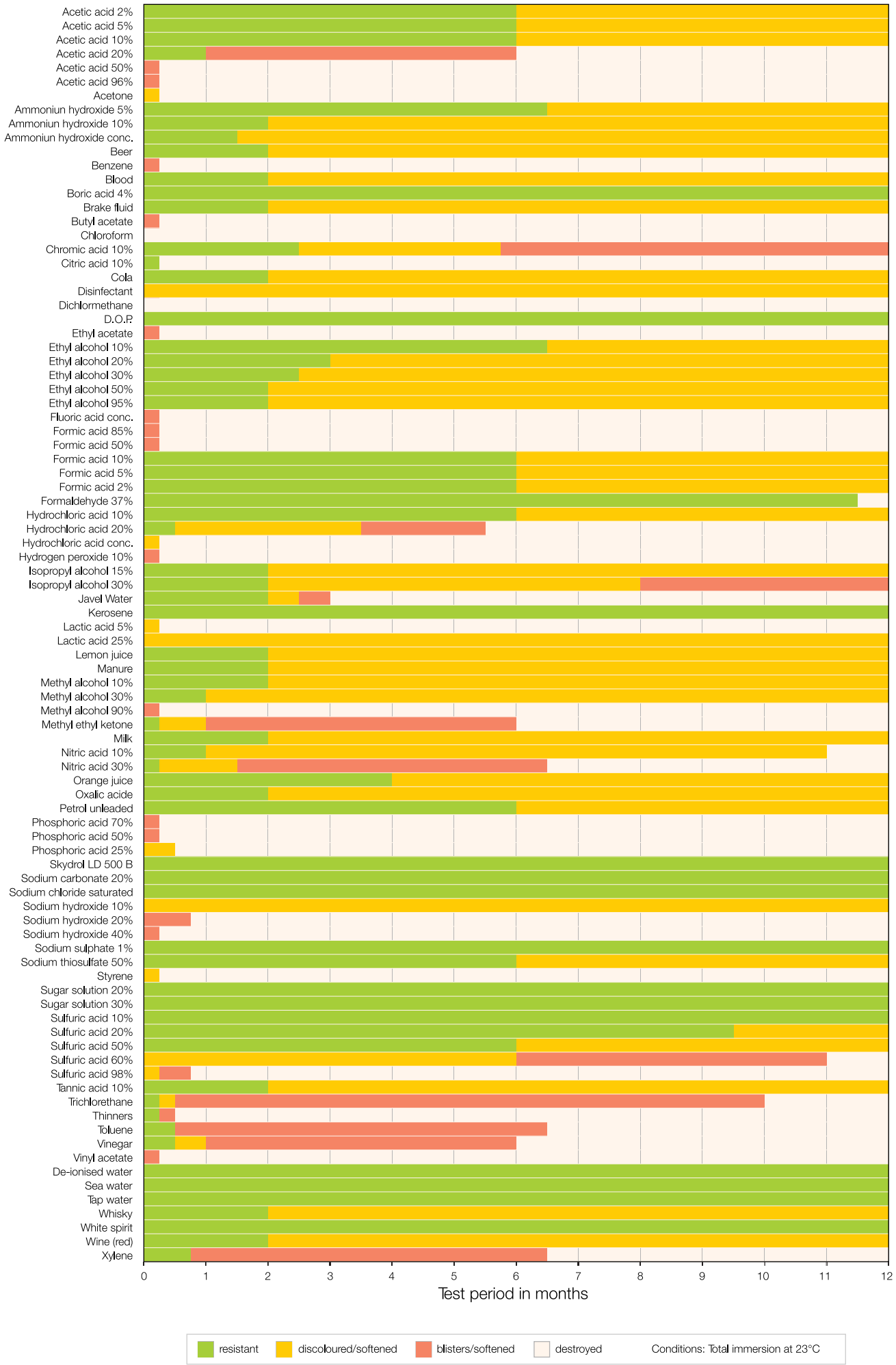
Please contact your local BASF Construction Chemical offices for further information or help in selecting the best floor.

Chemical Resistance Charts

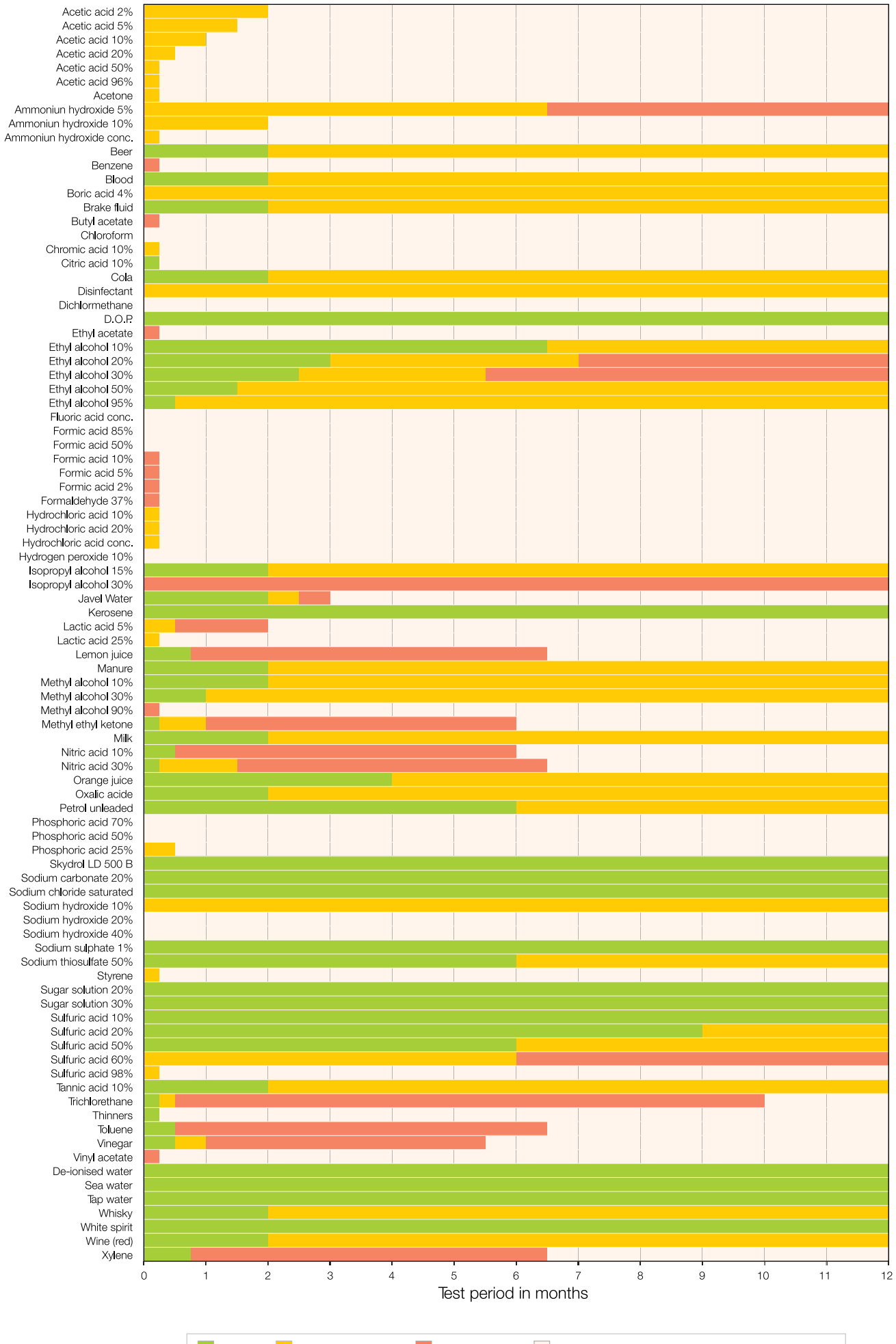
Chemical Resistance Chart — Mastertop® TC 467



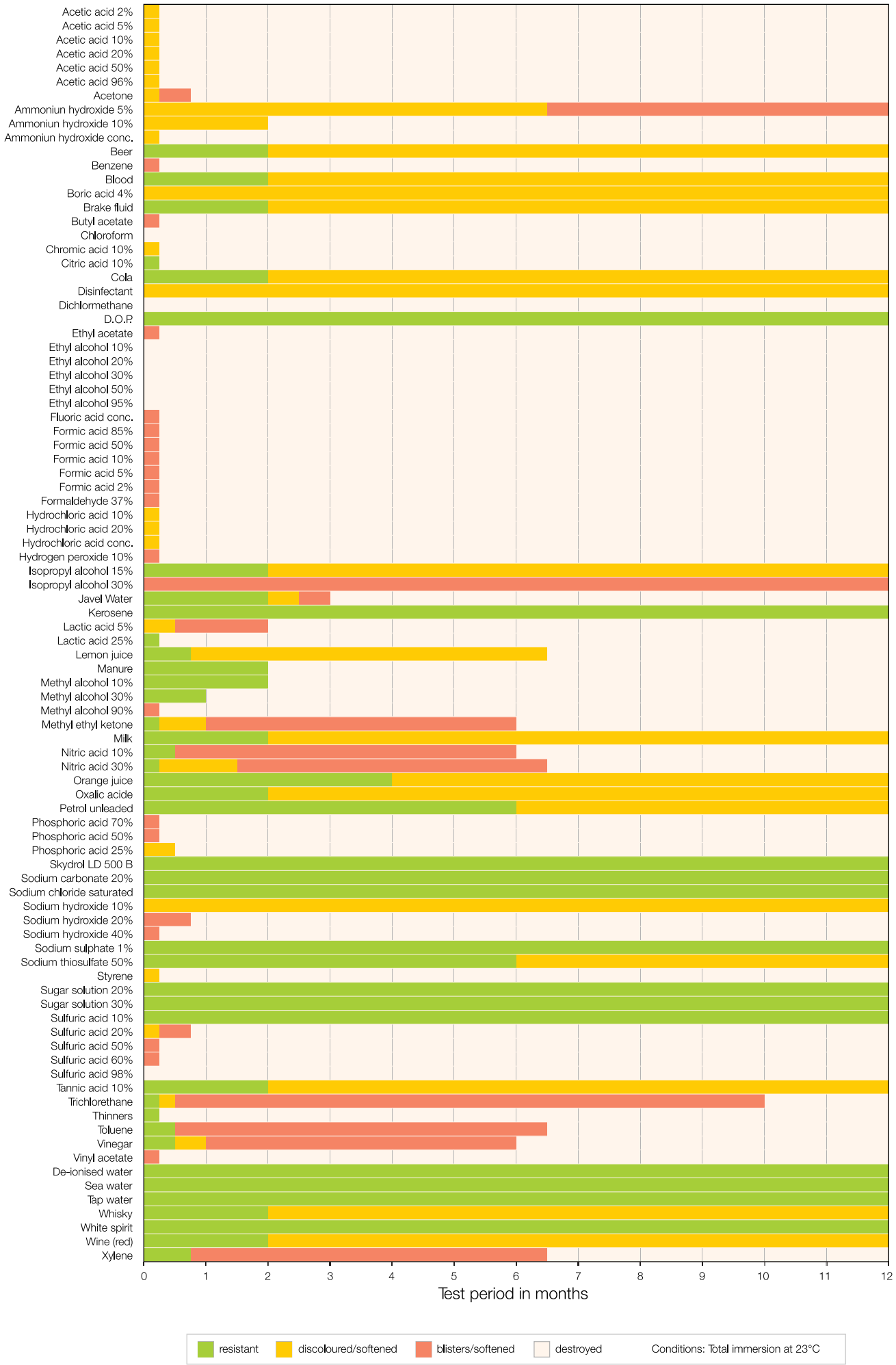
Chemical Resistance Chart — Mastertop® 1324 Series



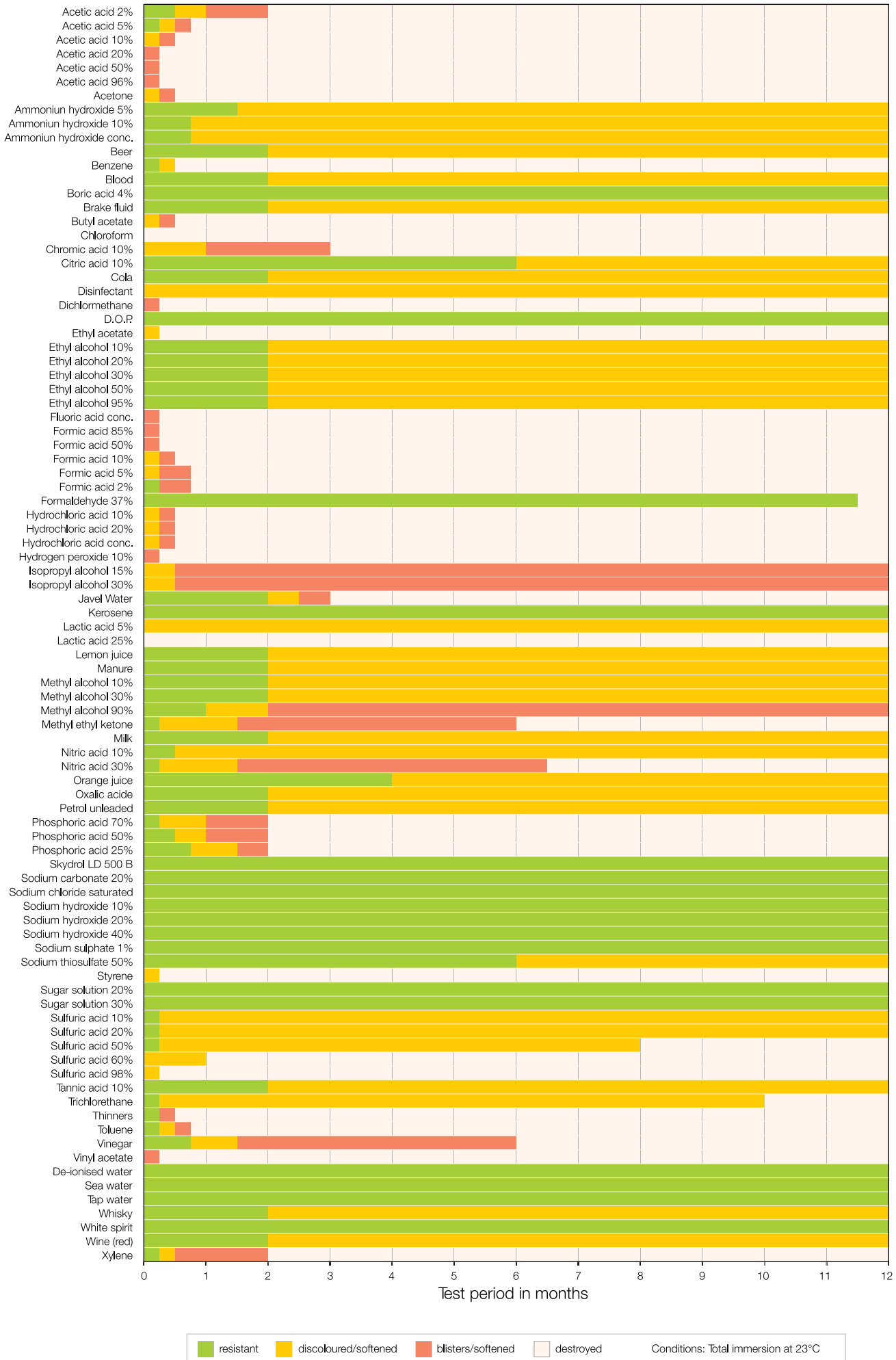
Chemical Resistance Chart — Mastertop® 1325 Series



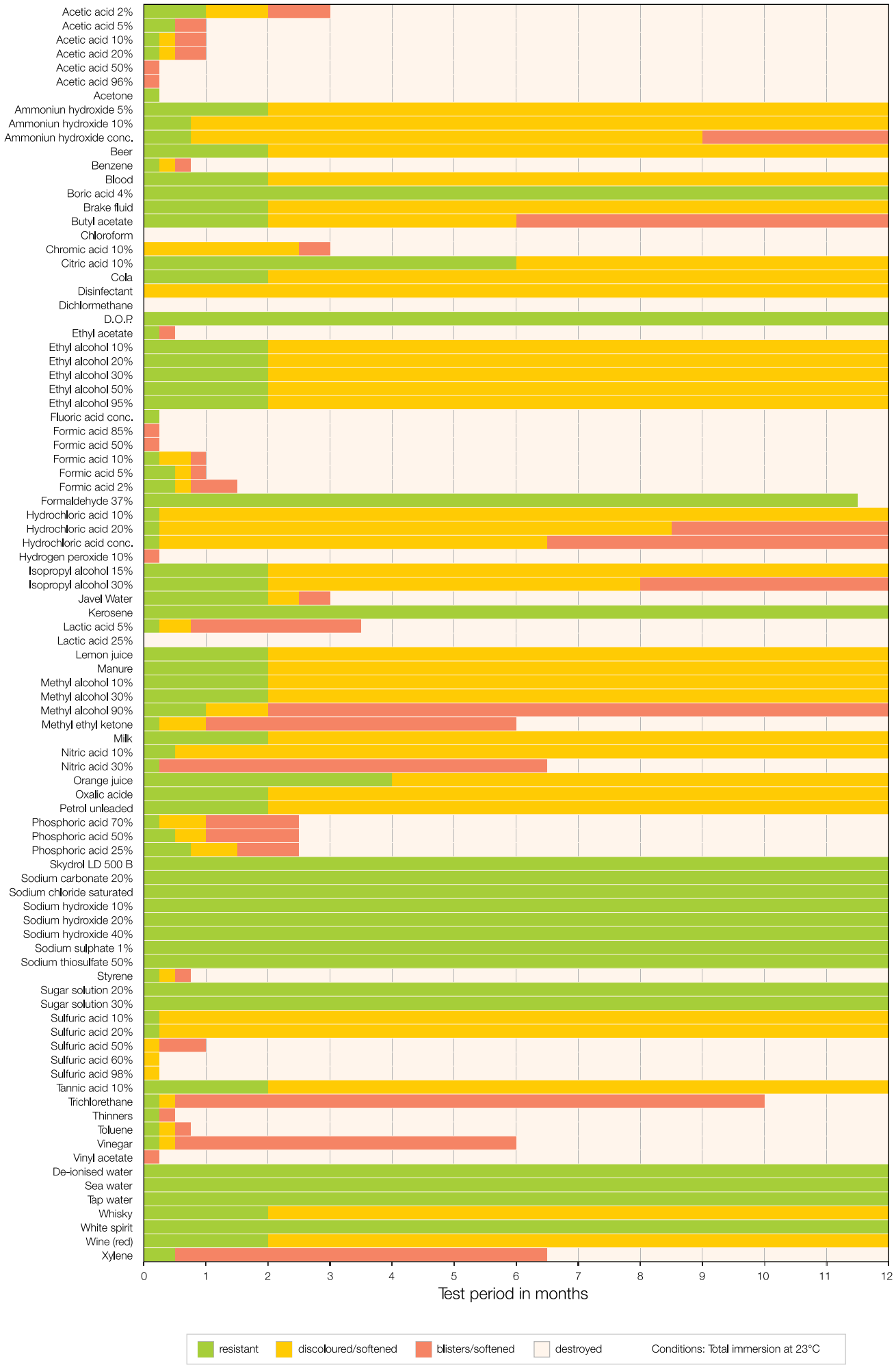
Chemical Resistance Chart — Mastertop® 1330/TC 495/1388



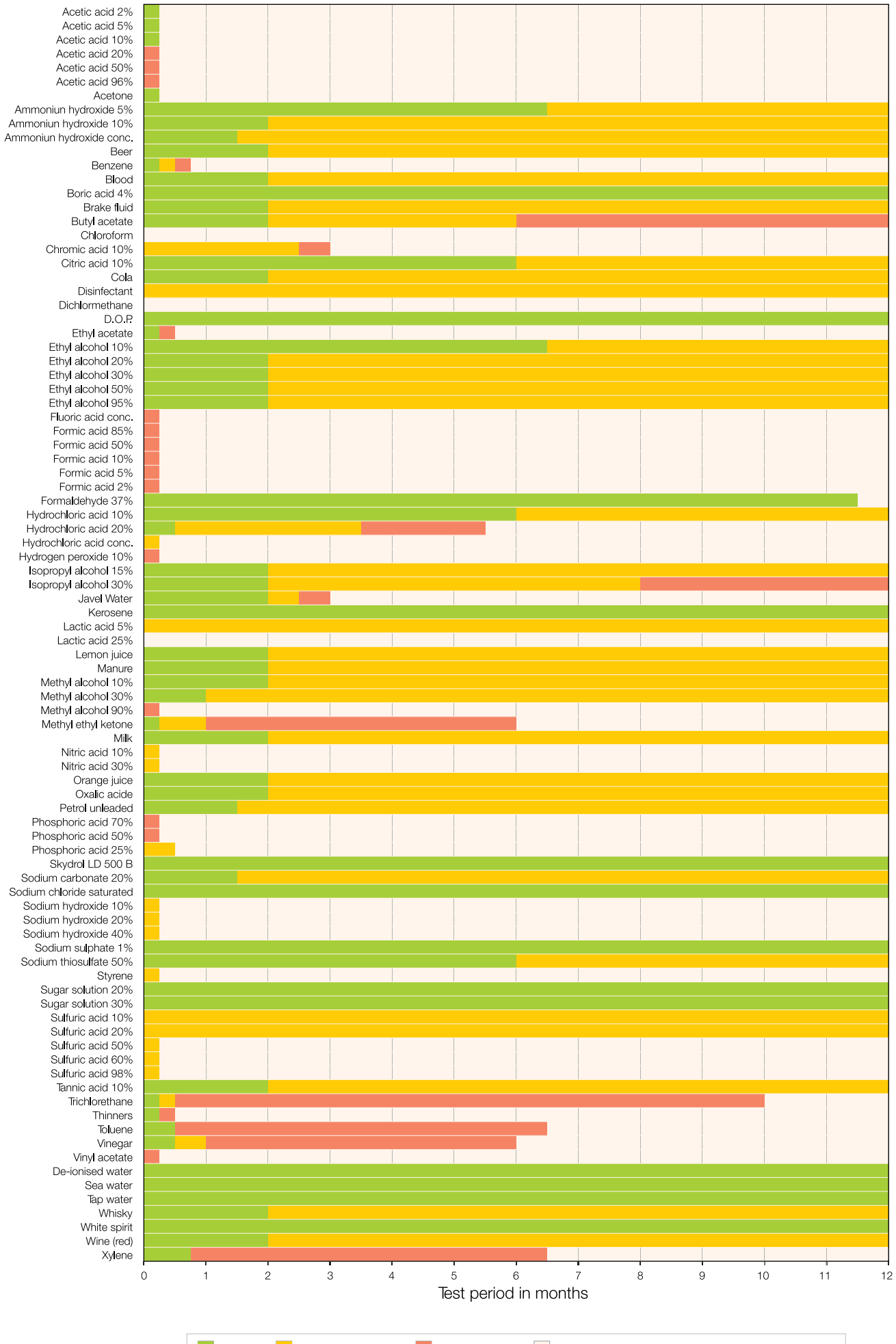
Chemical Resistance Chart — Mastertop® 1110



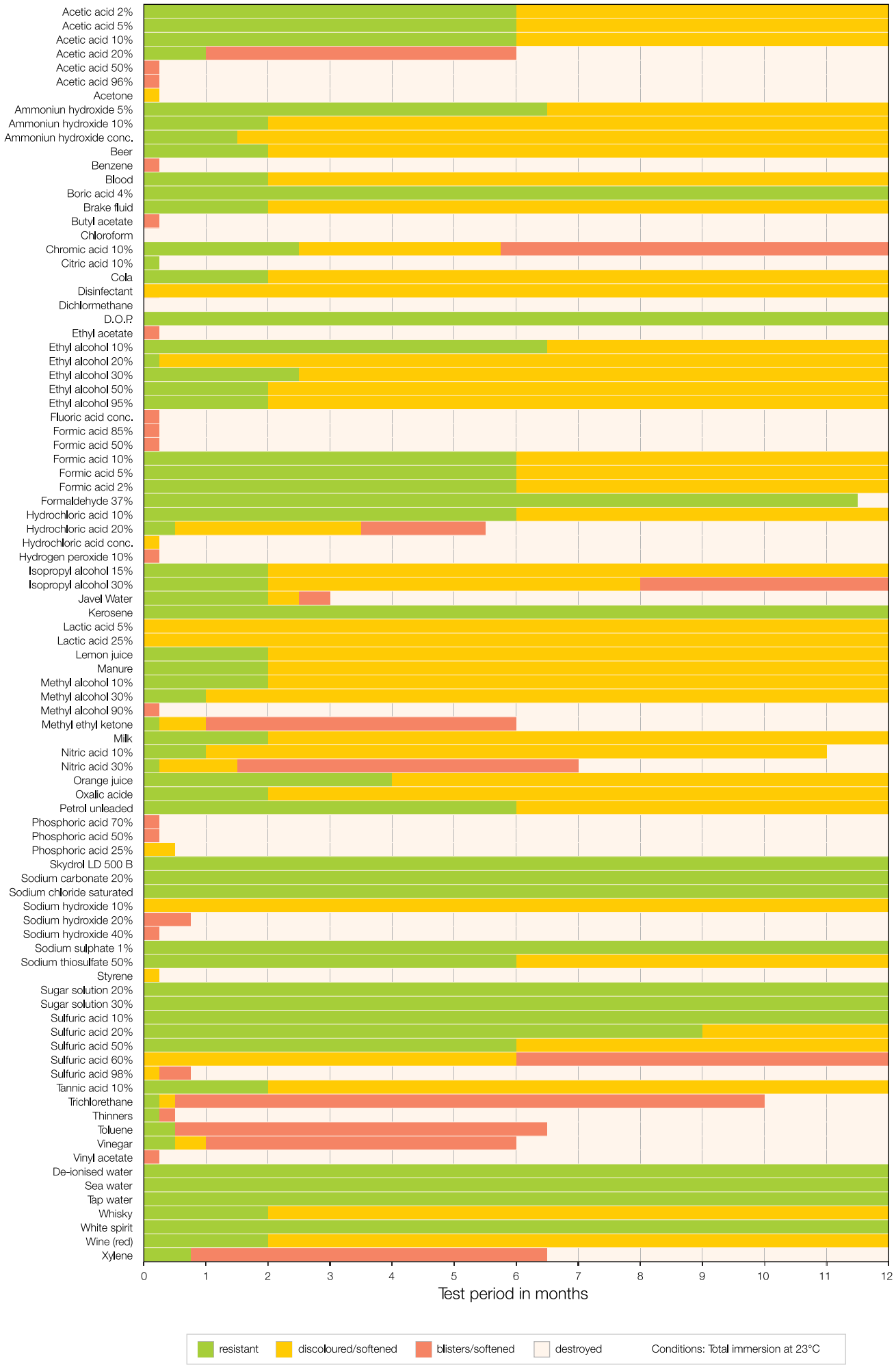
Chemical Resistance Chart — Mastertop® 1200 Series



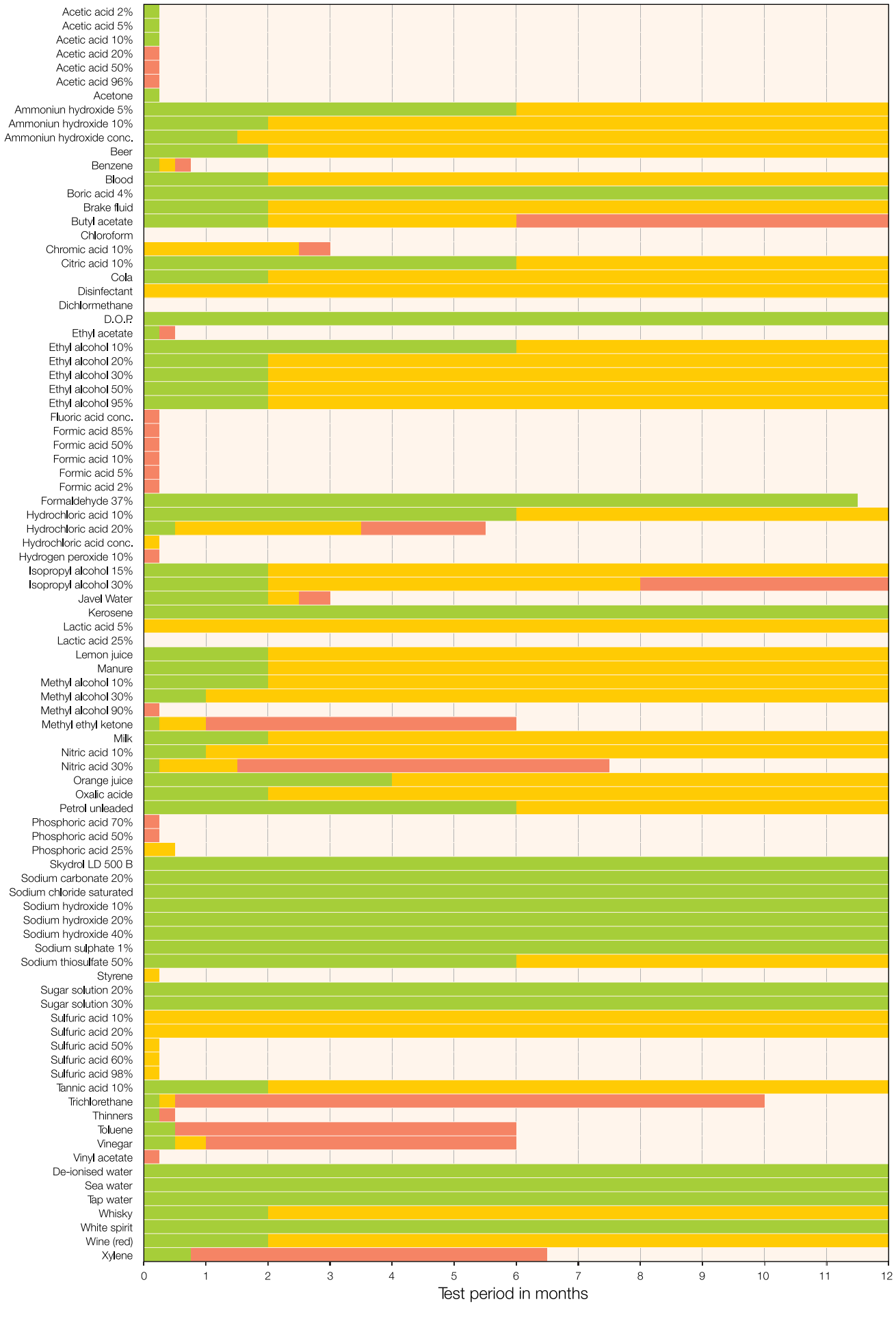
Chemical Resistance Chart — Mastertop® 1270/1277 AS/ESD



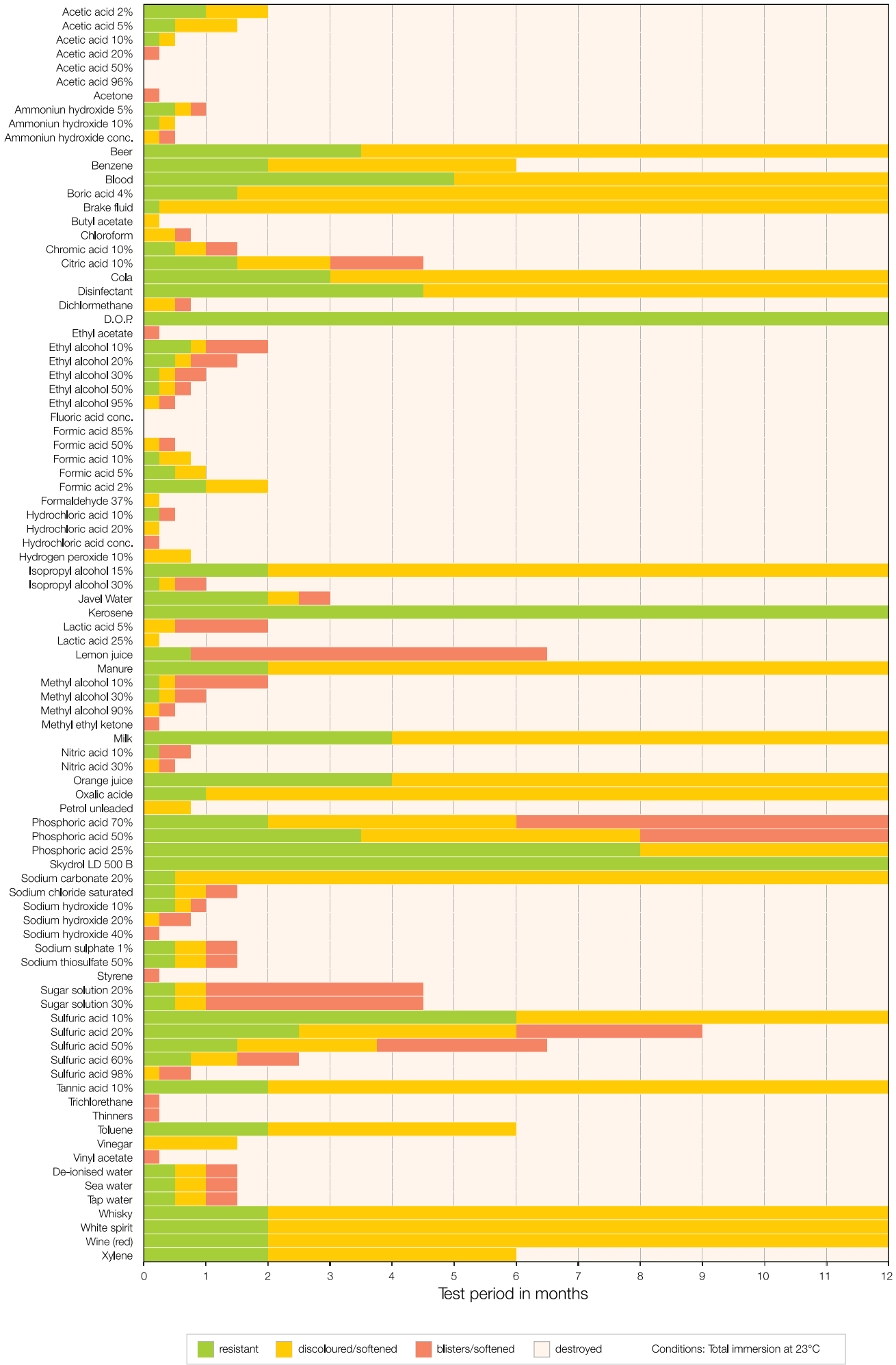
Chemical Resistance Chart — Mastertop® 1328 AS, 1328 AS/NS



Chemical Resistance Chart — Mastertop® 1080



Chemical Resistance Chart — Mastertop® TC 441



Multi-Product Chemical Resistance Chart

	MASTERTOP BC 370 / 370 AS	MASTERTOP TC 472	MASTERTOP BC 374	MASTERTOP BC 300	MASTERTOP BC 379 / 379 AS	CONIPUR BC 351	CONIPUR TC 458 / 459	MASTERTOP BC 375 / 375 AS
Acetone	(+)	−	(+)		(+)			
Acetic acid up to 5 %	(+)	(+)	+	(+)	+	+	(+)	+
Ammonia up to 32 %	+	+	+	+	+	(+)	(+)	(+)
Brake fluid	+	+	+	+	+	+	(+)	(+)
Butanol	+	+	+	+	+	+	−	
Calcium hydroxide saturated	+	+	+	+	+	+	+	+
Caustic soda solution up to 10 %	+	+	+	+	+	+		+
Caustic soda solution up to 50 %	+	+	+	+	+			
Chromic acid up to 20 %	+	(+)	+	+	+	−	−	(+)
Citric acid 10 %	+	+	+	+	+	+	+	+
Diesel fuel	+	+	+	+	+	+	+	+
Engine oil	+	+	+	+	+	+	+	+
Ethanol	(+)	−	+	−	+	+	−	(+)
Ethyl acetate	(+)	−	+	(+)	+	(+)	−	−
Ferric chloride solution	+	+	+	+	+			
Formaldehyde up to 38 %	+	+	+	+	+	+	(+)	+
Formic acid up to 2 %	(+)	−	(+)	(+)	+	+	(+)	+
Formic acid up to 5 %	−	−		−	(+)	+	(+)	+
Fruit juice	+	+	+	+	+	+	+	+
Heating oil	+	+	+	+	+	+	+	+
Hydraulic fluid	+	+	+	+	+	+	+	+
Hydrochloric acid up to 20 %	+	(+)	+	+	+	(+)	−	+
Hydrofluoric acid up to 20 %	−	−	−	−	(+)		−	(+)
Hydrogen peroxide up to 30 %	(+)	−	(+)	(+)	(+)	(+)	(+)	(+)
Jet fuel	+	+	+	+	+	+	+	+
Kerosene	+	+	+	+	+	+	+	+
Lactic acid up to 10 %	+	−	+	(+)	+	+	(+)	+
Magnesium chloride solution up to 35 %	+	+	+	+	+	+		+
Methanol		−			(+)		−	−
Methylene chloride	−	−		−			−	−
Methyl ethyl ketone (MEK)	−	−		−	(+)		−	−
Nitric acid up to 10 %	(+)	(+)	+	+	+	(+)	−	+
Nitric acid up to 20 %	+	−	+	+	+	(+)	−	(+)
Oxalic acid up to 10 %	+	+	+	+	+	+	+	+
Phenol up to 2 %	+	+	+	+	+	+	(+)	(+)
Phosphoric acid 20 %	(+)	(+)	+	+	+	+	+	+
Potassium hydroxide solution up to 50%	+	+	+	+	+			
Propanol	+		+		+	+	−	−
Skydrol	(+)		(+)		(+)			(+)
Sodium carbonate, saturated	+	+	+	+	+	+	+	+
Sodium chloride solution, any concentration	+	+	+	+	+	+	+	+
Sodium sulphate solution, any concentration	+	+	+	+	+	+	+	+
Sulphuric acid up to 40 %	+	+	+	+	+	+	(+)	+
Sulphuric acid up to 90 %	−	−			+		−	
Transmission fluid	+	+	+	+	+	+	+	+
Turpentine	+	+	+	+	+	+		
Vegetable oils	+	+	+	+	+	+	+	+
Water	+	+	+	+	+	+	+	+
Xylene	+	(+)		+	+	+	−	

+ resistant for 3 months (+) resistant for 3 days − not resistant not tested

A guide to the chemical resistance of UCRETE®flooring and MASTERFLEX®460

Introduction

This guide is intended to assist users, specifiers and applicators of UCRETE® floors and MASTERFLEX® 460 to select the most appropriate product for the chemical exposure conditions likely to be encountered. The data in this guide are based on immersion tests carried out in our laboratories and on practical experience gained from case histories over 25 years.

Three categories of resistance are used:

- **R** resistant (subject to reasonable standards of housekeeping).
- **L** limited resistance (occasional spillage tolerated if the floor is washed down or the spillage evaporates quickly).
- **NR** not resistant (rapid and severe attack even by small spillages).

Users should also be aware of the following:

• The data for UCRETE grades refer to floors:

They do not apply to UCRETE materials used as linings and subject to total or partial immersion. When lining drains, bunds and sumps UCRETE UD200 should be used. Resistance in such cases is likely to be more limited and your local BASF Construction Chemicals office should be consulted before UCRETE materials are proposed for such applications.

• Secondary containment:

When used in secondary containment or bunded areas, “limited resistance” is in most cases sufficient to provide protection of the underlying substrate for 72 hours in the event of a major spillage. For example, Bunded areas for concentrated nitric and sulphuric acid will be protected by 9 mm of UCRETE UD200 flooring although some surface erosion of the UCRETE® will occur.

• Staining and discoloration:

Many chemicals will stain or discolour the surface of UCRETE® flooring and MASTERFLEX® 460 without causing any deterioration or loss of properties. Common examples are dilute nitric acid, acetic acid hydrogen peroxide and sodium hypochlorite, which are widely used in food processing plants, chromic acid used in metal plating and toluene sulphonic acid, which is used frequently in the electronics industry.

In areas where very aggressive chemicals (chemicals marked L or NR) are used and spillage is frequent, some surface erosion is possible if good standards of housekeeping are not observed. In such areas UCRETE® UD200 is the product of choice. Where UCRETE® DP or HPQ are used the basecoats should be pigmented to minimise the aesthetic impact of any surface damage.

• Maximum service temperature:

UCRETE flooring has a maximum service temperature dependent upon grade and specification, as detailed in the individual Product Data Sheets. The maximum service temperature specified in the individual Product Data Sheet to protect against thermal shock, should be respected for all but the most minor spillages even if the table below shows that the grade of UCRETE® flooring concerned may be resistant to chemicals at a higher temperature.

• Solvents:

Many aggressive solvents will affect UCRETE® flooring on long-term exposure but are so volatile that spillages evaporate before any damage occurs. Typical examples are methylene chloride and tetrahydrofuran. In these cases, serviceability depends upon circumstances. For example, when used on a floor that is subject only to occasional spillage, UCRETE flooring is perfectly resistant to methylene chloride. However, in a sump or drain, where the methylene chloride may be covered in water and evaporation prevented, damage may occur after a few days or weeks. If there is any doubt, always contact your local BASF Construction Chemicals office.

• Joint sealants:

Because of their flexibility all joint sealants, including MASTERFLEX® 460, have lower long-term chemical and heat resistance than UCRETE flooring. This means that under aggressive conditions the joint sealants may have a shorter service life than the UCRETE floor, even if the table below shows the MASTERFLEX® 460 to be resistant to the chemical condition. It is recommended that joint sealants should be inspected on a regular basis and replaced as soon as signs of deterioration are noticed. This will eliminate the possibility of aggressive chemicals leaking through to the concrete and causing structural breakdown.

Chemical Resistance Chart — Ucrete® and Masterflex®

Chemical	Concentration %	Temperature °C	UCRETE UD200/DP/HPQ TZ/MF/WR	MASTERFLEX 460
Acetaldehyde	100	20	R	NR
Acetic acid	10	20	R	R
	10	85	R	NR
	25	20	R	L
	25	85	L	NR
	40	20	R	L
	99(Glacial)	20	L	NR
Acetic anhydride	100	20	L	NR
Acetone	100	20	R	L
Acrylic acid	100	20	R	L
Adipic acid	Saturated	20	R	R
Aluminium sulphate	50	20	R	R
Ammonium hydroxide	28	20	R	R
Ammonium nitrate	50	20	R	R
Ammonium sulphate	50	20	R	R
Amyl acetate	100	20	R	L
Aniline	100	20	R	L
Antifreeze (Ethylene glycol)	100	20	R	R
Aqua regia	-	20	L	L
Beer	-	20	R	R
Benzene	100	20	L	NR
Benzoic acid	100	20	R	L
Benzoyl chloride	100	20	R	L
Blood	-	20	R	R
Boric acid	Saturated	20	R	R
Brake fluid	-	20	R	L
Brine (Sodium Chloride)	Saturated	20	R	R
Butanol	100	20	R	R
Calcium chloride	50	20	R	R
Calcium hydroxide	Saturated	20	R	R
Calcium hypochlorite	Saturated	20	R	R
Caprolactam	100	20	R	NR
Carbon disulphide	100	20	R	L
Carbon tetrachloride	100	20	R	L
Castor oil	100	20	R	R
Chlorine water	Saturated	20	R	R
Chloroacetic acid	10	20	R	L
	50	20	L	NR
Chloroform	100	20	R	R
Chromic acid	10	20	R	R
	20	20	R	R
	30	20	R	L
Citric acid	20	20	R	R
	50	20	R	R
Copper (II) sulphate	Saturated	20	R	R
Cresols	100	20	L	NR
Crude oil	-	20	R	R
Cyclohexane	100	20	R	L
Decanoic (Capric) acid	100	20	R	R
	100	60	R	R
Detergents (acidic)	-	20	R	R
	-	80	R	R

Chemical Resistance Chart — Ucrete® and Masterflex® (continued)

Chemical	Concentration %	Temperature °C	UCRETE UD200/DP/HPQ TZ/MF/WR	MASTERFLEX 460
Detergents (alkaline)	-	20	R	R
	-	80	R	R
Diethylene glycol	100	20	R	R
Dimethyl formamide	100	20	NR	NR
Ethanol	100	20	R	R
Ethyl acetate	100	20	L	NR
Ethylene dichloride	100	20	L	NR
Ethylene glycol	100	20	R	R
Ethyl glycol acetate	100	20	R	L
Fats	-	80	R	R
Formalin	40	20	R	R
Formic acid	40	20	R	L
	70	20	R	NR
	90	20	L	NR
	100	20	L	NR
Fumaric acid	Saturated	20	R	R
Gallic acid	100	20	R	R
Gasoline	-	20	R	L
Glycolic acid	100	20	R	R
Heptanoic acid	100	20	R	NR
	100	60	R	NR
Hexane	100	20	R	R
Hydrobromic acid	48	20	R	L
Hydrochloric acid	10	20	R	R
	10	60	R	R
	37	20	R	NR
Hydrofluoric acid	4	20	R	R
	20	20	L	L
Hydrogen peroxide	30	20	R	R
Isopropanol	100	20	R	L
Jet fuel	-	20	R	R
Kerosene	-	20	R	R
Lactic acid	5	20	R	R
	25	60	R	NR
	85	20	R	L
	85	60	R	NR
Lauric acid	100	60	R	L
Magnesium nitrate	50	20	R	R
Maleic acid	30	20	R	R
Maleic anhydride	100	20	R	R
Malic acid	50	20	R	L
Methacrylic acid	100	20	R	L
Methanol	100	20	R	L
Methylated spirits	-	20	R	L
Methylene chloride	100	20	L	NR
Methyl ethyl ketone	100	20	L	NR
Methyl methacrylate	100	20	R	NR
Milk	-	20	R	R
Mineral oils	-	20	R	R
Monochlorobenzene	100	20	R	NR
Motor oil	-	20	R	R
N, N-dimethyl acetamide	100	20	NR	NR
N-methyl pyrollidone	100	20	NR	NR

Chemical Resistance Chart — Ucrete® and Masterflex® (continued)

Chemical	Concentration %	Temperature °C	UCRETE UD200/DP/HPQ TZ/MF/WR	MASTERFLEX 460
Nitric acid	5	20	R	L
	30	20	R	NR
	65	20	L	NR
Oleic acid	100	20	R	R
	100	80	R	L
Oleum	-	20	L	L
Oxalic acid	5	20	R	R
Paraffin	-	20	R	R
Perchloroethylene	100	20	R	L
Phenol	5	20	L	NR
Phenyl sulphuric acid	10	20	R	R
Phosphoric acid	5	20	R	R
	40	85	R	L
	50	20	R	R
	85	20	R	L
Picric acid	10	20	R	L
	50	20	R	L
Propylene glycol	100	20	R	R
Potassium dichromate	Saturated	20	R	R
Potassium hydroxide	50	20	R	NR
Salicylic acid	Saturated	20	R	R
Skydrol® 500B4	-	20	R	NR
Skydrol® LD4	-	20	R	NR
Sodium chlorate	Saturated	20	R	R
Sodium chloride	Saturated	20	R	R
Sodium hydroxide	20	20	R	L
	20	90	R	NR
	32	20	R	NR
	50	20	R	L
	50	60	R	NR
	50	90	L	NR
Sodium hypochlorite	15	20	R	R
Stearic acid	100	80	R	L
Styrene	100	20	R	NR
Sulphuric acid	5	20	R	R
	30	60	R	R5020RR
	98	20	L	L
Tar oil	-	20	R	R
Tartaric acid Saturated	Saturated	20	R	R
Tetrahydrofuran	100	20	L	NR
Thioglycolic acid	100	20	R	R
Toluene	100	20	R	NR
Toluene sulphonic acid	100	20	R	L
Trichloroacetic acid	100	20	L	NR
Trichlorobenzene	100	20	R	NR
Trichloroethylene	100	20	L	NR
Turpentine	-	20	R	R
Urea	20	20	R	R
Vegetable oils	-	80	R	R
Water (distilled)	-	85	R	R
White spirit	-	20	R	R
Xylene	100	20	R	L

* UCRETE HPQ with Lockcoat PU only

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Further information on BASF is available on the Internet at www.basf.com

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