

# **VERSADUR®**

**RIGID PVC - EXTRUDED  
POLYPROPYLENE - EXTRUDED/STRESS RELIEVED  
HIGH DENSITY POLYETHYLENE**

## **CHEMICAL RESISTANCE HANDBOOK**

**FOR**

VERSADUR 100 SERIES

TYPE I, GRADE 1, PVC

VERSADUR 200 SERIES

TYPE II, GRADE 1, PVC

VERSADUR 500 SERIES

POLYPROPYLENE

VERSADUR 600 SERIES

HIGH DENSITY POLYETHYLENE

**•HPG®**  
International, Inc.



Choose Your Corrosion Resistant Sheet Products With Confidence

Very few competent designers, engineers, and buyers are completely comfortable specifying corrosion resistant constructions when the materials to be used or the conditions are challenging or unusual.

Most corrosion resistant material manufactures supply bulletins listing terms such as “good”, “limited” etc., without describing what and whose values determined these criteria. This does not alleviate the specifier anxiety because he or she is uncertain about just what exactly is meant by these terms and what will result in practice. What is “good” or “limited” to one person may be “fair” or even “poor” to others with different backgrounds or expectations.

While we, too, publish a rating for our corrosion resistant materials in terms of “excellent”, “fair” or “non-resistant” for given corrosive service applications, we describe the objective test results on which these categorizations are based. This allows the specifier to make an objective decision about the material’s suitability.

Ratings are assigned on the basis of a comparison of the results of physical tests on randomly selected samples before and after 28 days of immersion in the test medium under carefully controlled conditions. After immersion the samples are washed and dried under constant TEMP. and relative humidity conditions. Half of the samples are tested after 24 hours of drying, the remainder after two weeks.

The following table indicates permissible percentage changes in physical test results for a service rating of excellent (+), fair (o), or non resistant (-). The changes in the physical properties were grouped to reflect the observed performance of the material in more than 30 years of field service.

**Allowable Percentage Change in physical properties after exposure for the given rating**

PROPERTY	PERFORMANCE		
	Excellent (+)	Fair (o)	Non-Resistant (-)
Change in Dimension	<1	1-3	>3
Change in Weight			
Increase	<1.8	1.8-6.0	>6
Decrease	<1.0	1.0-5.0	>5
Tensile Strength			
Increase	<120	120-140	>140
Decrease	≥80	79-60	<60
Elongation at Break			
Increase	<125	125-150	>150
Decrease	≥50	49-30	<30
Impact Strength (u-shaped notch)	≥75	74-50	<50
Flexural Strength			
Increase	<120	120-140	>140
Decrease	≥80	79-60	<60
Hardness (Ball Indentation)			
Increase	<125	125-140	>140
Decrease	≥75	74-50	<50

Symbol Definition:    < Less Than    > Greater Than    ≤ Equal to or Less Than    ≥ Equal to or Greater Than

REAGENT	CONCENTRATION	TEMP.	VERSADUR SERIES			
			100	200	500	600
ACETALDEHYDE (AQUEOUS)	40	104	o			-
	100	72	-	-	o	o
		140	-	-	-	-
ACETANILIDE	100	72	+	+		
ACETATE SOLVENTS (CRUDE)		72	-	-	+	+
		140	-	-	o	+
ACETATE SOLVENTS (PURE)		72	-	-	+	+
		140	-	-	o	o
ACETIC ACID	0 - 10	72	+	+	+	+
		104	+	+		
		140	o	o	+	o
	10 - 20	72	+	+	+	+
		104	+			
		140	o	o	o	o
	20 - 30	72	+	+	+	+
		104	+	+		
		140	o	o	o	o
	30 - 60	72	+	o	+	o
		140			o	o
		72	+	o	+	o
80	72	+	o	+	o	
	140	o	o	-	-	
	72	+	+			
97	104	o				
	72	o	o			
	104	o				
100	72	o	o			
	104	o				
	72	o	o	+	o	
ACETIC ACID - GLACIAL	100	72	o	o	-	-
		140	-	-	-	-
ACETIC ACID VAPORS		72	+	+	o	+
ACETIC ANHYDRIDE	100	72	-	-	-	-
		140	-	-	-	-
ACETONE		72	-	-	+	+
		140	-	-	+	o
ACETYLENE		72	+	+	+	o
ACID MIXTURES (AQUEOUS)						
1) SULFURIC/NITRIC						
10% H <sub>2</sub> SO <sub>4</sub>		72				
20% HNO <sub>3</sub>		140	o			
70% H <sub>2</sub> O		176	o			
2) SULFURIC/NITRIC						
48% H <sub>2</sub> SO <sub>4</sub>		72	+	o		
49% HNO <sub>3</sub>		104	o			
3% H <sub>2</sub> O		140				
3) SULFURIC/NITRIC						
50% H <sub>2</sub> SO <sub>4</sub>		72	+	o		
33% HNO <sub>3</sub>		104	o			
17% H <sub>2</sub> O		140	o			
4) SULFURIC/PHOSPHORIC		176				
37.5% H <sub>2</sub> SO <sub>4</sub>						
40% PHOSPHORIC						
22.5% H <sub>2</sub> O						
5) NITRIC 15%		72	+	+		
HYDROFLUORIC 4%		140				
6) SODIUM DICHROMATE 13%		72	+	+		
NITRIC ACID 16%		140	o	o		
WATER 71%						

REAGENT                      CONCENTRATION                      TEMP.                      VERSADUR SERIES  
LEGEND: + EXCELLENT                      o FAIR                      - NON-RESISTANT

	%	°F	100	200	500	600
ACRYLIC PRE-POLYMER IN AQUEOUS ETHANOL	200 G/1	104	+			
ADIPIC ACID	Satur.	72	+	+		+
		140	o	o		o
		176	o			
		212				
ALCOHOL, AQUEOUS WITH DENATURED CAMPHOR	200/0,51		+			
ALLYL ALCOHOL	96	72		+	+	+
		140	-	-	+	o
ALLYL CHLORIDE	100	72	-	-	+	+
		140	-	-	+	o
ALUM	Satur.	72	+	+	+	+
		104	+	+		
		140	o	o	+	+
		176				
		212				
ALUMINUM CHLORIDE	10	72	+	+	+	+
		104		+		
		140	o	o	+	+
		176	o	+		
		212	o	o		
ALUMINUM FLUORIDE		72	+	+	+	+
ALUMINUM HYDROXIDE		72	+	+	+	+
ALUMINUM OXYCHLORIDE		72	+	+	+	+
		140	+	+	+	+
ALUMINUM NITRATE		72	+	+	+	+
		140	+	+	+	+
ALUMINUM SULFATE	10	72	+	+	+	+
		104	+	o		
		140	+	+	+	+
AMMONIA - DRY GAS	100	72	+	+	+	+
		140	+	+	+	+
AMMONIA - LIQUID	25	72	+	+	+	
		104	+	o	o	
		140	o			
	Satur.	72	+	+		o
		104	+	o		
		140		o		o
AMMONIUM BIFLORIDE	20	72	+	+	+	+
		140	o		+	+
AMMONIUM CARBONATE		72	+	+	+	+
		140	+	+	+	+
AMMONIUM CHLORIDE		72	+	+	+	+
		140	+	o	+	+
AMMONIUM FLUORIDE	25	72	+	+	+	+
		140	o		o	+
AMMONIUM HYDROXIDE	28	72	+	o	+	+
		140	+	o	+	+

LEGEND: + EXCELLENT

o FAIR

- NON-RESISTANT

REAGENT	CONCENTRATION %	TEMP. °F	VERSADUR SERIES			
			100	200	500	600
AMMONIUM METAPHOSPHATE		72	+	+	+	+
AMMONIUM NITRATE	10	140	+	+	+	+
		72	+	+	+	+
		104		+		
		140	+	o	+	+
		176	o			
		212				
AMMONIUM PERSULFATE		72	+	+	+	+
		140	+	+	+	+
AMMONIUM PHOSPHATE (AMMONIACAL)		72	+	+	+	+
		140	+		+	+
AMMONIUM PHOSPHATE (NEUTRAL)		72	+	+	+	+
		140	+	+	+	+
AMMONIUM SULFATE		72	+	+	+	+
		140	+	+	+	+
AMMONIUM SULFIDE		72	+	+	+	+
		104	+			
		140	o	+	+	+
AMMONIUM THIOCYANATE		72	+	+	+	+
		140	+		+	+
AMYL ACETATE	100	72	-	-	-	o
		140	-	-	-	-
AMYL ALCOHOL	100	72	+	+	+	+
		140	+	o	+	+
AMYL CHLORIDE	100	72	-	-	-	o
		140	-	-	-	-
ANILINE	100	72	-	-	o	+
		140	-	-	o	o
ANILINE CHLOROHYDRATE		72	+	+	-	-
		140	-	-	-	-
ANILINE HYDROCHLORIDE		72	o		-	-
		140	-		-	-
ANTHRAQUINONE		72	+		o	
		140	+		-	
ANTHRAQUINONESULFONIC ACID		72	+	+	o	
		140	+	+	-	
ANTIMONY TRICHLORIDE	90	72	+	+	+	+
		140	+	+	+	+
AQUA REGIA	Satur.	72	+	o	o	o
		104	o			
		140	o	-	o	-
ARSENIC ACID	80	72	+	+	+	+
		140	o	o	+	+
	Satur.	140	o			
		176	o			
		212				
ARYSUFONIC ACID		72	o	o		
ASPHALT		72	+	+	+	+
BARIUM CARBONATE		72	+	+	+	+
		140	o	o	+	+
BARIUM CHLORIDE		72	+	+	+	+
		140	+	+	+	+

LEGEND: + EXCELLENT

o FAIR

- NON-RESISTANT

REAGENT	CONCENTRATION	TEMP.	VERSADUR SERIES			
			100	200	500	600
BARIUM HYDROXIDE		72	+	+	+	+
		140	+	+	+	+
BARIUM SULFATE	10	72	+	+	+	+
		140	+	o	+	+
BARIUM SULFIDE		72	+	+	+	+
		140	+	+	+	+
BEER		72	+		+	+
		140	+	+	+	+
BEET SUGAR LIQUOR		72	+	+	+	+
		140	+	+	+	+
BENZALDEHYDE		72	-	-	-	-
		140	-	-	o	-
BENZENE (GASOLINE)	100	72	+	+	-	-
		140	+	+	-	-
BENZENE/BENZOL MIXTURE	80/20	72				
		104				
BENZENE SULFURIC ACID	10	72	+	+		
		140	o	o		
BENZOIC ACID		72	+	+	+	+
		140	o	o	+	+
BENZOL		72	+	+	o	-
		140	+	+	+	+
BISMUTH CARBONATE		72	+	+	+	+
		140	+	+	+	+
BLEACH 12.5% ACTIVE Cl <sub>2</sub>		72	+	+	+	o
		140	o	o	+	o
BLEACHING POWDER (MOIST PASTE)		72	+	+		
		104	+	+		
		140	+	o		
BORAX	Satur.	72	+	+	+	+
		104	+	+		
		140	o	o	+	+
		176				
		212				
BORIC ACID		72	+	+	+	+
		140	+	+	+	+
BORON TRIFLUORIDE	100	72	+	+	+	+
		140	+	+	+	+
BRINE		72	+	+	+	+
		140	+	+	+	+
BROMIC ACID		72	+	+	+	+
		140	+	o	+	+
BROMINE, LIQUID	100	72	-	-	-	o
		140	-	-	-	-
BROMINE WATER	Satur.	72	+	-	o	o
		104	o			
		140		-	-	-
BUTANE	100	72	+	+	+	-
		140	+	o	o	-
BUTANOL (PRIMARY)	100	72	+	+		+
		140	o	-		+
		176				
BUTANOL (SECONDARY)		72	+	+		+
		140	o	-		+
BUTTER		72	+	+		
		104	+	+		
		140	+	+		

LEGEND: + EXCELLENT

o FAIR

- NON-RESISTANT



CAUSTIC SODA, LIQUID	5	72	+	+		
		104	+	+		
		140	o	o		
	10	72	+	+		
		104	+	+		
		180				
	14	200				
		15	200	o		
		20	72			
	30	104				
		140				
		176				
	40	72	+	+		
		104	+	+		
		140	o	o		
50	104					
	130	+	+			
	150	+	+			
CHLORACETIC ACID	33	176				
		72	+	+		
		104	+	+		
MONO + 500 <sub>G</sub> H <sub>2</sub> O	140	o	-			
	140	+				
	176	o				
	212					
	72	+	+			
CHLORIC ACID	20	140	o			
		72	+	+		
AQUEOUS		72	o			
CHLORINE GAS (DRY)		72	o	o	+	o
		140	-	-	o	o
CHLORINE GAS (MOIST)	97	72	o	-	+	o
		140	-	-	o	o
CHLORINE WATER (H <sub>2</sub> O + BLEACHING POWDER)	12.5	140			+	+
		176				
		212				
		Satur.	72	o	o	
CHLOROBENZENE	100	140	o			
		176	o			
		212				
		72	-	-	-	o
CHLOROFORM	100	140	-	-	-	-
		72	-	-	o	o
CHLOROSULFONIC ACID		140	-	-	-	-
		72	o	-	o	-
		140	-	-	-	-
CHROME ALUM	10	72	+	+	+	+
		104		+	+	
		140	o	+		+
		176	o			
		212				

LEGEND: + EXCELLENT

o FAIR

- NON-RESISTANT



CYCLOHEXANOL	100	72	+	+	+	+
		140	+	-	o	o
CYCLOHEXANONE		72	-	-	-	-
		140	-	-	-	-
DEGREASING BATH		130	+			
DEMINERALIZED WATER		72	+	+	+	+
		140	o	o	+	+
DEXTRIN		72	+	+	+	+
		140	+	+	+	+
DEXTROSE		72	+	+	+	+
		140	+	+	+	+
DIAZO SALTS		72	+	+	+	+
		140	o	o	+	+
DICHROMATE CLEANING SOLUTIONS		72	+	+		
		104	+	+		
		140	o	o		
DIESEL FUEL		72	+	+		
		104	+	+		
DIGLYCOLIC ACID		72	+	+	+	+
		140	o	o	+	+
DIMETHYLHYDRAZINE	15	125	+			
DIMETHYLAMINE		72	-	-	-	-
		140	-	-	-	-
DIOCTYLPHTHALATE		72	-	-	-	-
		140	-	-	-	-
DISODIUM PHOSPHATE		72	+	+	+	+
		140	+	+	+	+
DISTILLED WATER		72	+	+	+	+
		140	o	o	+	+
EAU DE COLOGNE	Satur.		+			
ELECTROLYTE N <sub>1</sub>		130	+			
ELECTROLYTE BATH WITH 150g/l H <sub>2</sub> SO <sub>4</sub> AND 40g/l THIOCRESLIC ACID		110	+			
ELECTROLYTE - LIQUID		72	+			
		104	+			
		140	o			
ETHERS	100	72	-	-	-	-
		140	-	-	-	-
ETHYL ACETATE		72	-	-	+	o
		140	-	-	+	o
ETHYL ACRYLATE		72	-	-	+	-
		140	-	-	o	-
ETHYL ALCOHOL	10	72	+	+	+	+
		104	+	+		
		140	+	o	+	+
	96	72	+	+	+	+
		104	+	+	+	
		140	o	o		+
ETHYL CHLORIDE		72	-	-	-	o
		140	-	-	-	-
ETHYL ETHER		72	-	-	o	o
		140	-	-	-	-
ETHYLENE BROMIDE		72	-	-	-	-
		140	-	-	-	-
ETHYLENE CHLOROXYDRIN		72	-	-	-	-
		140	-	-	-	-

REAGENT	CONCENTRATION %	TEMP. °F	VERSADUR SERIES			
			100	200	500	600
ETHYLENE DICHLORIDE		72	-	-	-	-
		140	-	-	-	-

LEGEND: + EXCELLENT

o FAIR

- NON-RESISTANT

ETHYLENE GLYCOL		72	+	+	+	+
		140	+	+	+	+
ETHYLENE OXIDE		72	-	-	o	-
		140	-	-	-	-
FATTY ACIDS		72	+	+	+	+
		140	+	+	+	o
FERRIC CHLORIDE		72	+	+	+	+
		140	+	+	+	+
FERRIC NITRATE		72	+	+	+	+
		140	+	+	+	+
FERRIC SULFATE		72	+	+	+	+
		140	+	o	+	+
FERROUS CHLORIDE		72	+	+	+	+
		140	+	+	+	+
FERROUS SULFATE		72	+	+	+	+
		140	+	+	+	+
FISH SOLUBLES		72	+	+	+	+
		140	+	+	+	+
FLUORINE GAS - DRY		72	o	-	o	o
		140	-	-	-	-
FLUORINE GAS - WET		72	o	-	o	o
		140	-	-	-	-
FLUOROBIC ACID		72	+	+	+	+
		140	+	+	+	+
FLUOROSILICIC ACID	40	72	+	+	+	+
		104	o	o	+	
		140	o	-		+
FLUSHING AGENT	Satur.	72	+	+		
		104	+	+		
FORMALDEHYDE	10	72	+	+	+	+
		104	+	+		
		140	o		+	o
	15	72	+	+		
		104		+		
		140	o	o		
		176	o			
FORMALIN	5	72	+	+		
		104	+	+		
		140	o	o		
	Conc.	72	+	+		
		104	o	o		
FORMIC ACID	50	72	+	+		
		104	+	+		
		140	+			
		176	o			
	100	72	+	+	+	+
		104	o	o		
		140	o	o	+	+
		176	o			
FREON 12		72	+	+	+	+
		140	o	o	+	o
FRUCTOSE		72	+	+	+	+
		140	+	+	+	+
FRUIT PULPS & JUICES		72	+	+	+	+
		140	+	+	+	+

REAGENT	CONCENTRATION	TEMP.	VERSADUR SERIES			
			100	200	500	600
FUEL OIL (CONT. H <sub>2</sub> SO <sub>4</sub> )		72	+	+	o	-
		104	+	+		
		140			-	-
FUEL OIL A		72	+			

LEGEND: + EXCELLENT                      o FAIR                      - NON-RESISTANT

		104	+				
		140	+				
FUEL OIL B		72	+				
		104	+				
		140	+				
FUEL OIL, EXTRA LIGHT (IMPORT)		72	+	o			
		104	+				
		140	o				
FURFURAL	100	72	-	-	-	o	
		140	-	-	-	-	
GALLIC ACID		72	+	+	+	+	
		140	+	+	+	+	
GAS (COKE OVEN)		72	+	o	+		
		140	+	-	o		
GAS - MANUFACTURED		72	-	-	+		
		140	-	-	o		
GAS - NATURAL (DRY)		72	+	+	+	o	
		140	+	+	o	-	
GAS -NATURAL (WET)		72	+	+	+	o	
		140	+	+	o	-	
GAS MIXTURE 88% N <sub>2</sub> 11% CO <sub>2</sub> 1% OXYGEN & NITROGEN OXIDES		72	+				
GASOLINE - REFINED		72	+	+	-	o	
		140	+	+	-	-	
GASOLINE - SOUR		72	+	+	-	o	
		140	+	+	-	-	
GELATINE		72	+	+	+	+	
		140	+	+	+	+	
GLUCOSE		72	+	+	+	+	
		140	o	o	+	+	
GLYCERIN (GLYCEROL)	100	72	+	+	+	+	
		104	+	+			
		140	+	+	+	+	
		176	+				
		212	o				
GLYCOL		72	+	+	+	+	
		140	+	+	+	+	
GLYCOLIC ACID	30	72	+	+	+	+	
		140	+	+	+	+	
GREEN LIQUOR (PAPER IND.)		72	+	+	+	+	
		140	+	+	+	+	
HEPTANE		72	+	o	-	o	
		140	+	-	-	-	
HEXANE		72	+	-	o		
		140	o	-	-		
HEXANOL, TERTIARY		72	+	o	+	+	
		140	+	-	+	o	
HYDROBROMIC ACID	20	72	+	+	+	+	
		140	o	o	+	+	
	40	140	+				
		176					

REAGENT	CONCENTRATION	TEMP.	VERSADUR SERIES			
			100	200	500	600
HYDROCHLORIC ACID	5	72	+	+		
		104	+	+		
		140	o	o		
	10	104		+		
		140	+			

LEGEND: + EXCELLENT

o FAIR

- NON-RESISTANT

		176	o			
		212				
	32	72	+	+		+
		104	+	+		
	36	72	+	+		+
		104	+	+		
		140	+	o		+
		176	o			
HYDROCYANIC ACID OR		72	+	+	+	+
HYDROGEN CYANIDE		140	+	+	+	+
HYDROFLUORIC ACID	4	72	+	o	+	
		140	o	o	+	
	5 - 7	72	+			
	10	72	+	+	+	+
		140	o	o	+	+
	48	72	+	o	+	+
		140	o	-	+	+
HYDROGEN		72	+	+	+	+
		140	+	+	+	+
HYDROGEN PEROXIDE	10	72	+	+		
		104	+	+		
	30	140		o		
		72	+	+	+	+
		104	+	+		
		140	+	o	+	o
	50	72	+	+	-	+
		140	o	-	-	o
	60	104	+			
	90	72	+	-	-	o
		140	+	-	-	o
HYDROGEN PHOSPHIDE		72	+	+	+	+
		140	+	o	+	+
HYDROGEN SULFIDE		72	+	+	+	+
(AQUEOUS SOLUTION)		140	+	+	+	+
HYDROGEN SULFIDE - DRY		72	+	+	+	+
		140	+	+	+	+
HYDROQUINONE		72	+	+	+	+
		140	+	+	+	+
HYDROXYLAMINE SULFATE		72	+	+	+	
		140	+	+	+	
HYPOCHLOROUS ACID		72	+	+	+	+
		140	+	+	+	+
IODINE (IN ALCOHOL)		72	-	-	+	-
		140	-	-	o	-
ISOPROPYL ALCOHOL		72	+	+	+	+
		140	+	+	+	+
KEROSENE		72	+	+	o	o
		140	+	+	-	-
KODAK FIXER		72	+	+		
		140	+	+		
KODAK SHORT STOP		72	+	+		
		140	+	+		

REAGENT	CONCENTRATION	TEMP.	VERSADUR SERIES			
			100	200	500	600
LACTIC ACID	%	72	+	+		
		104	+	+		
		140	o	o		
	28	72	+	+	+	+
		140	-	-	+	+
40	72	+	+			

LEGEND: + EXCELLENT

o FAIR

- NON-RESISTANT

LARD OIL	104	+	+		
	72	+	+		+
	140	o			
LAURIC ACID	72	+	+	+	
	140	+	+	o	
LAURYL CHLORIDE	72	+	+	o	o
	140	+	+	-	o
LAURYL SULFATE	72	+	+	o	-
	140	+	+	-	-
LEAD ACETATE	72	+	+	+	+
	140	+	+	+	+
LIME SULFUR	72	+	+	+	+
	140	+	+	+	+
LINOLEIC ACID	72	+	+	+	
	140	+	+	o	
LINSEED OIL	72	+		+	-
	140	+		+	-
LIQUORS	72	+	+	+	+
	140	+	+	+	+
LUBRICATING COMPOUND	72	+	+		
BEALON M285 (ESSO)	104	o	o		
	140	o	o		
LUBRICATING OILS	72	+		o	
	140	+		-	
MAGNESIUM CARBONATE	72	+	+	+	+
	140	+	+	+	+
MAGNESIUM CHLORIDE	72	+	+	+	+
	140	+	+	+	+
MAGNESIUM HYDROXIDE	72	+	+	+	+
	140	+		+	+
MAGNESIUM NITRATE	72	+	+	+	+
	140	+		+	+
MAGNESIUM SULFATE	72	+	+	+	+
	140	+	o	+	+
MALEIC ACID	72	+	+	+	+
	140	o		+	+
MALIC ACID	72	+	+	+	+
	140	o		+	+
MERCURIC CHLORIDE	72	+	+	+	+
	140	+	o	+	+
MERCURIC CYANIDE	72	+	+	+	+
MERCUROUS NITRATE	72	+	+	+	+
MERCURY	72	+	+	+	+
	140	+	+		+

REAGENT	CONCENTRATION	TEMP.	VERSADUR SERIES			
			100	200	500	600
METHYL ALCOHOL, AQUEOUS	%	°F				
	5	72	+	+		
		104	+	+		
	96	72	+	+		
		104	+	+		
		140	o			
	98	72	+	+		
		104	+	+		
	100	72	+	+	+	

LEGEND: + EXCELLENT                      o FAIR                      - NON-RESISTANT

		104		+		+	
		140		o		+	+
METHYL CHLORIDE		72		-		-	-
		140		-		-	-
METHYL ETHYLEKTONE		72		-		-	-
		140		-		-	-
METHYL SULFATE		72		+	+	o	
		140		o	o	-	
METHYL SULFURIC ACID	50	72		+	+	+	+
		140		+	+	+	+
METHYLENE CHLORIDE		72		-	-	+	-
		140		-	-	o	-
MILK		72		+	+	+	+
		140		+	+	o	+
MINERAL OILS		72		+		o	+
		140		+		-	-
MINERAL OIL (SHELL X-100)		72		+	+		
		104		+	+		
		140		+	+		
MOLASSES		72		+	+	+	+
		140		+	+	+	+
NAPHTHA		72		+	+	-	o
		140		+	o	-	o
NAPHTHALENE	100	72		-	-	+	o
		140		-	-	-	-
NICKEL ACETATE		72		+	+	+	+
		140		+	+	+	+
NICKEL CHLORIDE		72		+	+	+	+
		140		+	+	+	+
NICKEL NITRATE		72		+	+	+	+
		140		+	+	+	+
NICKEL SULPHATE		72		+	+	+	+
		140		+	+	+	+
NICOTINE		72		+	+	+	+
		140		+	+	+	+
NICOTINE ACID		72		+	+	+	+
		140		+	o	+	+

REAGENT	CONCENTRATION	TEMP.	VERSADUR SERIES			
			100	200	500	600
NITRIC ACID	5	72	+	+		
		104	+	+		
		140	o	o		
	10	72	+	+	+	+
		104	+	o		
		140	+	o	+	+
	50	176	o			
		72	+	o	o	
		104	+			
		140	o		-	

LEGEND: + EXCELLENT                      o FAIR                      - NON-RESISTANT

	65	72	+	-	-	
		104	o			
		140	-		-	
		176				
	68	72	+	+	-	
		140	o	-	-	
NITRIC ACID (ANHYDROUS)		72	-	-	o	-
		140	-	-	-	-
NITROBENZENE	100	72	-	-	+	-
		140	-	-	+	-
NITROUS OXIDE		72	+	+	o	
		140	+	o	-	
OILS & FATS		72	+	+	+	+
		140	+	+	+	+
OLEIC ACID		72	+	+	+	+
		140	+	+	o	+
OLEUM	10	72	-	-	-	-
		140	-	-		-
OLIVE OIL		72	+	+		
		104	+	+		
		140	+	+		
OXALIC ACID	80g/l	72	+	+	+	+
		104	+	+		
		140	o	o		+
OXYGEN		72	+	+	o	
		140	+	+	-	
OZONE	to .1% by weight	72	+			-
	10	72	+	-	o	-
		140	o	-	-	-
PALMITIC ACID	10	72	+	+	+	+
		140	+	+	o	o
	70	72	+	o	+	+
		140	-	-	o	o
PECTINE SOLUTION		104	+			
PERACETIC ACID	40	72	+	-		
		140	-	-		
PERCHLORIC ACID	10	72	+	+	o	+
		140	o	o	-	o
	70	72	o	o	o	
		140	-	-	-	

REAGENT	CONCENTRATION	TEMP.	VERSADUR SERIES			
			100	200	500	600
PHENOL	5	72	+	o		
		104	o	o		
		140	o			
	10	72	+	o		
		104	o			
		140				
		176				
90	72	o	o			
	104	o				
	140	-	-			
PHENYLHDRAZINE	100	72	o		o	
	100	72	-	-		

LEGEND: + EXCELLENT                      o FAIR                      - NON-RESISTANT

		140	-	-		
PHENYLHDRAZINE		72	o	o	o	
HYDROCHLORIDE		140	-	-	-	
PHOSGENE (GAS)		72	+	+	o	
		140	o	o	-	
PHOSGENE (LIQUID)		72	-	-	o	
		140	-	-	-	
PHOSPHORIC ACID	0 - 25	72	+	+	+	+
		104	+	+		
		140	o	o	+	+
		176	o			
		212				
	25 - 50	72	+	+	+	+
		140	+	o	+	+
	50 - 75	72	+	+	+	+
		140	+	+	+	+
	85	72	+	+		
		104	+	+		
		140	+			
		176	o			
		212				
PHOSPHOROUS (YELLOW)		72	+	o	o	+
		140	o	-	-	
PHOSPHOROUS PENTOXIDE	100	72	+	+	+	+
PHOSPHOROUS TRICHLORIDE	100	72	-	-	o	
		140	-	-	-	
PHOTOGRAPHIC CHEMICALS		72	+	+	+	+
		140	o	o	+	+
DEVELOPERS	Usage	72	+	+		
	Concent.	104	+	o		
ISOPA E & ISOPA 6	1:2	212				
RODINAL	Usage	72	+	+		
	Concent.	104	+	+		
		140	o	o		
ULTRAFIN	Usage	72		+		
	Concent.	104		+		
		140		o		

REAGENT	CONCENTRATION	TEMP. °F	VERSADUR SERIES			
			100	200	500	600
FIXING BATH	not given 100g/l	72	+	+		
		104	+	o		
		72	+	+		
		104	+	+		
		140	o	o		
PICRIC ACID		72	+	-	+	o
		140	-	-	o	
PLATING SOLUTIONS						
BRASS		72	+	+	+	+
		140	+	+	+	+
CADMIUM		72	+	+	+	+
		140	+	o	+	+
CHROMIUM		72	+	o	+	+
		140	o	o	+	+

LEGEND: + EXCELLENT                      o FAIR                      - NON-RESISTANT

COPPER		72	+	+	+	+
		140	+	+	+	+
GOLD		72	+	+	+	+
		140	+	+	+	+
INDIUM		72	+	+		
		140	+	+		
LEAD		72	+	+	+	+
		140	+	+	+	+
NICKEL		72	+	+	+	+
		140	+	+	+	+
RHODIUM		72	+	+	+	+
		140	+	+	+	+
SILVER		72	+	+	+	+
		140	+	+	+	+
TIN		72	+	+	+	+
		140	+	+	+	+
ZINC		72	+	+	+	+
		140	+	+	+	+
POTASSIUM ACID SULFATE		72	+	+	+	+
		140	+	+	+	+
POTASSIUM ANTIMONATE		72	+	+	+	+
		140	o	o		
POTASSIUM BICARBONATE		72	+	+	+	+
		140	+	+	+	+
POTASSIUM BICHROMATE		72	+	+	+	+
		140	+	+	+	+
POTASSIUM BISULFITE		72	+	+		
		140	+	+		
POTASSIUM BORATE		72	+	+	+	+
		140	o	o	+	+
POTASSIUM BROMATE	10	72	+	+	+	+
		140	+	+	+	+
POTASSIUM BROMIDE	10	72	+	+	+	+
		104		+		
		140	o	o	+	+
		176	o			
		212				
POTASSIUM CARBONATE		72	+	+	+	+
		140	+	+	+	+
AQUEOUS	10	104	+	+		
		140				
		176				
		121				

REAGENT	CONCENTRATION %	TEMP. °F	VERSADUR SERIES			
			100	200	500	600
POTASSIUM CHLORIDE`		72	+	+	+	+
		140	+	o	+	+
POTASSIUM CHROMATE	40	72	+	+	+	+
		140	+	+	+	+
POTASSIUM CUPROCYANIDE		72	+	+	+	+
POTASSIUM CYANIDE		72	+	+	+	+
		140	o	o	+	+
POTASSIUM DICHROMATE	40	72	+	+	+	+
		140	+	+	+	+
AQUEOUS	10	72	+	+		
		140				
		176				
		212				
POTASSIUM FERRICYANIDE		72	+	+	+	+
		140	o	o	+	+
POTASSIUM FLUORIDE		72	+	+	+	+

LEGEND: + EXCELLENT

o FAIR

- NON-RESISTANT

POTASSIUM HYDROXIDE		140	+	+	+	+
		72	+	+		
SOLUTION	5	140	+	+		
		72	+	+		
		104	+	+		
	10	140	o	o		
		104		+		
		140	o	o	+	+
		176	o			
		212				
	40	72	+	+		
		104	+	+		
		140	o	o		
	50	140	+			
		176	o			
		212	o			
POTASSIUM HYPOCHLORITE		72	+	o		
POTASSIUM NITRATE		140	o	-		
		72	+	+	+	+
		140	+	+	+	+
POTASSIUM PERBORATE		72	+	+	+	+
		140	+	+	+	+
POTASSIUM PERCHLORITE		72	+	+	+	+
POTASSIUM PERMANGANATE	5	72	+	+		
		104	+	+		
		140	+	o		
		176				
	10	72	+	+	+	+
		104	+	+		
		140	o	o	+	+
	Satur.	72	+	+		
		104	+	+		
		140	o	o		
POTASSIUM PERSULFATE	Satur.	72	+	+	+	+
		104	+	+	+	
		140	+	+		+
POTASSIUM SULFATE		72	+	+	+	+
		140	+	+	+	+
PROPANE		72	+	+	o	-
PROPARGYL ALCOHOL	7	72	+	+	o	-
		140	+	+	-	-

REAGENT	CONCENTRATION	TEMP.	VERSADUR SERIES			
			100	200	500	600
PROPYL ALCOHOL	%	72	+	+	+	+
		140	+	+	+	+
PROPYLENE DICHLORIDE		72	-	-	o	-
		140	-	-	-	-
RAYON COAGULATING BATH		72	+	+	+	+
		140	o	o	+	+
SALYCIC ACID	2.5 g per liter	72	+	+		
		104	+	+		
		140	o	o		
SALT WATER		72	+	+	+	+
		140	o	o	+	+
SEA WATER	100	104	+	+		+
		140	o	o		+
		176				
		212				
SELENIC ACID		72	+	+	+	+
		140	+	+	+	o
SERPENTINE OIL		72	+	+		

LEGEND: + EXCELLENT                      o FAIR                      - NON-RESISTANT

		104	o	o		
		140	o	o		
SILICIC ACID		72	+	+	+	+
		140	+	+	+	+
SILVER CYANIDE		72	+	+	+	+
		140	+	+	+	+
SILVER NITRATE		72	+	+	+	+
		140	o	o	+	+
SOAPS		72	+	+	+	+
		140	o	o	+	+
SOAP SOLUTION		72	+	+		
		104	+	+		
		140	o	o		
		176	o			
SODIUM ACETATE		72	+	+	+	+
		140	+	+	+	+
SODIUM ACID SULFATE		72	+	+	+	+
SODIUM ANTIMONATE		72	+	+	+	+
SODIUM ARSENITE		72	+	+	+	+
SODIUM BENZOATE		72	+	+	+	+
		140	o	o	+	+
SODIUM BICARBONATE		72	+	+	+	+
		140	+	+	+	+
SODIUM BISULFATE		72	+	+	+	+
		140	o	o	+	+
SODIUM BISULFITE	10	72	+	+	+	+
		104	+	o		
		140	o		+	+
		176			+	
		212			+	
SODIUM BROMIDE		72	+	+	+	+
		140	+	+	+	+
SODIUM CARBONATE (SODA ASH)	10	72	+	+	+	+
		104	+	+	+	
		140	o	o	+	+
		176			+	
		212			+	
SODIUM CHLORATE		72	+	+	+	+
		140	+	o	+	+

REAGENT	CONCENTRATION	TEMP.	VERSADUR SERIES			
			100	200	500	600
SODIUM CHLORIDE	10	72	+	+	+	+
		104	+	+	+	
		140	+	+	+	+
SODIUM CYANIDE		72	+	+	+	+
		140	+	+	+	+
		140	+	+	+	+
SODIUM DICHROMATE		72	+	+	+	+
		140	+	o	+	+
		140	+	+	+	+
SODIUM FERRICYANIDE		72	+	+	+	+
		140	+	+	+	+
		140	+	+	+	+
SODIUM FERROCYANIDE		72	+	+	+	+
		140	+	+	+	+
		140	+	+	+	+
SODIUM FLUORIDE		72	+	+	+	+
		140	+	+	+	+
		140	+	+	+	+
SODIUM HYDROGEN SULFIDE	10	72	+	+		
		104	+	+		
		140	+	+		
SODIUM HYDROXIDE		72	+	+	+	+
		140	+	+	+	+
		290 - 200			+	
SODIUM HYPOCHLORIDE 2% ACTIVE CHLORINE		72	+		+	+

LEGEND: + EXCELLENT

o FAIR

- NON-RESISTANT



		140			+	
		176			+	
		190			+	
	96	72	+	o	+	o
		104	+		+	
		140	o		+	-
		176			+	
	98	72		o	+	o
		104			+	
		140	o		+	-
		176	o		+	
TANNIC ACID		72	+	+	+	+
TANNING LIQUORS	10	140	+	+	+	+
		72	+	+	+	+
TARTARIC ACID		140	+	+	+	o
		72	+	+	+	+
TETRAETHYL LEAD	100	140	+	+	+	+
		72	+	o	+	
TETRAHYDROFURANE		140	o	-	o	
		72	-	-	o	o
		140	-	-	o	-
THIONYL CHLORIDE		72	-	-		-
		140	-	-		-
TIN CHLORIDE		72	+	+	+	
		140	+	+	o	
TITANIUM TETRACHLORIDE		72	+	o	+	
		140	-	-	-	

REAGENT	CONCENTRATION	TEMP.	VERSADUR SERIES			
			100	200	500	600
TOLUOL OR TOLUENE	100	72	-	-	-	-
		140	-	-	-	-
TRIBUTYL PHOSPHATE	100	72	-	-	+	
		140	-	-	o	
TRICHLORETHYLENE	100	72	-	-	-	-
		140	-	-	-	-
TRIETHANOLAMINE		72	o	o	+	+
		140	-	-	o	o
TRIETHYLAMINE		72	+	o	o	
		140	+	-	-	
TRIMETHYL PROPANE		72	+	+	o	
		140	o	o	-	
TRISODIUM PHOSPHATE		72	+	+	+	+
		140	+	+	+	+
TURKEY RED OIL		72	+			
		104	+			
TURPENTINE	100	140	o			
		72	+	+	-	
		140	o	o	-	
UREA	33	72	+	+	+	
		140	+	+	+	
AQUEOUS	10	104		+	+	
		140	o		+	

LEGEND: + EXCELLENT

o FAIR

- NON-RESISTANT

			176	o		+	
URINE			72	+	+	+	+
			140	o	o	+	+
VINEGAR			72	+	+	+	+
			140	o	o	+	+
VINYL ACETATE			72	-	-	+	
			140	-	-	o	
WATER	100		72	+	+		
			104	+	+		
			140	o	o		
			176				
			212				
WATER - ACID MINE WATER			72	+	+	+	+
			140	o	o	+	+
WATER - DISTILLED			72	+	+	+	+
			140	o	o	+	+
WATER - FRESH			72	+	+	+	+
			140	o	o	+	+
WATER - SALT			72	+	+	+	+
			140	o	o	+	+
WHISKEY			72	+	+	+	+
WINES			72	+	+		
			140	+	+		
XYLENE OR XYLOL	100		72	-	-	-	-
			140	-	-	-	-
ZINC CHLORIDE			72	+	+		+
			140	o	o		+
ZINC NITRATE			72	+	+	+	+
ZINC SULFATE			72	+	+	+	+
			140	+	o	+	+

LEGEND: + EXCELLENT

o FAIR

- NON-RESISTANT

When considering the chemical resistance of any sheet materials, it is important to take into account several factors. These factors might include temperature extremes and cycling, pressure extremes and cycling, exposure duration and mechanical stress. Combinations of chemicals and stress can negatively impact materials causing stress cracking.

The information provided in this document, while valid at the time it was produced, may not reflect material performance under different conditions. Furthermore, the combination of chemicals or compounds could detrimentally affect the chemical resistance of a material when exposed to that mixture. HPG makes no claims to the accuracy of the chemical resistance data when temperatures and pressures are exceeded and when solution strengths are altered or combined to create new mixtures.

This information is furnished without warranty, representation, inducement, or license of any kind, except that it is accurate to the best of HPG International, Inc.'s knowledge or obtained from sources believed by HPG International, Inc. to be accurate and HPG International, Inc. does not assume any legal responsibility for use or reliance upon same. Customers are encouraged to conduct their own tests. Before using any product, read its label.