THE SOURCE

FOR COMPOSITE RESINS SOLUTIONS

2000 EDITION

HETRON® and AROPOL™ Resin Selection Guide

For Corrosion Resistant FRP Applications

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INTERNATIONAL

Ashland®

Composite Polymers Division

WE HAVE A HETRON® AND AROPOL™ RESIN FOR YOUR FRP EQUIPMENT NEEDS

Resin Series	Characteristics	Suggested Applications
HIGH PERFORMANCE EPOXY VINYL ESTER		
HETRON 942/35	High performance epoxy vinyl ester resin with improved resistance to hydrocarbon solvents and superior thermal properties.	Equipment requiring superior thermal properties to HETRON 922 resin or less than 35% styrene. Meets FDA regulation Title 21 CFR.177.2420.
HETRON 980/35	High performance epoxy vinyl ester resin formulated to provide maximum heat and corrosion resistance to strong oxidizing chemicals.	Equipment requiring maximum corrosion resistance to bleach chemicals.
HETRON FR998/35	Flame retardant epoxy vinyl ester resin. Class I (ASTM E84) without antimony additives. Improved resistance to hydrocarbon solvents and oxidizing media. Superior thermal properties.	Equipment requiring superior corrosion resistance and thermal properties to standard flame retardant epoxy vinyl ester resins. Flame retardant applications where translucency is required.
HETRON 970/35	Best solvent resistance of any styrenated epoxy vinyl ester resin. Improved thermal properties.	Equipment where maximum thermal properties or solvent resistance is required.
HETRON FR990ZX	Styrene-free, epoxy vinyl ester. Exceptional resistance to organic solvents. Class I (ASTM E84) with 3% antimony trioxide.	Field applications where styrene odors are unacceptable.
EPOXY VINYL ESTER		
HETRON 922 Series	Corrosion resistant to both strong acids and bases. Inherent toughness provides fabrication advantages and resistance to both impact and thermal shock damage.	Equipment where strong acids and bases are encountered. Marine applications requiring Lloyd's approval. Meets FDA regulation Title 21 CFR.177.2420.
HETRON 922	Medium viscosity version.	
HETRON 922L	Low viscosity version.	
HETRON 922L-25	Low viscosity, promoted version.	
HETRON FR992	Flame resistant version of HETRON 922 epoxy vinyl ester resin. Class I (ASTM E84) with the addition of 3% antimony trioxide.	Flame resistant equipment requiring the corrosion resistance and toughness of HETRON 922 resin.
HETRON 980	Superior corrosion resistance to HETRON 922 resin. Improved thermal properties.	Equipment requiring superior thermal properties and corrosion resistance to that of HETRON 922 resin.
CHLORENDIC POLYESTER		
HETRON 92 Series	Flame resistant resin providing good corrosion resistance to vapors.	Equipment handling corrosive fumes.
HETRON 92	High viscosity version.	
HETRON 92FR	Class I (ASTM E84) without antimony trioxide.	
HETRON 92AT	Class I (ASTM E84) with the addition of 3-5% antimony trioxide.	

Resin Series	Characteristics	Suggested Applications
HETRON 197 Series	Highly corrosion and heat resistant. Low flame spread can be achieved with appropriate version.	Equipment where maximum corrosion and heat resistance to wet chlorine and other oxidizing chemicals is desired. Not for caustic service.
HETRON 197	Medium viscosity, non-thixotropic, unpromoted version, Class II (ASTM E84) with the addition of 3-5% antimony trioxide.	
HETRON 197-3	Low viscosity, thixotropic, unpromoted version, Class II (ASTM E84) with the addition of 5% antimony trioxide.	
HETRON 197P	Low viscosity, thixotropic, promoted version, Class II (ASTM E84) with the addition of 5% antimony trioxide.	
HETRON 197G	Solid ground version, Class II (ASTM E84) with the addition of styrene and 5% antimony trioxide.	
HETRON 72G	Highly corrosion and heat resistant. Available in solid only.	Used for linings, coatings, and pre-impregnated applications.

FURFURYL ALCOHOL RESIN

HETRON 800	Excellent resistance to both organic solvents and aqueous systems. Not recommended for strong oxidizers.	Equipment requiring corrosion and heat resistance beyond the capabilities of standard FRP equipment. Requires special manufacturing and equipment handling techniques. Call our technical service line at (800) 327-8720 or (614) 790-4399 for proper resin usage and suggested applications.

ISOPHTHALIC POLYESTER

HETRON 99P	Flame resistant resin providing moderate corrosion resistance, Class I (ASTM E84) with the addition of 3% antimony trioxide.	Equipment handling corrosive fumes. For process equipment enclosures.
AROPOL 7241 Series	Good corrosion resistance at moderate temperatures, including hydrocarbon solvent resistance.	General purpose corrosion resistant equipment. FDA versions are available.
AROPOL 7241	Low viscosity, unpromoted version.	
AROPOL 7241T-15	Thixotropic, low viscosity, promoted, FDA version.	
AROPOL 7241T-25	Thixotropic, low viscosity, promoted, FDA version.	
AROPOL 7334 Series	Resilient. Moderate heat and corrosion resistance.	General purpose corrosion resistant equipment. FDA versions are available.
AROPOL 7334	Low viscosity, unpromoted version.	
AROPOL 7334T-15	Thixotropic, low viscosity, promoted, FDA version.	
AROPOL 7334T-30	Thixotropic, low viscosity, promoted, FDA version.	

BISPHENOL A FUMARATE POLYESTER

HETRON 700	Broadest corrosion resistance to both acids and bases.	Equipment where maximum resistance to caustic environments is required.

Consult Technical Data Sheets for each resin's cure system, physical properties, and flame spread capabilities. Consult this Resin Selection Guide for temperature and concentration limits for specific environments. For any clarification or specialty applications call our technical service line at (800) 327-8720 or (614) 790-4399.

ADVANTAGES

Fiberglass reinforced plastic (FRP) has been used for various types of equipment in the chemical processing industry since the early 1950s. Its use has continued to grow in pulp and paper, power, waste treatment, semi-conductor, metals refining, petrochemical, pharmaceutical, and other industries. Process vessels of all shapes and sizes, scrubbers, hoppers, hoods, ducts, fans, stacks, pipes, pumps, pump bases, valve bodies, elevator buckets, heat-exchanger shells and tube sheets, mist-eliminator blades, grating, floor coatings, and tank lining systems are just a few examples of products made of FRP.

The chief reason for the popularity of these materials is their excellent resistance to corrosion. When choosing the best material of construction, FRP is often chosen due to its:

- Corrosion resistance to a wide range of acids, bases, chlorides, solvents, and oxidizers
- Heat resistance
- Electrical and thermal insulation
- High strength-to-weight ratio

ALSO

- Low maintenance
- Requires no cathodic protection, rust-free
- Ease of repair

Industry must deal with many different corrosion environments. THAT'S WHY ASHLAND SPECIALTY CHEMICAL COMPANY PROVIDES FIVE DIFFERENT TYPES OF RESINS FOR FRP EQUIPMENT. The full range of resins is available through one source, Ashland Specialty Chemical Company, to provide the corrosion resistance required to handle the many different corrosion environments encountered by industry.

TESTING AND TECHNICAL SERVICE INFORMATION

Ashland's materials evaluation laboratory in Columbus, Ohio, constantly evaluates the performance of HETRON and AROPOL resin laminates for corrosive service both in the field and in the laboratory. Additional evaluations are currently being conducted. Standard test laminate kits are supplied by Ashland for exposure in your laboratory or under your actual field conditions in accordance with ASTM C581. After exposure, they can be returned to Ashland for physical and visual examination and evaluation. Subsequently, a report will be issued with our recommendations based on the test results.

When requesting resin recommendations for corrosion resistant FRP equipment applications, users or specifiers should be prepared to supply the following data:

- All chemicals to which the equipment will be exposed: feedstocks, intermediates, products and by-products, waste materials, and cleaning chemicals
- Normal operating concentrations of chemicals, maximum and minimum concentrations (including trace amounts)
- pH range of the system
- Normal operating temperatures of the equipment, maximum and minimum temperatures
- Duration of normal, maximum and upset operating temperatures
- Abrasion resistance and/or agitation requirements
- Equipment size
- Manufacturing methods
- Flame resistance requirements
- Thermal insulation requirements

For questions regarding any of the recommendations listed in this guide, for recommendations for a particular application not listed, or to request a test kit or additional literature, contact Technical Service Information at:

Phone: **(800) 327-8720 or (614) 790-4399**
FAX: **(614) 790-6157**
E-mail: **hetron@ashland.com**
Mail: **Ashland Specialty Chemical Company**
Composite Polymers Division
Box 2219
Columbus, Ohio 43216, USA

INTERNET

For the most up-to-date corrosion information, product data sheets, and HETRON Newsletters, visit our web site at: **www.hetron.com**

INTRODUCTION

Liquid polyester and epoxy vinyl ester resins, as purchased from the resin supplier, are actually polymers dissolved in styrene monomer. The fabricator cures these resins to a solid state, reacting the polymer together with the styrene in the presence of glass reinforcements to produce a fiber reinforced rigid structure. The standards for these structures are defined by organizations such as ASTM and ASME.

The development and manufacture of HETRON and AROPOL polyester and epoxy vinyl ester resins has been a continuing process since 1955. They have been used to fabricate thousands of different types of corrosion resistant FRP equipment. Many versions of HETRON and AROPOL resins have been developed for ease of handling during hand lay-up, spray-up, filament winding, pultrusion, centrifugal casting, resin transfer molding and most other methods of commercial fabrication.

BASIS FOR RECOMMENDATIONS MADE IN THIS GUIDE

Through our experience since 1955 with corrosion resistant resins, we have learned that several resin chemistries are required to satisfactorily handle the wide range of corrosive chemicals found throughout industry. No single resin can be expected to perform well in all environments. That is why Ashland makes all five generic types of resins.

Resin recommendations must be conservative, reliable, and firm. Recommendations are based on a variety of sources, including evaluations of actual field service performance, laboratory (ASTM C581) and field tests of FRP laminate construction, and the combined knowledge of an experienced staff. Much of the information in this guide is based on field experience and recommends the right resin for the job–not a resin for all jobs. This guide is updated periodically to make use of the most recent available data. This usually results in the addition of chemical environments and resins. It may also result in raising or lowering the temperature or concentration at which a particular resin is recommended.

Unless otherwise noted, the recommendations are based on ASTM C581 standard laminate construction utilizing glass surfacing mat and no additives or fillers. For press molded, pultruded and other parts fabricated without an ASTM C581 corrosion resistant liner, it is important to establish their corrosion resistance through testing. Synthetic surfacing mat is suggested for environments known to attack glass fiber reinforcement. Care must be taken with other resin types (HETRON 197 series) as some synthetic surfacing mat/environment combinations may result in reduced corrosion resistance. Fillers should never be used without corrosion testing a representative laminate. Additives such as antimony oxide for enhanced flame retardance should not be added to the corrosion barrier.

FDA APPLICATIONS

The Food and Drug Administration (FDA) does not approve specific resins. However, the agency does publish a list of acceptable raw materials which can be used to make resins. Raw materials used to manufacture AROPOL 7241T-15, AROPOL 7334T-15, HETRON 922, HETRON 942/35 and selected other resins are listed as acceptable under FDA regulation 21 CFR.177.2420. Halogenated raw materials are not listed under FDA regulation 21 CFR.177.2420.

HOW TO USE THIS GUIDE

This Guide is a tabulation of the latest information regarding the resistance of HETRON and AROPOL resin-based FRP equipment under various corrosive operating conditions.

Special consideration should be given to fumes and splash and spill applications. In many cases where a recommendation for liquid service is given, that same resin can be used in fume service at temperatures and concentrations higher than that shown for the liquid. Tank lining applications also require special consideration due to the possibility of permeation by the corrosive material. However, extrapolations of this type must be made with caution and it is recommended that Technical Service Information be contacted at (800) 327-8720 or (614) 790-4399 for specific resin recommendations.

The following definitions will aid readers using this guide.

Temperature - Temperature data is NOT necessarily the maximum service temperature. It is the upper temperature at which a resin has been tested, used or evaluated. A resin may be suitable for higher temperature operation but additional information or testing would be required in order to establish such performance.

A Dash (–) - Showing no tested temperature recommendation indicates that data is not available. It does not mean that the resin is unsuitable for that environment. Ashland recommends coupon testing for confirmation.

LS - Indicates that limited service life can be expected. This means that a greater than normally acceptable chemical attack will occur. FRP may be the most economical material of construction for this type of equipment but further study including life-cycle cost analysis comparisons with other materials of construction is recommended.

NR - Resin is not recommended.

EPOXY VINYL ESTER RESIN COMPOSITES

Bisphenol A based epoxy vinyl ester resins are methacrylated epoxy difunctional polyesters. Novolac modified epoxy vinyl ester resins have higher functionality. Vinyl esters are classified separately from polyesters due to their enhanced mechanical properties. They offer excellent physical strength and, in general, much better impact and thermal shock resistance than polyester resins. While the standard epoxy vinyl ester resins are limited to 105-120˚C in most applications, other versions with higher-density crosslinking are suitable for temperatures above 120˚C.

These resins exhibit excellent resistance to acids, alkalis, hypochlorites, and many solvents. They are also suitable for flakeglass and fiberglass reinforced linings, coatings, and monolithic topping for tanks, vats, floors, troughs, and similar applications.

HIGH PERFORMANCE EPOXY VINYL ESTER RESIN COMPOSITES

Manufactured under a patented process, these resins offer maximum corrosion and temperature resistance to acids, alkalis, hypochlorites, and many solvents. These products have been formulated for maximum performance with methyl ethyl ketone peroxides. It is well documented that these catalysts provide optimal cure and thus maximum corrosion resistance.

- **HETRON 942/35:** A bisphenol A epoxy vinyl ester resin with improved thermal properties, formulated with less than 35% styrene. Provides superior corrosion resistance to hydrocarbon solvents.
- **HETRON 980/35:** A phenolic novolac epoxy vinyl ester resin formulated with less than 35% styrene. Provides maximum heat and corrosion resistance to strong oxidizing chemicals.
- **HETRON FR998/35:** Highly flame retardant epoxy vinyl ester resin formulated with less than 35% styrene. Excellent thermal properties and superior corrosion resistance to hydrocarbon solvents and oxidizing media. See Table 7 for ASTM E84 flame spread values for this and other flame retardant resins.
- **HETRON 970/35:** Highly crosslinked novolac epoxy vinyl ester resin with superior solvent and acid resistance.

EPOXY VINYL ESTER RESIN COMPOSITES

These resins offer excellent corrosion resistance to acids, alkalis, and some solvents.

- **HETRON 922:** Provides excellent corrosion resistance up to 105˚C.
- **HETRON FR992**: A flame retardant resin suitable for use to 105˚C. HETRON FR992 is an excellent choice for applications requiring both chemical and flame resistance. See Table 7 for ASTM E84 flame spread values.
- **HETRON 980:** A novolac modified epoxy vinyl ester resin with excellent corrosion resistance to about 120˚C. Can be used when organic chemicals such as benzyl chloride, chlorobenzene, phenol, and divinyl benzene are present.

TABLE 1-MECHANICAL PROPERTIES[1] OF HETRON AND AROPOL RESINS

RESIN	LAMINATES[2] AT TEMPERATURES											
	TENSILE STRENGTH, MPa						TENSILE MODULUS, GPa					
Temp. °C	**-43**	**25**	**65**	**95**	**120**	**150**	**-43**	**25**	**65**	**95**	**120**	**150**
HETRON 942/35	156	124	135	142	157	102	9	12	11	11	11	6
HETRON 980/35	128	101	98	107	106	115	13	12	10	11	10	7
HETRON FR998/35[3]	120	98	100	119	140	121	12	11	11	10	10	8
HETRON 970/35	169	130	127	134	145	148	12	12	12	12	10	8
HETRON 922	117	109	147	147	121	74	9	10	9	8	6	5
HETRON FR992[3]	127	119	117	140	119	93	11	11	9	9	6	6
HETRON 980	101	98	139	132	116	126	13	11	10	8	7	7
HETRON 197-3[3]	138	112	97	105	104	112	8	10	10	10	8	9
AROPOL 7241T-15	166	110	135	150	135	104	15	12	11	13	9	8
AROPOL 7334	139	102	131	133	124	110	13	10	7	6	5	5
HETRON 800	105	101	100	97	86	84	9	10	9	7	7	7
HETRON 92FR[3]	146	119	146	126	97	76	10	11	8	6	4	4
HETRON 99P[3]	121	106	106	127	131	110	13	9	9	8	7	6
HETRON 700	90	87	106	117	111	119	9	9	7	8	6	6

[1] Properties of production laminates will vary.
[2] Laminate sequence V M M Wr M Wr M. V=Veil M=Chopped Mat 0.5 kg/m² Wr=Woven Roving 0.8 kg/m², 6mm thickness, post cured
[3] Halogenated resins

CHLORENDIC POLYESTER RESIN COMPOSITES

Chlorendic resins are unsaturated, halogenated polyester resins. They are particularly well suited for equipment operating at elevated temperatures or in highly oxidizing environments such as hot, wet chlorine.

These resins are known for their ease of fabrication and are available in several user-friendly versions. They are particularly well suited for chimney liners, flue gas ducts, chrome plating tanks, pickling tanks, and chlorine headers. Refer to Table 7 for specific flame spread values.

- **HETRON 197 Series:** These resins are particularly good for acidic and oxidizing environments. Fabricators may choose the thixotropic HETRON 197-3 resin or the thixotropic and promoted HETRON 197P.
- **HETRON 72G:** The original solid ground chlorendic resin still continues to be the best for chromic acid service.
- **HETRON 92 Series:** These resins combine the maximum flame retardancy and moderate chemical resistance that are often required for the types of gas and fume service encountered in hood and duct equipment. HETRON 92AT and HETRON 92FR are thixotropic and promoted. HETRON 92 resin is suitable for compression molding.

ISOPHTHALIC POLYESTER RESIN COMPOSITES

Isophthalic polyester resins are a broad class of products of isophthalic acid, glycols, and maleic anhydride. The specific raw materials are selected to impart desired properties and corrosion resistance. These resins can be used for moderate corrosion resistance applications to a maximum temperature of 80˚C. They exhibit good resistance to water, acids, weak bases, and hydrocarbons such as gasoline and oil.

- **AROPOL 7241 Series:** Generally used for aqueous environments. AROPOL 7241T-15 offers the best corrosion and heat resistance of the isophthalic resins. AROPOL 7241T-15 is the widest used resin and is manufactured from raw materials listed as acceptable in FDA regulation Title 21 CFR.177.2420.
- **AROPOL 7334 Series:** A higher elongation resin used for applications such as tank linings and filament winding small diameter piping where toughness is required. It has a maximum service temperature of 65˚C.
- **HETRON 99P**: A flame retardant, brominated resin that provides moderate corrosion resistance for fume handling applications with flame retardant requirements such as hoods and ducts. See Table 7 for flame spread values. Please consult HETRON Technical Service for other corrosion resistant, flame retardant resins.

LAMINATES[2] AT TEMPERATURES												CASTINGS[4]						
FLEXURAL STRENGTH, MPa						FLEXURAL MODULUS, GPa						TENSILE STRENGTH MPa	TENSILE MODULUS GPa	ELONGATION BREAK %	FLEXURAL STRENGTH MPa	FLEXURAL MODULUS GPa	HDT ˚C	BARCOL HARDNESS
-43	**25**	**65**	**95**	**120**	**150**	**-43**	**25**	**65**	**95**	**120**	**150**	**25**	**25**	**25**	**25**	**25**	**–**	**25**
202	152	165	175	177	150	10	7	7	7	6	6	92	3.6	5.5	152	3.5	120	45
136	127	134	120	124	138	7	7	6	6	6	5	88	3.3	4.5	150	3.4	132	45
197	157	151	156	146	101	8	7	6	6	6	4	93	3.5	4.0	151	3.8	135	40
209	183	193	168	149	138	8	8	8	7	6	5	78	3.7	3.5	111	3.9	149	45
160	154	163	150	82	23	7	6	6	6	4	0	86	3.2	6.5	141	3.5	105	30
171	165	167	168	134	21	8	7	7	7	5	1	90	3.5	6.5	145	3.6	108	35
149	162	135	147	143	117	8	7	7	6	6	5	90	3.3	5.5	138	3.5	120	35
160	123	127	137	144	146	8	7	6	6	5	6	38	3.5	1.4	69	3.8	140	40
220	195	204	176	80	55	8	8	7	7	3	4	63	3.7	2.5	105	4.1	99	40
197	180	167	152	85	53	8	7	6	5	4	3	86	3.5	4.5	138	3.7	94	40
223	124	151	128	119	90	7	8	6	6	5	5	36	3.9	1.0	72	4.0	149	45
152	156	196	80	28	26	8	7	8	4	1	1	55	4.1	1.4	83	4.1	82	45
179	132	133	155	90	44	9	7	7	7	4	2	52	3.8	1.5	79	4.1	93	45
157	167	128	133	137	91	7	7	6	7	5	3	69	3.2	3.2	114	3.5	142	35

[4]Non-reinforced, post cured

FURFURYL ALCOHOL RESIN COMPOSITE

Furfuryl alcohol resin is based on a furan polymer derivative of furfuryl alcohol. It exhibits excellent resistance to strong alkalis and acids containing chlorinated organics and is superior to polyesters and epoxy vinyl esters in solvent resistance. Furfuryl alcohol resin is suitable for use up to about 120˚C for many corrosive applications. However, the furfuryl alcohol material is not suitable for oxidizing chemicals and should not be used for chromic or nitric acids, peroxides or hypochlorites.

Generally, the furfuryl alcohol resin is considered to be the best for all-around corrosion resistance. Fabrication and installation of equipment made with HETRON 800 resin requires special techniques that differ from those used with polyester and epoxy vinyl ester resins. Please contact HETRON Technical Service at (800) 327-8720 or (614) 790-4399 for assistance.

- **HETRON 800:** Requires the use of HETRON 803L-1 catalyst.

BISPHENOL A FUMARATE POLYESTER RESIN COMPOSITE

Bisphenol A fumarate polyester resin is made by reacting bisphenol A with propylene oxide and fumaric acid to provide a resin that is particularly resistant to alkali environments. This resin is recommended primarily for applications involving hot caustic solutions. It can also handle acids, selected organic solvents and salt solutions to a maximum temperature of 120˚C. For specific recommendations regarding HETRON 700 resin, contact HETRON Technical Service at (800) 327-8720 or (614) 790-4399.

- **HETRON 700:** A non-thixotropic unpromoted resin.

PHYSICAL PROPERTIES

The properties in this guide are typical values. These values, which vary from sample to sample, are based on tests conducted in our laboratories. Typical values should not be construed as a guaranteed analysis of any specific lot or as specification items.

Additional data on each individual resin including liquid properties and curing information is contained in the Technical Data Sheet for that resin. Ashland maintains Material Safety Data Sheets for all of its products. Material Safety Data Sheets contain health and safety information for assisting you in developing appropriate product handling procedures to protect your employees and customers. Our Material Safety Data Sheets should be read and understood by all of your employees before using Ashland's products in your facilities.

BARCOL HARDNESS

Barcol hardness values are taken as an indication of surface cure. ASTM standards indicate that FRP equipment should have a Barcol hardness of at least 90% of the manufacturer's published value for each resin. Experience indicates that Barcol hardness values are subject to a number of variables. In the case of a molded surface, these factors may be post cure, the curvature of a part or the use of one or more plies of synthetic surfacing veil. For non-molded resin surfaces, these factors may be paraffin wax, UV inhibitors, pigments, or other materials added to the resin. On a severely curved or irregular surface, an accurate Barcol hardness value may be impossible to obtain. In such cases, a flat sample using identical fabrication techniques should be monitored for cure during the manufacture of the actual part.

Experience indicates that Barcol hardness values of molded surfaces incorporating synthetic surfacing veil are less than the values of a comparable glass veil laminate. Reductions in Barcol hardness values of five units or more can be expected. Barcol hardness determination is used to check surface cure and is often accompanied by an acetone sensitivity test. The acetone sensitivity test is also valuable in judging cure when the use of the Barcol instrument is impractical. In this test, acetone solvent is liberally wiped over the test surface and allowed to evaporate. A tacky or soft surface during evaporation indicates under-cure.

THERMAL CONDUCTIVITY (K-VALUE)

The thermal conductivity of a glass reinforced laminate increases with glass content. The glass has a higher thermal conductivity than that of the resin. See Table 2 for thermal conductivity values.

TABLE 2
THERMAL CONDUCTIVITY
(TYPICAL K-VALUES: W/(m•˚C)

Resin	Casting	Composite M/M	Composite M/Wr/M/Wr
% GLASS	0	25	40
HETRON 942/35	0.18	0.17	0.19
HETRON 970/35	0.18	0.20	0.24
HETRON 922	0.18	0.20	0.22
HETRON 197-3	0.15	0.16	0.19
AROPOL 7240	0.17	0.15	0.19
HETRON 800	0.22	0.18	0.23
HETRON 700	0.17	0.18	0.20

M = Chopped Mat 0.5 kg/m² WR = Woven Roving 0.8 kg/m²

GLASS CONTENT

Mechanical properties increase with greater reinforcement content. Laminate properties can be tailored by the choice of resin, type of reinforcement (chopped glass mat, unidirectional roving, woven roving, etc.), orientation of the reinforcement, and reinforcement content. Mechanical properties of these constructions can be predicted by micro mechanics (lamination schedule) and the actual properties confirmed by testing. See Table 3 for composite physical properties versus glass content.

TABLE 3
COMPOSITE PROPERTIES VERSUS GLASS CONTENT
(TYPICAL VALUES)

Resin	M/M	M/Wr/M/Wr/M
Glass content %	25	40
HETRON 942/35		
Tensile Strength, MPa	83	147
Tensile Modulus, GPa	12	13
Flexural Strength, MPa	138	179
Flexural Modulus, GPa	6.8	8.8
HETRON 922		
Tensile Strength, MPa	91	125
Tensile Modulus, GPa	6	11
Flexural Strength, MPa	185	258
Flexural Modulus, GPa	7	10
HETRON 197-3		
Tensile Strength, MPa	81	117
Tensile Modulus, GPa	7	10
Flexural Strength, MPa	177	157
Flexural Modulus, GPa	8	10
AROPOL 7241T-15		
Tensile Strength, MPa	77	114
Tensile Modulus, GPa	8	12
Flexural Strength, MPa	113	161
Flexural Modulus, GPa	7	9
HETRON 800		
Tensile Strength, MPa	62	136
Tensile Modulus, GPa	5	9
Flexural Strength, MPa	126	224
Flexural Modulus, GPa	7	9
HETRON 700		
Tensile Strength, MPa	56	116
Tensile Modulus, GPa	5	10
Flexural Strength, MPa	108	274
Flexural Modulus, GPa	5	10

M = Chopped Mat 0.5 kg/m² Wr = Woven Roving 0.8 kg/m²

THERMAL EXPANSION/CONTRACTION

The thermal expansion of a composite decreases with increasing reinforcement content. This property is dependent on the type of reinforcement (chopped glass mat, unidirectional roving, woven roving, etc.), the orientation of the reinforcement, and reinforcement content. See Table 4 for thermal expansion values.

TABLE 4
COEFFICIENT OF LINEAR THERMAL EXPANSION[1]
(TYPICAL VALUES: x 10^{-5} mm/mm/°C)

Resin	Casting	Laminate M/M	Laminate M/Wr/M/Wr
Glass content %	0	25	40
HETRON 942/35	6.48	3.03	2.15
HETRON 980/35	6.06	-	-
HETRON 970/35	5.14	2.86	1.83
HETRON 922	5.68	2.83	2.19
HETRON FR992	5.10	-	-
HETRON 980	6.08	-	-
HETRON 197-3	5.26	2.99	2.32
AROPOL 7241T-15	6.21	3.22	2.59
AROPOL 7334	5.85	-	-
HETRON 800	4.45	2.90	1.58
HETRON 92FR	5.72	-	-
HETRON 99P	5.54	-	-
HETRON 700	6.04	3.08	2.66

[1]Harrop Thermodilatometric analyzer from –30 to 30°C. The CLTE is linear from –30 to 100°C for the glass reinforced laminates.
M = Chopped Mat 0.5 kg/m² Wr = Woven Roving 0.8 kg/m²

VOLUMETRIC CURE SHRINKAGE

Liquid resin decreases in volume during cure due to polymerization shrinkage. The linear shrinkage of a glass reinforced laminate is dependent on the type of reinforcement (chopped glass mat, unidirectional roving, woven roving, etc.), the orientation of the reinforcement, and reinforcement content. See Table 5 for typical volumetric shrinkage values.

TABLE 5
VOLUMETRIC CURE SHRINKAGE OF CASTINGS
(TYPICAL VALUES)

Resin	Density of Liquid (g/cm³)	Density of Solid (g/cm³)	Percent Shrinkage
HETRON 942/35	1.08	1.16	7.4
HETRON 980/35	1.08	1.17	8.3
HETRON 970/35	1.09	1.18	8.3
HETRON 922	1.04	1.14	9.6
HETRON FR992	1.14	1.24	8.8
HETRON 980	1.05	1.15	9.5
HETRON 197-3	1.14	1.24	8.1
AROPOL 7241T-15	1.07	1.17	9.3
AROPOL 7334	1.10	1.21	10.0
HETRON 800	1.21	1.28	5.8
HETRON 92FR	1.28	1.41	10.1
HETRON 99P	1.23	1.35	9.7
HETRON 700	0.97	1.12	13.4

ELECTRICAL PROPERTIES

The cured resins have high dielectric constants and low dissipation factors. Dielectric constant is the ratio of the capacitance of a weakly conducting material to that of air. Dissipation factor is the loss of energy resulting when a polymeric material experiences molecular motion in an alternating electric field. See Table 6 for electrical properties of standard resin castings.

TABLE 6
ELECTRICAL PROPERTIES OF CLEAR CASTINGS
(TYPICAL VALUES PER ASTM D150)

Resin	Dielectric constant[1]	Dissipation factor	Average dielectric constant[2]
HETRON 942/35	3.45	0.0050	3.38
HETRON 922	3.34	0.0123	3.39
HETRON FR992	3.29	0.0128	3.21
HETRON 980	3.44	0.0055	3.34
HETRON 197-3	3.04	0.0156	2.94
AROPOL 7334	3.49	0.0106	3.37
HETRON 800	5.35	0.0253	4.94
HETRON 92FR	3.37	0.0201	3.27
HETRON 99P	3.39	-	3.28
HETRON 700	2.94	0.0147	2.88

1 = KHz 2 = Average of 1KHz 10KHz 100KHz and 1MHz

FLAME RESISTANCE

Many HETRON polyester and epoxy vinyl ester resins are based on halogenated intermediates. These unique chemical structures account for their excellent corrosion resistance and also make these HETRON resin composites inherently flame resistant. For increased flame resistance, antimony oxide can be added to many of these resins during fabrication. Antimony oxide is not effective when added to non-halogenated resins. ASTM E84 "Standard Method of Test for Surface Burning Characteristics of Building Materials" is commonly referred to as the "Tunnel Test." This tunnel test is the accepted standard for determining flame spread values.

Current industry practice requires materials of construction for ducts, hoods, and other fume handling equipment to have a flame spread rating of 25 or less (commonly referred to as Class I). See Table 7 for specific flame spread values.

Several other tests commonly used for classifying smoke and flame retardant properties of FRP equipment include ASTM E162 "Standard Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source (Radiant Panel Test)," ASTM E662 "Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials (Smoke Chamber)," UL94 "Standard for Tests for Flammability of Plastic Materials for Parts in Devices and Appliances."

For more specific information on these and other flame resistance test results (UL94, oxygen index, cone calorimeter), contact your sales or technical service representative. Please consult HETRON Technical Service for low smoke alternatives.

TABLE 7
FLAME SPREAD VALUES OF COMPOSITES[1]
(TYPICAL VALUES PER ASTM E84)

Resin type	Flame spread	Class[2]
CONTROL: Asbestos/Cement	0	I
HETRON FR998/35 (no antimony trioxide required)	<25	I
HETRON FR992 (with 3% antimony trioxide)	<25	I
HETRON 197 Series (with 5% antimony trioxide)	30	II
HETRON 92AT (with 3% antimony trioxide)	<25	I
HETRON 92FR (no antimony trioxide required)	<25	I
HETRON 99P (with 3% antimony trioxide)	<25	I
HETRON 72G (with 5% antimony trioxide)	30	II
Control: Red Oak Lumber	100	III
Plywood	200	III
Non-Halogenated Resins	350-400	III

1 = 3mm thick laminates with approximately 30 percent chopped glass mat
2 = Class I = 0 to 25 flame spread; Class II = > 25 to 75 flame spread; Class III = > 75 flame spread per the ASTM E84 tunnel test.

LIST OF TRADEMARKS AND PRODUCT NAMES

AATREX.....Twin Laboratories
ADOGEN.....Sherex Chemical Co.
AEROSOL .....American Cyanamid Co.
ALIPAL .....GAF Corp.
ALODINE.....Henkel Corp.
AMCHEM.....Henkel Corp.
AMEREX.....Ashland Inc.
AMERGEL .....Ashland Inc.
AMINE SALT SOLUTIONS,
73973 M-A, M-B, M-C.....W.R. Grace Co.,
Dewey & Almy Div.
AMSCO.....Pure Oil Co.
ANTHIUM DIOXCIDE .....International Dioxcide Inc.
APACHE.....Diversey Corp.
ARMEEN .....Akzo Nobel
ARQUAD.....Akzo Nobel

BENTEC .....Diversey Corp.
BENZOFLEX.....Velsicol Chemical Corp.
BETZ SULFITE 3.....Betz Laboratories Inc.
BICEP.....Novartis Corp.
BIOCIDE .....Ashland Inc.
BONDERITE.....Henkel Corp.
BOWL CLEANSE.....Spartan Chemical Co., Inc.
BUILD .....Colgate-Palmolive Co.

C-56 .....Occidental Chemical Corp.
CALGON .....Calgon Corp.
CARBITOL.....Union Carbide Corp.
CELLOSOLVE .....Union Carbide Corp.
CELL PUTTY .....Rowe Products Co.
CHEM-REZ.....Ashland Inc.
CHLOROTHENE.....Dow Chemical Co.
CITREX.....Peabody Engineered Systems
CLEANER 508 .....Quaker Chemical Co.
CWT.....Ashland Inc.
CYAF .....Cytec Technology
CYGON .....American Cyanamid Co.

DAREX .....W.R. Grace Co.,
Dewey & Almy Div.
DAZAD .....W.R. Grace Co.
DEFOAMER .....Ashland Inc.
DFR-121 .....Arapahoe Chemicals
DICROBE .....Ecolab
DIVERSEY .....Diversey Corp.
DOWCLENE .....Dow Chemical Co.
DREWFAX.....Ashland Inc.
DREWSPERSE .....Ashland Inc.
DUAL.....Ciba Specialty Chemicals
DUREZ.....Occidental Chemical Corp.
DW-875 .....Staley Chemical Co.

ELECTRASOL .....Benckiser N.V.
ELVASE .....Union Carbide Corp.
EP 52-A65 .....Ashland Inc.
EPTAM .....Zeneca
ERIONAL.....Ciba Specialty Chemicals
EVA .....Union Carbide Corp.
EXALT.....Pennwalt Corp.

FLUOROLUBES .....Occidental Chemical Corp.
FREON.....E.I. Dupont de Nemours & Co.
FUSION .....Buffalo Color Corp.

G-61.....Rohm & Haas
GLASS CLEANER .....Spartan Chemical Co., Inc.
GLOBRITE.....Ashland Inc.
GOLDEN-GLO .....Spartan Chemical Co., Inc.

HALSO 99.....Occidental Chemical Corp.

IGEPAL.....Rhone Poulenc
IRGASOL .....Ciba Specialty Chemicals
ISOCURE .....Ashland Inc.
ISOPREP.....Richardson Chemical Co.

JM-235, JM-271 .....Johns-Manville

KYMENE .....Hercules, Inc.

LASSO.....Monsanto Co.
LIX.....Henkel Corp.

MAGNIFLOC .....Cytec Technology
MATAR.....Ecolab
MILOGARD .....Novartis Corp.
MULSOLINE .....Dye & Chemical Co. of
Canada, Ltd.
NEODOL .....Shell Oil Co.

OAKITE .....Oakite Products, Inc.
OLIN .....Olin Corp.
190 D.....BASF Wyandotte Corp.
OPM-1, OPM-2 .....Olin Corp.

PARCO.....Henkel Corp.
PAX HYSPEED.....Calgon Corp.
PD 64.....Spartan Chemical Co., Inc.
PEP SET .....Ashland Inc.
PLUS 5 .....Spartan Chemical Co., Inc.
POLYCO .....Rohm & Haas
POLYWET .....Uniroyal Chemical Co.
PRINCEP .....Novartis Corp.

RAYLENE.....Diversey Corp.
RICHAMIDE.....Richardson Chemical Co.
RICHONATE .....Richardson Chemical Co.
RJ-4 .....Ashland Inc.

SANI-FRESH.....Envair, Inc.
SD-20.....Spartan Chemical Co., Inc.
SEQUESTRENE.....Novartis Corp.
SKYDROL .....Solutia, Inc.
SOFTENER B.....Sherex Chemical Co.
SP-181.....Tretolite Div., Petrolite Corp.
STACKFAS MASTIC.....H.B. Fuller Co.

TELONE .....Dow Chemical Co.
TERGITOL .....Union Carbide Corp.
TEXTON.....Olin Corp.
THERMOLIN.....Olin Corp
35-D.....BASF Wyandotte Corp.
TINOFIX QF.....Ciba Specialty Chemicals

U-3400,U-7001 .....Staley Chemical Co.
ULTRAWET.....Mach I, Inc.

VARIQUAT.....Sherex Chemical Co.
VARISOFT .....Sherex Chemical Co.
VAROX.....R.T. Vanderbilt Co.
VARSOL .....Exxon Corp.
VIDDEN .....Dow Chemical Co.
VIVO-ZYME .....Soluble Nutrients, Inc.

ZIMMITE.....WZ Corp.

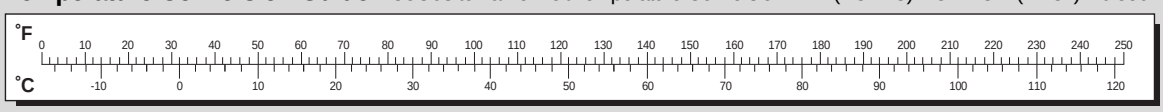
TEMPERATURE (˚C) FOR RESIN TYPES

CHEMICAL ENVIRONMENT	CONCEN-TRATION %	High Performance Epoxy Vinyl Ester Resins				Epoxy Vinyl Ester Resins					Fume Service
		HETRON 942/35	HETRON 980/35	HETRON FR998/35	HETRON 970/35	HETRON 922/FR992	HETRON 980	HETRON 197-3	HETRON 800	AROPOL 7241/7334	HETRON 92/99P
AATREX 4L	100	-	-	-	-	38/-	-	-	-	-/-	-/-
Acetaldehyde	100	NR	-	-	-	NR/NR	NR	NR	107	NR/NR	NR/-
Acetaldehyde (1% in air)		-	-	-	-	-/-	-	-	-	-/-	-/32
Acetaldehyde, Fumes (<40 lbs/cubic feet)		-	-	-	-	32/32	32	-	32	-/-	32/32
Acetic Acid	1	-	99	99	99	99/99	99	99	107	71/66	66/66
Acetic Acid	10	99	99	99	99	99/99	99	99	107	71/66	66/66
Acetic Acid	15	99	99	99	99	99/99	99	99	-	71/66	52/52
Acetic Acid	25	99	99	99	99	99/99	99	99	-	71/66	52/52
Acetic Acid	50	82	82	82	82	82/82	82	82	-	66/52	32/32
Acetic Acid	75	66	66	66	66	38/38	38	66	-	-/-	-/-
Acetic Acid (about 10% in hydrocarbon, liquid and vapor)		-	-	-	-	71/71	104	-	-	-/-	-/-
Acetic Acid (3-5% solids, pH 2-5)		-	-	-	-	74/74	74	74	74	-/-	-/-
Acetic Acid: Hydrochloric Acid	50 20	-	-	-	-	-/-	-	32	-	-/-	32/-
Acetic Acid: Hydrochloric Acid	50 18.5	-	-	-	-	-/-	-	29	-	-/-	29/29
Acetic Acid: Hydrogen Peroxide	95 1.5	-	-	-	-	-/-	-	32	-	-/-	32/32
Acetic Acid: Sodium Dichromate	70 30	-	-	-	-	-/-	-	71	-	-/-	-/-
Acetic Acid: Water (traces of sulfuric acid, methylene chloride, octyl alcohol, sodium chloride, and chlorobenzene)	1.3 48	-	-	-	-	NR/NR	-	66	-	66/NR	-/-
Acetic Acid, Glacial	100	NR	-	-	38	NR/NR	-	LS100	116	NR/NR	-/-
Acetic Acid, Vapor & Condensate	25	-	-	-	-	-/-	-	82	-	-/-	82/-
Acetic Anhydride	100	NR	-	-	38	NR/NR	-	38	107	NR/NR	-/-
Acetone	1	-	66	66	66	-/-	66	-	66	-/-	-/-
Acetone **Footnote 4**	100	NR	NR	NR	NR	NR/NR	NR	NR	54	NR/NR	NR/NR
Acetone: Toluene	50 50	NR	NR	NR	NR	NR/NR	NR	-	32	-/-	-/-
Acetone: A68 Water	10 90	-	66	66	66	-/-	66	-	66	-/-	-/-
Acetonitrile	100	-	NR	NR	-	NR/NR	NR	NR	27	NR/NR	NR/NR
Acetophenone	100	-	NR	NR	-	NR/NR	NR	32	-	NR/NR	-/-
Acetyl Chloride	100	-	-	-	-	-/-	-	NR	82	-/-	NR/-
Acetylsalicylic Acid	100	-	-	-	-	-/-	-	-	107	-/-	-/-
Acid Rinse (photographic)		-	-	-	-	-/-	-	32	-	-/-	-/-
Acid Contaminated: Organic: Water	2 1.5 96.5	-	-	-	-	NR/NR	-	66	-	66/NR	-/-
Acidic Gaseous Atmosphere (sat'd, weak phosphoric acid, hydrofluoric acid, and sulfuric acid, etc., at 3600 fpm) **Footnote 1**		-	-	-	-	-/-	-	32	-	-/-	-/-
Acrylamide	50	38	38	38	38	27/27	27	27	-	-/-	-/-
Acrylic Acid	10	38	38	38	-	38/38	38	38	-	38/38	-/-
Acrylic Acid	25	38	38	38	38	38/38	38	38	-	-/-	-/-
Acrylic Acid	100	-	-	-	38	-/-	-	NR	27	NR/NR	NR/NR
Acrylic Acid Dispersion: Acrylonitrile	98 2	-	-	-	-	-/-	-	32	-	-/-	-/-
Acrylic Acid Dispersion: Vinylidene Chloride	98 2	-	-	-	-	-/-	-	32	-	-/-	-/-
Acrylic Acid Emulsion		-	-	-	-	49/49	49	-	-	49/-	-/-
Acrylic Acid, Glacial	100	-	-	-	-	-/-	-	32	-	-/-	-/-
Acrylic Emulsions: Styrene Emulsions (DW-875, U-3400, and U-7001, all trademarks)		-	-	-	-	-/-	-	27	-	-/-	-/-
Acrylonitrile (latex dispersion)	2	-	-	-	27	-/-	-	-	107	-/-	-/-
Acrylonitrile (latex dispersion)	100	-	-	-	-	NR/NR	NR	NR	107	NR/NR	NR/NR
Acrylonitrile: 35D	2 98	-	-	-	-	-/-	-	32	-	-/-	-/-
Acrylonitrile: Acrylic Acid Dispersion	2 98	-	-	-	-	-/-	-	32	-	-/-	-/-
Activated Carbon Beds (water treatment)		99	-	-	99	-/-	-	93	-	-/-	-/-
ADOGEN 381: Xylene	25 75	-	-	-	-	-/-	-	38	-	-/-	-/-
ADOGEN 442	100	-	-	-	-	49/49	49	49	49	49/49	49/-
ADOGEN 448	100	-	-	-	-	49/49	49	49	49	49/49	49/-
AEROSOL (wetting agent)	100	-	-	-	-	-/-	-	32	-	-/-	32/-
Air: Hydrofluoric Acid, Fumes: Phosphorus Pentoxide, Fumes **Footnote 1**		-	-	-	-	-/-	-	157	-	-/-	-/-
Air: Methyl Sulfide: Methanol (traces of water, hydrogen sulfide, mercaptan, acetone, turpentine)	85 2.5 6	-	-	-	-	-/-	-	74	-	-/-	-/-

NR = Not recommended
— = Data not available
LS = Limited Service
Sat'd. = Saturated

Temperature Conversion Guide

Celsius to Fahrenheit Temperature Conversion: ˚F = (1.8 x ˚C) + 32 ˚C = (˚F -32) x 0.556



See page 13 for footnotes.

See page 11 for list of trademarks and product names.

TEMPERATURE (°C) FOR RESIN TYPES

CHEMICAL ENVIRONMENT	CONCEN-TRATION %	High Performance Epoxy Vinyl Ester Resins				Epoxy Vinyl Ester Resins					Fume Service
		HETRON 942/35	HETRON 980/35	HETRON FR998/35	HETRON 970/35	HETRON 922/FR992	HETRON 980	HETRON 197-3	HETRON 800	AROPOL 7241/7334	HETRON 92/99P
Air, Humid (trace of sulfur fumes)		-	-	-	-	93/93	93	93	-	93/66	-/-
Alcohol (ethoxylated, pH 8.5, carbon12-carbon15) **. . .Footnote 16**	100	-	-	-	-	-/-	-	49	-	-/-	-/-
Algaecide (phenate based)	100	-	-	-	-	-/-	-	52	-	52/-	-/-
ALIPAL CO433	28	-	-	-	-	-/-	-	38	38	-/-	-/-
ALIPAL CO433 Polymer/Toluene Emulsion (blended together in water)		-	-	-	-	-/-	-	NR	38	-/-	NR/-
Aliphatic Hydrocarbons	100	-	-	-	-	-/-	-	-	121	-/-	-/-
Aliphatic: Toluene: Aromatic (xylene = 3% of concentration)	6 86 5	-	-	-	-	-/-	-	-	-	32/-	-/-
Alkaline Soak Cleaner (10 oz/gal)		-	-	-	-	82/82	82	-	82	NR/NR	-/-
Alkanolamide Surfactant, Nonionic	55	-	-	-	-	-/-	-	49	-	-/-	-/-
Alkanolamide Surfactant	100	-	-	-	-	-/-	-	49	-	-/-	-/-
Alkyl Benzene Sulfonic Acid	92	82	-	-	82	-/82	82	38	-	-/-	-/-
Alkyl Ether Amine Oxide Surfactant, Nonionic		-	49	49	-	49/49	49	49	49	49/49	-/-
Alkylate (substituted benzene type, refinery)		-	-	-	-	-/-	-	32	-	32/-	-/-
Alkylate Sulfonates, Linear (conc.)		-	-	-	-	-/-	-	38	-	-/-	-/-
Allyl Chloride	100	27	-	-	27	NR/NR	27	-	32	-/-	-/-
Almond Oil	100	-	-	-	-	-/-	-	-	49	-/-	NR/-
ALODINE 401/45		-	-	-	-	-/-	-	49	-	-/-	-/-
Alpha Olefin Sulfonate	100	-	-	-	-	-/-	-	49	-	-/-	-/-
Alum (sat'd.)		121	121	121	121	99/99	121	121	-	82/66	121/121
Alum, Potassium	100	-	104	104	121	99/99	104	121	-	82/66	-/71
Aluminum (desmutter & deoxidizer) **. . . . . .Footnote 2**		-	-	-	-	-/-	-	32	-	-/-	-/-
Aluminum Bromide (sat'd.)		-	-	-	49	71/71	71	-	121	-/-	-/-
Aluminum Chloride	100	121	121	121	121	99/99	121	99	121	77/66	-/49
Aluminum Chloride: Fluosilicic Acid (slurry) **.Footnote 1**	2	-	-	-	38	-/-	-	99	-	-/-	-/-
Aluminum Chlorohydrate	50	99	-	-	99	99/99	99	74	-	-/-	-/-
Aluminum Chlorohydroxide	50	99	-	-	99	99/99	99	-	-	77/66	-/-
Aluminum Citrate (sat'd.)		-	93	93	-	93/93	93	-	-	77/49	-/-
Aluminum Etchant (5 oz/gal, phosphate free) **. . . . . .Footnote 1**		-	-	-	-	74/74	74	-	74	74/-	-/-
Aluminum Fluoride . . . . .Footnote 1	100	32	32	32	32	32/32	32	32	107	32/32	32/32
Aluminum Hardening Fixing Bath (photographic, fixing and rapid)		-	-	-	-	-/-	-	27	-	-/-	-/-
Aluminum Hydroxide (sat'd.)		NR	NR	NR	NR	82/82	93	-	107	-/-	-/-
Aluminum Hydroxide	20	NR	NR	NR	NR	82/82	93	-	107	66/66	-/-
Aluminum Nitrate (sat'd.)		82	82	82	82	82/82	82	-	-	71/60	-/-
Aluminum Oxide (wet with HCl, drying)		-	-	-	-	-/-	-	143	-	-/-	-/-
Aluminum Plating (sulfuric acid, sodium dichromate)		-	-	-	-	-/-	-	71	-	-/-	-/-
Aluminum Potassium Sulfate	100	121	121	121	121	99/99	104	99	-	82/66	82/71
Aluminum Reduction Plant, Fumes (roofing and siding)		-	-	-	-	-/-	-	-	-	-/-	54/-
Aluminum Sulfate	100	121	121	121	121	99/99	121	121	121	82/66	121/121
Aluminum Trichloride	40	-	-	-	-	82/82	99	99	-	-/-	-/-
AMCHEM 6-16: Nitric Acid	6 16	-	-	-	-	-/-	-	35	-	-/-	-/-
AMEREX 201	100	-	-	-	-	-/-	-	52	-	LS52/LS52	-/-
AMEREX 209	100	-	-	-	-	-/-	-	52	-	52/52	-/-
AMERGEL	100	-	-	-	-	-/-	-	LS32	-	-/-	-/-
Amine Salt Solutions (includes: 73973 M-A, M-B, and M-C, all trademarks)		-	-	-	-	-/-	-	29	-	-/-	-/-

[1] Synthetic surfacing veil generally used; use non-apertured synthetic veil with HETRON 197 series resins.
[2] Benzoic peroxide/dimethyl aniline cure system generally used.
[3] Post-cure strongly recommended.
[4] Solution may discolor.
[5] Non-thixotropic resins preferred.
[6] Acceptable as to odor and taste for AROPOL 7241T-15 type resin. Steamed 4 hours with atmospheric steam prior to exposure.
[7] Three 3-hour exposures to 30% nitric acid at 38°C to stimulate cleaning.
[8] C-veil only.
[9] HETRON 197 series and HETRON 700 resins appear to be unsuitable under cyclic conditions with some crazing but are resistant under static conditions.
[10] Dissolved solids, 1574-2183 ppm: PO_4, 0.25 ppm; total PO_4, 1.3 ppm; Cu, 0.7 ppm; Zn, 3.4 ppm; Fe, 1.8 ppm; $CaCo_3$ 450 ppm; NaCl, 527-702 ppm.
[11] No change in water at 25 cm^2/liter as in 80 – 110,000 liter tank.
[12] AROPOL 7343 satisfactory.
[13] Vol. 0.25% SO_2, 0.03% SO_3, 12.5% CO_2, 74.6% N_2, 4.9% O_2, 7.8% H_2O, fly ash, 176 g/m^3; velocity 18 m/s.
[14] Vol. 0.25% SO_2, 0.03% SO_3, 12.5% CO_2, 74.6% N_2, 4.9% O_2, 7.8% H_2O, fly ash, 42 g/m^3; velocity 2.4 m/s.
[15] Vol. 0.12% SO_2, 12% CO_2, 70% N_2, 5% O_2, 13.4% H_2O, 176 g/m3 of 1-2% H_2SO_4, 2-3000 ppm HCl, 10-20 ppm HF, rust water.
[16] HETRON 197 resin is the preferred resin.
[17] Lower than normally acceptable surface hardness can occur in service. Drying the surface can restore hardness.
[18] Exposure of perchloric acid to organics can be dangerous. Evaluate fully before use.
[19] HETRON FR992 at higher temperatures.
[20] Hydrogen peroxide suppliers must approve materials of construction.
[21] Check with technical service for specific resin recommendation.
[22] Double C-veil recommended.
[23] Double veil generally used, either double synthetic or synthetic backed by C-veil; use non-apertured veil backed by C-veil with HETRON 197.
[24] Abrasion resistant liner required.
[25] Carbon veil recommended at higher temperatures listed.

See page 11 for list of trademarks and product names.

TEMPERATURE (°C) FOR RESIN TYPES

CHEMICAL ENVIRONMENT	CONCENTRATION %	High Performance Epoxy Vinyl Ester Resins				Epoxy Vinyl Ester Resins					Fume Service
		HETRON 942/35	HETRON 980/35	HETRON FR998/35	HETRON 970/35	HETRON 922/FR992	HETRON 980	HETRON 197-3	HETRON 800	AROPOL 7241/7334	HETRON 92/99P
Amine Salts: Quaternary Ammonium Salts: Organotin (blended)	100	-	66	66	66	52/52	52	52	-	LS52/LS52	-/-
Amine: Hydrochloric Acid **Footnote 22**	2.9 1.1	-	-	-	-	93/93	93	93	-	-/-	-/-
Aminoethanol, (2-)	100	-	-	-	-	-/-	-	29	-	-/-	-/-
Aminoethoxy Ethanol	100	-	-	-	-	NR/NR	-	NR	LS132	NR/NR	NR/-
Aminoethyl Piperazine	100	-	-	-	-	NR/NR	-	NR	43	NR/NR	-/-
Ammonia (trace of pyridine)	5	-	-	-	-	-/-	-	-	43	-/-	-/-
Ammonia Fortified Glass Cleaner (includes trademark glass cleaner)		-	38	38	-	38/38	38	38	38	-/-	-/-
Ammonia Process (stack gas scrubbing)		-	-	-	-	-/-	-	52	-	-/-	-/-
Ammonia: Ammonium Nitrate: Hydrofluosilicic Acid (nitric acid = 2.5% of concentration, traces of phosphoric & sulfuric acid, wet vapor) **Footnote 1**	15 5 2.5	-	-	-	-	-/-	-	121	-	-/-	-/-
Ammonia, Aqueous: Hydrochloric Acid, 12% (pH to 0.3)		-	-	-	-	82/82	82	82	-	-/-	-/-
Ammonia, Dry Vapors		38	38	38	38	38/38	82	32	38	32/-	32/32
Ammonia, Fumes: Nitric Acid Fumes **Footnote 3**		-	-	-	-	-/-	-	49	-	-/-	-/-
Ammonia, Vapor: Sulfur Dioxide, Vapor (by volume)	.02 .06	-	-	-	-	-/-	-	32	-	-/-	-/-
Ammonia, Wet Vapors		-	NR	NR	NR	38/38	66	NR	-	32/-	-/32
Ammonium Acetate	50	-	-	-	27	43/43	43	-	-	-/-	-/NR
Ammonium Acid Sulfite: Ammonium Sulfite: Ammonium Sulfate (solids = 2% of concentration)	19 7 5	-	-	-	-	-/-	-	32	-	-/-	-/-
Ammonium Acid Sulfite : Ammonium Sulfite: Ammonium Sulfate	18 3 5	-	-	-	-	-/-	-	46	-	-/-	-/-
Ammonium Acid Sulfite: Ammonium Sulfite: Ammonium Sulfate (solids = 2% of concentration)	20 5 5	-	-	-	-	-/-	-	46	-	-/-	-/-
Ammonium Acid Sulfite: Ammonium Sulfite: Ammonium Sulfate (solids = 3% of concentration, pH 6)	24 8 5	-	-	-	-	-/-	-	46	-	-/-	-/-
Ammonium Acid Sulfite: Ammonium Sulfite: Ammonium Sulfate (solids = 3% of concentration)	25 4 6	-	-	-	-	-/-	-	49	-	-/-	-/-
Ammonium Benzoate	100	-	-	-	-	82/82	82	-	-	-/-	-/-
Ammonium Bicarbonate	10	71	71	71	71	71/71	71	-	-	-/-	-/-
Ammonium Bicarbonate	15	-	71	71	71	71/71	71	54	-	54/NR	54/60
Ammonium Bicarbonate	20	-	71	71	71	71/71	71	-	-	49/NR	-/-
Ammonium Bicarbonate (sat'd.)		-	66	66	66	66/66	66	-	-	NR/NR	-/60
Ammonium Bisulfate: Sulfuric Acid: Surfactant	6 30 10	-	-	-	-	-/-	-	43	-	-/-	-/-
Ammonium Bisulfite Liquor (black liquor)		-	82	82	82	82/82	82	91	-	-/-	-/-
Ammonium Bromide (sat'd.)		-	-	-	71	-/-	-	-	107	-/-	-/-
Ammonium Carbonate	10	66	66	66	66	38/38	66	NR	82	NR/NR	NR/-
Ammonium Carbonate	30	66	66	66	66	38/38	38	-	-	NR/NR	-/-
Ammonium Carbonate (sat'd.)		66	-	-	66	66/66	66	-	107	NR/NR	-/49
Ammonium Chloride (sat'd.)		99	99	99	99	99/99	99	93	107	82/82	93/93
Ammonium Chloride: Ammonium Nitrate: Urea	2.5 20 38	-	-	-	-	-/-	-	32	-	-/-	-/-
Ammonium Chloride: Zinc Chloride: Sodium Chloride (zinc chloride plating bath, concentration in oz/gal, pH 4.8 - 5.2)	3 18 31	-	-	-	-	-/-	-	32	-	-/-	-/-
Ammonium Citrate (sat'd.)		66	66	66	66	66/66	66	-	-	49/-	-/-
Ammonium Fluoride .... Footnote 1	10	66	66	66	66	66/66	66	-	-	-/-	-/-
Ammonium Fluoride .... Footnote 1	100	66	66	66	66	38/38	38	66	107	32/-	-/-
Ammonium Fluoride: Ammonium Hydroxide: Ammonium Nitrate (concentrations in g/l, trace of organics) **Footnote 1**	62 165 2	-	-	-	-	NR/NR	-	27	-	-/-	-/-
Ammonium Hydroxide	1	82	NR	NR	NR	93/93	93	NR	66	LS32/NR	60/82
Ammonium Hydroxide	5	82	NR	NR	NR	82/82	82	NR	38	NR/NR	32/32
Ammonium Hydroxide	10	54	60	60	49	71/71	82	NR	38	NR/NR	32/32
Ammonium Hydroxide	20	66	NR	NR	NR	66/66	66	NR	NR	NR/NR	NR/NR

See page 13 for footnotes.

See page 11 for list of trademarks and product names.

TEMPERATURE (°C) FOR RESIN TYPES

CHEMICAL ENVIRONMENT	CONCENTRATION %	High Performance Epoxy Vinyl Ester Resins				Epoxy Vinyl Ester Resins					Fume Service
		HETRON 942/35	HETRON 980/35	HETRON FR998/35	HETRON 970/35	HETRON 922/FR992	HETRON 980	HETRON 197-3	HETRON 800	AROPOL 7241/7334	HETRON 92/99P
Ammonium Hydroxide	28	-	NR	NR	NR	52/52	52	NR	NR	NR/NR	-/-
Ammonium Hydroxide	30	25	25	25	25	-/-	-	NR	-	NR/NR	-/-
Ammonium Hydroxide Based Etchant Spent (copper, 18 oz/gal)		-	-	-	-	49/49	49	49	-	-/-	-/-
Ammonium Hydroxide: Ammonium Fluoride: Ammonium Nitrate (concentrations in g/l, trace of organics) **Footnote 1**	165 62 2	-	-	-	-	NR/NR	-	27	-	-/-	-/-
Ammonium Lauryl Sulfate	100	-	-	-	49	54/54	54	54	-	54/-	-/-
Ammonium Metatungstate (pH 3.3)	50	-	-	-	-	LS82/LS82	-	LS82	-	-/-	-/-
Ammonium Nitrate (sat'd.)		121	121	121	121	99/99	104	93	104	71/66	93/93
Ammonium Nitrate: Ammonia: Hydrofluosilicic Acid (nitric acid = 2.5% of concentration, traces of phosphoric & sulfuric acid, wet vapor) **Footnote 1**	5 15 2.5	-	-	-	-	-/-	-	121	-	-/-	-/-
Ammonium Nitrate: Ammonium Chloride: Urea	20 2.5 38	-	-	-	-	-/-	-	32	-	-/-	-/-
Ammonium Nitrate: Ammonium Fluoride: Ammonium Hydroxide (concentrations in g/l, trace of organics) **Footnote 1**	2 62 165	-	-	-	-	NR/NR	-	27	-	-/-	-/-
Ammonium Nitrate: Urea: Water	10 40 50	-	-	-	-	49/49	-	-	-	-/-	-/-
Ammonium Nitrate: Urea: Water	30 20 50	-	-	-	-	49/49	-	-	-	-/-	-/-
Ammonium Nitrate: Urea: Water	44 35 21	-	-	-	-	-/-	-	49	-	-/-	-/-
Ammonium Nitrate: Urea: Water (URAN fertilizer, ammonium nitrate composition)	44.3 35.4 20.3	66	-	-	49	-/-	-	49	-	-/-	-/-
Ammonium Orthophosphate (di-H)		-	-	-	-	-/-	-	93	-	-/-	-/-
Ammonium Persulfate (sat'd.)		82	82	82	82	82/82	82	66	82	NR/NR	66/66
Ammonium Phosphate, di-basic (sat'd.)		99	99	99	99	99/99	99	66	82	NR/NR	66/66
Ammonium Phosphate (monobasic)	65	99	99	99	99	99/99	99	LS32	82	77/66	NR/NR
Ammonium Salt (primary alcohol glycol ether sulfate)	100	-	-	-	-	-/-	-	38	-	-/-	-/-
Ammonium Sulfate: Ammonium Acid Sulfite: Ammonium Sulfite (solids = 2% of concentration)	5 19 7	-	-	-	-	-/-	-	32	-	-/-	-/-
Ammonium Sulfate (sat'd.)		121	104	104	121	99/99	104	104	104	77/60	93/93
Ammonium Sulfate: Ammonium Acid Sulfite: Ammonium Sulfite	5 18 3	-	-	-	-	-/-	-	46	-	-/-	-/-
Ammonium Sulfate: Ammonium Acid Sulfite: Ammonium Sulfite (solids = 2% of concentration)	5 20 5	-	-	-	-	-/-	-	46	-	-/-	-/-
Ammonium Sulfate: Ammonium Acid Sulfite: Ammonium Sulfite (solids = 3% of concentration, pH 6)	5 24 8	-	-	-	-	-/-	-	46	-	-/-	-/-
Ammonium Sulfate: Ammonium Acid Sulfite: Ammonium Sulfite (solids = 3% of concentration)	6 25 4	-	-	-	-	-/-	-	49	-	-/-	-/-
Ammonium Sulfate: Diammonium Phosphate	10 10	-	-	-	-	-/-	-	-	-	32/32	-/-
Ammonium Sulfate: Ferric Sulfate	10.5 20	-	-	-	-	-/-	-	82	-	-/-	82/-
Ammonium Sulfate: Manganese Sulfate (concentration in g/l, trace of sulfur dioxide)	125 12	-	-	-	-	-/-	-	38	-	-/-	-/-
Ammonium Sulfate: Manganese Sulfates (concentration in g/l, trace of sulfur dioxide)	158 13	-	52	52	-	52/52	52	52	-	52/52	52/52
Ammonium Sulfate: Sulfuric Acid: Manganese Sulfate (concentration in g/l, trace of sulfur dioxide)	125 30 13	-	-	-	-	-/-	-	38	-	-/-	-/-
Ammonium Sulfates: Manganese Sulfate: Sulfuric Acid (concentration in g/l, trace of sulfur dioxide)	135 13 40	-	-	-	-	-/-	-	52	-	52/52	52/-
Ammonium Sulfide (sat'd.)		-	49	49	49	49/49	49	49	121	-/-	-/-
Ammonium Sulfite	10	-	38	38	66	38/38	38	-	-	-/-	-/-
Ammonium Sulfite: Ammonium Acid Sulfite: Ammonium Sulfate (solids = 2% of concentration)	7 19 5	-	-	-	-	-/-	-	32	-	-/-	-/-

See page 13 for footnotes.

See page 11 for list of trademarks and product names.

TEMPERATURE (°C) FOR RESIN TYPES

CHEMICAL ENVIRONMENT	CONCENTRATION %	High Performance Epoxy Vinyl Ester Resins				Epoxy Vinyl Ester Resins					Fume Service
		HETRON 942/35	HETRON 980/35	HETRON FR998/35	HETRON 970/35	HETRON 922/FR992	HETRON 980	HETRON 197-3	HETRON 800	AROPOL 7241/7334	HETRON 92/99P
Ammonium Sulfite: Ammonium Acid Sulfite: Ammonium Sulfate	3 18 5	-	-	-	-	-/-	-	46	-	-/-	-/-
Ammonium Sulfite: Ammonium Acid Sulfite: Ammonium Sulfate (solids = 2% of concentration)	5 20 5	-	-	-	-	-/-	-	46	-	-/-	-/-
Ammonium Sulfite: Ammonium Acid Sulfite: Ammonium Sulfate (solids = 3% of concentration, pH 6)	8 24 5	-	-	-	-	-/-	-	46	-	-/-	-/-
Ammonium Sulfite: Ammonium Acid Sulfite: Ammonium Sulfate (solids = 3% of concentration)	4 25 6	-	-	-	-	-/-	-	49	-	-/-	-/-
Ammonium Thiocyanate	20	99	99	99	99	99/99	99	93	-	77/66	-/-
Ammonium Thiocyanate		-	49	49	49	49/49	49	82	-	49/49	-/49
Ammonium Thiocyanate: Ammonium Thiosulfate: Water (ammonium sulfate = 2.3% of concentration)	4 5.5 88	-	-	-	-	54/54	54	54	43	54/43	-/-
Ammonium Thiocyanate: Hydrochloric Acid . . . .Footnote 22		-	-	-	-	-/-	-	82	-	-/-	-/-
Ammonium Thiocyanate: Hydrochloric Acid: Methyl Isobutyl Ketone	15	-	-	-	-	-/-	-	93	-	-/-	-/-
Ammonium Thiosulfate	60	38	38	38	38	38/38	38	82	-	NR/NR	-/NR
Ammonium Thiosulfate: Ammonium Thiocyanate: Water (ammonium sulfate = 2.3% of concentration)	5.5 4 88	-	-	-	-	54/54	54	54	43	54/43	-/-
Ammonium Tungstate (sat'd.)		-	-	-	-	-/-	-	-	121	-/-	-/-
AMSCO BKOH Solvent		-	-	-	-	38/38	38	38	-	38/38	-/-
Amyl Acetate	100	21	49	49	49	NR/NR	38	32	93	NR/NR	32/32
Amyl Acetate: Xylene	30 70	-	-	-	-	-/-	49	NR	49	-/-	-/-
Amyl Alcohol	100	82	93	93	99	49/49	93	93	93	38/NR	93/93
Amyl Chloride	100	49	49	49	49	NR/NR	49	LS49	-	NR/NR	NR/NR
Anaerobic Sewage		-	29	29	29	29/29	29	29	-	29/29	29/29
Aniline	100	NR	NR	NR	21	NR/NR	NR	NR	121	NR/NR	NR/-
Aniline Hydrochloride	100	82	82	82	82	66/66	82	-	107	-/-	-/-
Aniline Hydrochloride: Hydrogen Bromide: Water (hydrochloric acid = 1.5% and bromine = 1% of concentration)	15 4.5 78	-	-	-	-	60/60	60	60	60	-/-	-/-
Aniline Sulfate (sat'd.)		99	99	99	99	99/99	104	93	-	NR/NR	93/66
Anionic Polyelectrolytes (blend)	100	-	-	-	-	-/-	-	52	-	LS52/NR	-/-
Anionic Surfactant	58	-	-	-	-	-/-	-	49	-	-/-	-/-
Anodizing Solution Sulfuric Acid		-	-	-	-	-/-	-	32	-	-/-	-/-
ANTHIUM DIOXIDE	13	-	-	-	-	-/-	-	38	-	-/-	-/-
Anthracene Oil	6	-	-	-	-	-/-	-	32	-	32/32	32/32
Anthraquinone Disulfonic Acid	1	-	-	-	-	66/66	66	66	-	66/-	-/-
Antimony Chloride (sat'd.)		-	-	-	-	-/-	-	-	107	-/-	-/-
Antimony Oxychloride (sat'd.)		-	-	-	-	-/-	-	-	107	-/-	-/-
Antimony Pentachloride	100	-	-	-	-	32/32	32	32	-	32/32	32/32
Antimony Trichloride (sat'd.)		-	104	104	-	93/93	104	93	-	71/66	93/82
Antimony Trioxide: Hydrochloric Acid: Sulfuric Acid	5 15 35	-	-	-	-	-/-	-	38	-	-/-	-/-
APACHE	50	-	-	-	-	-/-	-	66	-	-/-	-/-
Apple Acid	10	-	-	-	-	-/-	-	35	-	-/-	-/-
Aqua Regia (conc., concentrated hydrochloric acid and nitric acid, 3:1) **. . . . . .Footnote 22**		-	NR	NR	-	NR/NR	NR	54	NR	NR/NR	-/-
Aqua Regia, Fumes (conc.)		-	-	-	-	-/-	-	32	NR	NR/NR	32/-
Aqueous Isopropanol: Dihydrogenated-Tallow Dimethyl Ammonium Chloride	25 75	-	-	-	-	49/49	49	49	49	49/49	49/-
Aqueous Isopropanol: Dimethyl Distearyl Ammonium Chloride	25 72	-	-	-	-	49/49	49	49	49	49/49	49/-
Aqueous Isopropanol: Quaternary Ammonium (dialkyl dimethyl type)	25 75	-	-	-	-	49/49	49	49	49	49/49	49/-
ARMEEN C (conc.)		-	-	-	-	-/-	-	49	49	NR/NR	-/-
ARMEEN DMCD (conc.)		-	-	-	-	-/-	-	49	49	49/49	-/-
Aromatic Solvent: Tributyl Phosphate	65 35	-	-	-	-	-/-	-	32	32	-/-	-/-
Aromatic Sulfonic Acid: Hydrochloric Acid: Sulfuric Acid (trace of chlorine)	25	-	-	-	-	-/-	-	27	-	-/-	-/-
Aromatic: Toluene: Aliphatic (xylene = 3% of concentration)	5 86 6	-	-	-	-	-/-	-	-	-	32/-	-/-
ARQUAD C/50 (conc.)		-	-	-	-	-/-	-	49	49	49/49	-/-
Arsenious Acid	100	38	38	38	38	32/32	32	-	-	-/-	-/-
Arsenious Acid (19° Baume')		-	82	82	82	82/82	82	82	-	32/-	82/82
Asphalt		-	-	-	-	-/-	-	-	-	91/-	-/-
Azelaic Acid (sat'd.)		-	-	-	-	-/-	-	32	-	-/-	-/-

See page 13 for footnotes.

See page 11 for list of trademarks and product names.

TEMPERATURE (°C) FOR RESIN TYPES

CHEMICAL ENVIRONMENT	CONCEN-TRATION %	High Performance Epoxy Vinyl Ester Resins				Epoxy Vinyl Ester Resins					Fume Service
		HETRON 942/35	HETRON 980/35	HETRON FR998/35	HETRON 970/35	HETRON 922/FR992	HETRON 980	HETRON 197-3	HETRON 800	AROPOL 7241/7334	HETRON 92/99P
Bactericide Phenate Based	100	-	-	-	-	52/52	52	52	-	52/52	-/-
Barium Acetate (sat'd.)		82	82	82	82	88/88	88	82	-	NR/NR	-/NR
Barium Carbonate	100	121	121	121	121	99/99	104	93	-	LS82/NR	93/82
Barium Chloride	100	99	99	99	99	99/99	99	93	93	82/66	93/93
Barium Hydroxide	10	66	71	71	NR	66/66	71	-	-	LS32/NR	NR/-
Barium Hydroxide (sat'd.)		66	66	66	NR	66/66	66	-	93	NR/NR	NR/-
Barium Sulfate	100	121	121	121	121	99/99	104	82	121	77/66	-/66
Barium Sulfide (sat'd.)		82	82	82	82	82/82	82	-	66	NR/NR	-/NR
Beer	100	49	NR	NR	NR	32/32	NR	NR	NR	32/32	NR/NR
Beer, Brewing Kettle Fumes		-	-	-	-	-/-	-	66	-	66/66	66/-
Beet Sugar Liquor		82	82	82	-	82/82	82	-	-	-/-	-/-
BENTEC	50	-	-	-	-	-/-	-	82	-	-/-	-/-
Benzal Chloride	100	-	-	-	-	NR/NR	-	-	121	NR/NR	-/-
Benzaldehyde	100	NR	-	-	21	NR/NR	-	NR	93	NR/NR	NR/NR
Benzene	1	-	38	38	38	NR/NR	38	32	66	LS32/NR	32/32
Benzene	100	NR	38	38	38	NR/NR	38	32	66	LS32/NR	32/32
Benzene Disulfonic Acid	100	-	-	-	-	-/-	-	91	-	-/-	-/-
Benzene Sulfonic Acid	30	-	104	104	66	99/99	104	93	93	66/NR	82/82
Benzene Sulfonic Acid (sat'd.)		-	104	104	-	99/99	104	38	93	NR/NR	32/32
Benzene Sulfonic Acid: Sulfuric Acid: Water	88 7 5	-	-	-	-	60/60	60	60	60	60/60	-/-
Benzene: Dimethylformamide: Water (tetrahydrofuran = 5% of concentration)	40 5 50	-	NR	NR	NR	NR/NR	NR	NR	32	NR/NR	NR/NR
Benzene Ethyl Benzene	33.5 66.5	27	-	-	38	-/-	-	38	-	-/-	-/-
Benzene: Hydrochloric Acid (wet)		27	-	-	-	-/-	-	32	-	-/-	32/-
Benzene, Vapor: Hydrogen Chloride, Vapor		-	-	-	-	-/-	-	29	-	-/-	-/-
Benzene, Vapors		27	-	-	49	-/-	-	32	32	32/32	32/-
Benzene, Vapors: Water, Vapors (trace of hydrochloric acid)		-	-	-	38	-/-	-	79	-	-/-	-/-
BENZOFLEX 9.88	100	-	-	-	-	49/49	49	49	49	49/49	-/-
Benzoic Acid (sat'd.)		99	99	99	99	99/99	99	121	121	77/66	121/121
Benzoic Anhydride	100	-	-	-	-	-/-	-	32	-	-/-	-/-
Benzotrichloride	100	-	-	-	-	NR/NR	-	-	121	NR/NR	NR/NR
Benzoyl Benzoic Acid (o-)	100	99	99	99	99	99/99	99	-	-	-/-	-/-
Benzoyl Chloride	100	-	-	-	-	NR/NR	-	NR	38	NR/NR	NR/-
Benzyl Alcohol	100	27	38	38	38	NR/NR	38	-	93	NR/NR	-/NR
Benzyl Benzoate	100	-	-	-	-	-/-	-	-	49	-/-	-/-
Benzyl Chloride	100	NR	27	27	27	NR/NR	27	NR	66	NR/NR	NR/-
BETZ SULFITE 3 (pH 5.5)		-	-	-	-	-/-	-	93	-	-/-	-/-
Bicarbonate: Chlorine Dioxide: Sodium Carbonate (pH 8)	5 3.7	-	-	-	-	-/-	-	38	-	-/-	-/-
BICEP	100	-	-	-	-	-/-	38	-	-	-/-	-/-
BIOCIDE 207	100	-	-	-	-	52/52	52	52	-	52/52	-/-
BIOCIDE 285	100	-	-	-	-	52/52	52	LS52	-	52/52	-/-
Biocide: Chlorophenol: Methylene Thiocyanate (blend)	100	-	-	-	-	52/52	52	LS52	-	52/52	-/-
Biocide Chlorphenate (organic sulfur type, blend)	100	-	-	-	-	52/52	52	52	-	52/52	-/-
BKOH AMSCO Solvent		-	-	-	-	38/38	38	38	-	38/38	-/-
Black Chrome Bath (chromic, acetic, barium, acetate)		-	-	-	-	-/-	-	46	-	-/-	-/-
Black Liquor (pH >7)		-	82	82	82	82/82	82	-	-	NR/NR	NR/-
Black Liquor (recovery furnace gases)		-	116	116	116	NR/NR	116	116	-	NR/NR	NR/NR
Black Liquor (room flooring, spills)		-	-	-	-	-/-	-	-	-	-/-	-/-
Bleach (ferricyanide with potassium bromide, used for photography)		-	27	27	-	-/-	-	27	-	-/-	-/-
Bleached Pulp		-	-	-	-	-/-	-	88	-	-/-	-/-
Blow Gas Absorber		-	-	-	-	49/49	49	-	-	-/-	-/-
BONDERITE 1303 (make-up and replenishing)		-	-	-	-	38/38	38	NR	-	-/-	-/-
BONDERITE 37,37S, 39 Footnote 1		-	-	-	-	-/-	-	66	-	-/-	-/-
BONDERITE 721-S .....Footnote 1		-	-	-	-	-/-	-	29	-	-/-	-/-
BONDERITE 722-C .....Footnote 1		-	-	-	-	-/-	-	49	-	-/-	-/-
BONDERITE 73 .....Footnote 1		-	-	-	-	-/-	-	85	-	-/-	-/-
BONDERITE K-710-O, 701-P		-	-	-	-	-/-	-	38	-	-/-	-/-
BONDERITE K-761 (pH 5-6)		-	-	-	-	-/-	-	49	-	-/-	-/-
Borax (sat'd.)		99	99	99	99	99/99	99	82	60	82/60	-/-
Bordeaux Mixture		-	-	-	-	-/-	-	60	-	-/-	-/-
Boric Acid (sat'd.)		99	104	104	99	99/99	104	93	93	82/66	-/82
Boric Acid: Nickel Chloride: Nickel Sulfate (concentration in oz/gal)	8 12 53	-	-	-	-	-/-	-	82	-	-/-	-/-
Boric Acid: Nickel Sulfate: Nickel Chloride (nickel plating, trace of brightener, concentration in oz/gal)	6 40 8	-	-	-	82	-/-	-	66	-	-/-	-/-

See page 13 for footnotes.

See page 11 for list of trademarks and product names.

TEMPERATURE (°C) FOR RESIN TYPES

CHEMICAL ENVIRONMENT	CONCENTRATION %	High Performance Epoxy Vinyl Ester Resins				Epoxy Vinyl Ester Resins					Fume Service
		HETRON 942/35	HETRON 980/35	HETRON FR998/35	HETRON 970/35	HETRON 922/FR992	HETRON 980	HETRON 197-3	HETRON 800	AROPOL 7241/7334	HETRON 92/99P
Boric Acid: Sodium Sulfate (sodium sulfate with traces of sulfuric acid, hydrogen peroxide, iron, and chloride, temperature cycled) . . . . . **Footnote 9**	15 25	-	-	-	-	96/96	96	96	-	-/-	-/-
Bottle Washer Solution	10	-	-	-	-	77/77	77	-	-	-/-	-/-
BOWL CLEANSE, mild		-	-	-	-	38/38	38	38	38	38/38	-/-
Brake Fluid	100	-	49	49	49	NR/NR	49	-	-	-/-	-/-
Brass Metal Plating (3% copper, 1% zinc, 5.6% sodium cyanides, 3% sodium carbonate)		82	82	82	82	82/82	82	82	-	-/-	-/-
Brew Kettle Fumes		-	-	-	-	-/-	-	66	-	66/66	66/-
Brighteners: Hydrochloric Acid . . . . . **Footnote 22**	30 10	-	-	-	-	-/-	-	49	-	-/-	-/-
Brine (saturated in chlorine, 300-310 g/l, pH 2)		-	104	104	99	99/99	104	104	-	NR/NR	-/-
Brine (sat'd., sodium and potassium) .		-	-	-	-	-/-	-	93	-	-/-	-/-
Brine, Dechlorinated (sat'd., traces of free chlorine, pH 2-3)		-	-	-	121	NR/NR	NR	93	-	-/-	-/-
Brine, Salt (sat'd.)		-	104	104	99	99/99	104	104	104	82/66	82/82
Bromine Water (sat'd.)		-	-	-	-	24/24	24	-	-	NR/NR	-/-
Bromine Water	5 95	-	-	-	-	82/82	93	-	-	-/-	-/-
Bromine, Dry Gas	100	38	38	38	38	32/32	38	60	-	NR/NR	60/-
Bromine, Wet Gas	100	38	32	32	38	32/32	32	32	-	NR/NR	32/32
Bronze Metal Plating (4% copper, 5% sodium cyanides, 3% sodium carbonate, 4.5% rochelle salts)		-	82	82	-	82/82	82	-	-	-/-	-/-
Brownstock (Pulp mill, pH <12) . . . . . **Footnote 21**	100	-	-	-	82	66/66	82	-	66	-/-	60/82
BUILD Detergent Solution (pH 9-10)		-	-	-	-	49/49	49	49	-	-/-	-/-
Butadiene Latex		-	-	-	-	-/-	-	-	-	27/-	-/-
Butoxyethanol, (2-)	100	38	-	-	38	-/-	-	29	-	-/-	-/-
Butoxyethoxyethanol, (2,2-)	100	38	-	-	38	-/-	-	29	-	-/-	-/-
Butyl Acetate	100	27	32	32	27	NR/NR	32	32	104	LS32/NR	32/32
Butyl Alcohol (includes normal, secondary and tertiary)	100	49	49	49	49	27/27	49	38	49	27/NR	-/88
Butyl Alcohol: Diisobutyl Ketone: Ethyl Hexylacetate	5 85 10	-	NR	NR	-	NR/NR	NR	27	38	-/-	-/-
Butyl CARBITOL (diethylene glycol monobutyl ether)	100	-	38	38	38	NR/NR	38	29	-	-/-	-/-
Butyl CELLOSOLVE	100	38	38	38	38	38/38	38	32	-	32/-	-/32
Butyl CELLOSOLVE: Monoethanolamine (alkaline film stripper)	57 30	-	-	-	-	NR/NR	-	NR	60	NR/NR	NR/-
Butyl Ether	100	-	-	-	-	27/27	27	27	141	27/-	27/-
Butyl Phthalate	100	-	-	-	-	-/-	-	38	-	-/-	-/-
Butylene Glycol	100	82	82	82	82	71/71	82	71	-	71/60	-/71
Butyric Acid	1	-	99	99	99	82/82	82	49	49	49/49	49/49
Butyric Acid	25	99	99	99	99	82/82	82	49	49	49/49	49/49
Butyric Acid	50	99	99	99	99	71/71	71	-	66	49/54	-/49
Butyric Acid	70	-	49	49	49	71/71	71	32	66	49/-	-/49
Butyric Acid	100	27	-	-	49	NR/NR	38	32	49	NR/NR	32/-
C-56	100	-	-	-	-	82/82	82	93	93	-/-	32/-
Cadmium Cyanide: Metal Plating (3% cadmium oxide, 10% sodium cyanide, 1.2% sodium hydroxide) . . .		-	-	-	82	99/99	104	NR	-	NR/NR	-/-
Calcium Bisulfide (sat'd.)		-	-	-	-	-/-	-	-	-	71/-	-/-
Calcium Bisulfite (sat'd.)		-	82	82	82	82/82	82	-	107	77/43	-/77
Calcium Carbonate (sat'd.)		82	82	82	82	82/82	82	-	-	71/43	-/71
Calcium Carbonate, 90%: Magnesium Hydroxide, 10% (traces of nickel & iron hydroxides)	25	-	-	-	-	-/-	-	-	-	-/LS49	-/-
Calcium Chlorate (sat'd.)		121	121	121	121	99/99	104	121	-	66/49	121/82
Calcium Chloride (sat'd.)		121	121	121	121	99/99	104	121	121	82/66	121/121
Calcium Chloride: Phosphoric Acid	25 10	-	-	-	-	-/-	-	38	-	-/-	-/-
Calcium Chloride: Sodium Chloride: Magnesium Chloride	10 12 2	-	-	-	-	-/-	-	66	-	-/-	-/-
Calcium Hydroxide	15	82	NR	NR	NR	82/82	82	-	107	82/32	-/71
Calcium Hydroxide	25	82	NR	NR	NR	-/-	-	-	107	71/32	-/71
Calcium Hydroxide (sat'd.)		99	NR	NR	NR	-/-	-	79	107	-/-	-/71
Calcium Hydroxide	1	-	NR	NR	NR	82/82	82	-	107	82/32	-/71
Calcium Hypochlorite (sat'd.) . . . . . **Footnotes 2,19**		82	71	71	66	71/71	71	49	NR	49/-	-/38
Calcium Nitrate (sat'd.)		99	104	104	99	99/99	104	-	104	82/66	-/82
Calcium Oxide (sat'd., lime slurry) . . .		-	77	77	-	77/77	77	66	-	-/-	-/-
Calcium Sulfate (sat'd.)		121	121	121	121	99/99	104	121	121	82/66	121/93
CALGON (sat'd., sodium hexametaphosphate)		49	-	-	-	-/-	-	-	104	-/-	-/-
Camphene, Chlorinated 68%: Xylene	90 10	-	-	-	-	-/-	-	49	49	-/-	-/-

See page 13 for footnotes.

See page 11 for list of trademarks and product names.

TEMPERATURE (°C) FOR RESIN TYPES

CHEMICAL ENVIRONMENT	CONCEN-TRATION %	High Performance Epoxy Vinyl Ester Resins				Epoxy Vinyl Ester Resins					Fume Service
		HETRON 942/35	HETRON 980/35	HETRON FR998/35	HETRON 970/35	HETRON 922/FR992	HETRON 980	HETRON 197-3	HETRON 800	AROPOL 7241/7334	HETRON 92/99P
Can Cleaner, Acidic (sulfuric and hydrofluoric acids, aluminum and oil Impurities, pH 1.2) **.....Footnote 1**		-	-	-	-	-/-	-	49	-	-/-	-/-
Can Treatment, Chrome-Free (pH 5-6)		-	-	-	-	-/-	-	49	-	-/-	-/-
Can Treatment, Chrome Phosphate (pH 2) **.....**		-	-	-	-	-/-	-	49	-	-/-	-/-
Canning Plant Waste		-	-	-	-	-/-	-	-	-	32/32	-/-
Capric Acid (sat'd.) **.....**		49	71	71	71	71/71	71	-	-	71/49	-/-
Caprylic Acid (sat'd., octanoic acid) **.**		99	99	99	99	82/82	93	60	-	71/38	-/71
Carbamide (sat'd.) **.....**		-	-	-	-	71/71	71	71	107	66/32	-/-
Carbon Beds (water treatments) **....**		-	-	-	-	-/-	-	93	-	-/-	-/-
Carbon Dioxide (wet, acidic) **.....**	100	-	121	121	-	99/99	121	121	-	93/66	121/121
Carbon Dioxide: Nitrogen: Water (by volume, oxygen = 5% of concentration, trace of sulfur dioxide)	12 70 14	-	-	-	-	-/-	-	49	-	-/-	-/-
Carbon Dioxide: Oxygen: Nitrogen (traces of chlorine, water and sulfur dioxide) **.....**	1.5 21 2.5	-	-	-	-	-/-	-	93	-	-/-	-/-
Carbon Dioxide, 14% (recovery boiler, (Kraft), no contact evaporation, trace of sulfur dioxide, 19% by volume moisture, 37 fps) **...**		-	-	-	-	NR/NR	-	171	-	NR/NR	-/-
Carbon Disulfide	100	NR	NR	NR	NR	NR/NR	NR	NR	32	NR/NR	NR/NR
Carbon Disulfide, Fumes (recovery fumes) **.....**		-	66	66	66	38/38	38	-	-	NR/NR	60/60
Carbon Monoxide Gas	100	177	-	-	177	99/99	121	121	71	93/71	71/93
Carbon Tetrachloride	100	82	82	82	82	LS32/66	66	52	107	LS32/NR	52/-
Carbon Tetrachloride, Vapor	100	93	93	93	93	32/66	66	60	107	32/32	60/32
Carbonic Acid (sat'd.) **.....**		-	-	-	-	71/71	71	71	-	71/54	71/71
Carbowax (polyethylene glycol) **.....**	100	-	-	-	82	38/38	49	-	-	-/-	-/-
Carboxylmethyl Cellulose	10	66	66	66	66	66/66	82	-	-	-/-	-/-
Carpet Shampoo		-	-	-	-	38/38	38	38	-	LS38/NR	-/-
Castor Oil	100	71	49	49	71	24/24	49	-	-	-/-	-/-
Catalytic Refining Feed		-	-	-	-	-/-	-	-	-	32/-	-/-
Catechol	100	-	-	-	-	-/-	-	-	121	-/-	-/-
Caustic, 50%: Ethyl Acetate: Methylene Chloride	1 16 83	-	NR	NR	-	NR/NR	NR	NR	LS32	NR/NR	NR/NR
Caustic Spent, Phenolic (refinery, neutralized to pH 5 - 6) **....**		-	54	54	-	54/54	54	54	54	54/-	-/-
Caustic Spent, Sulfidic (petrochemical, neutralized to pH 5 - 6)		-	54	54	-	54/54	54	54	54	54/-	-/-
CELL PUTTY 35	100	-	-	-	-	-/-	-	93	-	-/-	-/-
Cerous Nitrate (sat'd.) **.....**		-	32	32	-	32/32	32	32	32	-/-	-/-
Cheese Water		-	-	-	-	-/-	-	-	-	79/-	-/-
CHEM-REZ C-2006	100	-	-	-	-	-/-	-	38	38	-/-	-/-
CHEM-REZ C-2009	100	-	-	-	-	-/-	-	38	93	-/-	32/-
CHEM-REZ C-2075	100	-	-	-	-	-/-	-	38	38	-/-	-/-
China Clay, Slurry		-	-	-	-	-/-	-	27	-	-/-	-/-
Chloral (sat'd.) **.....**		-	-	-	-	-/-	-	-	107	-/-	-/-
Chlorate: Sulfuric Acid: Sodium Sulfite (methanol) **.....**		-	-	-	-	-/-	-	52	-	-/-	-/-
Chlorendic Anhydride	66	-	-	-	-	-/-	-	79	-	-/-	-/-
Chlorinated, 68%, Camphene: Xylene	90 10	-	-	-	-	-/-	-	49	49	-/-	-/-
Chlorinated Linseed Oil		-	-	-	-	-/-	-	32	-	-/-	-/-
Chlorinated Phenol Disinfectant ...		-	-	-	-	38/38	38	38	38	-/-	-/-
Chlorinated Pulp Stock .....Footnote 21		82	93	93	93	-/-	-	32	-	-/-	-/-
Chlorinated Rubber Polymer Reaction (wet with carbon tetrachloride, liquid and vapor phases) **.....**		-	-	-	-	-/-	-	32	-	-/-	-/-
Chlorinated Washer (hoods and ducts) **.....Footnote 21**		93	93	93	93	-/-	93	66	-	-/-	-/-
Chlorinated Wax	100	82	82	82	82	82/82	93	-	-	-/-	-/-
Chlorine (scrubbed with lime slurry) **.....Footnote 21**		-	-	-	-	-/-	-	38	-	-/-	-/-
Chlorine Absorption ...Footnote 21		-	-	-	-	-/-	-	49	-	-/-	-/-
Chlorine Dioxide (<1 g/l) **Footnote 21**		71	82	82	82	60/60	82	60	NR	NR/NR	NR/NR
Chlorine Dioxide (chilled liquid) **.....Footnote 21**		-	-	-	-	7/7	7	7	NR	-/-	-/-
Chlorine Dioxide (process absorbers) **.....Footnote 21**		-	-	-	82	-/-	82	54	-	-/-	-/-
Chlorine Dioxide (process bleach towers) **.....Footnote 21**		-	82	82	82	-/-	82	82	-	-/-	-/-
Chlorine Dioxide (process generator covers) **.....Footnote 21**		-	-	-	82	-/-	82	82	-	-/-	-/-
Chlorine Dioxide (retention tower) **...**		-	82	82	82	-/-	82	82	-	-/-	-/-
Chlorine Dioxide (washer, hoods and ducts) **.....Footnote 21**		-	82	82	82	-/-	82	60	-	-/-	-/-

See page 13 for footnotes.

See page 11 for list of trademarks and product names.

TEMPERATURE (°C) FOR RESIN TYPES

CHEMICAL ENVIRONMENT	CONCEN-TRATION %	High Performance Epoxy Vinyl Ester Resins				Epoxy Vinyl Ester Resins					Fume Service
		HETRON 942/35	HETRON 980/35	HETRON FR998/35	HETRON 970/35	HETRON 922/FR992	HETRON 980	HETRON 197-3	HETRON 800	AROPOL 7241/7334	HETRON 92/99P
Chlorine Dioxide (hooker single vessel process) **. . . .Footnotes 2, 21**		-	-	-	-	-/-	-	82	-	-/-	-/-
Chlorine Dioxide Generator (effluent R-2 system) **. .Footnote 21**		82	-	-	82	66/66	82	82	-	-/-	-/-
Chlorine Dioxide Generator (Olin type) **. . . . . .Footnote 21**		-	-	-	-	-/-	-	71	-	-/-	-/-
Chlorine Dioxide Generator (Solvay type) **. . . . . .Footnote 21**		-	-	-	-	-/-	-	63	-	-/-	-/-
Chlorine Dioxide Generator (spent acid) **. . . . . .Footnote 21**		-	-	-	-	-/-	-	54	-	-/-	-/-
Chlorine Dioxide: Sodium Carbonate: Bicarbonate (pH 8) **. . . . . .**	5 3.7	-	-	-	-	-/-	-	38	-	-/-	-/-
Chlorine Dioxide: Sodium Chloride . . . . . .Footnote 2	35 23	-	-	-	-	-/-	-	49	-	-/-	-/-
Chlorine Dioxide: Steam: Chlorine . . . . . .Footnote 21		-	82	82	82	-/-	82	66	-	-/-	-/-
Chlorine Dioxide, Fumes	5	71	82	82	82	60/60	82	49	NR	32/32	-/32
Chlorine Dioxide, Fumes	15	-	82	82	82	NR/NR	82	32	NR	NR/NR	-/-
Chlorine Gas (coolers & strippers) **. .**		-	-	-	-	NR/NR	-	149	NR	NR/NR	-/-
Chlorine Gas, Dry	100	121	121	121	121	82/82	121	149	107	82/38	-/93
Chlorine Gas, Wet	100	121	82	82	121	82/82	82	104	LS66	NR/NR	32/32
Chlorine Kill Tanks (caustic chlorine)		-	-	-	-	38/38	38	-	-	-/-	-/-
Chlorine Stripping		-	-	-	-	-/-	-	66	-	-/-	-/-
Chlorine Water (sat'd.) **. . . . . .**		93	99	99	99	82/82	82	93	-	NR/NR	91/52
Chlorine Water (gunk, wet chlorine) **. .**		-	99	99	99	-/-	-	32	-	-/-	-/-
Chlorine: Hydrochloric Acid: Water (chlorinated organics) **. . . . . .**		-	-	-	-	NR/NR	-	27	-	-/-	-/-
Chlorine: Hydrogen Chloride (hydrogen chloride sat'd. with tetrachlorocyclopentane, carbon tetrachloride, trace of hexachlorocyclopentane) **. . . . . .**	35 65	-	-	-	-	-/-	-	52	-	-/-	-/-
Chlorine: Ozone (rendering fumes) **. . . . . .Footnote 21**		-	-	-	-	-/-	-	49	-	-/-	-/-
Chlorine: Steam: Chlorine Dioxide . . . . . .Footnote 21		-	82	82	82	-/-	82	66	-	-/-	-/-
Chlorine, Fumes (cell plants, includes floors, walkways, roofing and siding) **. . . . . .**		-	-	-	-	49/49	49	49	-	-/-	32/32
Chlorine, Vapors: Phosphorus Oxychloride, Vapors: Hydrochloric Acid, Vapors (water vapors) **. . . . . .**		-	-	-	-	-/-	-	32	-	-/-	32/-
Chlorine, Vapors: Phosphorus Trichloride, Vapors: Hydrochloric Acid, Vapors (water vapors) **. . . . . .**	100	-	-	-	-	-/-	-	71	-	-/-	-/-
Chloroacetic Acid	1	49	49	49	49	49/49	49	32	-	32/NR	NR/NR
Chloroacetic Acid	25	-	49	49	49	49/49	49	32	-	32/NR	NR/NR
Chloroacetic Acid	50	38	38	38	38	38/38	38	32	-	NR/NR	NR/NR
Chlorobenzene	1	-	27	27	38	NR/NR	27	NR	121	NR/NR	NR/NR
Chlorobenzene	100	27	27	27	38	NR/NR	27	NR	121	NR/NR	NR/NR
Chlorofluorocarbon . . . .Footnote 1	100	-	-	-	-	-/-	-	71	-	-/-	71/-
Chloroform Alkaloids (hydrochloric acid, acetic acid and sodium chloride, water fume system)		-	-	-	-	-/-	-	32	-	-/-	-/-
Chloroform, Liquid (trichloromethane)	100	-	NR	NR	NR	NR/NR	NR	NR	60	NR/NR	NR/-
Chloroform, Vapor	100	-	-	-	-	NR/NR	-	NR	121	NR/NR	NR/-
Chloronaphthalene (chloromethane) **.**	100	-	-	-	-	-/-	-	-	107	-/-	-/-
Chlorophenol, Biocide: Methylene Thiocyanate (blend) **. . . . . .**	100	-	-	-	-	52/52	52	LS52	-	52/52	-/-
Chlorosulfonic Acid	100	-	NR	NR	NR	NR/NR	NR	NR	27	NR/NR	NR/-
CHLOROTHENE N.U	100	-	-	-	27	-/-	-	NR	27	-/-	-/-
Chlorotoluene, (o) **. . . . . .**	100	-	-	-	38	-/-	-	NR	-	-/-	NR/-
Chlorphenate, Biocide (organic sulfur type, blend) **. . . . . .**	100	-	-	-	-	52/52	52	52	-	52/52	-/-
Choline Chloride (reaction of trimethylamine, hydrochloric acid and ethylene oxide) **. . . . . .**		-	-	-	-	-/-	-	NR	-	-/-	-/-
Chromate (zinc blend inhibitor, stabilized) **. . . . . .**	100	-	-	-	-	-/-	-	52	-	52/NR	-/-
Chrome Acid Plating Bath (vapor) **. .**		-	-	-	-	-/-	-	93	-	-/-	-/-
Chrome Anodizing Solution		-	-	-	-	-/-	-	66	-	-/-	-/-
Chrome Barrel Plating Fumes		-	-	-	-	-/-	-	-	-	-/-	49/-
Chrome Bath, Black (chromic acid, acetic acid and barium acetate) **. . . .**		-	-	-	-	-/-	-	46	-	-/-	-/-
Chrome Free Can Treatment (pH 6) **.**		-	-	-	-	-/-	-	49	-	-/-	-/-
Chrome Phosphate (can treatment, pH 2) **. . . . . .**		-	-	-	-	-/-	-	49	-	-/-	-/-
Chrome Plating (liquid and vapors) **. .**		-	-	-	-	38/38	38	-	-	NR/NR	-/-

See page 13 for footnotes.

See page 11 for list of trademarks and product names.

TEMPERATURE (°C) FOR RESIN TYPES

CHEMICAL ENVIRONMENT	CONCEN-TRATION %	High Performance Epoxy Vinyl Ester Resins				Epoxy Vinyl Ester Resins					Fume Service
		HETRON 942/35	HETRON 980/35	HETRON FR998/35	HETRON 970/35	HETRON 922/FR992	HETRON 980	HETRON 197-3	HETRON 800	AROPOL 7241/7334	HETRON 92/99P
Chrome Reduction Process	25	-	-	-	-	-/-	-	104	-	-/-	-/-
Chrome Metal Plating (19% chromic acid with sodium fluosilicate and sulfate.) . .**Footnote 1**		49	-	-	66	38/38	38	93	-	NR/NR	NR/-
Chrome, Hard (plating baths)		-	-	-	-	-/-	-	54	NR	-/-	-/-
Chromic Acid . . . . . .**Footnote 3**	1	38	66	66	82	38/38	66	93	NR	49/49	93/-
Chromic Acid . . . . . .**Footnote 3**	5	38	66	66	82	38/38	66	82	NR	49/49	93/-
Chromic Acid . . . . . .**Footnote 3**	10	38	66	66	66	38/38	66	82	NR	49/49	82/-
Chromic Acid . . . . . .**Footnote 3**	20	38	49	49	66	38/38	49	66	NR	49/49	66/-
Chromic Acid . . . . . .**Footnote 3**	30	NR	NR	NR	NR	NR/NR	NR	49	NR	NR/NR	38/-
Chromic Acid (HETRON 72 satisfactory to 140F) . . . .**Footnote 3**	40	NR	NR	NR	NR	NR/NR	NR	32	NR	NR/NR	LS32/-
Chromic Acid (HETRON 72 satisfactory to 140F) . . . .**Footnote 3**	50	NR	NR	NR	NR	NR/NR	NR	LS32	NR	NR/NR	NR/NR
Chromic Acid (sat'd.) . . . .**Footnote 3**		-	-	-	NR	NR/NR	NR	49	NR	NR/NR	NR/NR
Chromic Acid (trace of sodium fluoride, high agitation) . . . . . .**Footnotes 1,3**	36	-	-	-	-	-/-	-	60	-	-/-	-/-
Chromic Acid (traces of sulfuric acid and hydrofluosilicic acid) **Footnote 1,3**	35.2	-	-	-	-	-/-	-	46	-	-/-	-/-
Chromic Acid Evaporator (55 oz/gal, vacuum, recovery units with 20% by volume concentrated sulfuric acid) . . . . . .**Footnote 3**		-	NR	NR	-	NR/NR	NR	71	NR	NR/NR	NR/NR
Chromic Acid: Hydrofluoric Acid: Nitric Acid . . . . . .**Footnotes 1,3**	6 3 2	-	-	-	-	-/-	-	27	-	-/-	-/-
Chromic Acid: Hydrofluoric Acid: Phosphoric Acid . . . .**Footnotes 1,3**	9 11 8	-	-	-	-	-/-	-	38	-	-/-	-/-
Chromic Acid: Nitric Acid: Hydrofluoric Acid . . .**Footnotes 1,3**	6 2 1.5	-	-	-	-	-/-	-	27	-	-/-	-/-
Chromic Acid: Phosphoric Acid: Hydrofluoric Acid . . .**Footnotes 1,3**	7 40 2	-	-	-	-	-/-	-	38	-	-/-	-/-
Chromic Acid: Sulfuric Acid . . . . . .**Footnote 2**	12.5 16	-	-	-	-	-/-	-	107	-	NR/NR	-/-
Chromic Acid: Sulfuric Acid . . . . . (concentration in oz/gal) . .**Footnote 2**	20 20	-	-	-	-	NR/NR	-	82	-	NR/NR	-/-
Chromic Acid: Sulfuric Acid (concentration in oz/gal) . .**Footnote 2**	20 32	-	-	-	-	-/-	-	32	-	NR/NR	-/-
Chromic Acid: Sulfuric Acid (concentration in oz/gal) . .**Footnote 2**	3 16	-	-	-	-	NR/NR	-	68	-	-/-	-/-
Chromic Acid:Sulfuric Acid (concentration in oz/gal) . .**Footnote 2**	250 2.5	-	NR	NR	-	NR/NR	NR	60	-	NR/NR	-/-
Chromic Acid: Sulfuric Acid (concentration in oz/gal) . .**Footnote 2**	300 3	-	NR	NR	-	NR/NR	NR	66	-	NR/NR	66/-
Chromic Acid: Sulfuric Acid (concentration in oz/gal) . .**Footnote 2**	400 4	-	NR	NR	-	NR/NR	NR	82	-	NR/NR	-/-
Chromic Acid: Sulfuric Acid (concentration in oz/gal) . .**Footnote 2**	400 400	-	NR	NR	-	NR/NR	NR	60	-	NR/NR	-/-
Chromic Acid: Sulfuric Acid: Hydrofluosilicic Acid (concentration in oz/gal, chrome plating) .**Footnotes 1,2**	45 .3 .5	-	-	-	66	-/-	-	46	-	-/-	-/-
Chromic Acid, Intermittent . . . . . .**Footnote 3**	20	-	NR	NR	66	NR/NR	NR	93	NR	NR/NR	-/-
Chromic Acid, Vapor . . . .**Footnote 3**	20	38	66	66	82	38/38	66	82	NR	49/49	LS66/LS66
Chromic Chloride (sat'd.)		-	-	-	-	-/-	-	-	104	-/-	-/-
Chromic Oxide: Sulfuric Acid	2 80	-	-	-	-	-/-	-	74	-	-/-	NR/-
Chromic Sulfate	100	-	66	66	82	66/66	66	-	-	-/-	-/-
Chromium Hardening Bath (photographic fixing and stop bath) . .		-	-	-	-	-/-	-	27	-	-/-	-/-
Chromium Potassium Sulfate (sat'd.)		-	-	-	-	-/-	-	-	107	-/-	-/-
Chromous Sulfate (sat'd.)		-	-	-	-	66/66	66	66	-	77/60	-/-
Citric Acid (sat'd.)		99	104	104	99	99/99	104	93	-	82/66	132/93
Citric Acid: Lactic Acid (sat'd.)		-	-	-	-	-/-	-	66	-	-/-	-/-
Clay, 20%: Potash Slurry, 20% (potash in sat'd brine)	40	-	-	-	-	-/-	-	27	-	-/-	-/-
Cleaner (disinfectant, PD 64 (Trademark))	100	-	-	-	-	38/38	38	38	38	-/-	-/-
CLEANER 508	100	-	-	-	-	-/-	-	71	-	-/-	-/-
Cleaner, Liquid (biodegradable, all purpose)		-	-	-	-	38/38	38	38	-	38/38	-/-
Coal Water Slurry . . . .**Footnote 24**	10 90	-	-	-	-	-/-	-	27	-	-/-	-/-
Coal, Medium Sulfur (power plant scrubber particulate, pH 1.9 - 3.6, trace of chlorine, 300,000 ACFM gas liquor, mist and fumes)		-	-	-	-	66/66	66	66	-	-/-	-/-
Coatings (sat'd., water reducible, acrylic spray liner (PPG Industries)) .		-	49	49	66	49/49	49	-	-	49/NR	-/-
Coatings (sat'd., water reducible, acrylic wet ink varnish (PPG Industries))		-	49	49	66	49/49	49	-	-	49/NR	-/-

See page 13 for footnotes.

See page 11 for list of trademarks and product names.

TEMPERATURE (°C) FOR RESIN TYPES

CHEMICAL ENVIRONMENT	CONCEN-TRATION %	High Performance Epoxy Vinyl Ester Resins				Epoxy Vinyl Ester Resins					Fume Service
		HETRON 942/35	HETRON 980/35	HETRON FR998/35	HETRON 970/35	HETRON 922/FR992	HETRON 980	HETRON 197-3	HETRON 800	AROPOL 7241/7334	HETRON 92/99P
Coatings (sat'd., water reducible, polyester white enamel (PPG Industries))		-	49	49	66	49/49	49	-	-	49/NR	-/-
Cobalt di (2 ethyl hexyl) **Phosphate: Tri-m-butyl phosphate: Livestock Spray Base** (Shell's)	30 5 65	-	-	-	-	-/-	-	82	-	-/-	-/-
Cobalt Nitrate (sat'd.)		-	60	60	49	60/60	60	60	-	-/-	-/-
Cocamidopropyl Betaine	100	-	-	-	-	49/49	49	49	-	49/-	-/-
Cocamidopropyl Dimethylamine	100	-	-	-	-	49/49	49	49	-	49/-	-/-
Coconut Fatty Acid (diethanol amide)	100	-	-	-	-	-/-	-	38	-	-/-	-/-
Coconut Oil	100	-	79	79	-	79/79	79	-	-	79/-	-/-
Cod Liver Oil	100	38	-	-	-	-/-	-	-	-	32/32	-/-
Coffee Roasting Fumes		-	-	-	-	-/-	-	-	-	-/-	66/-
Combustion Gases (particulate, cooling and washing with water)		-	-	-	-	-/-	-	38	-	-/-	38/-
Condensable Liquor (pulp and paper mill, pH 9)		-	-	-	-	54/54	54	32	-	-/-	-/-
Copper Acetate (sat'd.)		-	-	-	-	71/71	82	-	107	71/-	-/49
Copper Chloride (sat'd.)		121	121	121	121	99/99	104	121	121	82/66	121/121
Copper Chloride: Silver Nitrate	15 33	-	-	-	-	-/-	-	32	-	-/-	-/-
Copper Cyanide (sat'd.)		99	99	99	99	99/99	104	93	-	32/NR	93/32
Copper Cyanide Plating, Fumes		-	-	-	71	-/-	-	82	-	-/-	-/-
Copper Cyanide, Metal Plating (10.5% copper and 14% sodium cyanides, 6% rochelle salts)		71	82	82	71	82/82	82	NR	-	-/-	NR/-
Copper Cyanide: Potassium Hydroxide: Potassium Cyanide (concentration in oz/gal)	8 2 3	82	-	-	82	-/-	-	NR	-	-/-	-/-
Copper Electrolytic Cells		-	-	-	-	-/-	-	66	-	-/-	-/-
Copper Extractant (ion exchange oxime type)	100	-	-	-	-	-/-	-	46	-	-/-	-/-
Copper Leach Tanks		-	-	-	-	-/-	-	66	-	-/-	-/-
Copper Matte, Metal Plating (dipping bath, 30% iron chlorate, 19% hydrochloric acid)		93	93	93	93	93/93	93	82	-	-/-	-/-
Copper Nitrate (sat'd.)		99	104	104	99	99/99	104	60	-	71/60	60/71
Copper Oxide: Hydrobromic Acid (trace of bromine)	5 50	-	-	-	-	-/-	-	32	-	-/-	-/-
Copper Oxide: Lead: Sulfur (10% ferric oxide, 8% zinc sulfate, 3% bismuth sulfate dust)	18 25 25	-	-	-	-	-/-	-	93	-	-/-	-/-
Copper Oxychloride	20	-	-	-	-	-/-	-	-	-	NR/NR	60/-
Copper Oxychloride (sat'd.)		-	-	-	-	-/-	-	-	-	NR/NR	32/-
Copper Pellet Smelter, Fumes		-	-	-	-	-/-	-	149	-	-/-	-/-
Copper Pickle Bath (1 gal. sulfuric acid to 9 gal. water)		-	-	-	-	-/-	-	79	-	-/-	-/-
Copper Pickling Bath (10% ferric sulfate, 10% sulfuric acid)		-	-	-	-	99/99	99	104	-	-/-	-/-
Copper Salts: Nitric Acid (concentration in g/l) **Footnote 3**	190 15	-	-	-	-	-/-	-	66	-	-/-	66/-
Copper Salts: Nitric Acid (concentration in g/l) **Footnote 3**	190 20	-	-	-	-	-/-	-	82	-	-/-	-/-
Copper Salts: Sulfuric Acid (concentration in g/l)	31 21	-	-	-	-	-/-	-	66	-	-/-	-/-
Copper Salts: Sulfuric Acid (concentration in g/l)	31 33	-	-	-	-	-/-	-	82	-	-/-	-/-
Copper Salts: Sulfuric Acid: Nitric Acid (concentration in g/l)	112 17 9.5	-	-	-	-	-/-	-	82	-	-/-	-/-
Copper Smelter Fumes		-	-	-	-	-/-	-	66	-	-/-	-/-
Copper Sulfate (sat'd.)		121	121	121	121	99/99	104	121	121	82/49	121/121
Copper Sulfate: Sulfuric Acid	5 18	-	49	49	-	49/49	49	66	-	49/49	66/66
Copper Metal Plating (45% copper fluoboric acid, 19% copper sulfate, 8% sulfuric acid) **Footnote 1**		82	82	82	82	82/82	82	82	-	-/-	-/-
Copper: Sodium Persulfate (concentration in g/l, trace of sulfuric acid)	30 3	-	-	-	-	74/74	-	74	-	-/-	-/-
Copper: Sulfuric Acid: Iron (5 g/l zinc slurry/thickener)	80 10 10	-	-	-	-	-/-	-	82	-	-/-	-/-
Corn Oil	100	99	99	99	99	66/66	93	-	-	49/49	-/-
Corn Starch		99	99	99	-	99/99	104	-	-	49/49	-/-
Corn Sugar	100	110	99	99	-	99/99	104	-	-	49/49	-/-
Corn Syrup (crude acidic, decolorizing)	100	-	-	-	-	49/49	49	38	-	49/49	-/-
Cottonseed Oil	100	99	99	99	99	66/66	93	38	-	38/38	38/-
Cresol, Fumes	100	-	-	-	-	-/-	-	32	32	NR/NR	-/NR
Cresols, Mixture	100	-	-	-	-	-/-	-	-	66	NR/NR	-/NR
Cresylic Acid: Sodium Hydroxide	12 5	-	-	-	-	82/82	82	-	-	-/-	-/-
Cresylic Acid, Fumes	100	-	-	-	-	-/-	-	27	-	NR/NR	-/NR

See page 13 for footnotes.

See page 11 for list of trademarks and product names.

TEMPERATURE (°C) FOR RESIN TYPES

CHEMICAL ENVIRONMENT	CONCEN-TRATION %	High Performance Epoxy Vinyl Ester Resins				Epoxy Vinyl Ester Resins					Fume Service
		HETRON 942/35	HETRON 980/35	HETRON FR998/35	HETRON 970/35	HETRON 922/FR992	HETRON 980	HETRON 197-3	HETRON 800	AROPOL 7241/7334	HETRON 92/99P
Cresylics (water, neutral oils, mercaptans, hydrogen sulfide and waste liquor, pH 5 - 6)		-	-	-	-	-/-	-	54	54	54/-	-/-
Crude Sulfate: Turpentine		-	-	-	-	38/38	38	LS38	NR	38/NR	LS100/-
Cupric Chloride: Hydrochloric Acid (monel and nickel, cleaning baths)		-	-	-	-	-/-	-	82	-	-/-	-/-
Cupric Sulfate (cupric sulfate-0.1M, traces of ammonia, ammonia sulfate and sodium chloride)		-	91	91	-	91/91	91	LS90	-	-/-	NR/-
Cupric Sulfate: Ferric Sulfate: **Sulfuric Acid**	10 10 20	-	-	-	-	-/-	-	82	-	-/-	-/-
Cutback Diluent, Refinery		-	-	-	-	-/-	-	-	-	32/-	-/-
CWT 102	100	-	-	-	-	-/-	-	52	-	52/52	-/-
Cyaf 5101		-	-	-	-	-/-	-	-	-	32/32	-/-
Cyanide, Fumes: Ozone, Fumes (20 lbs/day at 2% oxygen) **Footnote 21**		-	-	-	-	-/-	-	32	-	-/-	-/-
Cyanoacetic Acid: Methyl Isobutyl Ketone (0.8 sulfuric acid in saturated sodium chloride)	8 60	-	-	-	-	-/-	-	LS38	-	-/-	-/-
Cyanuric Chloride (scrubbed with 5.25% sodium hydroxide)		-	-	-	-	-/-	-	NR	-	-/-	-/-
Cyclohexane	1	-	66	66	66	49/49	66	60	66	49/NR	60/-
Cyclohexane	100	-	66	66	66	49/49	66	60	66	49/NR	60/-
Cyclohexane, Vapor		-	-	-	-	82/82	82	79	-	79/-	79/79
Cyclohexanone	100	-	-	-	-	-/-	-	-	38	NR/NR	-/-
Cyclo-Octadiene	100	-	-	-	-	-/-	-	38	-	-/-	-/-
CYGON 400	4	-	-	-	-	NR/NR	-	66	66	-/-	-/-
CYGON 400	100	-	-	-	-	NR/NR	NR	NR	66	-/-	NR/-
DAREX 45		-	-	-	-	-/-	-	82	-	-/-	-/-
DAZAD 30		-	-	-	-	-/-	-	82	-	-/-	-/-
DDT, Insecticide Solution	3	-	-	-	-	-/-	-	-	-	-/-	60/-
Decanol	100	-	-	-	82	-/-	-	-	-	71/71	-/-
DEFOAMER, L-917B	100	-	-	-	-	60/60	60	60	-	-/-	-/-
DEFOAMER, L-880, 21-905	100	-	-	-	-	60/60	60	-	-	-/-	-/-
Desulfurizer, Feed/Refinery		-	-	-	-	-/-	-	-	-	32/-	-/-
Detergent (pH 8)	3	-	-	-	-	-/-	-	-	-	-/-	82/-
Detergent (dimethyl benzyl N-alkyl with 23% hydrochloric acid, 25% phosphoric acid and inerts)		-	-	-	-	38/38	38	38	38	-/-	-/-
Detergent (ELECTRASOL, trademark)	5	-	-	-	66	66/66	66	-	-	-/-	-/-
Detergent (ULTRAWET 45DS, biodegradable)	100	-	-	-	-	-/-	-	54	-	-/-	-/-
Detergent (ULTRAWET 60K, biodegradable)	100	-	-	-	-	-/-	-	66	-	-/-	-/-
Detergent (ULTRAWET 60L, biodegradable)	100	-	-	-	-	-/-	-	38	-	-/-	-/-
Detergent (sat'd., PAX HYSPEED, trademark)		-	-	-	-	-/-	-	60	-	-/-	-/-
Detergent (dimethyl benzyl N-alkyl type, hydrochloric acid, 23%, inerts, 77%)		-	-	-	-	38/38	38	38	38	-/-	-/-
Detergent (dimethyl benzyl N-alkyl type, phosphoric acid, 25%, inerts, 75%)		-	-	-	-	38/38	38	38	38	-/-	-/-
Detergent, Alcohols	100	-	-	-	82	49/49	82	-	-	-/-	-/-
Detergent, Dishwashing Liquid (biodegradable)		-	-	-	-	38/38	38	38	-	38/38	-/-
Detergents, Germicidal (conc.)		-	-	-	-	-/-	-	38	38	-/-	38/-
Detergent, Germicidal (DICROBE NN)		-	-	-	-	-/-	-	38	-	-/-	-/-
Detergent, Germicidal (MATAR, Trademark, conc.)		-	-	-	-	-/-	-	38	-	-/-	-/-
Detergents, Organic		-	38	38	93	38/38	38	38	38	NR/NR	-/-
Detergent, Organic (pH 10-11)	100	82	-	-	82	-/-	-	NR	82	-/-	71/-
Detergent, Organic (pH 12)		82	-	-	-	-/-	-	-	-	NR/NR	-/-
Detergent Solution (BUILD, pH 9 -10, 10-12% solids)		-	-	-	-	49/49	49	49	-	-/-	-/-
Detergent Solution (CASCADE)	5	82	-	-	82	99/99	104	99	-	-/-	99/-
Detergents, Sulfated		-	-	-	-	-/-	-	-	-	82/-	-/-
Detergents, Sulfated (concentrations = 1 - 50%)		-	82	82	82	99/99	104	93	-	82/38	93/-
Detergents, Sulfonated		-	-	-	-	99/99	104	-	-	71/38	-/-
Detergents, Sulfonated (sodium hydroxide, sodium tripolyphosphate, hypochlorite and bisulfite fumes)		-	-	-	82	99/99	104	88	-	-/-	-/-
Detergents, Sulfonated, Fumes (neutralization fumes)		-	-	-	82	99/99	104	88	-	-/-	-/-
Developers, Photographic (including color, moderately alkaline.)		-	-	-	-	-/-	-	27	-	-/-	-/-

See page 13 for footnotes.

See page 11 for list of trademarks and product names.

TEMPERATURE (°C) FOR RESIN TYPES

CHEMICAL ENVIRONMENT	CONCEN-TRATION %	High Performance Epoxy Vinyl Ester Resins				Epoxy Vinyl Ester Resins					Fume Service
		HETRON 942/35	HETRON 980/35	HETRON FR998/35	HETRON 970/35	HETRON 922/FR992	HETRON 980	HETRON 197-3	HETRON 800	AROPOL 7241/7334	HETRON 92/99P
DFR-121		-	-	-	-	38/38	38	38	NR	38/38	-/-
Diallylphthalate	100	99	99	99	99	82/82	99	-	99	71/54	-/-
Diammonium Phosphate	65	99	-	-	99	NR/NR	-	LS107	-	-/-	-/-
Diammonium Phosphate Vapor		-	-	-	-	-/-	-	-	-	-/-	32/32
Diammonium Phosphate:											
Ammonium Sulfate	10 10	-	-	-	-	-/-	-	-	-	32/32	-/-
Dibasic Acids	80	-	-	-	-	-/-	91	-	-	NR/NR	-/-
Dibromopropanol (2, 3-)	100	-	-	-	38	NR/NR	NR	-	41	-/-	-/-
Dibromopropyl Phosphate	100	-	-	-	-	-/-	-	-	41	-/-	-/-
Dibutyl Ether	100	99	99	99	99	27/27	66	27	-	27/-	27/27
Dibutyl Phthalate	100	82	93	93	99	66/66	93	32	93	32/32	-/-
Dibutyl Sebacate	100	66	-	-	66	99/99	99	-	-	-/-	-/-
Dicalcium Phosphate, Gas (liquid scrubbing, pH 3 - 4)		-	-	-	-	-/-	-	149	149	-/-	-/-
Dichloro-(2)**-Propylphosphate**	100	-	-	-	-	-/-	-	-	41	-/-	-/-
Dichloro (2,6)-**Aniline**-(4)-**: Hydrochloric Acid**	32	-	-	-	-	LS77/LS77	-	LS77	77	LS77/NR	-/-
Dichlorobenzene	1	-	49	49	49	NR/NR	38	NR	104	NR/NR	NR/-
Dichlorobenzene	100	38	49	49	49	NR/NR	38	NR	104	NR/NR	NR/-
Dichlorobenzene (o-)	100	-	-	-	-	NR/NR	38	LS49	-	NR/NR	NR/-
Dichloroethane (1,2-)	100	-	-	-	27	NR/NR	-	NR	66	NR/NR	NR/-
Dichloroisopropyl Phosphate	100	-	-	-	-	-/-	-	-	41	-/-	-/-
Dichloronitrobenzene (2,4-) (trace of nitric acid and water)	100	-	-	-	-	-/-	-	-	110	-/-	-/-
Dichlorophenol	1	-	-	-	-	NR/NR	-	NR	60	NR/NR	NR/-
Dichlorophenol	100	-	-	-	-	NR/NR	-	NR	60	NR/NR	NR/-
Dichlorophenoxyacetic Acid	2	-	-	-	49	-/-	-	-	-	-/-	60/60
Dichloropropane	100	27	NR	NR	38	NR/NR	NR	NR	-	NR/NR	NR/-
Dichloropropane: Dichloropropene		-	NR	NR	27	NR/NR	NR	NR	-	-/-	-/-
Dichloropropene	100	NR	NR	NR	27	NR/NR	NR	NR	-	NR/NR	NR/-
Dichloropropene: Dichloropropane		-	NR	NR	27	NR/NR	NR	NR	-	-/-	-/-
Dichloropropionic Acid	100	27	NR	NR	27	NR/NR	NR	-	-	-/-	-/-
Dichromate Bleach: Sulfuric Acid (photographic)		-	-	-	-	-/-	-	27	-	-/-	-/-
Dicoco Dimethyl Ammonium Chloride		-	-	-	-	49/49	49	49	49	49/49	49/-
Dicoco Dimethyl Quaternary	75	-	-	-	-	49/49	49	49	49	49/49	49/-
Dicyclopentadiene	100	-	-	-	-	-/-	-	38	-	-/-	-/-
Diesel Fuel	100	99	93	93	99	79/79	93	79	-	79/60	79/38
Diesel Fuel, Premium		-	-	-	-	-/-	-	-	-	32/-	-/-
Diethanolamine	30	-	49	49	49	27/27	49	43	-	32/-	-/-
Diethanolamine	100	49	49	49	49	27/27	49	43	66	-/-	-/32
Diethyl Benzene	100	66	66	66	66	27/27	49	49	66	NR/NR	-/-
Diethyl Carbonate	100	27	-	-	38	NR/NR	NR	-	138	-/-	-/-
Diethyl Ketone	100	NR	27	27	27	NR/NR	NR	-	102	NR/NR	-/-
Diethyl Sulfate	100	49	38	38	49	NR/NR	38	38	-	-/-	-/-
Diethylamine	100	-	-	-	-	NR/NR	NR	-	107	-/-	-/-
Diethylene Glycol	100	-	99	99	99	99/99	99	121	107	82/66	121/121
Diethylene Glycol Monoethyl Ether	100	-	-	-	-	-/-	-	-	107	-/-	-/-
Diethylene Glycol N-butyl Ether	100	-	-	-	-	32/32	32	29	-	-/-	-/-
Diethylene Imide Oxide	10	-	-	-	-	-/-	-	38	-	-/-	-/-
Diethylene Triamine **Footnote 3**	100	-	-	-	-	-/-	-	NR	38	-/-	NR/-
Diethylene Triamine: Sodium Hydroxide: Water (ethylenediamine, 10% of concentration)	10 10 70	-	-	-	-	-/-	-	-	60	-/-	-/-
Diethylhexyl Phosphoric Acid (in kerosene)	20	82	-	-	82	49/49	66	-	-	-/-	-/-
Digester Blow Down, Vapors		-	-	-	-	-/-	-	104	-	-/-	NR/-
Digester Room, Pulp Mill (floors and spills)		-	-	-	32	32/32	32	-	-	-/-	-/-
Diglycolamine	100	-	-	-	-	NR/NR	-	NR	LS132	NR/NR	NR/-
Diglycolamine (saturated with carbon dioxide and hydrogen sulfide)	100	-	-	-	-	NR/NR	-	NR	LS132	-/-	NR/-
Dihydrogenated-Tallow Dimethyl Ammonium Chloride: Aqueous Isopropanol	75 25	-	-	-	-	49/49	49	49	49	49/49	49/-
Diisobutyl Ketone: Butyl Alcohol: Ethyl Hexylacetate	85 5 10	-	NR	NR	-	NR/NR	NR	27	38	-/-	-/-
Diisobutyl Phthalate	100	66	66	66	66	38/38	66	32	-	-/-	-/-
Diisobutylene	100	38	38	38	38	32/32	38	38	-	-/-	-/-
Diisopropanolamine	100	49	49	49	66	27/27	49	-	-	-/-	-/-
Dimethyl Acetamide	70	-	-	-	-	-/-	-	66	-	-/-	NR/-
Dimethyl Aniline	100	-	-	-	-	-/-	-	-	107	-/-	-/-
Dimethyl Distearyl Ammonium Chloride: Aqueous Isopropanol	72 25	-	-	-	-	49/49	49	49	49	49/49	49/-
Dimethyl Distearyl Quaternary (in isopropanol)		-	-	-	-	49/49	49	49	-	49/49	49/-

See page 13 for footnotes.

See page 11 for list of trademarks and product names.

TEMPERATURE (°C) FOR RESIN TYPES

CHEMICAL ENVIRONMENT	CONCEN-TRATION %	High Performance Epoxy Vinyl Ester Resins				Epoxy Vinyl Ester Resins					Fume Service
		HETRON 942/35	HETRON 980/35	HETRON FR998/35	HETRON 970/35	HETRON 922/FR992	HETRON 980	HETRON 197-3	HETRON 800	AROPOL 7241/7334	HETRON 92/99P
Dimethyl Distearyl Quaternary (in neutral organic solvent)	7.2	-	-	-	NR	-/-	-	38	32	-/-	-/-
Dimethyl Formamide	30	-	-	-	NR	NR/NR	-	32	32	NR/NR	-/-
Dimethyl Formamide	100	NR	NR	NR	NR	NR/NR	NR	NR	LS32	NR/NR	-/-
Dimethyl Morpholine	100	27	-	-	49	NR/NR	38	LS49	-	NR/NR	NR/-
Dimethyl Phthalate	100	82	-	-	82	49/49	66	-	107	NR/NR	-/NR
Dimethyl Sulfate	100	-	-	-	-	-/-	-	-	93	-/-	-/-
Dimethyl Tin Dichloride	50	-	-	-	-	-/-	-	27	27	-/-	-/-
Dimethylamine	4	-	-	-	-	-/-	-	54	-	-/-	-/-
Dimethylformamide: Benzene: Water (tetrahydrofuran = 5% of concentration)	5 40 50	-	NR	NR	NR	NR/NR	NR	NR	32	NR/NR	NR/NR
Dioctyl Phthalate	100	99	66	66	99	49/49	66	-	-	NR/NR	-/NR
Dioxane	1	-	-	-	-	NR/NR	NR	-	52	-/-	-/-
Dioxane	100	-	-	-	-	NR/NR	NR	-	52	-/-	-/-
Diphenyl Ether	100	49	49	49	49	27/27	49	-	-	NR/NR	NR/NR
Diphenyl Methane Diisocyanate	100	-	-	-	-	-/-	-	-	-	49/49	-/-
Diphenyl Oxide	100	49	49	49	49	27/27	49	-	-	NR/NR	NR/NR
Dipropylene Glycol	100	99	99	99	99	82/82	99	-	-	71/49	71/71
Dipropylene Glycol Dibenzoate	100	-	-	-	-	49/49	49	49	49	49/49	-/-
Disinfectant (chlorinated phenol type)		-	-	-	-	38/38	38	38	-	-/-	-/-
Disinfectant, Cleaner (PD 64, Trademark)		-	-	-	-	38/38	38	38	38	-/-	-/-
Dispersant, Anionic (blend)	100	-	-	-	-	-/-	-	52	38	52/52	-/-
Dispersant, Nonionic (blend)	100	-	-	-	-	-/-	-	52	-	LS52/NR	-/-
Dispersing Agents	100	-	-	-	-	-/-	-	52	-	52/52	-/-
Di-Syston (1 to 10 dilution)		-	-	-	-	-/-	-	49	49	-/-	-/-
DIVERSEY 514 (14 oz/gal) **Footnote 1**		-	-	-	-	-/-	-	27	-	-/-	-/-
DIVERSEY 808 (5.3 oz/gal) **Footnote 1**		-	-	-	-	-/-	-	60	-	-/-	-/-
Divinyl Benzene	100	49	-	-	49	NR/NR	49	32	-	NR/NR	-/-
Dodecane	100	-	49	49	49	27/27	49	-	-	-/-	-/-
Dodecene	100	82	82	82	82	-/-	-	32	-	NR/NR	NR/NR
Dodecene (trace of hydrochloric acid)	100	-	-	-	-	-/-	-	49	-	NR/NR	-/-
Dodecyl Alcohol	100	-	-	-	-	66/66	82	38	-	-/-	-/-
Dodecylbenzene Sulfonic Acid	100	93	-	-	99	99/99	104	-	-	-/-	-/-
Dodecylbenzene Sulfonic Acid: Sulfuric Acid: Water (oil = 1% of concentration)	85 10 4	66	66	66	66	-/-	-	66	-	-/-	66/-
Dolomite Kiln Gases (wet)		-	-	-	-	-/-	-	66	-	-/-	-/-
DOWCLENE EC	100	49	-	-	-	-/-	-	27	49	-/-	-/-
DREWFAX 260	100	-	-	-	-	-/-	-	60	-	-/-	-/-
DREWFAX 335	100	-	-	-	-	-/-	-	60	-	-/-	-/-
DREWFAX 339	100	-	-	-	-	-/-	-	LS32	-	-/-	-/-
DREWSPERSE 732 (also DREWSPERSE 734 & 780)	100	-	-	-	-	-/-	-	52	-	52/52	-/-
DREWSPERSE 738 (also DREWSPERSE 741 & 735)	100	-	-	-	-	-/-	-	52	-	LS52/NR	-/-
DUAL 8E	100	-	-	-	-	-/-	38	-	-	-/-	-/-
Dye Plant Water Treatment (pH 2 - 3)		-	-	-	-	-/-	-	82	-	-/-	-/-
Electronics Plant Waste		-	-	-	-	32/32	32	-	-	-/-	-/-
Electrostatic Precipitator Fumes: Sulfate (traces of carbonate, fluorides and bicarbonates) **Footnote 1**	3	-	-	-	-	85/85	85	85	-	-/-	-/-
ELVASE		-	-	-	-	38/38	38	38	38	38/38	-/-
Emulsifier, Oil and Grease (alkanolamide type)	100	-	-	-	-	-/-	-	49	-	-/-	-/-
EP 52-A65	100	-	-	-	-	32/32	32	32	32	32/32	-/-
EPTAM (conc., herbicide) **Footnote 4**		-	-	-	-	-/-	-	49	49	-/-	-/-
ERIONAL NW	100	-	-	-	-	32/32	32	32	-	-/-	-/-
Esters, Fatty Acid	100	82	82	82	82	82/82	82	49	-	82/66	-/-
Etchant, Spent: Ammonium Hydroxide Based (copper = 18 oz/gal)		-	-	-	-	49/49	49	49	-	-/-	-/-
Etchant, Fresh (composed of 50% ammonium hydroxide)		-	-	-	-	49/49	49	49	-	-/-	-/-
Ethanol (see ethyl alcohol)		-	-	-	-	-/-	-	-	-	-/-	-/-
Ethanolamine	100	NR	-	-	27	NR/NR	32	32	66	NR/NR	-/-
Ethoxylated Alcohol (pH 8.5, C(12)-C(15))	100	-	-	-	-	-/-	-	49	-	-/-	-/-
Ethoxylated Nonyl Phenol	100	-	-	-	38	-/-	-	38	-	-/-	-/-
Ethyl Acetate	1	-	NR	NR	21	NR/NR	NR	NR	52	NR/NR	NR/NR
Ethyl Acetate	100	NR	NR	NR	21	NR/NR	NR	NR	52	NR/NR	NR/NR
Ethyl Acetate: Methylene Chloride: Caustic 50%	16 83 1	-	NR	NR	-	NR/NR	NR	NR	LS32	NR/NR	NR/NR
Ethyl Acetoacetate (sat'd.)		-	-	-	-	-/-	-	27	-	-/-	-/-
Ethyl Acrylate	100	-	NR	NR	NR	NR/NR	NR	-	27	-/-	-/-
Ethyl Alcohol **Footnote 17**	1	-	66	66	66	66/66	66	-	66	-/-	-/-

See page 13 for footnotes.

See page 11 for list of trademarks and product names.

TEMPERATURE (°C) FOR RESIN TYPES

CHEMICAL ENVIRONMENT	CONCEN-TRATION %	High Performance Epoxy Vinyl Ester Resins				Epoxy Vinyl Ester Resins					Fume Service
		HETRON 942/35	HETRON 980/35	HETRON FR998/35	HETRON 970/35	HETRON 922/FR992	HETRON 980	HETRON 197-3	HETRON 800	AROPOL 7241/7334	HETRON 92/99P
Ethyl Alcohol .....**Footnote 17**	15	27	66	66	66	66/66	66	-	66	-/-	-/-
Ethyl Alcohol .....**Footnote 17**	50	27	66	66	66	38/38	66	66	38	32/-	66/-
Ethyl Alcohol .....**Footnote 17**	100	27	38	38	38	NR/NR	38	38	38	NR/NR	-/-
Ethyl Amine	100	-	-	-	-	-/-	-	-	93	-/-	-/-
Ethyl Benzene	1	-	49	49	49	NR/NR	38	NR	-	NR/NR	NR/NR
Ethyl Benzene	100	38	-	-	49	NR/NR	38	NR	-	NR/NR	NR/NR
Ethyl Benzene: Benzene	66.5 33.5	27	-	-	38	-/-	-	38	-	-/-	-/-
Ethyl Bromide	100	NR	NR	NR	NR	NR/NR	NR	NR	93	NR/NR	NR/NR
Ethyl Chloride	100	27	27	27	27	NR/NR	NR	32	104	NR/NR	32/-
Ethyl Chloroformate	100	-	-	-	-	-/-	-	27	-	-/-	-/-
Ethyl Ether	100	NR	-	-	NR	NR/NR	-	NR	32	NR/NR	NR/NR
Ethyl Hexylacetate: Butyl Alcohol: Diisobutyl Ketone	10 5 85	-	NR	NR	-	NR/NR	NR	27	38	-/-	-/-
Ethyl Silicate	100	-	-	-	-	-/-	-	38	-	-/-	-/-
Ethyl Sulfate	100	38	38	38	38	27/27	38	38	107	-/-	-/-
Ethyl Sulfuric Acid		-	-	-	-	-/-	-	-	107	-/-	-/-
Ethylene Chloride (also called ethylene dichloride)	100	NR	NR	NR	27	NR/NR	NR	NR	38	NR/NR	NR/-
Ethylene Chlorohydrin	100	38	38	38	38	NR/NR	38	93	-	NR/NR	93/-
Ethylene Diamine	100	-	-	-	-	-/-	-	-	38	-/-	NR/-
Ethylene Dibromide	100	NR	-	-	-	NR/NR	-	NR	29	NR/NR	NR/NR
Ethylene Disulfonic Acid (sat'd.) ...		-	-	-	-	-/-	-	-	107	-/-	-/-
Ethylene Glycol	100	99	99	99	99	99/99	99	121	121	82/66	121/121
Ethylene Glycol Monobutyl Ether ..	100	66	66	66	66	66/66	66	32	-	32/-	-/32
Ethylene Oxide	100	NR	-	-	-	-/-	-	-	121	-/-	-/-
Ethylene Tetrachloride	100	-	-	-	-	-/-	-	-	121	-/-	-/-
Ethylenediaminetetraacetic Acid (EDTA)	38	-	38	38	38	32/32	32	32	-	-/-	-/-
Ethylenediaminetetraacetic Acid (EDTA)	100	-	38	38	38	27/27	38	-	-	-/-	-/-
EVA		-	-	-	-	38/38	38	38	38	38/38	-/-
EXALT		-	-	-	-	27/27	27	-	-	-/-	-/-
Exxon Latex (blended in water with a trace of ALIPAL CO433)	62	-	-	-	-	-/-	-	38	38	-/-	-/-
Fat Splitting Exhaust Gas		-	-	-	-	-/-	-	-	-	91/-	-/-
Fatty Acid: Sulfuric Acid	5	-	-	-	-	38/38	38	-	-	-/-	-/-
Fatty Acid, Alkanolamide		-	-	-	-	-/-	-	38	-	-/-	-/-
Fatty Acids (sat'd.)		121	121	121	121	99/99	104	121	121	82/66	121/121
Fatty Nitrogen Compounds: Xylene	25 75	-	-	-	-	-/-	-	38	-	-/-	-/-
FCU Feed		-	-	-	-	-/-	-	-	-	32/-	-/-
Ferric Acetate (sat'd.)		82	-	-	82	82/82	82	-	-	-/-	-/-
Ferric Chloride (sat'd.)		99	104	104	99	99/99	104	121	121	82/66	121/121
Ferric Chloride (traces of ferrous chloride and hydrochloric acid)	48	99	-	-	82	82/82	-	74	-	-/-	-/-
Ferric Chloride Mist: Hydrocarbons		-	-	-	-	-/-	-	121	-	-/-	-/-
Ferric Chloride: Hydrochloric Acid .	29 18.5	-	-	-	82	82/82	-	82	-	-/-	-/-
Ferric Nitrate (sat'd.)		99	104	104	99	99/99	104	121	121	82/66	121/121
Ferric Sulfate (sat'd.)		99	104	104	99	99/99	104	93	107	82/66	93/93
Ferric Sulfate: Ammonium Sulfate .	20 10.5	-	-	-	-	-/-	-	82	-	-/-	82/-
Ferric Sulfate: Cupric Sulfate: Sulfuric Acid	10 10 20	-	-	-	-	-/-	-	82	-	-/-	-/-
Ferric Sulfate: Hydrochloric Acid (monel & nickel cleaning baths)		-	-	-	-	-/-	-	82	-	-/-	-/-
Ferricyanide Bleach: Potassium Bromide (photography)		-	-	-	-	-/-	-	27	-	-/-	-/-
Ferrous Chloride (sat'd.)		99	104	104	99	99/99	104	104	-	71/60	104/104
Ferrous Nitrate (sat'd.)		99	104	104	99	99/99	104	104	-	71/60	71/71
Ferrous Sulfate (sat'd.)		99	104	104	99	99/99	104	104	-	82/66	104/104
Ferrous Sulfate: Sulfate	16 15	-	-	-	-	-/-	-	-	-	-/-	-/-
Fertilizer Fumes		-	-	-	-	66/66	66	-	-	-/-	66/38
Fertilizer Solution, 10-34-0 .....**Footnote 12**		-	-	-	66	66/66	66	-	-	27/27	-/-
Fertilizer Solution, 8-8-8		66	-	-	49	49/49	66	-	-	-/-	-/-
Fertilizer Solution, Nitrogen, 28 .....**Footnote 12**		-	-	-	66	66/66	66	-	-	27/27	-/-
Fire Retardant Liquid Formulation: Osmose Company Premix	50 100	-	-	-	-	-/-	-	-	-	27/-	-/-
Fish Oil and Meal Exhaust Gas		-	-	-	-	79/79	79	79	79	79/-	-/-
Fish Tanks .....**Footnote 6**		-	-	-	-	-/-	-	-	-	32/32	-/-
Fixing Baths (photography)		-	-	-	-	-/-	-	27	-	-/-	-/-
Floor Wax Polymers		-	-	-	-	-/-	-	27	-	-/-	-/-
Flue Gas .....**Footnote 13**		-	-	-	171	-/-	-	171	-	NR/NR	82/82
Flue Gas .....**Footnote 14**		-	-	-	177	NR/NR	NR	138	-	NR/NR	82/82
Flue Gas (recovery boiler)		-	-	-	171	NR/NR	-	177	-	NR/NR	-/-
Flue Gas Scrubbing (ammonia neutralization)		-	-	-	-	-/-	-	52	-	-/-	-/-
Flue Gas, Chemical Incinerator		-	-	-	-	-/-	-	149	-	-/-	-/-
Flue Gas, Coal Fired		-	-	-	-	NR/NR	-	171	NR	NR/NR	82/82

See page 13 for footnotes.

See page 11 for list of trademarks and product names.

TEMPERATURE (°C) FOR RESIN TYPES

CHEMICAL ENVIRONMENT	CONCEN-TRATION %	High Performance Epoxy Vinyl Ester Resins				Epoxy Vinyl Ester Resins					Fume Service
		HETRON 942/35	HETRON 980/35	HETRON FR998/35	HETRON 970/35	HETRON 922/FR992	HETRON 980	HETRON 197-3	HETRON 800	AROPOL 7241/7334	HETRON 92/99P
Flue Gas, Garbage Incinerator		-	-	-	-	-/-	-	82	-	-/-	-/-
Flue Gas, Hog Fuel (trace of hydrochloric acid, pH 3.7 - 7)		-	-	-	-	-/-	-	68	NR	-/-	-/-
Flue Gas, Wet **Footnote 15**		99	-	-	99	-/-	-	60	-	-/-	82/82
Fluoboric Acid **Footnote 1**	10	99	104	104	99	99/99	104	129	-	-/-	129/82
Fluoboric Acid (sat'd) **Footnote 1**		99	93	93	99	82/82	93	-	93	32/32	-/32
Fluoride Mist and Fumes: Magnesium Oxide **Footnote 1**		-	-	-	-	-/-	-	-	-	-/-	66/-
Fluoride Salts: Hydrochloric Acid **Footnote 1**	30 10	49	-	-	-	-/-	-	49	-	-/-	-/-
Fluorides: Methyl Isobutyl Ketone: Hydrofluoric Acid (concentrations in g/l) **Footnote 1**	300 40	-	-	-	-	-/-	-	27	-	-/-	-/-
Fluorides: Methyl Isobutyl Ketone: Sulfuric Acid (concentrations in g/l) **Footnote 1**	200 500	-	-	-	-	-/-	-	27	-	-/-	-/-
Fluorine Gas **Footnote 1**	100	27	-	-	27	121/121	121	-	LS130	NR/NR	-/-
Fluorine Scrubber (recover, fluorosilicic acid) **Footnote 1**		-	-	-	-	-/-	-	71	-	-/-	-/-
Fluorine: Phosphoric Acid: Silicone Dioxide **Footnote 1**	1.2 54 2	-	-	-	-	-/-	-	79	-	-/-	-/-
Fluorine: Phosphorus Pentoxide **Footnote 1**	1.5 1.5	-	-	-	-	93/93	93	29	-	-/-	-/-
FLUOROLUBES (oils and greases)	100	-	-	-	-	32/32	32	32	-	32/32	32/-
Fluorosilicic Acid: Phosphoric Acid: Sulfuric Acid (gypsum slurry cooler) **Footnote 1**	5 28 5	-	-	-	-	-/-	-	88	-	-/-	-/-
Fluosilicic Acid **Footnote 1**	1	-	82	82	82	66/66	66	82	93	38/-	38/38
Fluosilicic Acid **Footnote 1**	10	82	82	82	82	66/66	66	82	93	38/-	38/38
Fluosilicic Acid **Footnote 1**	25	38	38	38	38	49/49	49	82	93	32/32	-/32
Fluosilicic Acid **Footnote 1**	35	38	38	38	38	38/38	38	71	93	NR/NR	NR/NR
Fluosilicic Acid (sat'd.) **Footnote 1**		-	38	38	38	38/38	38	38	93	-/-	-/-
Fluosilicic Acid Fumes, Wet **Footnote 1**		82	82	82	82	66/66	93	66	-	-/-	-/-
Fluosilicic Acid: Aluminum Chloride (slurry) **Footnote 1**	2	-	-	-	38	-/-	-	99	-	-/-	-/-
Fly Ash Slurry		66	66	66	66	-/-	-	32	-	32/32	-/-
Formaldehyde	25	66	66	66	66	66/66	66	93	107	66/49	93/93
Formaldehyde	37	66	66	66	66	66/66	66	66	107	32/32	-/32
Formaldehyde	44	66	66	66	66	32/32	32	66	107	32/32	-/32
Formaldehyde	52	66	66	66	66	66/66	66	66	66	-/-	-/32
Formamide	100	-	-	-	-	38/38	38	38	LS38	38/-	-/-
Formic Acid	1	-	82	82	82	82/82	82	93	107	66/32	93/93
Formic Acid	10	82	82	82	82	82/82	82	93	107	66/32	93/93
Formic Acid	25	-	49	49	49	49/49	49	60	71	49/-	32/32
Formic Acid	50	-	49	49	49	49/49	49	38	49	NR/NR	32/32
Formic Acid	90	-	49	49	49	-/-	49	38	38	-/-	-/-
Formic Acid	100	-	38	38	38	-/-	-	38	38	NR/NR	NR/NR
Formic Acid, 60%: Organics, Unknown (sat'd.)	50 50	-	-	-	-	-/-	-	4	-	-/-	-/-
Formic Acid, Vapor	10	-	-	-	-	-/-	-	91	-	-/-	91/-
Fossil Fuel, Sulfur Dioxide Removal (limestone injection mist after scrubber, pH 2 - 12)		-	-	-	-	-/-	-	60	-	-/-	-/-
Fourdrinier Drying Section Fumes		-	-	-	-	-/-	-	54	-	-/-	54/32
Fourdrinier Liquor		-	-	-	-	-/-	-	49	-	-/-	-/-
Freon 2	100	-	-	-	38	24/24	24	-	38	-/-	-/-
Fruit Juices **Footnote 6**		-	-	-	-	-/-	-	-	-	32/-	-/-
Fuel Oil, #1 and #2	100	-	77	77	77	77/77	77	77	77	77/54	77/-
Fuel Oil, Naval, MIL-F-859A	100	-	-	-	-	-/-	-	79	-	-/-	79/-
Fumigant, VIDDEN D (conc.) **Footnote 4**		-	-	-	-	-/-	-	NR	49	-/-	-/-
Fumigant, Soil (sat'd.)		-	-	-	-	-/-	-	NR	49	-/-	NR/-
Fumigants (conc.)		-	-	-	-	-/-	-	NR	49	NR/NR	NR/-
Fungicide, Phenate Based	100	-	-	-	-	-/-	-	52	-	52/52	32/-
Fungus, 95% Relative Humidity (MIL E-5272C, **Aspergillus Flavus** (10836), **Chaetomium Globosum** (6205), **Memenoniella Echinata** (9597), **Penicillium Citrinum** (9849))		-	-	-	-	-/-	-	29	-	29/29	29/-
Furfural	5	-	66	66	66	49/49	66	32	107	-/-	32/32
Furfural	10	-	-	-	49	38/49	-	-	107	-/-	-/-
Furfural	100	NR	NR	NR	NR	NR/NR	NR	-	107	NR/NR	NR/-
Furfuryl Alcohol	100	NR	-	-	27	-/-	-	38	107	-/-	-/-
Furnace Oil	100	-	-	-	-	-/-	-	-	-	32/-	-/-
G-61	100	-	-	-	-	-/-	-	52	-	-/-	-/-
Gallic Acid (sat'd.)		-	-	-	38	-/-	-	27	121	-/-	-/-
Gallotannin	100	-	-	-	-	-/-	-	93	-	-/-	-/-
Galvanizing Line Fumes		-	-	-	-	-/-	-	93	-	-/-	-/-

See page 13 for footnotes.

See page 11 for list of trademarks and product names.

TEMPERATURE (°C) FOR RESIN TYPES

CHEMICAL ENVIRONMENT	CONCEN-TRATION %	High Performance Epoxy Vinyl Ester Resins				Epoxy Vinyl Ester Resins					Fume Service
		HETRON 942/35	HETRON 980/35	HETRON FR998/35	HETRON 970/35	HETRON 922/FR992	HETRON 980	HETRON 197-3	HETRON 800	AROPOL 7241/7334	HETRON 92/99P
Garbage Incinerator (water scrubber and fumes)		-	-	-	-	-/-	-	82	-	-/-	-/-
Gas Oil (dirty, refinery)		-	-	-	-	-/-	-	-	-	32/-	-/-
Gasohol (contact laboratory for specific gasohol blend) **.Footnote 21**	100	-	-	-	-	-/-	-	-	-	-/-	-/-
Gasoline (Contact laboratory for specific gasoline) **.....Footnote 21**	100	-	-	-	-	-/-	-	-	-	-/-	-/-
Gelatin .....Footnote 6		-	-	-	-	-/-	-	-	-	38/NR	-/-
GLOBRITE 15		-	-	-	-	82/82	82	71	-	71/38	-/-
GLOBRITE X-200		-	-	-	-	38/38	38	38	38	38/38	-/-
Gluconic Acid	50	-	-	-	-	38/38	52	52	-	52/52	-/49
Glucose	100	121	121	121	121	99/99	104	82	-	82/66	82/82
Glycerine	100	99	-	-	99	99/99	104	93	121	82/66	93/93
Glycerine (in salt saturated water)	70	-	-	-	-	-/-	-	116	-	-/-	-/-
Glycerol Dibromohydrin	100	-	-	-	-	-/-	-	-	41	-/-	-/-
Glycerol Dichlorohydrin	100	-	-	-	-	-/-	-	-	52	-/-	-/-
Glycerol Monochlorohydrin	100	-	-	-	-	-/-	-	-	52	-/-	-/-
Glycolic Acid	35	-	93	93	93	82/82	93	60	93	60/49	60/60
Glycolic Acid	70	38	38	38	38	38/38	38	38	93	38/38	49/49
Glyoxal	40	38	-	-	38	27/27	27	-	-	-/-	-/-
Glyoxylic Acid	25	-	-	-	-	LS102/LS102	-	NR	NR	NR/NR	NR/-
Gold Pickling (with sulfuric acid)	25	-	66	66	66	66/66	66	66	-	66/-	-/-
Gold Plating (pH 4.4)		-	-	-	-	-/-	-	-	-	-/-	-/-
Gold Metal Plating (23% potassium ferrocyanide with potassium gold cyanide and sodium cyanide)		38	93	93	38	93/93	93	93	-	-/-	-/-
GOLDEN-GLO		-	38	38	-	38/38	38	38	-	38/38	-/-
Green Liquor (pulp mill) **.Footnote 8**		82	82	82	82	82/82	82	NR	-	NR/NR	NR/-
Gypsum Slurry Cooler (fertilizer plant)		-	-	-	-	-/-	-	88	-	-/-	-/-
Gypsum Slurry: Phosphoric Acid, 1% (trace of hydrogen fluoride) **.....Footnote 1**		-	-	-	-	-/-	-	38	-	-/-	-/-
HALSO 99	100	-	-	-	-	NR/NR	-	NR	32	NR/NR	NR/NR
Heptane (traces of hydrochloric acid, water and other heavy organics)		-	-	-	-	-/-	-	99	-	-/-	-/-
Heptane, normal	100	99	93	93	99	93/93	93	93	121	93/-	32/49
Heptane, Vapor and Condensate	100	-	99	99	99	49/49	49	49	-	-/-	49/49
Herbicide Powder and Fumes		-	-	-	-	-/-	-	38	-	-/-	-/-
Herbicide, Liquid .....Footnote 4	10	-	-	-	49	-/-	-	49	49	27/NR	-/-
Hexachlorocyclopentadiene	100	-	-	-	-	82/82	82	93	93	NR/NR	27/-
Hexachlorocyclopentadiene (high purity)	100	-	-	-	-	-/-	-	32	-	-/-	32/-
Hexachloroendomethylene (hexachloroendomethylene tetrahydrophthalic anhydride, wet)	100	-	-	-	-	-/-	-	27	-	-/-	27/-
Hexamethylenetetramine	28	-	-	-	49	-/-	-	27	-	-/-	27/-
Hexane	100	71	71	71	71	71/71	71	71	71	71/71	-/-
Hexylene Glycol Ammonium Chloride		-	49	49	-	49/49	49	49	49	49/49	49/-
Humid Air (trace of sulfur fumes)		-	-	-	-	93/93	93	93	-	93/66	-/-
Hydraulic Fluid (Ashland)	100	-	-	-	82	-/-	-	121	-	-/-	-/-
Hydraulic Fluid (SKYDROL 500)	100	-	-	-	82	66/66	82	82	-	54/38	-/-
Hydrazine	10	-	-	-	NR	-/-	-	38	-	-/-	-/-
Hydrazine	70	NR	NR	NR	NR	NR/NR	NR	NR	LS38	NR/NR	NR/-
Hydrazine Sulfate (sat'd.)		-	-	-	-	-/-	-	-	107	-/-	-/-
Hydriodic Acid	58	-	-	-	66	-/-	-	-	121	NR/NR	-/-
Hydrobromic Acid	1	-	104	104	104	99/99	104	93	-	71/38	-/71
Hydrobromic Acid	18	82	104	104	104	99/99	104	93	-	71/38	-/71
Hydrobromic Acid	25	82	93	93	93	93/93	93	93	-	71/38	-/71
Hydrobromic Acid	48	71	71	71	71	71/71	71	93	NR	71/-	-/-
Hydrobromic Acid: Copper Oxide (trace of bromine)	50 5	-	-	-	-	-/-	-	32	-	-/-	-/-
Hydrobromic Acid, Fumes	100	-	-	-	-	-/-	-	143	-	-/-	-/-
Hydrocarbon Alkylation		-	-	-	-	-/-	-	49	-	-/-	-/-
Hydrocarbons: Ferric Chloride Mist		-	-	-	-	-/-	-	121	-	-/-	-/-
Hydrochloric Acid (muriatic acid) **.....Footnote 22**	1	99	104	104	110	99/99	104	110	110	71/49	99/99
Hydrochloric Acid ....Footnote 22	5	99	104	104	110	99/99	104	110	110	71/49	99/99
Hydrochloric Acid ....Footnote 22	10	99	104	104	110	99/99	104	110	110	71/49	99/99
Hydrochloric Acid ....Footnote 22	15	99	104	104	110	99/99	104	110	110	71/49	99/99
Hydrochloric Acid ....Footnote 22	20	93	93	93	110	93/93	93	110	82	49/NR	99/99
Hydrochloric Acid ....Footnote 22	25	82	82	82	82	82/82	82	82	66	49/NR	66/66
Hydrochloric Acid ....Footnote 22	32	66	66	66	82	66/66	66	82	66	NR/NR	38/38
Hydrochloric Acid ....Footnote 22	36	52	52	52	71	52/52	52	66	52	NR/NR	99/99
Hydrochloric Acid ....Footnote 22	37	38	38	38	52	38/38	38	38	NR	NR/NR	99/99
Hydrochloric Acid (traces of octyl, decyl, butyl, and phosphorous chlorides, also phenol and phosphorous trichloride) **Footnote 22**	37	-	-	-	-	-/-	-	38	-	-/-	-/-

See page 13 for footnotes.

See page 11 for list of trademarks and product names.

TEMPERATURE (°C) FOR RESIN TYPES

CHEMICAL ENVIRONMENT	CONCEN-TRATION %	High Performance Epoxy Vinyl Ester Resins				Epoxy Vinyl Ester Resins					Fume Service
		HETRON 942/35	HETRON 980/35	HETRON FR998/35	HETRON 970/35	HETRON 922/FR992	HETRON 980	HETRON 197-3	HETRON 800	AROPOL 7241/7334	HETRON 92/99P
Hydrochloric Acid (trace of 2,6 dichloro-4-nitroaniline)	32	-	-	-	-	-/-	-	77	-	NR/NR	-/-
Hydrochloric Acid (trace of 2,6 dichloro-4-aniline)	32	-	-	-	-	LS77/LS77	-	LS77	-	LS77/LS77	-/-
Hydrochloric Acid (trace of acetone)		-	-	-	-	49/49	49	-	-	-/-	-/-
Hydrochloric Acid (conc., traces of aqua regia and phenol) **Footnote 22**		-	-	-	-	-/-	-	27	-	-/-	-/-
Hydrochloric Acid (free chlorine)	100	110	110	110	110	-/-	-	93	NR	-/-	93/-
Hydrochloric Acid (traces of chlorotoluene and toluene)	30	-	-	-	-	-/-	-	60	-	-/-	-/-
Hydrochloric Acid (traces of cresylic acid and phenol) **Footnote 22**	32	-	-	-	-	NR/NR	-	LS79	-	LS79/LS79	NR/-
Hydrochloric Acid (trace of organics) **Footnote 22**	36	-	-	-	-	NR/NR	NR	27	-	27/27	-/-
Hydrochloric Acid (with sat'd. ferrous chloride)	15	-	-	-	-	-/-	-	116	-	-/-	NR/-
Hydrochloric Acid: Acetic Acid	20 50	-	-	-	-	-/-	-	32	-	-/-	32/-
Hydrochloric Acid: Acetic Acid	18.5 50	-	-	-	-	-/-	-	29	-	-/-	29/29
Hydrochloric Acid: Amine **Footnote 22**	1.1 2.9	-	-	-	-	93/93	93	93	-	-/-	-/-
Hydrochloric Acid: Ammonium Thiocyanate **Footnote 22**		-	-	-	-	-/-	-	82	-	-/-	-/-
Hydrochloric Acid: Aromatic Sulfonic Acid: Sulfuric Acid (trace of chlorine)	25	-	-	-	-	-/-	-	27	-	-/-	-/-
Hydrochloric Acid: Benzene (wet)		27	-	-	-	-/-	-	32	-	-/-	32/-
Hydrochloric Acid: Brighteners **Footnote 22**	10 30	-	-	-	-	-/-	-	49	-	-/-	-/-
Hydrochloric Acid: Chlorine: Water (chlorinated organics)		-	-	-	-	NR/NR	-	27	-	-/-	-/-
Hydrochloric Acid: Cupric Chloride (monel & nickel cleaning baths)		-	-	-	-	-/-	-	82	-	-/-	-/-
Hydrochloric Acid: Dichloro(2,6)-**Aniline-**(4)-	32	-	-	-	-	LS77/LS77	-	LS77	77	LS77/NR	-/-
Hydrochloric Acid: Ferric Chloride	18.5 29	-	-	-	82	82/82	-	82	-	-/-	-/-
Hydrochloric Acid: Ferric Sulfate (monel & nickel cleaning baths)		-	-	-	-	-/-	-	82	-	-/-	-/-
Hydrochloric Acid: Fluoride Salts **Footnote 1**	10 30	49	-	-	-	-/-	-	49	-	-/-	-/-
Hydrochloric Acid: Hydrofluoric Acid (trace of HAI 75 inhibitor) **Footnote 1**	12 3	-	-	-	-	66/66	66	-	-	-/-	-/-
Hydrochloric Acid: Hydrofluoric Acid: Nitric Acid **Footnote 1**	77 13 10	-	-	-	-	-/-	-	38	-	-/-	-/-
Hydrochloric Acid: Inerts (traces of alkyl dimethyl benzyl ammonium chloride and tributyl tin chloride/ethylene oxide/amine)	23 77	-	-	-	-	38/38	38	38	38	-/-	-/-
Hydrochloric Acid: Methyl Isobutyl Ketone: Ammonium Thiocyanate	15	-	-	-	-	-/-	-	93	-	-/-	-/-
Hydrochloric Acid: Methylamino Ether: Methanol (traces of isobutyronitrile and impurities)	23 74 2	-	-	-	-	-/-	-	27	27	-/-	-/-
Hydrochloric Acid: Nitric Acid **Footnote 3**	10 10	-	-	-	-	93/93	93	93	-	NR/NR	-/-
Hydrochloric Acid: Nitric Acid **Footnote 22**	20 5	-	-	-	-	-/-	-	99	-	-/-	-/-
Hydrochloric Acid: Nitric Acid: Sulfuric Acid **Footnote 3**	30 12 20	-	-	-	-	-/-	-	32	-	-/-	-/-
Hydrochloric Acid: Phosphoric Acid (saturated with phosphorous)	9 15	-	-	-	-	-/-	-	104	-	-/-	-/-
Hydrochloric Acid: Phosphoric Acid (saturated with chlorine)	9 15	99	99	99	99	-/-	-	104	-	-/-	-/-
Hydrochloric Acid: Phosphoric Acid: Hydrofluoric Acid (concentration in ppm) **Footnote 1**	1 85 500	-	-	-	-	-/-	-	110	-	NR/NR	-/-
Hydrochloric Acid: Phosphorus Acid	2 70	-	82	82	-	82/82	82	82	-	49/-	-/-
Hydrochloric Acid: Pigment Slurry: Water (trace of sodium chloride)	3 8 88	-	-	-	-	-/-	-	93	-	-/-	NR/-
Hydrochloric Acid: Silicone Oil	21 79	-	-	-	-	-/-	-	91	-	-/-	-/-
Hydrochloric Acid: Sodium Chloride (saturated with sodium chloride)	5	-	99	99	-	99/99	99	-	-	-/-	-/-
Hydrochloric Acid: Sulfuric Acid	14 45	-	-	-	-	-/-	-	60	-	-/-	-/-
Hydrochloric Acid: Sulfuric Acid (iron and steel cleaning bath)	9 23	-	99	99	99	93/93	93	82	-	-/-	-/-
Hydrochloric Acid: Sulfuric Acid: Antimony Trioxide	15 35 5	-	-	-	-	-/-	-	38	-	-/-	-/-
Hydrochloric Acid: Sulfuric Acid Water (nitric acid = 10% of concentration)	30 20 40	-	-	-	-	-/-	-	32	-	-/-	-/-

See page 13 for footnotes.

See page 11 for list of trademarks and product names.

TEMPERATURE (°C) FOR RESIN TYPES

CHEMICAL ENVIRONMENT	CONCENTRATION %	High Performance Epoxy Vinyl Ester Resins				Epoxy Vinyl Ester Resins					Fume Service
		HETRON 942/35	HETRON 980/35	HETRON FR998/35	HETRON 970/35	HETRON 922/FR992	HETRON 980	HETRON 197-3	HETRON 800	AROPOL 7241/7334	HETRON 92/99P
Hydrochloric Acid: Terephthalic Acid: Water (dimethylformamide = 7% of concentration)	28 14 51	-	-	-	-	-/-	-	38	38	-/-	-/-
Hydrochloric Acid: Trimethylamine .	37 100	-	-	-	-	-/-	-	54	-	-/-	-/-
Hydrochloric Acid: Trimethylamine (ethylene oxide reaction)		-	-	-	-	-/-	-	NR	-	-/-	-/-
Hydrochloric Acid, 10% (HCl 10% by volume with ferric and ferrous chlorides, pH 1)	10	-	-	-	-	-/-	-	49	-	-/-	-/-
Hydrochloric Acid, 12%: Ammonia, Aqueous (pH to 0.3)		-	-	-	-	82/82	82	82	-	-/-	-/-
Hydrochloric Acid, 28%: Xylene (hydrochloric acid with inhibitor)	50 50	-	-	-	-	24/24	24	-	-	-/-	-/-
Hydrochloric Acid, 32%: Methyl Alcohol (inhibitor)	44 56	-	-	-	-	24/24	24	-	-	-/-	-/-
Hydrochloric Acid, 33% (trace of amine) . . . . . **Footnote 22**	98.8	-	-	-	-	-/-	-	27	-	-/-	-/-
Hydrochloric Acid, Fumes (pickling tank covers)	30	-	-	-	-	-/-	-	102	-	-/-	-/-
Hydrochloric Acid, Fumes: Sulfur Dioxide, Fumes: Sulfur Trioxide, Fumes (sulfuric acid, caustic and water fumes)		-	-	-	-	-/-	-	88	-	-/-	-/-
Hydrochloric Acid, Vapor . . . . . **Footnote 22**	32	99	99	99	99	99/99	-	107	-	-/-	-/-
Hydrochloric Acid, Vapor: Methyl Alcohol, Vapor: Water, Vapor . . . . . **Footnote 17**	2 93 5	-	-	-	-	NR/NR	NR	LS66	38	-/-	-/-
Hydrochloric Acid, Vapors: Chlorine, Vapors: Phosphorus Oxychloride, Vapors (water vapors)		-	-	-	-	-/-	-	32	-	-/-	32/-
Hydrochloric Acid, Vapors: Chlorine, Vapors: Phosphorus Trichloride, Vapors (water vapors)	100	-	-	-	-	-/-	-	71	-	-/-	-/-
Hydrocyanic Acid (sat'd.)		99	66	66	99	66/66	66	93	-	38/-	93/93
Hydrofluoric Acid . .Footnotes 1, 23	1	66	66	66	66	66/66	66	66	NR	38/NR	49/49
Hydrofluoric Acid . .Footnotes 1, 23	5	66	66	66	66	66/66	66	66	NR	38/NR	38/38
Hydrofluoric Acid . .Footnotes 1, 23	10	49	49	49	66	49/49	49	49	NR	LS27/NR	38/38
Hydrofluoric Acid . .Footnotes 1, 23	15	38	38	38	38	38/38	38	38	NR	NR/NR	38/38
Hydrofluoric Acid . .Footnotes 1, 23	20	32	32	32	32	32/32	32	32	NR	NR/NR	NR/NR
Hydrofluoric Acid . .Footnotes 1, 23	22	LS27	LS32	LS32	32	LS27/LS27	LS32	32	NR	NR/NR	NR/NR
Hydrofluoric Acid . .Footnotes 1, 23	40	NR	NR	NR	NR	NR/NR	NR	32	NR	NR/NR	NR/NR
Hydrofluoric Acid: Chromic Acid: Nitric Acid . . . . . .Footnotes 1,3	1.5 6 2	-	-	-	-	-/-	-	27	-	-/-	-/-
Hydrofluoric Acid: Chromic Acid: Nitric Acid . . . . . .Footnotes 1,3	3 6 2	-	-	-	-	-/-	-	27	-	-/-	-/-
Hydrofluoric Acid: Chromic Acid: Phosphoric Acid . . .Footnotes 1,3	2 7 40	-	-	-	-	-/-	-	38	-	-/-	-/-
Hydrofluoric Acid: Chromic Acid: Phosphoric Acid . . .Footnotes 1,3	11 9 8	-	-	-	-	-/-	-	38	-	-/-	-/-
Hydrofluoric Acid: Fluorides: Methyl Isobutyl Ketone (concentrations in g/l) . . .**Footnote 1**	40 300	-	-	-	-	-/-	-	27	-	-/-	-/-
Hydrofluoric Acid: Hydrochloric Acid (trace of HAI 75 inhibitor) **Footnote 1**	3 12	-	-	-	-	66/66	66	-	-	-/-	-/-
Hydrofluoric Acid: Hydrochloric Acid: Nitric Acid . . . . . .Footnote 1	13 77 10	-	-	-	-	-/-	-	38	-	-/-	-/-
Hydrofluoric Acid: Hydrochloric Acid: Phosphoric Acid (concentrations in ppm) **.Footnote 1**	500 1 85	-	-	-	-	-/-	-	110	-	NR/NR	-/-
Hydrofluoric Acid: Nitric Acid . . . . . **.Footnotes 1,3**	2.5 7.5	-	-	-	-	-/-	-	74	-	-/-	-/-
Hydrofluoric Acid: Nitric Acid . . . . . **.Footnotes 1,3**	3 20	-	-	-	-	-/-	-	57	-	-/-	-/-
Hydrofluoric Acid: Nitric Acid (pickling solution) . . . .**Footnotes 1,3**	3.5 20	-	-	-	-	38/38	38	38	-	-/-	-/-
Hydrofluoric Acid: Nitric Acid . . . . . **.Footnotes 1,3**	5 15	-	-	-	-	-/-	-	74	-	-/-	-/-
Hydrofluoric Acid: Sulfuric Acid: Sodium Dichromate (hydrochloric acid, 60% by volume) . . .**Footnote 1**	20 28 3	-	-	-	-	-/-	-	49	-	-/-	-/-
Hydrofluoric Acid, Fumes: Air: Phosphorus Pentoxide, Fumes . . . . . **.Footnote 1**		-	-	-	-	-/-	-	157	-	-/-	-/-
Hydrofluoric Acid, Vapors . . . . . **.Footnotes 1,3**	35	49	49	49	49	49/49	49	49	-	-/-	LS27/LS27
Hydrofluoric Acid, Vapors: Nitric Acid, Vapors . . . . . .Footnotes 1,3	5 35	-	-	-	-	-/-	-	93	-	-/-	-/-

See page 13 for footnotes.

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TEMPERATURE (°C) FOR RESIN TYPES

CHEMICAL ENVIRONMENT	CONCEN-TRATION %	High Performance Epoxy Vinyl Ester Resins				Epoxy Vinyl Ester Resins					Fume Service
		HETRON 942/35	HETRON 980/35	HETRON FR998/35	HETRON 970/35	HETRON 922/FR992	HETRON 980	HETRON 197-3	HETRON 800	AROPOL 7241/7334	HETRON 92/99P
Hydrofluosilicic Acid . . .Footnote 1	10	82	82	82	82	66/66	66	82	-	38/-	38/38
Hydrofluosilicic Acid . . .Footnote 1	35	38	38	38	38	38/38	38	71	-	NR/NR	NR/NR
Hydrofluosilicic Acid: Ammonia: Ammonium Nitrate (nitric acid = 2.5% of concentration, traces of phosphoric & sulfuric acids, wet vapor) **Footnote 1**	2.5 15 5	-	-	-	-	-/-	-	121	-	-/-	-/-
Hydrofluosilicic Acid: Chromic Acid: Sulfuric Acid (concentrations in oz/gal., chrome plating) **Footnotes 1,2**	.5 45 .3	-	-	-	66	-/-	-	46	-	-/-	-/-
Hydrogen Bromide: Aniline Hydrochloride: Water (hydrochloric acid = 1.5% and bromine = 1% of concentration)	4.5 15 78	-	-	-	-	60/60	60	60	60	-/-	-/-
Hydrogen Bromide, Dry	100	-	82	82	82	82/82	82	93	-	32/32	32/32
Hydrogen Bromide, Wet	100	-	82	82	82	82/82	82	82	-	32/32	-/-
Hydrogen Chloride (chlorine, chlorine dioxide, chlorine monoxide, hydrogen, nitrogen, and oxygen) . . .		-	-	-	-	-/-	-	32	-	-/-	-/-
Hydrogen Chloride Gas (chlorine upsets to 392°F)		-	-	-	-	-/-	-	177	-	-/-	-/-
Hydrogen Chloride Gas, Dry Fumes	100	121	121	121	177	99/99	104	177	-	49/49	-/-
Hydrogen Chloride Gas, Wet	100	104	104	104	104	99/99	104	110	-	49/49	49/49
Hydrogen Chloride: Chlorine (hydrogen chloride saturated with tetrachlorocyclopentane, carbon tetrachloride, trace of hexachlorocyclopentane)	65 35	-	-	-	-	-/-	-	52	-	-/-	-/-
Hydrogen Chloride, Absorber	36	-	-	-	-	-/-	-	113	-	NR/NR	-/-
Hydrogen Chloride, Anhydrous . . .	100	-	-	-	-	-/-	-	121	-	32/32	121/121
Hydrogen Chloride, Steam . . . . . .Footnote 1		-	-	-	-	-/-	-	116	-	-/-	-/-
Hydrogen Chloride, Vapor: Benzene, Vapor		-	-	-	-	-/-	-	29	-	-/-	-/-
Hydrogen Fluoride, Vapor . . . . . .Footnote 1	35	-	-	-	82	-/-	-	35	-	-/-	35/35
Hydrogen Fluoride, Wet . . . . . .Footnote 1	12	-	93	93	82	82/82	93	71	-	-/-	32/32
Hydrogen Fluoride, Wet . . . . . .Footnote 1	100	-	-	-	32	32/32	32	-	-	32/32	32/32
Hydrogen Iodide: Sulfuric Acid (concentration in g/l)	66 25	-	-	-	-	-/-	-	71	-	-/-	-/-
Hydrogen Iodide, Vapor: Iodine, Vapor		-	-	-	-	-/-	-	66	-	-/-	66/-
Hydrogen Peroxide . . . . . .Footnotes 2,3,20,21	5	-	66	66	66	66/66	66	99	-	66/NR	-/-
Hydrogen Peroxide . . . . . .Footnotes 2,20	30	37	66	66	66	38/38	38	-	-	-/-	-/-
Hydrogen Peroxide . . . . . .Footnotes 2,20	35	-	-	-	-	41/41	-	41	NR	-/-	41/49
Hydrogen Peroxide . . . . . .Footnote 20	50	-	-	-	-	-/-	-	38	NR	NR/NR	38/-
Hydrogen Peroxide (with caustic bleach, pH <10.7) **. .Footnotes 2,20**		-	-	-	-	66/66	66	38	-	32/32	-/-
Hydrogen Peroxide: Acetic Acid . . .	1.5 95	-	-	-	-	-/-	-	32	-	-/-	32/32
Hydrogen Peroxide: Sulfuric Acid (traces of zinc sulfate, sodium sulfide and oxygen)	2 1.5	-	99	99	-	99/99	99	-	-	-/-	-/-
Hydrogen Peroxide, Vapor & Condensate . . . . .Footnotes 2,20	5	-	-	-	-	-/-	-	49	-	-/-	49/-
Hydrogen Peroxide, Vapors . . . . . .Footnotes 2,20	50	-	-	-	-	-/-	-	60	60	-/-	38/38
Hydrogen Sulfide	100	99	99	99	99	99/99	104	121	121	60/60	121/121
Hydrogen Sulfide (sewer gas)		-	-	-	-	32/32	32	32	32	32/32	32/-
Hydrogen Sulfide: Sulfur Dioxide: Sulfur (electrostatic precipitators) . .		-	-	-	-	-/-	-	138	-	-/-	-/-
Hydrogen Sulfide, Fumes, Wet		-	-	-	-	-/-	-	-	-	-/-	66/-
Hydrogen: Ozone . . . . .Footnote 21		-	-	-	-	-/-	-	38	NR	-/-	-/-
Hydroxyacetic Acid	35	-	93	93	38	82/82	93	60	-	60/49	60/60
Hydroxyacetic Acid	70	38	38	38	38	38/38	38	38	-	49/49	49/49
Hydroxyacetic Acid: Phosphoric Acid: Sulfuric Acid . . . . . .Footnote 2	29 51 20	-	-	-	-	-/-	-	118	-	-/-	-/-
Hydroxylamine Acid Sulfate: Sulfuric Acid (sat'd. hydroxylamine acid sulfate)	70	-	-	-	-	-/-	-	52	-	-/-	-/-
Hydroxylammonium Acid Sulfate (also hydroxylamine acid sulfate) . . .	90	-	-	-	-	-/-	-	99	-	-/-	-/-
Hydroxylammonium Acid Sulfate: Propionic Acid: Water	89 1 10	-	-	-	-	-/-	-	79	-	-/-	-/-
Hydroxylammonium Acid Sulfate: Sulfuric Acid	90 10	-	-	-	-	-/-	-	82	-	-/-	-/-

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TEMPERATURE (°C) FOR RESIN TYPES

CHEMICAL ENVIRONMENT	CONCEN-TRATION %	High Performance Epoxy Vinyl Ester Resins				Epoxy Vinyl Ester Resins					Fume Service
		HETRON 942/35	HETRON 980/35	HETRON FR998/35	HETRON 970/35	HETRON 922/FR992	HETRON 980	HETRON 197-3	HETRON 800	AROPOL 7241/7334	HETRON 92/99P
Hydroxylammonium Acid Sulfate: Sulfuric Acid: Water . . .Footnote 4	11 75 14	-	-	-	-	-/-	-	38	-	-/-	-/-
Hydroxylammonium Acid Sulfate: Sulfuric Acid: Water . . .Footnote 4	20 60 20	-	-	-	-	-/-	-	38	-	-/-	-/-
Hypochlorous Acid	10	-	-	-	-	66/66	66	41	NR	41/41	41/41
Hypochlorous Acid	20	-	-	-	-	49/49	49	32	NR	32/NR	32/32
Hypochlorous Acid (conc.)		-	-	-	-	32/32	32	32	NR	32/NR	32/32
Hypophosphoric Acid	50	-	38	38	-	38/38	38	-	-	-/-	-/-
Hypophosphorous Acid	50	49	32	32	49	32/32	32	46	46	-/-	-/-
IGEPAL CO-630	100	-	-	-	-	-/-	-	41	-	-/-	-/-
Iminoethyl Alcohol	100	-	-	-	-	-/-	-	43	-	-/-	-/-
Incinerator, Flue Gas Fumes . . . . . .Footnote 21		-	-	-	-	-/-	-	149	-	-/-	-/-
Inerts: Hydrochloric Acid (traces of alkyl dimethyl benzyl ammonium chloride and tributyl tin chloride/ethylene oxide/amine)	77 23	-	-	-	-	38/38	38	38	38	-/-	-/-
Inerts: Isopropyl Alcohol: Sodium Xylene Sulfate (traces of potassium ricinoleate and o-phenylphenol)	67 10 10	-	-	-	-	38/38	38	38	38	-/-	-/-
Inerts: Phosphoric Acid (trace of alkyl dimethyl benzyl ammonium chloride)	75 25	-	38	38	-	38/38	38	38	38	-/-	-/-
Iodine Vapor	100	66	-	-	82	-/-	-	79	-	-/-	79/82
Iodine, Vapor: Hydrogen Iodide, Vapor		-	-	-	-	-/-	-	66	-	-/-	66/-
IRGASOL DA	100	-	-	-	-	32/32	32	32	-	-/-	-/-
Iron Perchloride	20	-	-	-	-	-/-	-	-	-	-/-	60/60
Iron Metal Plating (45% iron chloride, 15% calcium chloride, 20% iron sulfate, 11% ammonia sulfate)		121	82	82	121	82/82	82	82	-	-/-	-/-
Iron: Sulfuric Acid: Copper (5 g/l zinc slurry/thickener)	10 10 80	-	-	-	-	-/-	-	82	-	-/-	-/-
Isoamyl Alcohol	100	49	49	49	49	38/38	49	-	129	-/-	-/-
ISOCURE 306,308,608	100	-	-	-	-	32/32	32	32	32	32/32	-/-
Iso-Decanol	100	49	82	82	82	82/82	82	66	82	71/-	-/-
ISOPREP 33 (5 oz/gal)		-	-	-	-	74/74	74	-	74	74/66	-/-
ISOPREP 44 (10 oz/gal)		-	-	-	-	82/82	82	-	82	NR/NR	-/-
Isopropyl Alcohol	10	49	49	49	49	27/27	38	71	66	54/27	-/-
Isopropyl Alcohol	100	49	49	49	49	27/27	38	32	66	27/NR	-/32
Isopropyl Alcohol: Sodium Xylene Sulfate: Inerts (traces of potassium ricinoleate and o-phenylphenol)	10 10 67	-	-	-	-	38/38	38	38	38	-/-	-/-
Isopropyl Amine	100	49	49	49	49	38/38	49	32	49	-/-	-/-
Isopropyl Palmitate	100	110	-	-	110	99/99	104	-	-	82/-	-/82
Itaconic Acid	25	49	99	99	49	49/49	99	35	-	-/-	-/-
Itaconic Acid (methylene succinic acid)	10	-	99	99	49	49/49	99	38	-	-/-	-/-
Jet Fuel A (recommendation same for Jet Fuel PFB) **. . . . .Footnote 21**	100	-	-	-	-	-/-	-	-	-	32/-	-/-
Jet Fuel, JP-4 . . . . . .Footnote 21	100	49	49	49	49	49/49	49	-	-	49/38	-/-
JM-235 & JM-271 (adhesives) **. . . . . .Footnote 21**	100	-	-	-	-	38/38	38	38	38	38/38	-/-
JP-9 Fuel, JP-10 Fuel . .Footnote 21	100	-	-	-	-	-/-	-	-	-	27/27	-/-
Kaolin Slurry		-	-	-	-	-/-	-	27	-	27/27	-/-
Kerosene	100	82	82	82	82	79/79	79	82	-	79/66	79/49
Kerosene: Organics: Phosphoric Acid (isodecanol, 10%)	70 20 30	-	-	-	-	-/-	-	66	66	-/-	-/-
Kerosene: Xylene: Phosphoric Acid, 85%	33 33 33	-	-	-	-	-/-	-	38	-	-/-	-/-
Kerosene, Vapor and Condensate . .	100	-	-	-	-	-/-	-	49	-	-/-	49/49
Knotter, Fumes		-	-	-	-	-/-	-	82	-	-/-	-/-
KYMENE, Resin Solution	40	-	-	-	-	-/-	-	32	-	-/-	-/-
Lactic Acid	100	99	99	99	99	99/99	104	93	107	71/54	93/93
Lactic Acid: Citric Acid (sat'd.)		-	-	-	-	-/-	-	66	-	-/-	-/-
LASSO EC	100	-	-	-	-	27/27	38	27	27	-/-	-/-
LASSO Herbicide (1 to 10 dilution) **. . . . . .Footnote 4**		-	-	-	-	-/-	-	49	49	-/-	-/-
Latex, Acrylic	100	49	49	49	49	38/38	38	-	-	-/-	-/-
Latex, Dispersion in Water	100	-	49	49	49	38/38	38	38	38	-/-	-/-
Latex, Rubber	100	-	49	49	49	38/38	38	-	-	-/-	-/-
Latex, Vinyl	100	-	49	49	49	38/38	38	-	-	-/-	-/-
Lauric Acid (sat'd.)		-	-	-	-	99/99	104	-	-	71/54	-/-
Lauric/Myristic Monoethanolamide: Sodium Xylene Sulfonate (solution)		-	-	-	-	49/49	49	49	-	-/-	-/-
Lauryl Alcohol (n-dodecanol)	100	82	82	82	82	49/49	49	49	-	49/-	-/-
Lauryl Chloride	100	99	-	-	-	-/-	-	99	-	-/-	-/-
Lauryl Chloride, Crude, Acidic	100	99	-	-	-	-/-	-	99	-	-/-	-/-
Lauryl Mercaptan	100	66	-	-	66	-/-	-	49	-	-/-	-/-
Lauryl Pyridinium Chloride	10	-	-	-	-	-/-	-	68	-	-/-	-/-
Lead Acetate	100	110	110	110	110	99/99	104	71	-	71/-	71/71

See page 13 for footnotes.

See page 11 for list of trademarks and product names.

TEMPERATURE (°C) FOR RESIN TYPES

CHEMICAL ENVIRONMENT	CONCEN-TRATION %	High Performance Epoxy Vinyl Ester Resins				Epoxy Vinyl Ester Resins					Fume Service
		HETRON 942/35	HETRON 980/35	HETRON FR998/35	HETRON 970/35	HETRON 922/FR992	HETRON 980	HETRON 197-3	HETRON 800	AROPOL 7241/7334	HETRON 92/99P
Lead Chloride (sat'd.)		-	104	104	-	99/99	104	-	107	-/-	-/-
Lead Nitrate (sat'd.)		-	104	104	-	99/99	104	-	107	-/-	-/-
Lead Metal Plating (alkaline, 8% lead acetate, 20% sodium hydroxide)		-	-	-	-	82/82	82	NR	-	-/-	NR/NR
Lead Metal Plating (8% lead with fluoroboric and boric acids) **Footnote 1**		-	NR	NR	-	93/93	93	93	-	-/-	-/-
Lead Sulfur: Copper Oxide (10% ferric oxide, 8% zinc sulfate, 3% bismuth sulfate dust)	25 25 18	-	-	-	-	-/-	-	93	-	-/-	-/-
Levulinic Acid (sat'd., 4-oxopentanoic acid)		110	104	104	110	99/99	104	-	107	71/-	-/-
Light Gas Cycle Storage		-	-	-	-	-/-	-	-	-	32/-	-/-
Lignin: Spent Acid: Tall Oil, Crude (sulfuric acid = 1% of concentration, pH 3)	60 29 10	-	-	-	-	NR/NR	-	93	93	-/-	-/-
Ligno-Sulfonic Acid		-	-	-	-	-/-	-	32	-	-/-	-/-
Lime Kiln Stack Gases		-	-	-	-	-/-	-	149	-	-/-	-/-
Lime Slurry (sat'd.)		-	77	77	-	77/77	77	82	-	66/27	82/82
Lime, Thiosorbic (sat'd.)		-	-	-	-	-/-	-	66	-	-/-	-/-
Linear Alkylate Sulfonates (conc.)		-	-	-	-	-/-	-	38	-	-/-	-/-
Linoleic Acid	100	-	-	-	-	-/-	-	-	-	71/-	-/-
Linseed Oil	100	110	104	104	110	99/99	104	93	-	71/54	66/-
Linseed Oil, Chlorinated		-	-	-	-	-/-	-	32	-	-/-	-/-
Liquid Cleaner (all purpose, biodegradable)	100	-	-	-	-	38/38	38	38	-	38/38	-/-
Lithium Bromide	100	99	104	104	121	99/99	104	82	-	-/-	-/-
Lithium Carbonate (sat'd.)		82	82	82	82	66/66	66	82	-	-/-	NR/-
Lithium Chloride	45	-	104	104	99	99/99	104	121	-	-/-	121/-
Lithium Chloride (sat'd.)		99	104	104	99	99/99	104	71	-	71/-	71/71
Lithium Chloride: Methyl Alcohol **Footnote 17**	25 75	-	-	-	-	-/-	-	38	-	-/-	-/-
Lithium Hydroxide (sat'd.)		82	-	-	NR	66/66	66	NR	-	-/-	NR/-
Lithium Sulfate	100	-	104	104	-	99/99	104	93	-	-/-	-/-
Livestock Spray Base (Shell's): **Cobalt di** (2 ethyl hexyl) **Phosphate: Tri-m-butyl Phosphate**	65 30 5	-	-	-	-	-/-	-	82	-	-/-	-/-
LIX 64N	100	-	-	-	-	-/-	-	46	-	-/-	-/-
LPC	10	-	-	-	-	-/-	-	68	-	-/-	-/-
Magnesite Mill Spent Liquor		-	-	-	-	-/-	-	66	-	-/-	-/-
Magnesite Recovery Boiler Blow Down (acetic, sulfuric, sulfurous formic acids, acetone)		-	-	-	-	-/-	-	99	-	NR/NR	-/-
Magnesium Bicarbonate (sat'd.)		-	82	82	82	82/82	82	82	-	82/54	-/66
Magnesium Bisulfite	100	82	82	82	82	82/82	82	82	-	-/-	-/-
Magnesium Bisulfite Acid Liquor: Sulfur Dioxide (chlorides, pH 4.5 - 5) **Footnote 7**	5	-	-	-	-	-/-	-	82	-	-/-	-/-
Magnesium Carbonate (sat'd.)		82	82	82	82	82/82	82	71	-	82/66	71/71
Magnesium Chloride (sat'd.)		121	121	121	121	99/99	104	104	104	82/66	104/104
Magnesium Chloride (hexahydrate, filter aid, activated carbon)	66	-	-	-	-	-/-	-	154	-	-/-	-/-
Magnesium Chloride: Calcium Chloride: Sodium Chloride	2 10 12	-	-	-	-	-/-	-	66	-	-/-	-/-
Magnesium Hydroxide (sat'd.)		99	NR	NR	NR	99/99	104	-	-	-/NR	-/-
Magnesium Hydroxide, 10%: Calcium Carbonate, 90% (traces of nickel & iron hydroxides)	25	-	-	-	-	-/-	-	-	-	-/LS49	-/-
Magnesium Nitrate (sat'd.)		99	99	99	99	71/71	71	-	-	71/54	-/71
Magnesium Oxide Acid (condensate)		-	-	-	-	-/-	-	71	-	-/-	-/-
Magnesium Oxide: Fluoride Mist and Fumes **Footnote 1**		-	-	-	-	-/-	-	-	-	-/-	66/-
Magnesium Sulfate (sat'd.)		121	121	121	121	99/99	104	93	121	82/66	93/93
MAGNIFLOC 509-C and 573-C	100	-	-	-	60	-/-	-	-	-	32/32	-/-
MAGNIFLOC E343	100	-	-	-	-	-/-	-	-	-	32/32	-/-
Maleic Acid	5	-	-	-	121	99/99	104	-	-	-/-	-/-
Maleic Acid (sat'd.)		121	121	121	121	82/82	82	93	93	71/38	93/-
Maleic Acid (traces of phthalic acid, fumaric acid, benzoic and quinone)	18	-	-	-	-	-/-	-	49	-	-/-	-/-
Maleic Anhydride	100	-	-	-	-	66/66	66	-	-	66/49	-/-
Maleic Residue		-	-	-	-	-/-	-	85	-	-/-	-/-
Malic Acid	10	-	121	121	121	-/-	-	35	-	-/-	-/-
Manganese Chloride (sat'd., also called manganous chloride)		99	-	-	99	-/-	-	-	107	-/-	-/-
Manganese Oxide (sat'd.)		-	-	-	-	-/-	-	-	107	-/-	-/-
Manganese Sulfate (sat'd., also called manganous sulfate)		99	104	104	99	99/99	104	-	107	-/-	-/-
Manganese Sulfate: Ammonium Sulfate (concentration in g/l, trace of sulfur dioxide)	12 125	-	-	-	-	-/-	-	38	-	-/-	-/-

See page 13 for footnotes.

See page 11 for list of trademarks and product names.

TEMPERATURE (°C) FOR RESIN TYPES

CHEMICAL ENVIRONMENT	CONCEN-TRATION %	High Performance Epoxy Vinyl Ester Resins				Epoxy Vinyl Ester Resins					Fume Service
		HETRON 942/35	HETRON 980/35	HETRON FR998/35	HETRON 970/35	HETRON 922/FR992	HETRON 980	HETRON 197-3	HETRON 800	AROPOL 7241/7334	HETRON 92/99P
Manganese Sulfate: Ammonium Sulfates: Sulfuric Acid (concentration in g/l, pH 5)	13 135 40	-	-	-	-	-/-	-	52	-	52/52	52/-
Manganese Sulfate: Sulfuric Acid	90 10	-	-	-	-	-/-	-	38	-	-/-	-/-
Manganese Sulfate: Sulfuric Acid (concentration in g/l)	50 28	-	-	-	-	-/-	-	93	-	-/-	-/-
Manganese Sulfate: Sulfuric Acid: Ammonium Sulfate (concentration in g/l, pH 9)	13 30 125	-	-	-	-	-/-	-	38	-	-/-	-/-
Manganese Sulfates: Ammonium Sulfate (concentration in g/l, pH 5)	13 158	-	52	52	-	52/52	52	52	-	52/52	52/52
Marine Fouling		-	-	-	-	-/-	-	38	-	-/-	38/-
MATAR Detergent, Germicidal (conc.)		-	-	-	-	-/-	-	38	-	-/-	-/-
Melamine Resin		-	-	-	49	-/-	-	27	-	-/-	-/-
Mercaptan, Aromatic	100	-	-	-	-	-/-	-	27	-	NR/NR	-/-
Mercaptan, Organic (butanol, water, hydrogen sulfide)		-	-	-	-	-/-	-	-	-	-/-	52/-
Mercapto-Ethanol	100	-	-	-	-	-/-	-	27	27	-/-	-/-
Mercaptopropionic, Crude Acid	100	-	-	-	-	NR/NR	-	NR	93	NR/NR	NR/-
Mercuric Chloride (sat'd.)		99	99	99	99	99/99	104	99	104	82/66	99/99
Mercurous Chloride (sat'd.)		99	99	99	99	99/99	104	99	-	82/54	99/99
Mercury	100	121	-	-	121	99/99	104	121	-	82/-	121/121
Metal Phosphate Salts (sat'd.)		-	-	-	-	-/-	-	27	-	-/-	-/-
Metal Phosphates (traces of hydrofluosilicic acid and hydrogen fluoride) **Footnote 1**	30	-	-	-	-	-/-	-	27	-	-/-	-/-
Metal Plating, Brass (3% copper, 1% zinc, 5.6% sodium cyanides, 3% sodium carbonate)		82	82	82	82	82/82	82	82	-	-/-	-/-
Metal Plating, Bronze (4% copper, 5% sodium cyanides, 3% sodium carbonate, 4.5% rochelle salts)		-	82	82	-	82/82	82	-	-	-/-	-/-
Metal Plating, Cadmium Cyanide (3% cadmium oxide, 10% sodium cyanide, 1.2% sodium hydroxide)		-	-	-	82	99/99	104	NR	-	NR/NR	-/-
Metal Plating, Chrome (19% chromic acid with sodium fluosilicate and sulfate) **Footnote 1**		49	-	-	66	38/38	38	93	-	NR/NR	NR/-
Metal Plating, Copper (45% copper fluoboric acid, 19% copper sulfate, 8% sulfuric acid) **Footnote 1**		82	82	82	82	82/82	82	82	-	-/-	-/-
Metal Plating, Copper Cyanide (10.5% copper, 14% sodium cyanide, 6% rochelle salts)		71	82	82	71	82/82	82	NR	-	-/-	NR/-
Metal Plating, Gold (23% potassium ferrocyanide with potassium gold cyanide and sodium cyanide)		38	93	93	38	93/93	93	93	-	-/-	-/-
Metal Plating, Iron (45% iron chloride, 15% calcium chloride, 20% iron sulfate, 11% ammonia sulfate)		121	82	82	121	82/82	82	82	-	-/-	-/-
Metal Plating, Lead (alkaline, 8% lead acetate, 20% sodium hydroxide)		-	-	-	-	82/82	82	NR	-	-/-	NR/NR
Metal Plating, Lead (8% lead, with fluoboric and boric acids) **Footnote 1**		-	NR	NR	-	93/93	93	93	-	-/-	-/-
Metal Plating, Nickel (nickel sulfamate-50 oz/gal, magnesium chloride-3.5 oz/gal, boric acid-3 oz/gal, pH 3.7)		-	-	-	-	-/-	-	66	-	-/-	-/-
Metal Plating, Nickel (44% nickel sulfate, 4% ammonium chloride, 4% boric acid)		-	93	93	82	93/93	93	-	-	-/-	-/-
Metal Plating, Nickel (11% nickel sulfate, 2% nickel chloride, 1% boric acid)		-	93	93	82	93/93	93	93	-	-/-	-/-
Metal Plating, Nickel, Bright		-	-	-	-	-/-	-	82	-	-/-	-/-
Metal Plating, Silver (4% silver, 7% potassium cyanide, 5% sodium cyanide, 2% potassium carbonate)		-	82	82	82	93/93	93	NR	-	NR/NR	-/-
Metal Plating, Tin Fluoroborate (18% stannous fluoroborate, 7% tin, 9% fluoroboric acid, 2% boric acid) **Footnote 1**		-	99	99	99	93/93	93	93	-	-/-	-/-
Metal Plating, Zinc Cyanides (9% zinc cyanide, 4% sodium cyanide, 9% sodium hydroxide)	180	-	-	-	-	71/71	71	NR	-	-/-	NR/32
Metaphosphoric Acid	100	-	-	-	-	-/-	-	-	107	-/-	-/-
Methacrylic Acid	10	-	-	-	-	-/-	-	38	-	-/-	-/-
Methacrylic Acid, Glacial	100	-	-	-	-	-/-	-	32	-	-/-	-/-
Methanamide	100	-	38	38	-	LS38/LS38	LS38	38	38	38/LS38	-/-

See page 13 for footnotes.

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TEMPERATURE (°C) FOR RESIN TYPES

CHEMICAL ENVIRONMENT	CONCEN-TRATION %	High Performance Epoxy Vinyl Ester Resins				Epoxy Vinyl Ester Resins					Fume Service
		HETRON 942/35	HETRON 980/35	HETRON FR998/35	HETRON 970/35	HETRON 922/FR992	HETRON 980	HETRON 197-3	HETRON 800	AROPOL 7241/7334	HETRON 92/99P
Methane Sulfonic Acid	100	-	-	-	-	-/-	-	-	93	-/-	-/-
Methanol: Air: Methyl Sulfide (traces of water, hydrogen sulfide, mercaptan, acetone, turpentine)	6 85 2.5	-	-	-	-	-/-	-	74	-	-/-	-/-
Methanol: Hydrochloric Acid: Methylamino Ether (traces of isobutyronitrile and impurities)	2 23 74	-	-	-	-	-/-	-	27	27	-/-	-/-
Methyl Acetate	100	-	-	-	-	-/-	-	-	66	-/-	-/-
Methyl Acrylamide	48	-	-	-	-	-/-	-	32	-	-/-	-/-
Methyl Alcohol **Footnote 17**	100	NR	38	38	38	NR/NR	38	38	66	32/27	32/32
Methyl Alcohol (traces of hydrochloric acid and methyl chloride) **Footnote 17**	94	-	NR	NR	-	NR/NR	NR	38	-	-/-	-/-
Methyl Alcohol: Hydrochloric Acid, 32% (inhibitor)	56 44	-	-	-	-	24/24	24	-	-	-/-	-/-
Methyl Alcohol: Lithium Chloride **Footnote 17**	75 25	-	-	-	-	-/-	-	38	-	-/-	-/-
Methyl Alcohol: Sodium Chlorate: Sulfuric Acid (sodium sulfate)		-	-	-	-	-/-	-	52	-	-/-	-/-
Methyl Alcohol: Water	80 20	-	38	38	38	NR/NR	38	38	66	32/27	32/32
Methyl Alcohol, 60%: Water (dissolved heavy organics, traces of heptane, hydrochloric acid and zinc chloride, two phases) **Footnote 17**		-	-	-	-	-/-	-	60	-	-/-	-/-
Methyl Alcohol, Vapor: Hydrochloric Acid, Vapor: Water, Vapor **Footnote 17**	93 2 5	-	-	-	-	NR/NR	NR	LS66	38	-/-	-/-
Methyl Chloride (chloromethane)	100	-	NR	NR	NR	NR/NR	NR	4	NR	-/-	4/-
Methyl Chloroform	100	-	-	-	-	-/-	-	27	-	-/-	-/-
Methyl Cyclohexanol	100	-	-	-	-	-/-	-	-	93	-/-	-/-
Methyl Ethyl Ketone	100	NR	NR	NR	21	NR/NR	NR	NR	66	NR/NR	NR/NR
Methyl Ethyl Ketone: Sulfuric Acid, 50%	10 90	-	-	-	-	27/27	27	27	27	27/-	27/-
Methyl Isobutyl Ketone	100	NR	NR	NR	-	NR/NR	NR	NR	66	NR/NR	-/-
Methyl Isobutyl Ketone: Cyanoacetic Acid (0.8% sulfuric acid in saturated sodium chloride)	60 8	-	-	-	-	-/-	-	LS38	-	-/-	-/-
Methyl Isobutyl Ketone: Fluorides: Hydrofluoric Acid (concentration in g/l) **Footnote 1**	300 40	-	-	-	-	-/-	-	27	-	-/-	-/-
Methyl Isobutyl Ketone: Fluorides: Sulfuric Acid (concentrations in g/l) **Footnote 1**	200 500	-	-	-	-	-/-	-	27	-	-/-	-/-
Methyl Isobutyl Ketone Hydrochloric Acid: Ammonium Thiocyanate	15	-	-	-	-	-/-	-	93	-	-/-	-/-
Methyl Phenol Fumes	100	-	-	-	-	-/-	-	27	-	-/-	-/-
Methyl Styrene	100	-	NR	NR	49	NR/NR	NR	NR	-	NR/NR	NR/-
Methyl Sulfate	100	-	-	-	-	-/-	-	-	93	-/-	-/-
Methyl Sulfide: Air: Methanol (traces of water, hydrogen sulfide, mercaptan, acetone, turpentine)	2.5 85 6	-	-	-	-	-/-	-	74	-	-/-	-/-
Methyl Sulfonic Acid	100	-	-	-	-	-/-	-	-	93	-/-	-/-
Methyl Tertiary Butyl Ether	100	-	-	-	-	-/-	27	-	27	27/-	-/-
Methylamino Ether: Hydrochloric Acid: Methanol (traces of isobutyronitrile and impurities)	74 23 2	-	-	-	-	-/-	-	27	27	-/-	-/-
Methylene Bisthiocyanate: Polychlorophenol (blend)		-	-	-	-	-/-	-	LS52	-	52/52	-/-
Methylene Chloride	100	NR	NR	NR	-	NR/NR	-	NR	LS32	NR/NR	NR/NR
Methylene Chloride: Ethyl Acetate: Caustic 50%	83 16 1	-	NR	NR	-	NR/NR	NR	NR	LS32	NR/NR	NR/NR
Methylene Succinic Acid	25	-	-	-	-	-/-	-	38	-	-/-	-/-
Methylene Thiocyanate: Biocide: Chlorophenol (blend)	100	-	-	-	-	52/52	52	LS52	-	52/52	-/-
Milk and Milk Products	100	-	NR	NR	NR	82/82	82	-	-	82/66	-/-
MILOGARD 4L	100	-	-	-	-	-/-	38	-	-	-/-	-/-
Mineral Oils	100	121	121	121	121	93/93	99	104	82	82/66	32/82
Mineral Spirits	100	104	121	121	138	104/104	104	138	121	82/-	-/-
Mineral Wool Slurry		-	-	-	-	-/-	-	32	-	-/-	-/-
Monochloroacetic Acid	50	-	-	-	NR	-/-	-	32	-	-/-	-/-
Monochlorobenzene	100	27	27	27	38	NR/NR	27	NR	121	NR/NR	NR/NR
Monochlorotoluene: Water	50 50	-	-	-	-	-/-	-	-	93	-/-	-/-
Monoethanolamine (also called ethanolamine)	100	-	27	27	49	NR/NR	27	27	66	NR/NR	-/-
Monoethanolamine (desulfurizing, sulfur dioxide and hydrogen sulfate)	100	-	-	-	-	NR/NR	-	NR	132	NR/NR	NR/NR
Monoethanolamine Butyl CELLOSOLVE (alkaline film stripper)	30 57	-	-	-	-	NR/NR	-	NR	60	NR/NR	NR/-

See page 13 for footnotes.

See page 11 for list of trademarks and product names.

TEMPERATURE (°C) FOR RESIN TYPES

CHEMICAL ENVIRONMENT	CONCENTRATION %	High Performance Epoxy Vinyl Ester Resins				Epoxy Vinyl Ester Resins					Fume Service
		HETRON 942/35	HETRON 980/35	HETRON FR998/35	HETRON 970/35	HETRON 922/FR992	HETRON 980	HETRON 197-3	HETRON 800	AROPOL 7241/7334	HETRON 92/99P
Monohydroxysuccinic Acid	10	-	-	-	-	-/-	-	35	-	-/-	-/-
Monosodium Phosphate (pH 1-3)	10	-	-	-	-	-/-	-	93	-	-/-	-/-
Morpholine	10	-	-	-	27	-/-	-	38	66	-/-	-/-
Motor Oil	100	121	104	104	121	99/99	104	-	-	-/-	-/-
MULSOLINE 6000		-	-	-	-	-/-	-	66	-	-/-	-/-
Muriatic Acid (see hydrochloric acid)		-	-	-	-	-/-	-	-	-	-/-	-/-
Mustard (3% sodium chloride, 5% acetic acid)		-	-	-	-	-/-	-	-	-	71/-	-/-
Myristic Acid (tetradecanoic acid)	100	121	121	121	121	99/99	104	-	-	-/-	-/-
Naphtha	100	99	99	99	99	82/82	93	93	-	82/66	93/93
Naphthalene	100	99	99	99	99	82/82	93	32	99	66/49	32/54
Naphthalene Sulfonic Acid	100	-	-	-	-	-/-	-	-	107	-/-	-/-
Naphthanol Sulfonic Acid	100	-	-	-	-	-/-	-	-	107	-/-	-/-
Naphthenic Acid (sat'd.)		-	-	-	-	-/-	-	-	-	82/-	-/-
Naphthoquinone (scrubbing with water)		-	-	-	-	-/-	-	66	-	-/-	-/-
Naphthoquinone (1,4) (sat'd.)		-	-	-	-	-/-	-	66	-	-/-	-/-
Naphthylamine Sulfonic Acid (sat'd.)		-	-	-	-	-/-	-	43	-	-/-	-/-
NEODOL 25-3S	100	-	-	-	-	-/-	-	49	-	-/-	-/-
Neopentyl Glycol	90	-	-	-	-	-/-	-	66	-	-/-	-/-
Nickel Chloride (sat'd.)		99	104	104	99	99/99	104	104	104	82/66	104/104
Nickel Chloride: Boric Acid: Nickel Sulfate (concentration: oz/gal)	12 8 53	-	-	-	-	-/-	-	82	-	-/-	-/-
Nickel Chloride: Nickel Sulfate: Boric Acid (nickel plating, trace of brightener, concentration in oz/gal)	8 40 6	-	-	-	82	-/-	-	66	-	-/-	-/-
Nickel Electrolyte (Inco Metals, purified)		-	-	-	-	-/-	-	-	-	-/-	-/-
Nickel Nitrate (sat'd)		99	104	104	99	99/99	104	104	104	82/66	104/104
Nickel Soap Catalyst		-	-	-	-	-/-	-	32	-	-/-	-/-
Nickel Sulfate (sat'd)		99	99	99	99	99/99	104	104	110	82/66	104/104
Nickel Sulfate: Boric Acid: Nickel Chloride (concentration in oz/gal)	53 8 12	-	-	-	-	-/-	-	82	-	-/-	-/-
Nickel Sulfate: Nickel Chloride: Boric Acid (nickel plating, trace of brightener, concentration in oz/gal)	40 8 6	-	-	-	82	-/-	-	66	-	-/-	-/-
Nickel, Metal Plating (nickel sulfamate-50 oz/gal, magnesium chloride-3.5 oz/gal, boric acid-3 oz/gal pH 3.7)		-	-	-	-	-/-	-	66	-	-/-	-/-
Nickel, Metal Plating (44% nickel sulfate, 4% ammonium chloride, 4% boric acid)		-	93	93	82	93/93	93	-	-	-/-	-/-
Nickel, Metal Plating (11% nickel sulfate, 2% nickel chloride, 1% boric acid)		-	93	93	82	93/93	93	93	-	-/-	-/-
Nickel, Bright, Metal Plating		-	-	-	-	-/-	-	82	-	-/-	-/-
Nickel-Cobalt (solvent extraction circuit, 0.3 - 1.5 g/l fluorides, pH 1.8 - 4.5) **Footnote 1**		-	-	-	-	-/-	-	85	-	-/-	-/-
Nitrating Acid (spent and strong)		-	-	-	-	NR/NR	-	27	NR	NR/NR	NR/-
Nitric Acid **Footnote 3**	1	-	82	82	82	99/99	104	-	-	-/-	-/-
Nitric Acid **Footnote 3**	5	82	82	82	82	71/71	71	99	32	71/49	99/93
Nitric Acid **Footnote 3**	10	66	66	66	66	49/49	60	93	32	32/-	60/79
Nitric Acid **Footnote 3**	20	49	66	66	66	49/49	66	60	NR	NR/NR	-/-
Nitric Acid **Footnote 3**	28	-	-	-	38	38/38	54	-	NR	-/-	-/-
Nitric Acid **Footnote 3**	35	-	-	-	38	38/38	49	60	NR	NR/NR	-/-
Nitric Acid **Footnote 3**	40	NR	NR	NR	27	NR/NR	NR	49	NR	NR/NR	NR/-
Nitric Acid **Footnote 3**	50	NR	NR	NR	NR	NR/NR	NR	43	NR	NR/NR	NR/-
Nitric Acid **Footnote 3**	52.4	NR	NR	NR	NR	NR/NR	NR	43	NR	NR/NR	NR/-
Nitric Acid (0.5 oz/gal of wetting agent, concentration in oz/gal) **Footnote 3**	2	-	-	-	-	-/-	-	27	-	-/-	-/-
Nitric Acid, Fumes: Ammonia, Fumes **Footnote 3**		-	-	-	-	-/-	-	49	-	-/-	-/-
Nitric Acid: AMCHEM 6-16	16 6	-	-	-	-	-/-	-	35	-	-/-	-/-
Nitric Acid: Chromic Acid: Hydrofluoric Acid **Footnotes 1,3**	2 6 1.5	-	-	-	-	-/-	-	27	-	-/-	-/-
Nitric Acid: Copper Salts (concentration in g/l) **Footnote 3**	15 190	-	-	-	-	-/-	-	66	-	-/-	66/-
Nitric Acid: Copper Salts (concentration in g/l) **Footnote 3**	20 190	-	-	-	-	-/-	-	82	-	-/-	-/-
Nitric Acid: Hydrochloric Acid **Footnote 3**	10 10	-	-	-	-	93/93	93	93	-	NR/NR	-/-
Nitric Acid: Hydrochloric Acid **Footnote 22**	5 20	-	-	-	-	-/-	-	99	-	-/-	-/-
Nitric Acid: Hydrochloric Acid: Hydrofluoric Acid **Footnote 1**	10 77 13	-	-	-	-	-/-	-	38	-	-/-	-/-
Nitric Acid: Hydrochloric Acid: Sulfuric Acid **Footnote 3**	12 30 20	-	-	-	-	-/-	-	32	-	-/-	-/-

See page 13 for footnotes.

See page 11 for list of trademarks and product names.

TEMPERATURE (°C) FOR RESIN TYPES

CHEMICAL ENVIRONMENT	CONCEN-TRATION %	High Performance Epoxy Vinyl Ester Resins				Epoxy Vinyl Ester Resins					Fume Service
		HETRON 942/35	HETRON 980/35	HETRON FR998/35	HETRON 970/35	HETRON 922/FR992	HETRON 980	HETRON 197-3	HETRON 800	AROPOL 7241/7334	HETRON 92/99P
Nitric Acid: Hydrofluoric Acid . . . . . .Footnotes 1,3	7.5 2.5	-	-	-	-	-/-	-	74	-	-/-	-/-
Nitric Acid: Hydrofluoric Acid . . . . . .Footnotes 1,3	20 3	-	-	-	-	-/-	-	57	-	-/-	-/-
Nitric Acid: Hydrofluoric Acid (pickling solution) **. . . .Footnotes 1,3**	20 3.5	-	-	-	-	38/38	38	38	-	-/-	-/-
Nitric Acid: Hydrofluoric Acid . . . . . .Footnotes 1,3	15 5	-	-	-	-	-/-	-	74	-	-/-	-/-
Nitric Acid: Hydrofluoric Acid: Chromic Acid . . . . . .Footnotes 1,3	2 3 6	-	-	-	-	-/-	-	27	-	-/-	-/-
Nitric Acid: Phosphoric Acid . . . . . .Footnote 3	4 80	-	-	-	-	-/-	-	93	-	-/-	-/-
Nitric Acid: Phosphoric Acid: Sulfuric Acid (trace of non-ionic surfactant) **. . . . . .Footnote 3**	20 11 5	-	-	-	-	27/27	27	-	-	-/-	-/-
Nitric Acid: Sulfuric Acid . . . . . .Footnote 3	5 20	-	-	-	-	-/-	-	99	-	NR/NR	-/-
Nitric Acid: Sulfuric Acid . . . . . .Footnote 3	15 15	-	-	-	-	-/-	-	82	-	-/-	-/-
Nitric Acid: Sulfuric Acid: Copper Salts (concentration in g/l) **. . . . . .**	9.5 17 112	-	-	-	-	-/-	-	82	-	-/-	-/-
Nitric Acid: Sulfuric Acid: Sodium Dichromate (concentration in g/l, trace of chromic sulfate) **. . . . . .Footnote 3**	3.8 7.8 25	-	-	-	-	-/-	-	82	-	-/-	-/-
Nitric Acid, 34%: Phosphoric Acid, 85% (concentration by volume) **. . . . . .Footnote 3**	4 7	-	-	-	-	-/-	-	49	-	-/-	-/-
Nitric Acid, 70%: Sulfuric Acid, 70% (pickling acid) **. . . . . .Footnote 3**	10.5 51	-	-	-	-	27/27	27	27	-	-/-	-/-
Nitric Acid, Vapor . . . . . .Footnote 3	10	-	82	82	82	71/71	82	79	-	-/-	79/-
Nitric Acid, Vapor . . . . . .Footnote 3	20	-	-	-	82	-/-	-	-	-	-/-	LS66/-
Nitric Acid, Vapor . . . . . .Footnote 3	24	-	-	-	82	-/-	-	-	NR	NR/NR	-/-
Nitric Acid, Vapor . . . . . .Footnote 3	35	-	82	82	82	71/71	82	93	-	-/-	-/-
Nitric Acid, Vapor . . . . . .Footnote 3	48	-	-	-	82	-/-	-	-	NR	NR/NR	-/-
Nitric Acid, Vapor . . . . . .Footnote 3	60	-	82	82	82	71/71	82	-	-	-/-	35/35
Nitric Acid, Vapor and Condensate . . . . . .Footnote 3	5	-	-	-	-	-/-	-	82	-	-/-	-/-
Nitric Acid, Vapor: Phosphoric Acid, Vapor	5 95	-	-	-	-	-/-	-	93	-	-/-	93/-
Nitric Acid, Vapors: Hydrofluoric Acid, Vapors . . . . . .Footnotes 1,3	35 5	-	-	-	-	-/-	-	93	-	-/-	-/-
Nitric-Dinitro-Toluene, Fumes: Sulfuric Acid, Fumes . .Footnote 3		-	-	-	-	-/-	-	-	93	NR/NR	-/-
Nitrobenzene	100	27	NR	NR	38	NR/NR	NR	-	107	NR/NR	-/-
Nitrogen	100	-	-	-	-	-/-	-	-	-	82/-	-/-
Nitrogen: Carbon Dioxide: Water (by volume, oxygen = 5% of concentration, trace of sulfur dioxide)	70 12 14	-	-	-	-	-/-	-	49	-	-/-	-/-
Nitrogen: Oxygen	50 50	-	-	-	-	-/-	-	29	-	-/-	-/-
Nitrogen: Oxygen: Carbon Dioxide (traces of chlorine, water, and sulfur dioxide) **. . . . . .**	2.5 21 1.5	-	-	-	-	-/-	-	93	-	-/-	-/-
Nitrogen: Sulfur Dioxide: Oxygen (traces of 80% sulfuric acid) **. . . . . .**	79 7 15	-	-	-	-	-/-	-	79	-	-/-	-/-
Nitromethane	100	-	-	-	-	-/-	-	32	-	-/-	-/-
Nitromethane, (tris- hydroxymethyl): **Water** (trace of formaldehyde, pH 3) .	51 49	-	-	-	-	49/49	49	49	-	-/-	-/-
Nitrophenol	100	-	-	-	-	-/-	-	-	107	NR/NR	-/-
Nitrotoluene (p-)**: Sulfonic Acid . . . .**	24	-	-	-	-	-/-	-	93	-	-/-	NR/-
Nitrous Acid	10	-	-	-	-	-/-	-	32	-	49/-	32/32
Nitrous Acid	100	-	-	-	-	-/-	-	-	-	49/-	-/-
Nonandioic Acid (sat'd.) **. . . . . .**		-	-	-	-	-/-	-	32	-	-/-	-/-
Nonyl Phenol (monoalkyl phenol) **. . .**	100	-	43	43	-	43/43	43	43	43	43/43	-/-
Nonylphenoxytriethanol Sulfate (sodium salt) **. . . . . .**	28	-	-	-	-	-/-	-	38	38	-/-	-/-
Nuclear Waste (water, low level ion exchange) **. . . . . .Footnote 21**		-	-	-	-	-/-	-	32	-	-/-	-/-
Nuclear Waste Solution (ammonium nitrate and fluoride) **.Footnotes 1,21**		-	38	38	-	38/38	-	38	-	-/-	-/-
Nuclear, Rad Waste . . .Footnote 21		-	-	-	-	-/-	-	38	-	-/-	-/-
Nut Oil, Ground	100	-	-	-	-	-/-	-	-	-	32/32	60/-
OAKITE Stripper SA (conc.) **. . . . . .**		-	-	-	82	-/-	-	NR	-	-/-	NR/-
Octanoic Acid (sat'd.) **. . . . . .**		99	93	93	99	82/82	93	60	-	71/38	-/-
Oil, Crude (sweet and sour) **. . . . . .**	100	121	99	99	121	99/99	99	99	-	82/66	-/-
Oil, Crude (storage tank bottoms) **. . .**		-	99	99	-	93/93	99	-	-	54/43	-/-
Oil, Crude, B	100	-	-	-	-	-/-	-	-	-	32/32	-/-
Oil, Furnace	100	-	-	-	-	-/-	-	-	-	32/-	-/-
Oil, Heating	100	-	-	-	-	-/-	-	-	-	32/-	-/-

See page 13 for footnotes.

See page 11 for list of trademarks and product names.

TEMPERATURE (°C) FOR RESIN TYPES

CHEMICAL ENVIRONMENT	CONCEN-TRATION %	High Performance Epoxy Vinyl Ester Resins				Epoxy Vinyl Ester Resins					Fume Service
		HETRON 942/35	HETRON 980/35	HETRON FR998/35	HETRON 970/35	HETRON 922/FR992	HETRON 980	HETRON 197-3	HETRON 800	AROPOL 7241/7334	HETRON 92/99P
Oil, Low Sulfur Crude	100	-	-	-	-	-/-	-	-	-	49/-	-/-
Oil, Medium Sulfur Crude	100	-	-	-	-	-/-	-	-	-	32/-	-/-
Oil, Mid-Continent Sweet	100	-	-	-	-	-/-	-	-	-	32/-	-/-
Oil, Oxidized Petroleum Heavy Bottoms (7.8 lbs/gal with about 10% acetic acid)		-	71	71	-	71/71	71	-	-	-/-	-/-
Oil, Refinery Waste Effluent		-	-	-	-	-/-	-	32	-	-/-	-/-
Oil, Slop, Refinery		-	-	-	-	-/-	-	-	-	32/-	-/-
Oil, Sour Crude, Wyoming		-	99	99	-	99/99	99	-	-	99/66	-/-
Oil, Transformer	100	-	99	99	99	99/99	99	104	-	32/32	-/-
Oil, Waste (various ketones and aromatics)		-	-	-	-	NR/NR	-	-	32	-/-	-/-
Oil, Water Separation		-	-	-	-	-/-	-	32	-	32/32	32/-
Oil, West Texas (sour and sweet)		-	-	-	-	-/-	-	-	-	32/-	-/-
Oils (animal, mineral or vegetable)	100	-	93	93	-	93/93	93	-	121	49/32	-/-
Olefin (alpha) **Sulfonate**	100	-	-	-	-	-/-	-	49	-	-/-	-/-
Oleic Acid	100	99	99	99	93	93/93	99	93	107	82/54	93/93
Oleoparathion	3	-	-	-	-	-/-	-	-	-	-/-	60/-
Oligomeric Dispersant	100	-	-	-	-	54/54	54	54	-	54/54	54/-
OLIN 58981		-	-	-	-	-/-	-	49	-	-/-	-/-
Olive Oil	100	121	121	121	121	93/93	99	60	-	82/54	60/-
OPM-1 and OPM-2		-	-	-	-	-/-	-	82	-	-/-	-/-
Ore-Smelting Furnace Gas (wet with dust, 40% sodium, 23% cadmium, 6% lead, 21% boron, 8% zinc and other oxides)		-	-	-	-	NR/NR	-	177	-	NR/NR	-/-
Organic, (Alkyl Benzene)**: Sulfuric Acid**	1.5 2 96.5	-	-	-	-	NR/NR	-	66	-	66/NR	-/-
Organic Contaminants: Acid: Water	2 75	-	-	-	-	-/-	-	71	-	-/-	-/-
Organics (fluorinated, chlorinated acids neutralized with lime, effluent) **Footnote 1**		-	-	-	-	-/-	-	38	38	-/-	-/-
Organics: Kerosene: Phosphoric Acid (10% isodecanol)	20 70 30	-	-	-	-	-/-	-	66	66	-/-	-/-
Organics, Unknown: Formic Acid, 60% (saturated with sodium chloride)	50 50	-	-	-	-	-/-	-	4	-	-/-	-/-
Organotin: Amine Salts: Quaternary Ammonium Salts (blended)	100	-	66	66	66	52/52	52	52	-	LS52/LS52	-/-
Osmose Company Premix: Fire Retardant Liquid Formulation	100 50	-	-	-	-	-/-	-	-	-	27/-	-/-
Oxalic Acid	100	49	104	104	99	99/99	104	104	93	82/60	104/104
Oxidizing Gases	100	-	-	-	-	-/-	-	32	-	-/-	32/32
Oxygen: Carbon Dioxide: Nitrogen (traces of chlorine, water and sulfur dioxide)	21 1.5 2.5	-	-	-	-	-/-	-	93	-	-/-	-/-
Oxygen: Nitrogen	50 50	-	-	-	-	-/-	-	29	-	-/-	-/-
Oxygen: Sulfur Dioxide: Nitrogen (traces of 80% sulfuric acid)	15 7 79	-	-	-	-	-/-	-	79	-	-/-	-/-
Ozone (dry vapor) **Footnote 21**	3	-	-	-	-	-/-	-	60	-	-/-	-/-
Ozone (wet, sewage treatment, concentration in ppm) **Footnote 21**		-	-	-	-	-/-	-	38	NR	-/-	-/-
Ozone Treatment (condominium waste, 4 lbs/day @ 2% ozone)		-	-	-	-	-/-	-	32	-	-/-	-/-
Ozone: Chlorine (rendering fumes) **Footnote 21**		-	-	-	-	-/-	-	49	-	-/-	-/-
Ozone: Hydrogen Footnote 21		-	-	-	-	-/-	-	38	NR	-/-	-/-
Ozone, Fumes: Cyanide, Fumes (20 lbs/day @ 2% ozone)**Footnote 21**		-	-	-	-	-/-	-	32	-	-/-	-/-
Palmitic Acid (hexadecanoic acid, sat'd.)		121	121	121	121	99/99	104	-	-	71/71	60/71
Paper Machine, Fumes (pH<8)		-	32	32	-	32/32	32	32	-	-/-	32/32
Paper Mill Liquor		-	-	-	-	-/-	-	-	-	82/49	-/-
Parathion, Wet		-	-	-	-	-/-	-	-	-	-/-	60/-
PARCO 450/45 (hydrogen fluoride present, pH 1) **Footnote 1**		-	-	-	-	-/-	-	49	-	-/-	-/-
PARCO Cleaner 550R	100	-	-	-	-	-/-	-	43	-	-/-	-/-
Paraffin Wax	100	-	-	-	-	-/-	-	-	104	-/-	-/-
Peanut Oil	100	82	82	82	-	82/82	82	-	-	79/-	-/-
Peel Oil	100	-	-	-	-	-/-	-	-	-	49/49	-/-
Pentachloroethene	100	-	-	-	-	-/-	-	-	107	-/-	-/-
PEP SET 1505 and 2590	100	-	-	-	-	32/32	32	32	32	32/32	-/-
Perchloric Acid Footnote 18	5	-	82	82	66	82/82	82	29	-	NR/NR	-/-
Perchloric Acid Footnote 18	10	66	-	-	66	66/66	66	29	-	NR/NR	-/-
Perchloric Acid Footnote 18	30	38	-	-	38	27/27	27	29	-	NR/NR	-/-
Perchloric Acid Footnote 18	70	-	-	-	-	-/-	-	29	-	NR/NR	-/-
Perchloroethylene	100	49	38	38	49	27/27	38	38	121	NR/NR	32/NR
Perchloroethylene, Vapor & Condensate	100	-	-	-	-	-/-	-	49	-	-/-	49/NR
Petroleum Ether	100	-	-	-	-	-/-	-	-	-	-/-	32/-

See page 13 for footnotes.

See page 11 for list of trademarks and product names.

TEMPERATURE (°C) FOR RESIN TYPES

CHEMICAL ENVIRONMENT	CONCEN-TRATION %	High Performance Epoxy Vinyl Ester Resins				Epoxy Vinyl Ester Resins					Fume Service
		HETRON 942/35	HETRON 980/35	HETRON FR998/35	HETRON 970/35	HETRON 922/FR992	HETRON 980	HETRON 197-3	HETRON 800	AROPOL 7241/7334	HETRON 92/99P
Petroleum Oil & Waxes (water emulsion)	1	-	-	-	-	-/-	-	60	-	-/-	-/-
Phenol (also called carbolic acid)	2	-	38	38	49	27/27	38	82	82	NR/NR	-/-
Phenol	5	-	27	27	49	NR/NR	27	82	82	NR/NR	-/-
Phenol	10	-	-	-	49	-/-	-	38	82	NR/NR	NR/-
Phenol	15	-	NR	NR	32	NR/NR	NR	LS32	49	NR/NR	NR/NR
Phenol	85	-	-	-	21	NR/NR	-	NR	32	NR/NR	NR/-
Phenol	100	-	NR	NR	-	NR/NR	NR	NR	LS50	NR/NR	NR/-
Phenol, Fumes		-	NR	NR	NR	NR/NR	NR	-	104	-/-	-/-
Phenol Sulfonic Acid (sat'd)		-	-	-	-	-/-	-	43	-	NR/NR	-/-
Phenolic Resin (urea modified, DUREZ 24942, pH 7- 8)		-	-	-	-	-/-	-	32	-	-/-	-/-
Phenolic: Caustic, Spent (refinery, neutralized to pH 5 - 6)		-	54	54	-	54/54	54	54	54	54/-	-/-
Phenols (some sulfates, hydrogen sulfide, water and waste liquor, pH 5-6)		-	-	-	-	54/54	54	54	54	54/-	-/-
Phenyl Carbinol	100	-	-	-	-	-/-	-	-	49	-/-	-/-
Phenyl Ether	100	-	-	-	-	-/-	-	-	93	-/-	-/-
Phosphate Salts	25	-	-	-	-	32/32	32	32	-	32/32	32/32
Phosphate: Phosphoric Acid Waste Liquor (pH 1- 3)	10	-	-	-	-	-/-	-	93	-	-/-	-/-
Phosphonitrillic Chloride, Vapors (chlorine, hydrochloric acid, benzene and water vapors)		-	-	-	-	-/-	-	49	-	-/-	-/-
Phosphoric Acid	85	99	99	99	99	99/99	104	121	121	71/66	104/104
Phosphoric Acid	100	99	99	99	99	99/99	104	121	-	32/NR	-/-
Phosphoric Acid (super-phosphoric acid)	105	-	99	99	104	99/99	104	121	-	32/NR	-/-
Phosphoric Acid (traces of sulfuric acid with silica tetrafluoride)**Footnote 1**	60	-	-	-	-	-/-	-	154	-	-/-	-/-
Phosphoric Acid Plant Tailings		-	-	-	-	-/-	-	-	-	-/-	38/-
Phosphoric Acid Waste Liquor: Phosphate (pH 1- 3)	10	-	-	-	-	-/-	-	93	-	-/-	-/-
Phosphoric Acid: Calcium Chloride	10 25	-	-	-	-	-/-	-	38	-	-/-	-/-
Phosphoric Acid: Chromic Acid: Hydrofluoric Acid . . .Footnotes 1,3	40 7 2	-	-	-	-	-/-	-	38	-	-/-	-/-
Phosphoric Acid: Fluorine: Silicone Dioxide . . . . . .Footnote 1	54 1.2 2	-	-	-	-	-/-	-	79	-	-/-	-/-
Phosphoric Acid: Fluorosilicic Acid: Sulfuric Acid (gypsum slurry cooler) **. . . . . .Footnote 1**	28 5 5	-	-	-	-	-/-	-	88	-	-/-	-/-
Phosphoric Acid: Hydrochloric Acid (saturated with phosphorous)	15 9	-	-	-	-	-/-	-	104	-	-/-	-/-
Phosphoric Acid: Hydrochloric Acid (saturated with chlorine)	15 9	99	99	99	99	-/-	-	104	-	-/-	-/-
Phosphoric Acid: Hydrochloric Acid: Hydrofluoric Acid (concentration in ppm) **. . .Footnote 1**	85 1 500	-	-	-	-	-/-	-	110	-	NR/NR	-/-
Phosphoric Acid: Hydrofluoric Acid: Chromic Acid . . . . . .Footnotes 1,3	8 11 9	-	-	-	-	-/-	-	38	-	-/-	-/-
Phosphoric Acid: Hydroxyacetic Acid: Sulfuric Acid . . . . . .Footnote 2	51 29 20	-	-	-	-	-/-	-	118	-	-/-	-/-
Phosphoric Acid: Inerts (trace of alkyl dimethyl benzyl ammonium chloride)	25 75	-	38	38	-	38/38	38	38	38	-/-	-/-
Phosphoric Acid: Kerosene: Organics (10% isodecanol)	30 70 20	-	-	-	-	-/-	-	66	66	-/-	-/-
Phosphoric Acid: Nitric Acid . . . . . .Footnote 3	80 4	-	-	-	-	-/-	-	93	-	-/-	-/-
Phosphoric Acid: Nitric Acid: Sulfuric Acid (trace of non-ionic surfactant) **. . . . . .Footnote 3**	11 20 5	-	-	-	-	27/27	27	-	-	-/-	-/-
Phosphoric Acid: Polyvinyl Alcohol	8 92	-	-	-	-	-/-	-	32	-	-/-	-/-
Phosphoric Acid: Sodium Hydroxide (phosphate mix)		-	NR	NR	-	77/77	77	-	-	-/-	-/-
Phosphoric Acid: Sodium Hydroxide (phosphoric acid with polyvinyl alcohol, alternately)	8 30	-	NR	NR	-	99/99	99	99	-	-/-	-/-
Phosphoric Acid: Sodium Phosphate (scrap liquor, pH 1-3)		-	-	-	-	-/-	-	93	-	-/-	-/-
Phosphoric Acid: Sulfuric Acid	20 10	-	-	-	-	-/-	-	71	-	-/-	-/-
Phosphoric Acid: Sulfuric Acid: Water (2% sodium hydroxide, trace of trisodium phosphate)	14 2 82	-	-	-	-	-/-	-	38	-	-/-	-/-
Phosphoric Acid: Sulfuric Acid: Water (2% sodium hydroxide, trace of trisodium phosphate)	20 2.5 75	-	-	-	-	-/-	-	38	-	-/-	-/-
Phosphoric Acid, 1%: Gypsum Slurry (trace of hydrogen fluoride)**Footnote 1**		-	-	-	-	-/-	-	38	-	-/-	-/-

See page 13 for footnotes.

See page 11 for list of trademarks and product names.

TEMPERATURE (°C) FOR RESIN TYPES

CHEMICAL ENVIRONMENT	CONCENTRATION %	High Performance Epoxy Vinyl Ester Resins				Epoxy Vinyl Ester Resins					Fume Service
		HETRON 942/35	HETRON 980/35	HETRON FR998/35	HETRON 970/35	HETRON 922/FR992	HETRON 980	HETRON 197-3	HETRON 800	AROPOL 7241/7334	HETRON 92/99P
Phosphoric Acid, 28%, Fumes (reactor, traces of fluorides and ammonia) **.....Footnote 1**		-	-	-	-	-/-	-	121	-	-/-	-/-
Phosphoric Acid, 85%: Kerosene: Xylene	33 33 33	-	-	-	-	-/-	-	38	-	-/-	-/-
Phosphoric Acid, 85%: Nitric Acid, 34% (concentration by volume) **.....Footnote 3**	7 4	-	-	-	-	-/-	-	49	-	-/-	-/-
Phosphoric Acid, 85%: Sulfuric Acid, 93%	50 50	-	-	-	-	-/-	-	71	-	NR/NR	NR/NR
Phosphoric Acid, Vapor and Condensate	70	121	-	-	-	-/-	-	149	-	-/-	-/-
Phosphoric Acid, Vapor: Nitric Acid, Vapor	95 5	-	-	-	-	-/-	-	93	-	-/-	93/-
Phosphoric Acid, Wet Process (conc.)	-	-	-	-	-/-	-	91	-	-/-	-/-	
Phosphorus Acid	70	38	38	38	38	38/38	38	-	-	-/-	-/-
Phosphorus Acid (conc.)		-	-	-	-	-/-	-	-	107	-/-	-/-
Phosphorus Acid: Hydrochloric Acid	70 2	-	82	82	-	82/82	82	82	-	49/-	-/-
Phosphorus Oxychloride .....Footnote 4	100	-	NR	NR	-	NR/NR	NR	27	NR	27/27	NR/-
Phosphorus Oxychloride, Vapors: Chlorine, Vapors: Hydrochloric Acid, Vapors (water vapors)		-	-	-	-	-/-	-	32	-	-/-	32/-
Phosphorus Pentoxide: Fluorine .....Footnote 1	1.5 1.5	-	-	-	-	93/93	93	29	-	-/-	-/-
Phosphorus Pentoxide, Fumes: Air: Hydrofluoric Acid, Fumes .....Footnote 1		-	-	-	-	-/-	-	157	-	-/-	-/-
Phosphorus Sesquisulfide	100	-	-	-	-	-/-	-	71	-	-/-	-/-
Phosphorus Trichloride .....Footnote 4	100	NR	NR	NR	NR	NR/NR	NR	NR	38	32/NR	NR/NR
Phosphorus Trichloride, Vapors: Chlorine, Vapors: Hydrochloric Acid, Vapors (water vapors)	100	-	-	-	-	-/-	-	71	-	-/-	-/-
Photographic Film Dryer		-	-	-	-	-/-	-	-	-	-/-	32/-
Photographic Processing Chemicals		-	-	-	-	-/-	-	27	-	-/-	-/-
Phthalic Acid	100	99	99	99	99	99/99	104	-	107	-/-	-/-
Phthalic Anhydride (sat'd.)		-	-	-	-	99/99	104	38	-	66/38	38/66
Picric Acid (alcoholic)	10	NR	38	38	38	38/38	38	38	-	NR/NR	38/38
Picric Acid (sat'd.)		NR	-	-	-	-/-	-	-	74	NR/NR	-/-
Pigment Slurry: Hydrochloric Acid: Water (trace of sodium chloride)	8 3 88	-	-	-	-	-/-	-	93	-	-/-	NR/-
PLUS 5		-	-	-	-	38/38	38	38	-	LS38/NR	-/-
Polyacrylamide (pH 12)	40	-	-	-	38	-/-	-	NR	-	-/-	-/-
Polyacrylamide Emulsion	100	-	-	-	-	-/-	-	-	-	32/-	-/-
Polychlorocyclohexane Sulfide	1	-	-	-	-	-/-	-	-	-	-/-	60/60
Polychlorophenate Organosulfur (blend)	100	-	-	-	-	-/-	-	52	-	52/52	-/-
Polychlorophenates (alcohol and amines blended)	100	-	-	-	-	-/-	-	52	-	52/52	-/-
Polychlorophenol: Methylene Bisthiocyanate (blend)		-	-	-	-	-/-	-	LS52	-	52/52	-/-
POLYCO 2631		-	-	-	-	-/-	-	43	-	-/-	-/-
Polyelectrolytes, Anionic	100	-	54	54	-	54/54	54	54	-	54/54	54/54
Polyethylene, Oxy Derivative, Surfactant	100	-	-	-	-	-/-	-	41	-	-/-	-/-
Polymer/Toluene Emulsion, ALIPAL CO433 (blended together in water)		-	-	-	-	-/-	-	NR	38	-/-	NR/-
Polymethylene Polyphenyl Isocyanate	100	-	-	-	-	-/-	-	-	-	49/49	-/-
Polyphosphoric Acid	115	99	99	99	99	99/99	104	-	-	-/-	-/-
Polyvinyl Acetate Emulsion		-	-	-	-	99/99	99	38	-	49/27	38/38
Polyvinyl Alcohol	10	38	82	82	49	82/82	82	-	-	49/49	-/-
Polyvinyl Alcohol	100	38	49	49	49	49/49	49	27	-	27/27	27/32
Polyvinyl Alcohol: Phosphoric Acid	92 8	-	-	-	-	-/-	-	32	-	-/-	-/-
Polyvinyl Chloride Latex (with 35 parts DOP)		49	49	49	49	49/49	49	43	-	-/-	-/-
Polyvinylidiene Chloride Latex	100	-	-	-	-	-/-	-	-	-	27/-	27/32
POLYWET ND-2	100	-	-	-	-	54/54	54	54	-	54/54	54/-
Potash Mine Fumes		-	-	-	-	-/-	-	-	-	-/-	32/32
Potash Slurry, 20%: Clay, 20% (potash in saturated brine)	40	-	-	-	-	-/-	-	27	-	-/-	-/-
Potassium Aluminum Sulfate (sat'd.)		121	104	104	121	99/99	104	82	-	82/54	66/71
Potassium Bicarbonate	10	66	66	66	66	71/71	71	32	-	71/54	32/32
Potassium Bicarbonate (sat'd.)		-	-	-	82	71/71	71	-	-	60/-	-/32
Potassium Bromate	10	-	-	-	-	-/-	-	-	66	-/-	-/-
Potassium Bromide (sat'd.)		38	71	71	82	71/71	71	-	93	71/54	-/-

See page 13 for footnotes.

See page 11 for list of trademarks and product names.

TEMPERATURE (°C) FOR RESIN TYPES

CHEMICAL ENVIRONMENT	CONCEN-TRATION %	High Performance Epoxy Vinyl Ester Resins				Epoxy Vinyl Ester Resins					Fume Service
		HETRON 942/35	HETRON 980/35	HETRON FR998/35	HETRON 970/35	HETRON 922/FR992	HETRON 980	HETRON 197-3	HETRON 800	AROPOL 7241/7334	HETRON 92/99P
Potassium Bromide: Ferricyanide Bleach (photography)		-	-	-	-	-/-	-	27	-	-/-	-/-
Potassium Carbonate	10	66	82	82	82	82/82	82	43	93	32/-	32/32
Potassium Carbonate	25	66	82	82	82	82/82	82	43	93	32/-	32/32
Potassium Carbonate (sat'd.)		-	-	-	-	32/32	32	43	93	-/-	NR/32
Potassium Chloride	100	99	99	99	99	99/99	104	121	121	82/66	93/93
Potassium Chloride (sat'd., mercury grade)		-	-	-	-	-/-	-	82	-	-/-	-/-
Potassium Chloride (sat'd. in bromine and chlorine, pH 2-4)		-	-	-	-	-/-	-	88	-	-/-	-/-
Potassium Chloride, Vapors (wet)		-	-	-	-	-/-	-	32	-	-/-	32/-
Potassium Cyanide (sat'd.)		-	-	-	-	-/-	-	-	27	-/-	-/-
Potassium Cyanide: Copper Cyanide: Potassium Hydroxide (concentration in oz/gal)	3 8 2	82	-	-	82	-/-	-	NR	-	-/-	-/-
Potassium Dichromate	100	99	-	-	99	99/99	104	93	-	82/-	93/-
Potassium Ferricyanide (sat'd.)		99	99	99	99	99/99	104	-	82	82/66	-/93
Potassium Ferrocyanide (sat'd.)		99	99	99	99	99/99	104	93	93	82/66	93/93
Potassium Fluoride (sat'd.) **Footnote 1**		-	-	-	-	66/66	66	66	-	-/-	-/-
Potassium Hydroxide	10	66	NR	NR	NR	66/66	66	NR	93	NR/NR	NR/-
Potassium Hydroxide	25	66	NR	NR	NR	66/66	66	NR	93	NR/NR	NR/-
Potassium Hydroxide	45	82	NR	NR	NR	66/66	66	NR	93	NR/NR	NR/-
Potassium Hydroxide	50	-	NR	NR	NR	66/66	66	NR	66	NR/NR	-/-
Potassium Hydroxide (2 oz/gal)		-	NR	NR	NR	66/66	66	79	-	-/-	-/-
Potassium Hydroxide: Copper Cyanide: Potassium Cyanide (concentration in oz/gal)	2 8 3	82	-	-	82	-/-	-	NR	-	-/-	-/-
Potassium Nitrate	100	99	104	104	99	99/99	104	104	121	82/66	93/93
Potassium Oxalate (sat'd.)		66	-	-	-	-/-	-	-	107	-/-	-/-
Potassium Permanganate	100	99	104	104	99	99/99	104	66	-	52/NR	66/66
Potassium Persulfate	100	99	99	99	99	99/99	104	32	107	32/-	32/32
Potassium Pyrophosphate	100	66	66	66	66	38/38	38	38	-	-/-	-/-
Potassium Sulfate	100	99	99	99	99	99/99	104	104	121	82/66	93/93
Potassium: Sodium (depleted brines)	100	-	-	-	-	-/-	-	93	-	-/-	-/-
Power Plant Scrubber, Medium Sulfur Coal (pH < 8)		66	66	66	66	66/66	66	66	-	-/-	-/-
PRINCEP 4L	100	-	-	-	-	-/-	38	-	-	-/-	-/-
Propenoic Acid (see acrylic acid)		-	-	-	-	-/-	-	-	-	-/-	-/-
Propionic Acid	1	27	27	27	27	27/27	27	27	27	27/27	27/-
Propionic Acid	20	-	93	93	82	93/93	93	-	-	-/-	-/-
Propionic Acid	50	-	82	82	82	82/82	82	27	-	-/-	-/-
Propionic Acid	100	27	-	-	38	NR/NR	-	-	-	-/-	-/-
Propionic Acid: Hydroxylammonium Acid Sulfate: Water	1 89 10	-	-	-	-	-/-	-	79	-	-/-	-/-
Propylene Glycol	100	99	99	99	99	99/99	104	82	-	77/66	38/77
Pulp and Paper Mill (acidic waste) **Footnote 21**		-	32	32	-	32/32	32	66	-	32/32	-/-
Pulp and Paper Mill (condensable liquor, pH 9) **Footnote 21**		-	54	54	-	54/54	54	54	-	-/-	-/-
Pulp and Paper Mill, Fumes (includes bleach, digester or boiler fumes) **Footnote 21**		-	-	-	-	-/-	-	-	-	-/-	32/-
Pulp and Paper Mill, Gas (non-condensable) **Footnote 21**		-	-	-	-	-/-	-	74	-	-/-	-/-
Pulp Stock (chlorinated, pH 4.5)		-	-	-	-	-/-	-	88	-	-/-	-/-
Pulp Stock, Fumes		-	-	-	-	-/-	-	-	-	49/49	-/-
Pulp, Bleached		-	-	-	-	-/-	-	88	-	-/-	-/-
PVC Latex (with 35 parts DOP) **Footnote 21**		-	-	-	-	-/-	-	43	-	-/-	-/-
Quaternary (includes hexylene and methosulfate types)		-	-	-	-	49/49	49	49	49	49/49	49/-
Quaternary (dimethyl, distearyl in isopropanol)		-	-	-	-	49/49	49	49	-	49/49	49/-
Quaternary (dimethyl, distearyl in "neutral" organic solvent)		-	88	88	-	88/88	88	88	88	88/66	88/-
Quaternary Ammonium Compound (in isopropanol, cationic)		-	-	-	-	49/49	49	49	49	49/49	49/-
Quaternary Ammonium Salts: Amine Salts: Organotin (blended)	100	-	66	66	66	52/52	52	52	-	LS52/LS52	-/-
Quaternary Ammonium: Aqueous Isopropanol (dialkyl dimethyl type)	75 25	-	-	-	-	49/49	49	49	49	49/49	49/-
Quaternary Softener (difatty complex)		-	-	-	-	49/49	49	49	27	49/49	49/-
R-2 Solutions (sat'd.)		-	-	-	-	-/-	-	82	-	-/-	-/-
Radiochemical Hoods (glove boxes)		-	-	-	-	-/-	-	-	-	-/-	32/-
RAYLENE	50	-	-	-	-	-/-	-	66	-	-/-	-/-
Rayon Spin Bath		-	-	-	60	66/66	66	82	-	-/-	77/-
Rayon Spin Bath, Fumes		-	-	-	-	-/-	-	LS93	LS93	-/-	NR/-

See page 13 for footnotes.

See page 11 for list of trademarks and product names.

TEMPERATURE (°C) FOR RESIN TYPES

CHEMICAL ENVIRONMENT	CONCEN-TRATION %	High Performance Epoxy Vinyl Ester Resins				Epoxy Vinyl Ester Resins					Fume Service
		HETRON 942/35	HETRON 980/35	HETRON FR998/35	HETRON 970/35	HETRON 922/FR992	HETRON 980	HETRON 197-3	HETRON 800	AROPOL 7241/7334	HETRON 92/99P
Rayon Spinning Fumes		-	-	-	60	-/-	-	60	-	-/-	60/38
Recovery Boiler, Blow Down (acetone and acetic, sulfuric, sulfurous and formic acids)		-	-	-	-	NR/NR	-	99	-	NR/NR	NR/-
Recovery Boiler, Kraft Type (no contact evaporation, trace of sulfur dioxide, 12-14% carbon dioxide, 19%, by volume, moisture, 37 fps)		-	-	-	-	NR/NR	-	171	-	NR/NR	-/-
Recovery Boiler, Stack Gases		-	-	-	-	NR/NR	NR	149	-	NR/NR	-/-
Red Liquor (ammonium bisulfite based)		-	82	82	82	66/66	74	66	-	-/-	-/-
Reformer Charge		-	-	-	-	-/-	-	-	-	32/-	-/-
Resorcinol	100	-	-	-	-	-/-	-	-	121	-/-	-/-
Rhodium Plating, Phosphate		-	-	-	-	-/-	-	49	-	-/-	-/-
RICHAMIDE CDA	100	-	-	-	-	-/-	-	49	-	-/-	-/-
RICHONATE 1850	100	-	-	-	-	-/-	-	49	-	-/-	-/-
RJ-4 Fuel	100	-	27	27	-	27/27	27	27	-	27/27	27/-
Salicylic Acid (sat'd.)		60	-	-	-	71/71	71	-	121	-/-	-/-
SANI-FRESH Soap Solution		-	-	-	-	-/-	-	49	-	-/-	-/-
Scrubber Sludge (30% calcium sulfate, 15% fly ash, pH 11)		-	-	-	-	49/49	49	NR	-	-/-	-/-
Scrubber Sludge (30% calcium sulfate, 15% fly ash, pH 5)		-	-	-	-	-/-	-	49	-	-/-	-/-
SD-20		-	-	-	-	38/38	38	38	-	38/38	-/-
Sea Water	100	-	93	93	99	99/99	99	82	-	82/66	-/-
Sea Water (1.75 x Normal, pH 7.5)		-	-	-	-	-/-	-	82	-	-/-	-/-
Sea Water, Desalination (2.75 x Normal, pH 7.5)		-	-	-	-	-/-	-	54	-	-/-	-/-
Selenious Acid	100	-	49	49	49	99/99	99	-	-	-/-	-/-
Septic System		-	-	-	-	32/32	32	32	32	32/32	32/32
Sequestering Agents	100	-	-	-	-	52/52	52	52	-	52/52	-/-
SEQUESTRENE 30A	100	-	-	-	-	32/32	32	-	-	-/-	-/-
Sewage Gas, Hydrogen Sulfide		32	32	32	32	32/32	-	32	32	32/32	32/-
Sewage Treatment		-	-	-	-	32/32	32	32	-	32/32	32/32
Sewage Treatment Fumes		-	-	-	-	32/32	32	32	-	32/32	-/32
Sewage, Anaerobic		-	-	-	-	29/29	29	29	-	29/29	29/29
Sewage, Municipal (treated and untreated)		-	-	-	-	32/32	32	32	32	32/32	32/32
Sewage, Septic Tank		-	-	-	-	32/32	32	-	-	32/32	-/-
Shampoo, Carpet		-	-	-	-	38/38	38	38	-	LS38/NR	-/-
Shampoo, Liquid	100	-	-	-	-	-/-	-	49	-	-/-	-/-
Silicone Dioxide: Fluorine: Phosphoric Acid **Footnote 1**	2 1.2 54	-	-	-	-	-/-	-	79	-	-/-	-/-
Silicone Oil: Hydrochloric Acid	79 21	-	-	-	-	-/-	-	91	-	-/-	-/-
Silicone Tetrachloride	100	-	-	-	-	-/-	-	-	60	-/-	-/-
Silver Cyanide (sat'd)		-	-	-	-	99/99	99	-	-	-/-	-/-
Silver Nitrate	100	-	99	99	99	99/99	99	104	-	82/66	93/93
Silver Nitrate: Copper Chloride	33 15	-	-	-	-	-/-	-	32	-	-/-	-/-
Silver Refining Cells		-	-	-	-	-/-	-	32	-	-/-	-/-
Silver, Metal Plating (4% silver, 7% potassium and 5% sodium cyanides, 2% potassium carbonate)		-	82	82	82	93/93	93	NR	-	NR/NR	-/-
Slimicide (polychlorophenate-organosulfur, blend)	100	-	-	-	-	-/-	-	52	-	52/52	-/-
Slimicide (thiocyanate-poly-chlorophenol, blend)	100	-	-	-	-	-/-	-	LS52	-	52/52	-/-
Slimicide: Organotin: Amine		-	-	-	-	-/-	-	52	-	LS52/NR	-/-
Smelting Furnace (gas and dust, wet)		-	-	-	-	-/-	-	171	-	-/-	-/-
Smoke, Particulate (cooling and washing with water)		-	-	-	-	-/-	-	38	-	-/-	38/-
Soap Plant Fumes		-	-	-	-	32/32	32	32	32	32/32	32/38
Soap Solution		-	-	-	-	-/-	-	32	-	32/32	-/-
Soap Tower Exhaust Fumes		-	-	-	-	-/-	-	71	-	-/-	-/-
Soda Ash: Sodium Carbonate (thickener fumes)		-	-	-	-	-/-	-	82	-	-/-	60/-
Sodium Acetate	100	-	99	99	99	99/99	104	93	107	66/-	93/66
Sodium Acid Sulfite	15	-	-	-	-	-/-	-	74	-	-/-	-/-
Sodium Alkyl Benzene Sulfonate	100	-	-	-	-	-/-	-	38	-	-/-	-/-
Sodium Alkyl Xanthate	100	-	-	-	-	66/66	66	-	-	-/-	-/-
Sodium Alkylaryl Sulfonate (pH 8)	40	-	-	-	82	49/49	49	49	-	-/-	-/-
Sodium Aluminate (sat'd.)		-	-	-	49	71/71	71	NR	66	NR/NR	NR/NR
Sodium Ammonium Phosphate		-	-	-	-	-/-	-	93	-	-/-	-/-
Sodium Benzoate (sat'd.)		-	-	-	82	99/99	104	79	-	79/-	79/79
Sodium Bicarbonate	10	-	82	82	82	82/82	82	60	107	82/49	60/-
Sodium Bicarbonate (sat'd.)		-	82	82	82	71/71	71	60	107	60/-	60/60
Sodium Bicarbonate: Sodium Sulfate: Sodium Carbonate (0.1% fluoride fumes, electrostatic precipitator) **Footnotes 1,2**	.1 3 .5	-	-	-	-	85/85	85	85	-	-/-	-/-

See page 13 for footnotes.

See page 11 for list of trademarks and product names.

TEMPERATURE (°C) FOR RESIN TYPES

CHEMICAL ENVIRONMENT	CONCEN-TRATION %	High Performance Epoxy Vinyl Ester Resins				Epoxy Vinyl Ester Resins					Fume Service
		HETRON 942/35	HETRON 980/35	HETRON FR998/35	HETRON 970/35	HETRON 922/FR992	HETRON 980	HETRON 197-3	HETRON 800	AROPOL 7241/7334	HETRON 92/99P
Sodium Bichromate		-	-	-	-	-/-	-	-	-	-/-	-/32
Sodium Bichromate: Sulfuric Acid (sugar reaction product, pH 2.6)		-	-	-	-	-/-	-	60	-	-/-	-/-
Sodium Bisulfate	100	-	99	99	99	99/99	104	93	107	82/66	93/93
Sodium Bisulfide	15	-	60	60	-	60/60	60	71	60	-/-	-/-
Sodium Bisulfide	45	-	60	60	-	60/60	60	71	60	-/-	-/-
Sodium Bisulfide	65	-	-	-	-	-/-	-	71	-	-/-	-/-
Sodium Bisulfide: Sodium Hydroxide	15 15	-	-	-	-	60/60	60	-	60	NR/NR	-/-
Sodium Bisulfite (sat'd.)		-	104	104	99	99/99	104	93	107	82/32	93/93
Sodium Bisulfite: Sodium Sulfite (sat'd.)	50 50	-	-	-	-	-/-	-	66	-	-/-	-/-
Sodium Bisulfite: Sodium Sulfite: Sodium Sulfate	15 15 15	-	-	-	-	-/-	-	74	-	-/-	-/-
Sodium Borate (sat'd.)		-	104	104	99	99/99	104	77	60	82/60	77/77
Sodium Bromate	20	-	-	-	-	-/-	-	-	66	-/-	-/-
Sodium Bromide	100	-	104	104	99	99/99	104	121	-	82/66	104/104
Sodium Carbonate	2	-	82	82	82	82/82	82	71	71	66/-	49/-
Sodium Carbonate	10	-	82	82	82	82/82	82	71	71	LS71/NR	49/-
Sodium Carbonate	25	-	82	82	82	71/71	71	32	71	32/32	32/-
Sodium Carbonate	32	-	82	82	82	71/71	71	-	104	32/-	-/-
Sodium Carbonate (sat'd.)		-	82	82	82	71/71	71	32	107	-/-	82/32
Sodium Carbonate: Chlorine Dioxide: Bicarbonate (pH 8)	3.7 5	-	-	-	-	-/-	-	38	-	-/-	-/-
Sodium Carbonate: Soda Ash (thickener fumes)		-	-	-	-	-/-	-	82	-	-/-	60/-
Sodium Carbonate: Sodium Sulfate: Sodium Bicarbonate (0.1% fluoride fumes, electrostatic precipitator) **Footnotes 1,2**	.5 3 .1	-	-	-	-	85/85	85	85	-	-/-	-/-
Sodium Carbonate, Vapor & Condensate	10	-	-	-	-	-/-	-	82	-	-/-	82/82
Sodium Chlorate	90	-	104	104	99	99/99	104	93	-	54/54	-/-
Sodium Chlorate (sat'd)		-	104	104	113	99/99	104	93	-	NR/NR	-/32
Sodium Chlorate: Sodium Chloride (concentration in M)	3.2 3.4	-	99	99	99	-/-	-	82	-	-/-	-/-
Sodium Chlorate: Sulfuric Acid (concentration in g/l, saturated with chlorine dioxide, traces of methyl alcohol) **Footnote 2**	120 450	-	-	-	-	-/-	-	63	-	-/-	-/-
Sodium Chlorate: Sulfuric Acid: Methyl Alcohol (sodium sulfate)		-	-	-	-	-/-	-	52	-	-/-	-/-
Sodium Chlorate, Vapors		-	-	-	-	-/-	-	-	-	-/-	66/-
Sodium Chloride (sat'd)		-	104	104	-	99/99	104	121	121	82/66	93/93
Sodium Chloride (sat'd., pH 3)		-	99	99	-	99/99	99	99	-	-/-	-/-
Sodium Chloride (sat'd., pH 3.5)		-	-	-	-	-/-	-	74	-	-/-	-/-
Sodium Chloride (chlorine saturated, pH 10.5)		-	-	-	93	-/-	-	88	-	-/-	NR/-
Sodium Chloride (chlorine saturated, 300-310 g/l, pH 2)		-	-	-	-	-/-	-	99	-	-/-	-/-
Sodium Chloride (sat'd., saturated with chlorine, pH 2.5)		-	-	-	-	-/-	-	77	-	-/-	-/-
Sodium Chloride (sat'd., saturated with chlorine)		-	-	-	-	-/-	-	104	-	NR/NR	-/-
Sodium Chloride (sat'd., trace of chlorine, pH 11)		-	-	-	99	-/-	-	74	-	-/-	-/-
Sodium Chloride (sat'd., saturated with chlorine, pH 3)		-	-	-	-	-/-	-	99	-	NR/NR	-/-
Sodium Chloride: Calcium Chloride: Magnesium Chloride	12 10 2	-	-	-	-	-/-	-	66	-	-/-	-/-
Sodium Chloride: Chlorine Dioxide **Footnote 2**	23 35	-	-	-	-	-/-	-	49	-	-/-	-/-
Sodium Chloride: Hydrochloric Acid (sat'd. sodium chloride)	5	-	99	99	-	99/99	99	-	-	-/-	-/-
Sodium Chloride: Sodium Chlorate (concentration in M)	3.4 3.2	-	99	99	99	-/-	-	82	-	-/-	-/-
Sodium Chloride: Sodium Hydroxide, Wet (chute, 100-150 tons/day)		-	-	-	-	-/-	-	32	-	-/-	-/-
Sodium Chloride: Sodium Nitrate: Sulfuric Acid	8 8 20	-	-	-	-	-/-	-	82	-	-/-	-/-
Sodium Chloride: Sulfuric Acid	8 12	-	-	-	-	-/-	-	99	-	-/-	-/-
Sodium Chloride: Zinc Chloride: Ammonium Chloride (zinc chloride plating bath, concentration in oz/gal, pH 4.8 - 5.2)	31 18 3	-	-	-	-	-/-	-	32	-	-/-	-/-
Sodium Chloride, Dechlorinated (sat'd. sodium chloride, traces of free chlorine, pH 2-3) **Footnote 8**		-	-	-	-	NR/NR	-	93	-	-/-	-/-
Sodium Chloride, Mercury Grade (sat'd.)		-	-	-	-	-/-	-	82	-	-/-	-/-

See page 13 for footnotes.

See page 11 for list of trademarks and product names.

TEMPERATURE (°C) FOR RESIN TYPES

CHEMICAL ENVIRONMENT	CONCENTRATION %	High Performance Epoxy Vinyl Ester Resins				Epoxy Vinyl Ester Resins					Fume Service
		HETRON 942/35	HETRON 980/35	HETRON FR998/35	HETRON 970/35	HETRON 922/FR992	HETRON 980	HETRON 197-3	HETRON 800	AROPOL 7241/7334	HETRON 92/99P
Sodium Chloride, Vapor & Condensate (sat'd.)		-	-	-	-	-/-	-	82	-	-/-	82/82
Sodium Chlorite	2	-	104	104	66	99/99	104	99	-	-/-	-/-
Sodium Chlorite	25	-	104	104	66	99/99	104	79	-	-/-	79/79
Sodium Chlorite (sat'd.)		-	-	-	-	99/99	104	66	-	NR/NR	-/-
Sodium Chlorosulfonate (sat'd.)		-	-	-	-	-/-	-	-	107	-/-	-/-
Sodium Chromate (sat'd.)		-	104	104	99	99/99	104	82	-	-/-	-/-
Sodium Cumene Sulfonate	43	-	-	-	-	-/-	-	49	-	-/-	-/-
Sodium Cyanide	10	-	99	99	99	99/99	99	LS49	-	49/-	-/-
Sodium Cyanide	50	-	99	99	99	99/99	99	LS66	-	-/-	-/-
Sodium Cyanide (sat'd.)		-	99	99	99	99/99	99	LS71	107	38/-	-/38
Sodium Dichromate (sat'd.)		-	99	99	99	99/99	99	-	-	49/49	32/-
Sodium Dichromate: Acetic Acid	30 70	-	-	-	-	-/-	-	71	-	-/-	-/-
Sodium Dichromate: Hydrofluoric Acid: Sulfuric Acid (hydrochloric acid, 60% by volume) **Footnote 1**	3 20 28	-	-	-	-	-/-	-	49	-	-/-	-/-
Sodium Dichromate: Nitric Acid: Sulfuric Acid (concentration in g/l, trace of chromic sulfate) **Footnote 3**	25 3.8 7.8	-	-	-	-	-/-	-	82	-	-/-	-/-
Sodium Dichromate: Sulfuric Acid (concentration in oz/gal)	3 30	-	-	-	-	NR/NR	-	66	-	-/-	-/-
Sodium Dichromate: Sulfuric Acid (concentration in oz/gal)	4 32	-	-	-	-	NR/NR	-	71	-	-/-	-/-
Sodium Dichromate: Sulfuric Acid (concentration in oz/gal)	5 30	-	-	-	-	NR/NR	-	82	-	-/-	-/-
Sodium Dichromate: Sulfuric Acid (concentration in oz/gal)	5 42	-	-	-	-	NR/NR	-	71	-	-/-	-/-
Sodium Dichromate: Sulfuric Acid (concentration in g/l, saturated in chromic sulfate)	52 9	-	-	-	-	NR/NR	-	27	-	-/-	-/-
Sodium Diphosphate (sat'd.)		-	-	-	99	-/-	-	-	-	82/-	-/-
Sodium Dodecylbenzene Sulfonate (pH 8)	40	-	-	-	71	-/-	-	49	-	-/-	-/-
Sodium Ethoxysulfate	100	-	-	-	-	-/-	-	49	-	-/-	-/-
Sodium Ferricyanide (sat'd.)		-	-	-	99	99/99	104	121	-	82/66	104/104
Sodium Ferrocyanide (sat'd.)		-	-	-	99	99/99	104	82	-	82/66	-/104
Sodium Fluoride **Footnote 1**	100	-	82	82	82	82/82	82	-	-	-/-	-/-
Sodium Fluoride (traces of potassium fluoride, sodium hydroxide and potassium hydroxide) **Footnote 1**	4	-	-	-	-	82/82	82	NR	-	-/-	-/-
Sodium Fluoride: Sodium Chloride **Footnote 1**	1 20	-	-	-	-	-/-	-	-	-	-/-	-/-
Sodium Fluorosilicate	100	-	-	-	49	66/66	66	-	-	-/-	-/-
Sodium Hexametaphosphate (sat'd.)		-	66	66	66	66/66	66	66	66	-/-	-/-
Sodium Hydrogen Phosphate		-	-	-	-	-/-	-	93	-	-/-	-/-
Sodium Hydrosulfide	65	-	-	-	-	60/60	60	71	60	-/-	-/-
Sodium Hydrosulfide: Sodium Hydroxide	15 15	-	-	-	-	60/60	60	-	60	NR/NR	-/-
Sodium Hydroxide **Footnote 25**	0.5	49	82	82	82	82/82	82	NR	82	38/NR	60/82
Sodium Hydroxide **Footnote 25**	1	49	82	82	82	82/82	82	-	82	LS32/NR	60/82
Sodium Hydroxide **Footnote 25**	5	49	NR	NR	NR	71/71	71	NR	71	NR/NR	NR/82
Sodium Hydroxide **Footnote 25**	10	49	NR	NR	NR	71/71	71	NR	71	NR/NR	NR/-
Sodium Hydroxide **Footnote 25**	25	-	-	-	NR	66/66	60	NR	66	NR/NR	NR/-
Sodium Hydroxide **Footnote 25**	50	49	82	82	82	93/93	82	NR	82	NR/NR	NR/-
Sodium Hydroxide (scrubbing chlorine, chlorine dioxide) **Footnote 2**	5	-	-	-	-	49/49	49	-	NR	NR/NR	-/-
Sodium Hydroxide (scrubbing chlorine blow gas)	20	-	-	-	-	LS49/LS49	LS49	-	NR	NR/NR	-/-
Sodium Hydroxide: Cresylic Acid	5 12	-	-	-	-	82/82	82	-	-	-/-	-/-
Sodium Hydroxide: Diethylene Triamine: Water (ethylenediamine, 10% of concentration)	10 10 70	-	-	-	-	-/-	-	-	60	-/-	-/-
Sodium Hydroxide: Phosphoric Acid		-	NR	NR	-	77/77	77	-	-	-/-	-/-
Sodium Hydroxide: Phosphoric Acid (phosphoric acid with polyvinyl alcohol, alternately)	30 8	-	NR	NR	-	99/99	99	99	-	-/-	-/-
Sodium Hydroxide: Sodium Bisulfide	15 15	-	-	-	-	60/60	60	-	60	NR/NR	-/-
Sodium Hydroxide: Sodium Hydrosulfide	15 15	-	-	-	-	60/60	60	-	60	NR/NR	-/-
Sodium Hydroxide: Sodium Thiosulfate: Sodium Sulfide	30 2 2	-	-	-	-	-/-	-	NR	71	NR/NR	NR/NR
Sodium Hydroxide: Sulfuric Acid, Paste (sulfide reduction process, sodium hydroxide - 10% exposure time, sulfuric acid - 90% exposure time)	5 20	-	-	-	-	-/-	-	66	-	-/-	-/-
Sodium Hydroxide, Wet: Sodium Chloride (chute, 100-150 tons/day)		-	-	-	-	-/-	-	32	-	-/-	-/-

See page 13 for footnotes.

See page 11 for list of trademarks and product names.

TEMPERATURE (°C) FOR RESIN TYPES

CHEMICAL ENVIRONMENT	CONCEN-TRATION %	High Performance Epoxy Vinyl Ester Resins				Epoxy Vinyl Ester Resins					Fume Service
		HETRON 942/35	HETRON 980/35	HETRON FR998/35	HETRON 970/35	HETRON 922/FR992	HETRON 980	HETRON 197-3	HETRON 800	AROPOL 7241/7334	HETRON 92/99P
Sodium Hypochlorite (stable) **.Footnotes 2,3,5,19**	2	49	49	49	49	66/66	66	52	NR	-/NR	52/-
Sodium Hypochlorite (stable) **.Footnotes 2,3,5,19**	5.25	49	49	49	49	66/66	66	52	NR	-/NR	52/NR
Sodium Hypochlorite (stable) **.Footnotes 2,3,5,19**	10	49	49	49	49	66/66	66	49	NR	-/NR	38/NR
Sodium Hypochlorite (stable) **.Footnotes 2,3,5,19**	15	-	NR	NR	NR	66/66	66	43	NR	NR/NR	NR/NR
Sodium Hypochlorite Bleach Reactor .Footnote 2	6	-	NR	NR	NR	-/-	-	60	-	NR/NR	NR/-
Sodium Hypochlorite Reactor (10% excess sodium hydroxide)	15	-	-	-	-	49/49	49	-	-	-/-	-/-
Sodium Hypochlorite Vapors (concentration above 5.25%)		-	-	-	-	66/66	66	-	60	-/-	66/-
Sodium Lauryl Sulfate	100	-	71	71	71	82/82	82	38	-	-/-	-/-
Sodium Meta-Arsenite	50	-	-	-	-	-/-	-	54	-	-/-	-/-
Sodium Methacrylate (pH 10 - 10.5)	25	-	-	-	-	-/-	-	82	-	-/-	-/-
Sodium Monophosphate (sat'd.)		-	99	99	99	99/99	104	-	-	82/66	-/66
Sodium Nitrate (sat'd.)		-	99	99	99	99/99	104	121	-	82/66	104/104
Sodium Nitrate: Sodium Chloride: Sulfuric Acid	8 8 20	-	-	-	-	-/-	-	82	-	-/-	-/-
Sodium Nitrite (sat'd.)		-	-	-	-	99/99	104	82	-	82/66	82/-
Sodium Oxalate (sat'd.)		-	-	-	99	-/-	-	-	107	-/-	-/-
Sodium Persulfate	20	-	-	-	-	49/49	49	-	-	-/-	-/-
Sodium Persulfate: Copper (concentration in g/l, trace of sulfuric acid)	3 30	-	-	-	-	74/74	-	74	-	-/-	-/-
Sodium Phosphate: Phosphoric Acid (scrap liquor, pH 1-3)		-	-	-	-	-/-	-	93	-	-/-	-/-
Sodium Phosphate, Mono (pH 1-3)	10	-	-	-	99	-/-	-	93	-	-/-	-/-
Sodium Polyacrylate (pH 9 - 10.5)	25	-	82	82	82	66/66	66	82	-	-/-	-/-
Sodium Potassium (depleted brines)	100	-	-	-	-	-/-	-	93	-	-/-	-/-
Sodium Silicate .Footnote 1	6	-	99	99	99	99/99	104	71	71	32/NR	-/-
Sodium Silicate (pH 12) **.Footnote 1**		-	-	-	-	-/-	-	93	-	NR/NR	-/-
Sodium Sulfate	100	-	99	99	99	99/99	104	104	121	79/66	32/82
Sodium Sulfate: Boric Acid (sodium sulfate with traces of sulfuric acid, hydrogen peroxide, iron and chloride, temperature cycled) **.Footnote 9**	25 15	-	-	-	-	96/96	96	96	-	-/-	-/-
Sodium Sulfate: Sodium Bisulfite: Sodium Sulfite	15 15 15	-	-	-	-	-/-	-	74	-	-/-	-/-
Sodium Sulfate: Sodium Carbonate: Sodium Bicarbonate (0.1% fluoride fumes, electrostatic precipitator) **.Footnote 2**	3 .5 .1	-	-	-	-	85/85	85	85	-	-/-	-/-
Sodium Sulfate: Sodium Xylene: Sulfonate	2 40	-	-	-	-	-/-	-	66	-	-/-	NR/-
Sodium Sulfate: Sulfuric Acid	23 35	-	-	-	-	-/-	-	82	-	-/-	-/-
Sodium Sulfate: Sulfuric Acid (saturated with chlorine)	23 35	-	-	-	-	-/-	-	54	-	-/-	-/-
Sodium Sulfate: Sulfuric Acid (traces of carbon disulfide and hydrogen sulfide)	20 10	-	-	-	-	-/-	-	52	-	-/-	-/-
Sodium Sulfate: Sulfuric Acid (saturated in carbon disulfide)	5 3	-	-	-	-	-/-	-	60	-	-/-	-/-
Sodium Sulfate: Sulfuric Acid: Zinc Sulfate (saturated with hydrogen sulfite, traces of carbon sulfite and amines)	8 4 3	-	-	-	-	-/-	-	85	-	-/-	85/-
Sodium Sulfate: Sulfuric Acid: Zinc Sulfate	20 10 8	-	-	-	-	35/35	35	-	-	-/-	-/-
Sodium Sulfate: Sulfuric Acid: Zinc Sulfate	5 5 3	-	96	96	-	96/96	96	-	-	-/-	-/-
Sodium Sulfhydrate	15	-	-	-	-	60/60	60	71	60	-/-	-/-
Sodium Sulfhydrate	45	-	-	-	-	60/60	60	71	60	NR/NR	-/-
Sodium Sulfhydrate	65	-	-	-	-	-/-	-	71	-	NR/NR	-/-
Sodium Sulfide	10	-	-	-	99	99/99	104	60	104	27/NR	32/-
Sodium Sulfide (sat'd.)		-	-	-	99	99/99	104	NR	104	NR/NR	NR/32
Sodium Sulfide: Sodium Thiosulfate: Sodium Hydroxide	2 2 30	-	-	-	-	-/-	-	NR	71	NR/NR	NR/NR
Sodium Sulfite	100	-	99	99	99	99/99	104	104	-	32/32	93/-
Sodium Sulfite: Sodium Bisulfite (sat'd.)	50 50	-	-	-	-	-/-	-	66	-	-/-	-/-
Sodium Sulfite: Sodium Bisulfite: Sodium Sulfate	15 15 15	-	-	-	-	-/-	-	74	-	-/-	-/-
Sodium Sulfite: Sulfuric Acid: Chlorate (methanol)		-	-	-	-	-/-	-	52	-	-/-	-/-

See page 13 for footnotes.

See page 11 for list of trademarks and product names.

TEMPERATURE (°C) FOR RESIN TYPES

CHEMICAL ENVIRONMENT	CONCENTRATION %	High Performance Epoxy Vinyl Ester Resins				Epoxy Vinyl Ester Resins					Fume Service
		HETRON 942/35	HETRON 980/35	HETRON FR998/35	HETRON 970/35	HETRON 922/FR992	HETRON 980	HETRON 197-3	HETRON 800	AROPOL 7241/7334	HETRON 92/99P
Sodium Tartrate (sat'd.)		-	-	-	99	-/-	-	-	107	-/-	-/-
Sodium Tetraborate (sat'd.)		-	82	82	82	93/93	93	82	93	82/66	-/82
Sodium Tetrachlorophenate	13	-	-	-	-	-/-	-	32	-	-/-	-/-
Sodium Thiocyanate	100	-	93	93	93	93/93	93	-	-	-/-	-/-
Sodium Thiosulfate	100	-	82	82	82	49/49	49	-	104	32/32	-/32
Sodium Thiosulfate: Sodium Hydroxide: Sodium Sulfide	2 30 2	-	-	-	-	-/-	-	NR	71	NR/NR	NR/NR
Sodium Tripolyphosphate (sat'd.)		-	99	99	99	99/99	99	52	-	52/27	-/52
Sodium Xylene Sulfate: Isopropyl Alcohol: Inerts (traces of potassium ricinoleate and o-phenylphenol)	10 10 67	-	-	-	-	38/38	38	38	38	-/-	-/-
Sodium Xylene Sulfonate	40	-	-	-	71	99/99	104	66	-	32/NR	-/-
Sodium Xylene Sulfonate: Lauric/Myristic Monoethanolamide (solution)		-	-	-	-	49/49	49	49	-	-/-	-/-
Sodium Xylene Sulfonate: Sodium Sulfate	40 2	-	-	-	-	-/-	-	66	-	-/-	NR/-
SOFTENER B		-	-	-	-	88/88	88	88	88	88/66	88/-
Soil (includes: acid soil, Bainbridge, GA; alkaline soil, Roswell, NM; clay soil)		-	-	-	-	32/32	32	32	-	32/32	32/-
Soil, Fumigant (dilute)		-	-	-	-	-/-	-	NR	49	NR/NR	NR/-
Solvent BKOH AMSCO		-	-	-	-	38/38	38	38	-	38/38	-/-
Sorbitol		-	66	66	82	66/66	66	-	-	-/-	-/82
Soya Oil	100	-	99	99	99	82/82	82	-	-	82/54	-/-
Soya Oil: Sulfuric Acid	90 10	-	-	-	-	-/-	-	149	-	-/-	-/-
Soybean Oil (epoxidized)	100	66	99	99	66	49/49	66	52	-	-/-	-/-
SP-181 (oil treating chemical)		-	-	-	-	-/-	-	-	-	27/-	-/-
Spent Acid (excess sulfuric acid, pH 1)	2	-	-	-	-	NR/NR	-	93	93	-/-	-/-
Spent Acid: Lignin: Tall Oil, Crude (sulfuric acid = 1% of concentration, pH 3)	29 60 10	-	-	-	-	NR/NR	-	93	93	-/-	-/-
Spent Acid: Tall Oil (lignin, pH 1)	2	-	-	-	-	NR/NR	-	93	93	-/-	-/-
Spent Acid: Tall Oil, Crude (lignin, pH 4.3)	2	-	-	-	-	NR/NR	-	93	93	-/-	-/-
STACKFAS MASTIC		-	-	-	-	-/-	-	38	-	-/-	-/-
Stainless Steel Pickle (sulfamic acid = 6 oz/gal, ferric sulfate = 0.1 oz/gal)		-	-	-	-	-/-	-	71	-	-/-	-/-
Stannic Chloride	100	-	82	82	99	82/82	82	82	107	82/38	32/82
Stannous Chloride	100	-	99	99	99	99/99	99	121	-	82/38	93/93
Starch		-	-	-	-	-/-	-	82	-	-/-	-/-
Starch Hydrolyzer		-	-	-	-	-/-	-	143	-	-/-	-/-
Starch, Digested, Neutralizer		-	-	-	-	-/-	-	121	-	-/-	-/-
Steam (traces of ammonia, phosphoric acid and fluorine) **Footnote 2**		-	-	-	-	-/-	-	60	-	-/-	-/-
Steam (trace of ammonia)		-	-	-	104	-/-	-	99	-	-/-	-/-
Steam (sulfuric acid fumes = 0.05%)		-	-	-	104	-/-	-	149	-	-/-	-/-
Steam		-	104	104	104	99/99	104	104	-	66/66	38/38
Steam: Chlorine Dioxide: Chlorine Footnote 21		-	82	82	82	-/-	82	66	-	-/-	-/-
Steam: Sulfuric Acid (cyanuric acid tank, calcined urea)	16	-	-	-	-	-/-	-	99	-	99/NR	-/-
Stearic Acid	100	-	99	99	99	99/99	104	121	121	82/66	93/93
Styrene	100	-	27	27	49	NR/NR	27	NR	-	NR/NR	NR/NR
Styrene Emulsions: Acrylic Emulsions (DW-875, U-3400, and U-7001, all trademarks)		-	-	-	-	-/-	-	27	-	-/-	-/-
Succinonitrile	100	-	38	38	38	38/38	38	-	-	-/-	-/-
Sugar Beet, Liquor		-	82	82	82	82/82	82	-	-	-/-	-/-
Sugar Cane, Liquor	100	82	82	82	82	82/82	82	-	-	-/-	-/-
Sugar Solution Footnote 6	60	-	99	99	99	99/99	99	-	-	32/32	-/-
Sulfamic Acid	15	99	99	99	99	99/99	99	71	-	71/38	-/71
Sulfanilic Acid	100	-	99	99	99	99/99	99	-	-	-/-	-/-
Sulfate Recovery Boiler Gases		-	-	-	-	-/-	-	149	-	-/-	-/-
Sulfate Salts: Sulfuric Acid (sulfates include metal, salts, sodium, magnesium and zinc)	24 10	-	-	-	-	-/-	-	57	-	-/-	-/-
Sulfate Electrostatic Precipitator Fumes (traces of carbonate, fluorides and bicarbonates) **Footnote 1**	3	-	-	-	-	85/85	85	85	-	-/-	-/-
Sulfate: Ferrous Sulfate	15 16	-	-	-	-	-/-	-	-	-	-/-	-/-
Sulfide Anolyte (nickel plating tank, pH 1.5)		-	-	-	-	-/-	-	66	-	-/-	-/-
Sulfide Anolyte: Nickel Sulfate: Nickel Chloride (electrorefining process, pH 1.5)		-	-	-	-	-/-	-	77	-	-/-	-/-
Sulfite Liquors		-	104	104	-	99/99	104	71	-	71/49	71/71

See page 13 for footnotes.

See page 11 for list of trademarks and product names.

TEMPERATURE (°C) FOR RESIN TYPES

CHEMICAL ENVIRONMENT	CONCEN-TRATION %	High Performance Epoxy Vinyl Ester Resins				Epoxy Vinyl Ester Resins					Fume Service
		HETRON 942/35	HETRON 980/35	HETRON FR998/35	HETRON 970/35	HETRON 922/FR992	HETRON 980	HETRON 197-3	HETRON 800	AROPOL 7241/7334	HETRON 92/99P
Sulfo-Isophthalic, (5-) **Acid** (sodium salt)	25	-	-	-	-	-/-	-	38	-	-/-	-/-
Sulfonated Aliphatics (hydrochloric acid, hydrogen sulfide and butanol)		-	-	-	-	-/-	-	60	-	-/-	-/-
Sulfonyl Chloride, Aromatic	100	-	-	-	-	-/-	-	27	-	NR/NR	-/-
Sulfophthalic Acid, (4-)	25	-	-	-	-	-/-	-	49	-	-/-	-/-
Sulfophthalic Acid, (4-): **Sulfuric Acid**	50 1.6	-	-	-	-	-/-	-	32	-	LS32/NR	-/-
Sulfur		-	-	-	149	-/-	-	-	-	-/-	-/93
Sulfur Burner (wet gas and gas cooler)		-	-	-	-	NR/-	-	177	-	NR/NR	-/-
Sulfur Chloride	100	-	NR	NR	-	NR/NR	NR	NR	107	NR/NR	NR/-
Sulfur Chloride, Vapor		-	-	-	93	NR/NR	-	-	-	NR/NR	-/-
Sulfur Coal (power plant scrubber, pH 1.9 - 3.6, includes mist, fumes and liquor)		-	-	-	-	-/-	-	66	-	-/-	-/-
Sulfur Dichloride	100	-	-	-	-	-/-	-	NR	38	NR/NR	NR/-
Sulfur Dichloride, Vapor		-	NR	NR	-	NR/NR	NR	-	27	NR/NR	-/-
Sulfur Dioxide (dry or wet)	100	-	121	121	121	99/99	121	121	121	82/66	93/-
Sulfur Dioxide (desulfurizing, hydrogen sulfide with monoethanolamine)	100	-	-	-	-	NR/NR	-	NR	132	NR/NR	NR/-
Sulfur Dioxide (ammonia scrubber process)		-	-	-	-	-/-	-	32	-	-/-	-/-
Sulfur Dioxide (trace of sulfur trioxide)	2	-	-	-	-	-/-	-	121	-	-/-	121/-
Sulfur Dioxide (saturated with water, hydrogen fluoride, hydrogen sulfide and sulfuric acid) **.....Footnote 1**		-	-	-	-	-/-	-	77	-	-/-	-/-
Sulfur Dioxide Burner Gas (wet)		-	-	-	177	NR/NR	-	177	-	NR/NR	-/-
Sulfur Dioxide Removal (sulfur dioxide removal by CITREX or Citrate Process)		-	-	-	-	-/-	-	60	-	-/-	-/-
Sulfur Dioxide Removal Fossil Fuel (limestone injection mist after scrubber, pH 2 -12)		-	-	-	-	-/-	-	60	-	-/-	-/-
Sulfur Dioxide: Magnesium Bisulfite Acid Liquor (chlorides, pH 4.5 - 5) **.....Footnote 7**	5	-	-	-	-	-/-	-	82	-	-/-	-/-
Sulfur Dioxide: Nitrogen: Oxygen (traces of 80% sulfuric acid)	7 79 15	-	-	-	-	-/-	-	79	-	-/-	-/-
Sulfur Dioxide: Sulfur: Hydrogen Sulfide (electrostatic precipitators)		-	-	-	-	-/-	-	138	-	-/-	-/-
Sulfur Dioxide, Fumes (pulp mill)		-	-	-	-	-/-	-	177	NR	-/-	-/-
Sulfur Dioxide, Fumes: Sulfur Trioxide, Fumes (water spray)		-	49	49	-	49/49	49	-	-	-/-	-/-
Sulfur Dioxide, Fumes: Sulfur Trioxide, Fumes		-	66	66	-	66/66	66	-	-	-/-	-/-
Sulfur Dioxide, Fumes: Sulfur Trioxide, Fumes: Hydrochloric Acid, Fumes (sulfuric acid, caustic and water fumes)		-	-	-	-	-/-	-	88	-	-/-	-/-
Sulfur Dioxide, Vapor: Ammonia, Vapor (by volume)	.06 .02	-	-	-	-	-/-	-	32	-	-/-	-/-
Sulfur Dioxide, Vaporization	100	-	-	-	-	-/-	-	60	-	-/-	-/-
Sulfur Fungicide		-	-	-	-	-/-	-	-	-	82/-	-/-
Sulfur Fungicide (wettable)	8	-	-	-	-	-/-	-	60	-	-/-	60/-
Sulfur Trioxide, Dry	100	-	-	-	149	99/99	104	32	-	NR/NR	32/-
Sulfur Trioxide, Fumes: Sulfur Dioxide, Fumes (water spray)		-	49	49	-	49/49	49	-	-	-/-	-/-
Sulfur Trioxide, Fumes: Sulfur Dioxide, Fumes		-	66	66	-	66/66	66	-	-	-/-	-/-
Sulfur Trioxide, Fumes: Sulfur Dioxide, Fumes: Hydrochloric Acid, Fumes (sulfuric acid, caustic and water fumes)		-	-	-	-	-/-	-	88	-	-/-	-/-
Sulfur Trioxide, Wet	100	-	-	-	-	NR/NR	-	32	-	NR/NR	32/-
Sulfur: Lead: Copper Oxide (10% ferric oxide, 8% zinc sulfate, 3% bismuth sulfate dust)	25 25 18	-	-	-	-	-/-	-	93	-	-/-	-/-
Sulfur: Sulfur Dioxide: Hydrogen Sulfide (electrostatic precipitators)		-	-	-	-	-/-	-	138	-	-/-	-/-
Sulfur, Molten (traces of hydrogen sulfide, sulfur dioxide, sulfur trioxide and water)	100	-	-	-	-	NR/NR	-	127	127	NR/NR	-/-
Sulfur, Molten	100	-	-	-	-	NR/NR	-	121	-	NR/NR	-/-
Sulfur, Molten, Vapors	100	-	-	-	-	-/-	-	149	-	-/-	-/-
Sulfuric Acid	1	99	104	104	104	99/99	104	104	99	82/66	99/99
Sulfuric Acid	5	99	104	104	104	99/99	104	104	99	82/66	99/99
Sulfuric Acid	25	99	104	104	104	99/99	104	104	99	66/49	93/93

See page 13 for footnotes.

See page 11 for list of trademarks and product names.

TEMPERATURE (°C) FOR RESIN TYPES

CHEMICAL ENVIRONMENT	CONCENTRATION %	High Performance Epoxy Vinyl Ester Resins				Epoxy Vinyl Ester Resins					Fume Service
		HETRON 942/35	HETRON 980/35	HETRON FR998/35	HETRON 970/35	HETRON 922/FR992	HETRON 980	HETRON 197-3	HETRON 800	AROPOL 7241/7334	HETRON 92/99P
Sulfuric Acid	50	93	93	93	93	93/93	93	93	93	49/NR	93/93
Sulfuric Acid	70	82	82	82	82	82/82	82	88	88	NR/NR	66/66
Sulfuric Acid	75	38	49	49	49	38/38	49	79	66	NR/NR	38/-
Sulfuric Acid	80	NR	NR	NR	NR	NR/NR	NR	66	38	NR/NR	NR/NR
Sulfuric Acid (heavy polymer, traces of iron and hydrocarbons)	60	-	-	-	-	-/-	-	27	-	-/-	-/-
Sulfuric Acid (xylene derivative, T-amine and alkaline metal salt)	20	-	-	-	-	38/38	38	38	38	38/NR	-/-
Sulfuric Acid (trace of dichlorides)	30	-	-	-	-	NR/NR	-	74	74	-/-	-/-
Sulfuric Acid (trace of dichlorides)	76	-	-	-	-	NR/NR	-	LS74	74	NR/NR	-/-
Sulfuric Acid (gold pickling)	25	-	66	66	-	66/66	66	66	-	66/-	-/-
Sulfuric Acid (with lime, used for treating waste oils, gear, cutting, etc.)	93	-	-	-	-	-/-	-	NR	82	NR/NR	NR/-
Sulfuric Acid (contaminated with manganese sulfate and manganese oxide)	10	-	-	-	-	-/-	-	99	-	-/-	-/-
Sulfuric Acid (trace of organics)	30	-	-	-	-	-/-	-	74	74	-/-	-/-
Sulfuric Acid (trace of organics)	76	-	-	-	-	NR/NR	-	74	74	-/-	-/-
Sulfuric Acid (waste pickle liquid)		-	-	-	-	LS93/LS93	-	93	-	NR/NR	-/-
Sulfuric Acid (2% excess sulfuric acid, spent acid, pH 1)		-	-	-	-	NR/NR	-	93	93	-/-	-/-
Sulfuric Acid (pickle liquid tank covers)	25	-	-	-	-	-/-	-	93	-	-/-	-/-
Sulfuric Acid Vapor	10	99	104	104	121	99/99	104	121	121	82/66	93/93
Sulfuric Acid Vapor	20	-	82	82	121	82/82	82	104	-	82/66	-/-
Sulfuric Acid Vapor	50	-	60	60	121	60/60	60	60	82	49/49	60/60
Sulfuric Acid Vapor	80	-	-	-	121	-/-	-	60	-	-/-	60/60
Sulfuric Acid Vapor (trace of nitric acid)	70	-	-	-	-	NR/NR	-	93	-	-/-	-/-
Sulfuric Acid: Ammonium Bisulfate: Surfactant	30 6 10	-	-	-	-	-/-	-	43	-	-/-	-/-
Sulfuric Acid Anodizing Solution		-	-	-	-	-/-	-	32	-	-/-	-/-
Sulfuric Acid: Aromatic Sulfonic Acid: Hydrochloric Acid (trace of chlorine)	25	-	-	-	-	-/-	-	27	-	-/-	-/-
Sulfuric Acid: Benzene Sulfonic Acid: Water	7 88 5	-	-	-	-	60/60	60	60	60	60/60	-/-
Sulfuric Acid: Chlorate: Sodium Sulfite (methanol)		-	-	-	-	-/-	-	52	-	-/-	-/-
Sulfuric Acid: Chromic Acid (concentration in oz/gal) **.Footnote 2**	16 12.5	-	-	-	-	-/-	-	107	-	NR/NR	-/-
Sulfuric Acid: Chromic Acid (concentration in oz/gal) **.Footnote 2**	20 20	-	-	-	-	NR/NR	-	82	-	NR/NR	-/-
Sulfuric Acid: Chromic Acid (concentration in oz/gal) **.Footnote 2**	32 20	-	-	-	-	-/-	-	32	-	NR/NR	-/-
Sulfuric Acid: Chromic Acid (concentration in oz/gal) **.Footnote 2**	16 3	-	-	-	-	NR/NR	-	68	-	-/-	-/-
Sulfuric Acid: Chromic Acid (concentration in oz/gal) **.Footnote 2**	2.5 250	-	NR	NR	-	NR/NR	NR	60	-	NR/NR	-/-
Sulfuric Acid: Chromic Acid (concentration in oz/gal) **.Footnote 2**	3 300	-	NR	NR	-	NR/NR	NR	66	-	NR/NR	66/-
Sulfuric Acid: Chromic Acid (concentration in oz/gal) **.Footnote 2**	4 400	-	NR	NR	-	NR/NR	NR	82	-	NR/NR	-/-
Sulfuric Acid: Chromic Acid (concentration in oz/gal) **.Footnote 2**	400 400	-	NR	NR	-	NR/NR	NR	60	-	NR/NR	-/-
Sulfuric Acid: Chromic Acid: Hydrofluosilicic Acid (concentration in oz/gal, chrome plating) **.Footnotes 1,2**	.3 45 .5	-	-	-	66	-/-	-	46	-	-/-	-/-
Sulfuric Acid: Chromic Oxide	80 2	-	-	-	-	-/-	-	74	-	-/-	NR/-
Sulfuric Acid: Copper Salts (concentration in g/l)	21 31	-	-	-	-	-/-	-	66	-	-/-	-/-
Sulfuric Acid: Copper Salts (concentration in g/l)	33 31	-	-	-	-	-/-	-	82	-	-/-	-/-
Sulfuric Acid: Copper Salts: Nitric Acid (concentration in g/l)	17 112 9.5	-	-	-	-	-/-	-	82	-	-/-	-/-
Sulfuric Acid: Copper Sulfate	18 5	-	49	49	-	49/49	49	66	-	49/49	66/66
Sulfuric Acid: Copper: Iron (5 g/l zinc slurry/thickener)	10 80 10	-	-	-	-	-/-	-	82	-	-/-	-/-
Sulfuric Acid: Dichromate Bleach (photographic)		-	-	-	-	-/-	-	27	-	-/-	-/-
Sulfuric Acid: Dodecylbenzene Sulfonic Acid: Water (oil = 1% of concentration)	10 85 4	66	66	66	66	-/-	-	66	-	-/-	66/-
Sulfuric Acid: Fatty Acid	5	-	-	-	-	38/38	38	-	-	-/-	-/-
Sulfuric Acid: Ferric Sulfate: Cupric Sulfate	20 10 10	-	-	-	-	-/-	-	82	-	-/-	-/-
Sulfuric Acid: Fluorides: Methyl Isobutyl Ketone (concentrations in g/l) **.Footnote 1**	500 200	-	-	-	-	-/-	-	27	-	-/-	-/-

See page 13 for footnotes.

See page 11 for list of trademarks and product names.

TEMPERATURE (°C) FOR RESIN TYPES

CHEMICAL ENVIRONMENT	CONCEN-TRATION %	High Performance Epoxy Vinyl Ester Resins				Epoxy Vinyl Ester Resins					Fume Service
		HETRON 942/35	HETRON 980/35	HETRON FR998/35	HETRON 970/35	HETRON 922/FR992	HETRON 980	HETRON 197-3	HETRON 800	AROPOL 7241/7334	HETRON 92/99P
Sulfuric Acid: Fluorosilicic Acid: Phosphoric Acid (gypsum slurry cooler) . . . . . **Footnote 1**	5 5 28	-	-	-	-	-/-	-	88	-	-/-	-/-
Sulfuric Acid: Hydrochloric Acid . . .	45 14	-	-	-	-	-/-	-	60	-	-/-	-/-
Sulfuric Acid: Hydrochloric Acid (iron and steel cleaning bath)	23 9	-	99	99	99	93/93	93	82	-	-/-	-/-
Sulfuric Acid: Hydrochloric Acid: Antimony Trioxide	35 15 5	-	-	-	-	-/-	-	38	-	-/-	-/-
Sulfuric Acid: Hydrochloric Acid: Nitric Acid . . . . . **Footnote 3**	20 30 12	-	-	-	-	-/-	-	32	-	-/-	-/-
Sulfuric Acid: Hydrochloric Acid: Water (nitric acid = 10% of concentration)	20 30 40	-	-	-	-	-/-	-	32	-	-/-	-/-
Sulfuric Acid: Hydrofluoric Acid: Sodium Dichromate (hydrochloric acid = 60% by volume) . . **Footnote 1**	28 20 3	-	-	-	-	-/-	-	49	-	-/-	-/-
Sulfuric Acid: Hydrogen Iodide (concentration in g/l)	25 66	-	-	-	-	-/-	-	71	-	-/-	-/-
Sulfuric Acid: Hydrogen Peroxide (traces of zinc sulfate, sodium sulfide and oxygen)	1.5 2	-	99	99	-	99/99	99	-	-	-/-	-/-
Sulfuric Acid: Hydroxyacetic Acid: Phosphoric Acid . . . . . **Footnote 2**	20 29 51	-	-	-	-	-/-	-	118	-	-/-	-/-
Sulfuric Acid: Hydroxylamine Acid Sulfate (saturated hydroxylamine acid sulfate)	70	-	-	-	-	-/-	-	52	-	-/-	-/-
Sulfuric Acid: Hydroxylammonium Acid Sulfate	10 90	-	-	-	-	-/-	-	82	-	-/-	-/-
Sulfuric Acid: Hydroxylammonium Acid Sulfate: Water . . . **Footnote 4**	75 11 14	-	-	-	-	-/-	-	38	-	-/-	-/-
Sulfuric Acid: Hydroxylammonium Acid Sulfate: Water . . . **Footnote 4**	60 20 20	-	-	-	-	-/-	-	38	-	-/-	-/-
Sulfuric Acid: Manganese Sulfate . .	10 90	-	-	-	-	-/-	-	38	-	-/-	-/-
Sulfuric Acid: Manganese Sulfate (concentration in g/l)	28 50	-	-	-	-	-/-	-	93	-	-/-	-/-
Sulfuric Acid: Manganese Sulfate: Ammonium Sulfate (concentration in g/l, pH 9)	30 13 125	-	-	-	-	-/-	-	38	-	-/-	-/-
Sulfuric Acid: Manganese Sulfate: Ammonium Sulfates (concentration in g/l, pH 5)	40 13 135	-	-	-	-	-/-	-	52	-	52/52	52/-
Sulfuric Acid: Nitric Acid Footnote 3	20 5	-	-	-	-	-/-	-	99	-	NR/NR	-/-
Sulfuric Acid: Nitric Acid Footnote 3	15 15	-	-	-	-	-/-	-	82	-	-/-	-/-
Sulfuric Acid: Nitric Acid: Phosphoric Acid (trace of non-ionic surfactant) . . . . . **Footnote 3**	5 20 11	-	-	-	-	27/27	27	-	-	-/-	-/-
Sulfuric Acid: Nitric Acid: Sodium Dichromate (concentration in g/l, trace of chromic sulfate) . . . . . **Footnote 3**	7.8 3.8 25	-	-	-	-	-/-	-	82	-	-/-	-/-
Sulfuric Acid, Organic (alkyl benzene)	75 2	-	-	-	-	-/-	-	71	-	-/-	-/-
Sulfuric Acid: Phosphoric Acid	10 20	-	-	-	-	-/-	-	71	-	-/-	-/-
Sulfuric Acid: Phosphoric Acid: Water (sodium hydroxide = 2% of concentration, trace of trisodium phosphate)	2 14 82	-	-	-	-	-/-	-	38	-	-/-	-/-
Sulfuric Acid: Phosphoric Acid: Water (sodium hydroxide = 2% of concentration, trace of trisodium phosphate)	2.5 20 75	-	-	-	-	-/-	-	38	-	-/-	-/-
Sulfuric Acid: Sodium Bichromate (sugar reaction product, pH 2.6)		-	-	-	-	-/-	-	60	-	-/-	-/-
Sulfuric Acid: Sodium Chlorate (concentration in g/l, saturated with chlorine dioxide, traces of methyl alcohol) . . . . . **Footnote 2**	450 120	-	-	-	-	-/-	-	63	-	-/-	-/-
Sulfuric Acid: Sodium Chlorate: Methyl Alcohol (sodium sulfate)		-	-	-	-	-/-	-	52	-	-/-	-/-
Sulfuric Acid: Sodium Chloride	12 8	-	-	-	-	-/-	-	99	-	-/-	-/-
Sulfuric Acid: Sodium Chloride: Sodium Nitrate	20 8 8	-	-	-	-	-/-	-	82	-	-/-	-/-
Sulfuric Acid: Sodium Dichromate (concentration in oz/gal)	30 3	-	-	-	-	NR/NR	-	66	-	-/-	-/-
Sulfuric Acid: Sodium Dichromate (concentration in oz/gal)	32 4	-	-	-	-	NR/NR	-	71	-	-/-	-/-
Sulfuric Acid: Sodium Dichromate (concentration in oz/gal)	30 5	-	-	-	-	NR/NR	-	82	-	-/-	-/-
Sulfuric Acid: Sodium Dichromate (concentration in oz/gal)	42 5	-	-	-	-	NR/NR	-	71	-	-/-	-/-

See page 13 for footnotes.

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TEMPERATURE (°C) FOR RESIN TYPES

CHEMICAL ENVIRONMENT	CONCENTRATION %	High Performance Epoxy Vinyl Ester Resins				Epoxy Vinyl Ester Resins					Fume Service
		HETRON 942/35	HETRON 980/35	HETRON FR998/35	HETRON 970/35	HETRON 922/FR992	HETRON 980	HETRON 197-3	HETRON 800	AROPOL 7241/7334	HETRON 92/99P
Sulfuric Acid: Sodium Dichromate (concentration in g/l, saturated in chromic sulfate)	9 52	-	-	-	-	NR/NR	-	27	-	-/-	-/-
Sulfuric Acid: Sodium Sulfate	35 23	-	-	-	-	-/-	-	82	-	-/-	-/-
Sulfuric Acid: Sodium Sulfate (saturated with chlorine)	35 23	-	-	-	-	-/-	-	54	-	-/-	-/-
Sulfuric Acid: Sodium Sulfate (traces of carbon disulfide and hydrogen sulfide)	10 20	-	-	-	-	-/-	-	52	-	-/-	-/-
Sulfuric Acid: Sodium Sulfate (saturated in carbon disulfide)	3 5	-	-	-	-	-/-	-	60	-	-/-	-/-
Sulfuric Acid: Sodium Sulfate: Zinc Sulfate (saturated with hydrogen sulfite, traces of carbon sulfite and amines)	4 8 3	-	-	-	-	-/-	-	85	-	-/-	85/-
Sulfuric Acid: Sodium Sulfate: Zinc Sulfate	10 20 8	-	-	-	-	35/35	35	-	-	-/-	-/-
Sulfuric Acid: Sodium Sulfate: Zinc Sulfate	5 5 3	-	96	96	-	96/96	96	-	-	-/-	-/-
Sulfuric Acid: Soya Oil	10 90	-	-	-	-	-/-	-	149	-	-/-	-/-
Sulfuric Acid: Steam (cyanuric acid tank, calcined urea)	16	-	-	-	-	-/-	-	99	-	99/NR	-/-
Sulfuric Acid: Sulfate Salts (sulfates include metal salts, sodium, magnesium and zinc)	10 24	-	-	-	-	-/-	-	57	-	-/-	-/-
Sulfuric Acid: Sulfophthalic Acid, (4-)	1.6 50	-	-	-	-	-/-	-	32	-	LS32/NR	-/-
Sulfuric Acid, 50%: Methyl Ethyl Ketone	90 10	-	-	-	-	27/27	27	27	27	27/-	27/-
Sulfuric Acid, 70%: Nitric Acid, 70% (pickling acid) **Footnote 3**	51 10.5	-	-	-	-	27/27	27	27	-	-/-	-/-
Sulfuric Acid, 93%: Phosphoric Acid, 85%	50 50	-	-	-	-	-/-	-	71	-	NR/NR	NR/NR
Sulfuric Acid, Fumes (scrubber)	33	-	-	-	-	-/-	-	91	-	-/-	-/-
Sulfuric Acid, Fumes: Nitric-Dinitro-Toluene, Fumes **Footnote 3**		-	-	-	-	-/-	-	-	93	NR/NR	-/-
Sulfuric Acid, Paste: Sodium Hydroxide (sulfide reduction process, sodium hydroxide - 10% exposure time, sulfuric acid - 90% exposure time)	20 5	-	-	-	-	-/-	-	66	-	-/-	-/-
Sulfuric Acid, Waste (leaching, pH 2-5)		-	-	-	-	-/-	-	-	-	32/32	-/-
Sulfuric Acid, Waste (177 g/l with metal salts)		-	-	-	-	-/-	-	-	-	-/-	-/-
Sulfuric Evaporation (concentration up to 70%)	70	-	-	-	-	NR/NR	-	85	-	NR/NR	-/-
Sulfurous Acid	10	-	38	38	49	38/38	38	66	93	NR/NR	32/32
Sulfurous Acid (sat'd.)		-	38	38	-	38/38	38	66	-	NR/NR	-/-
Sulfurous Acid (acidic gas atmosphere, saturated and weak at 3600 fpm) **Footnote 1**		-	-	-	-	-/-	-	32	-	-/-	-/-
Surfactant (nonyl phenoxytriethoxy ethanol type)	28	-	-	-	-	-/-	-	38	38	-/-	-/-
Surfactant (modified linear aliphatic polyether, nonionic)		-	-	-	-	NR/NR	-	49	-	-/-	-/-
Surfactant, Alkanolamide	100	-	-	-	-	-/-	-	49	-	-/-	-/-
Surfactant: Ammonium Bisulfate: Sulfuric Acid	10 6 30	-	-	-	-	-/-	-	43	-	-/-	-/-
Surfactant, Anionic	58	-	-	-	-	-/-	-	49	-	-/-	-/-
Surfactant, Nonionic: Alkanolamide	55	-	-	-	-	-/-	-	49	-	-/-	-/-
Surfactant, Nonionic: Alkyl Ether Amine Oxide (nonionic)		-	49	49	-	49/49	49	49	49	49/49	-/-
Surfactant, Nonionic, TERGITOL 15-S-9	100	-	-	-	-	-/-	-	38	-	-/-	-/-
Surfactant, Polyethylene, Oxy Derivative	100	-	-	-	-	-/-	-	41	-	-/-	-/-
Surfactants, Amide Type	100	-	-	-	-	-/-	-	49	-	-/-	-/-
Surfactants, Linear Primary Alcohol Type (also includes alcohol type-ethanol)	100	-	-	-	-	-/-	-	49	-	-/-	-/-
Sweetwater		82	82	82	-	82/82	82	-	-	-/-	-/-
Tall Oil		-	66	66	104	66/66	66	93	-	-/-	-/-
Tall Oil, Crude: Spent Acid (lignin, pH 4.3)	2	-	-	-	-	NR/NR	-	93	93	-/-	-/-
Tall Oil, Crude: Spent Acid: Lignin (sulfuric acid = 1% of concentration, pH 3)	10 29 60	-	-	-	-	NR/NR	-	93	93	-/-	-/-
Tall Oil: Spent Acid (lignin, pH 1)	2	-	-	-	-	NR/NR	-	93	93	-/-	-/-
Tannic Acid (sat'd.)		-	-	-	99	99/99	99	121	-	82/66	93/93

See page 13 for footnotes.

See page 11 for list of trademarks and product names.

TEMPERATURE (°C) FOR RESIN TYPES

CHEMICAL ENVIRONMENT	CONCEN-TRATION %	High Performance Epoxy Vinyl Ester Resins				Epoxy Vinyl Ester Resins					Fume Service
		HETRON 942/35	HETRON 980/35	HETRON FR998/35	HETRON 970/35	HETRON 922/FR992	HETRON 980	HETRON 197-3	HETRON 800	AROPOL 7241/7334	HETRON 92/99P
Tar Camphor	100	-	-	-	-	-/-	-	27	-	-/-	27/-
Tartaric Acid (sat'd.)		-	99	99	99	99/99	99	121	121	82/66	104/104
TELONE, Fumigant (conc.) **.Footnote 4**		-	-	-	-	-/-	-	NR	49	-/-	-/-
Terephthalic Acid: Hydrochloric Acid: Water (dimethylformamide = 7% of concentration)	14 28 51	-	-	-	-	-/-	-	38	38	-/-	-/-
TERGITOL 15-S-9 Surfactant, Nonionic	100	-	-	-	-	-/-	-	38	-	-/-	-/-
Tetrachlorocyclopentane (saturated with chlorine, traces of hydrochloric acid, carbon tetrachloride, hexachlorocyclopentane)	100	-	-	-	-	-/-	-	71	-	-/-	-/-
Tetrachloroethene	100	-	-	-	49	-/-	-	-	107	-/-	-/-
Tetrachloroethylene (also called perchloroethylene)		-	-	-	-	-/-	-	-	-	-/-	-/-
Tetrachlorophenol (sodium salt)	13	-	-	-	-	-/-	-	32	-	-/-	-/-
Tetrachloropyridine	100	-	-	-	49	49/49	49	49	-	-/-	-/-
Tetrahydrofuran	100	-	-	-	-	-/-	-	-	38	-/-	-/-
Tetrahydrofuryl Alcohol	100	-	-	-	-	-/-	-	-	107	-/-	-/-
Tetrakis (Hydroxymethyl) **Phosphonium Chloride** (vapors, also hydrochloric acid and water vapors)		-	-	-	-	-/-	-	32	-	-/-	32/-
Tetrakis (Hydroxymethyl) **Phosphonium Chloride**	100	-	-	-	-	-/-	-	77	-	-/-	-/-
Tetrapotassium Pyrophosphate	60	-	-	-	66	38/38	38	52	-	32/NR	52/52
Tetrasodium Ethylenediamine Tetraacetate	100	-	-	-	-	66/66	66	-	-	-/-	-/-
Tetrasodium Pyrophosphate	5	-	-	-	-	66/66	66	52	-	52/-	-/52
Tetrasodium Pyrophosphate (sat'd)		-	-	-	-	38/38	38	-	-	32/NR	-/52
TEXTONE Bleach		-	-	-	99	99/99	104	-	-	-/-	-/-
THERMOLIN RF-230	100	-	-	-	-	-/-	-	35	-	-/-	-/-
Thioglycol Acid	10	-	-	-	38	38/38	38	-	-	-/-	-/-
Thioglycol, Mono	100	-	-	-	-	-/-	-	27	27	-/-	-/-
Thionyl Chloride, Vapor	100	-	-	-	-	-/-	-	66	-	NR/NR	NR/-
Tin Fluoborate, Metal Plating (18% stannous fluoborate, 7% tin, 9% fluoboric acid, 2% boric acid) **.Footnote 1**		-	99	99	99	93/93	93	93	-	-/-	-/-
TINOFIX QF	50	-	-	-	-	-/-	-	32	32	32/32	-/-
Titanium Chloride (sat'd.)		-	-	-	-	-/-	-	-	107	-/-	-/-
Titanium Sulfate (sat'd.)		-	-	-	-	-/-	-	-	107	-/-	-/-
Titanium Sulfate (reduction process)		-	-	-	-	-/-	-	27	-	-/-	-/-
Tobias Acid	100	-	99	99	99	99/99	99	-	-	-/-	-/-
Toluene	100	-	49	49	49	NR/NR	38	32	107	NR/NR	32/32
Toluene Diisocyanate (sat'd.)		-	-	-	-	27/27	27	66	-	NR/NR	-/NR
Toluene Sulfonic Acid	65	-	99	99	99	99/99	99	38	38	-/-	-/-
Toluene Sulfonic Acid	100	-	99	99	99	99/99	99	-	107	-/-	-/-
Toluene: Acetone	50 50	NR	NR	NR	NR	NR/NR	NR	-	32	-/-	-/-
Toluene: Aromatic: Aliphatic (xylene = 3% of concentration)	86 5 6	-	-	-	-	-/-	-	-	-	32/-	-/-
Toluene, Vapor	100	-	-	-	-	-/-	-	93	93	-/-	-/-
Toluene, Vapor & Condensate	100	-	-	-	-	-/-	-	49	49	-/-	49/-
Toluene, Vapor & Reflux	100	-	-	-	-	-/-	-	110	110	-/-	-/-
Toxaphene: Xylene	90 10	-	-	-	-	-/-	-	49	49	-/-	-/-
Transmission Fluid, Automatic	100	-	-	-	-	-/-	-	-	-	32/-	-/-
Tributyl Phosphate	100	-	66	66	60	-/-	66	-	-	66/NR	-/-
Tributyl Phosphate: Aromatic Solvent	35 65	-	-	-	-	-/-	-	32	32	-/-	-/-
Trichloroacetic Acid	50	-	99	99	99	99/99	99	93	-	32/-	93/-
Trichloroacetonitrile (traces of acetonitrile and hydrochloric acid)	100	-	-	-	-	-/-	-	29	29	-/-	-/-
Trichlorobenzene	100	-	-	-	-	NR/NR	-	NR	107	NR/NR	NR/-
Trichlorobenzene, Vapors (wet with hydrochloric acid)		-	-	-	-	-/-	-	99	-	-/-	-/-
Trichloroethane, (1,1,1-)	100	-	27	27	49	-/-	27	NR	49	NR/NR	NR/-
Trichloroethylene .Footnote 4	100	-	NR	NR	NR	NR/NR	NR	NR	82	NR/NR	NR/-
Trichloroethylene, (1,1,2-)	100	-	NR	NR	NR	NR/NR	NR	NR	85	NR/NR	NR/-
Trichloroethylene, Fumes (22% hydrochloric acid, 10% chlorine, 9% oxygen, 6% carbon monoxide and 4% hydrogen)		-	-	-	-	-/-	-	-	79	-/-	79/-
Trichloroethylene, Vapors (hydrochloric acid, chlorine and water vapors)		-	-	-	-	-/-	-	49	-	-/-	49/-
Trichloromonofluoromethane .Footnote 1	100	-	27	27	38	-/-	27	-	-	-/-	-/-
Tricresyl Phosphate	100	-	49	49	71	27/27	49	-	71	-/-	-/-
Tridecylbenzene Sulfonate (detergent based)		-	-	-	-	49/49	49	49	-	-/-	-/-

See page 13 for footnotes.

See page 11 for list of trademarks and product names.

TEMPERATURE (°C) FOR RESIN TYPES

CHEMICAL ENVIRONMENT	CONCEN-TRATION %	High Performance Epoxy Vinyl Ester Resins				Epoxy Vinyl Ester Resins					Fume Service
		HETRON 942/35	HETRON 980/35	HETRON FR998/35	HETRON 970/35	HETRON 922/FR992	HETRON 980	HETRON 197-3	HETRON 800	AROPOL 7241/7334	HETRON 92/99P
Triethanol Ammonium Lauryl Sulfate	100	-	-	-	-	-/-	-	27	-	NR/NR	-/-
Triethanolamine	100	-	66	66	66	66/66	66	-	-	-/-	-/-
Triethanolamine Linear Alkylate Sulfonate	60	-	-	-	-	-/-	-	38	-	-/-	-/-
Triethylamine	100	-	49	49	49	66/66	66	-	66	-/-	-/-
Triethylene Glycol	100	-	-	-	82	-/-	-	82	-	-/-	-/-
Trifluorovinyl Chloride (oils and greases) **Footnote 1**	100	-	-	-	-	-/-	-	32	-	-/-	32/-
Trihydroxybenzoic Acid (sat'd.)		-	-	-	-	-/-	-	27	121	-/-	-/-
Tri-m-butyl Phosphate:											
Cobalt di (2 ethyl hexyl) **Phosphate:**											
Livestock Spray Base (Shell's)	5 30 65	-	-	-	-	-/-	-	82	-	-/-	-/-
Trimethyl Borate (in methyl alcohol) **Footnote 3**	98	-	-	-	-	-/-	-	66	-	-/-	-/-
Trimethyl Carbinol	100	-	-	-	-	-/-	-	38	-	-/-	-/-
Trimethylamine Hydrochloride (pH 3 - 4)	100	-	-	-	-	54/54	54	54	-	54/-	-/-
Trimethylamine: Hydrochloric Acid	100 37	-	-	-	-	-/-	-	54	-	-/-	-/-
Trimethylamine: Hydrochloric Acid (ethylene oxide reaction)		-	-	-	-	-/-	-	NR	-	-/-	-/-
Triphenyl Phosphate	100	-	38	38	-	38/38	38	49	-	32/NR	-/32
Trisodium Phosphate	25	-	121	121	121	99/99	99	66	-	-/-	-/-
Trisodium Phosphate (sat'd.)		-	121	121	121	99/99	99	32	-	NR/NR	32/-
Tuna Oil	100	-	-	-	-	71/71	71	-	-	71/49	-/-
Turpentine, Crude Sulfate		-	-	-	-	38/38	38	LS38	NR	38/NR	LS100/-
Turpentine, Pure Gum	100	-	-	-	-	32/32	38	49	-	32/-	-/32
Ultraformer Feed, Refinery (also includes heavy feed)		-	-	-	-	-/-	-	-	-	32/32	-/-
Ultraformer Feed, Xylene		-	-	-	-	-/-	-	32	-	-/-	-/-
Uranium Extraction		-	-	-	82	-/-	-	32	-	-/-	-/-
Uranium SX Units		-	-	-	-	32/32	32	32	-	-/-	-/-
Urea (sat'd.)		-	49	49	49	82/82	82	71	107	66/32	-/32
Urea: Ammonium Chloride: Ammonium Nitrate	38 2.5 20	-	-	-	-	-/-	-	32	-	-/-	-/-
Urea: Ammonium Nitrate: Water	40 10 50	-	-	-	-	49/49	-	-	-	-/-	-/-
Urea: Ammonium Nitrate: Water	20 30 50	-	-	-	-	49/49	-	-	-	-/-	-/-
Urea: Ammonium Nitrate: Water	35 44 21	-	-	-	-	-/-	-	49	-	-/-	-/-
Urea: Ammonium Nitrate: Water (URAN fertilizer, ammonium nitrate composition)	35.4 44.3 20.3	66	-	-	49	-/-	-	49	-	-/-	-/-
Urea-Formaldehyde Resin	100	-	-	-	49	-/-	-	27	-	-/-	-/-
Uric Acid (conc.)		-	-	-	-	-/-	-	-	107	-/-	-/-
Urotropine	28	-	-	-	-	-/-	-	27	-	-/-	27/-
Vanasol	1	-	-	-	-	27/27	27	27	-	27/-	-/-
VARIQUAT K-300		-	-	-	-	49/49	49	49	49	49/49	49/-
VARISOFT 222-90		-	-	-	-	49/49	49	49	49	49/49	49/-
VAROX 185E		-	-	-	-	49/49	49	49	49	49/49	-/-
VARSOL	100	-	-	-	-	93/93	93	93	-	93/NR	NR/-
Veneer Drying Fumes		-	-	-	-	-/-	-	149	-	-/-	-/-
VIDDEN D Fumigant (conc.) **Footnote 4**		-	-	-	-	-/-	-	NR	49	-/-	-/-
Vinegar	100	-	99	99	99	99/99	93	99	-	82/66	32/-
Vinyl Toluene	100	-	27	27	49	27/27	27	27	-	NR/NR	-/-
Vinylidene Chloride: 190D	2 98	-	-	-	-	-/-	-	32	-	-/-	-/-
Vinylidene Chloride: Acrylic Acid Dispersion	2 98	-	-	-	-	-/-	-	32	-	-/-	-/-
VIVO-ZYNE	100	-	-	-	-	-/-	-	-	-	38/38	-/-
Wash Solution (pH 13.6)		-	-	-	-	-/-	-	NR	-	-/-	NR/-
Waste Water Treatment		-	-	-	-	-/-	-	-	-	-/-	-/38
Waste, Organic, Vapors (water, hydrochloric acid and chlorine vapors)		-	-	-	82	-/-	-	79	-	-/-	-/-
Water (contaminated with aromatic solvents, hydrocarbon resins, organics, slightly acid to basic)		-	-	-	-	-/-	-	38	-	-/-	38/-
Water (pH 3, pH 7, pH 10)		-	-	-	-	-/-	-	52	-	32/32	-/-
Water (13,000 ppm acetic acid)		-	-	-	-	-/-	-	66	-	66/66	-/-
Water (3,000 ppm iso-octyl alcohol)		-	-	-	-	-/-	-	66	-	66/66	-/-
Water (100 ppm methylene chloride)		-	-	-	-	-/-	-	66	-	66/66	-/-
Water (saturated with 1.5 - 2.5% ozone in oxygen)		-	-	-	-	-/-	-	60	-	-/-	-/-
Water (50 ppm phenol)		-	-	-	49	-/-	-	32	-	-/-	-/-
Water (500 ppm sodium chloride)		-	-	-	-	-/-	-	66	-	66/66	-/-
Water (8000 ppm chlorobenzene)		-	-	-	-	-/-	-	66	-	66/49	-/-
Water (pH 5 - 9 (1-13 at times) with hydrochloric acid, chlorine, benzoic acid, benzoyl, benzal, benzyl chlorides present)		-	-	-	-	-/-	-	49	-	-/-	-/-
Water Slurry: Coal Footnote 24	90 10	-	-	-	-	-/-	-	27	-	-/-	-/-
Water Treatment (dye plant, pH 2-3)		-	-	-	-	-/-	-	82	-	-/-	-/-

See page 13 for footnotes.

See page 11 for list of trademarks and product names.

TEMPERATURE (°C) FOR RESIN TYPES

CHEMICAL ENVIRONMENT	CONCEN-TRATION %	High Performance Epoxy Vinyl Ester Resins				Epoxy Vinyl Ester Resins					Fume Service
		HETRON 942/35	HETRON 980/35	HETRON FR998/35	HETRON 970/35	HETRON 922/FR992	HETRON 980	HETRON 197-3	HETRON 800	AROPOL 7241/7334	HETRON 92/99P
Water Treatment (softening and coagulating)		-	-	-	-	-/-	-	32	-	32/32	32/-
Water: Acetic Acid (traces of sulfuric acid, methylene chloride, octyl alcohol, sodium chloride and chlorobenzene)	48 1.3	-	-	-	-	NR/NR	-	66	-	66/NR	-/-
Water: Acetone	90 10	-	66	66	66	-/-	66	-	66	-/-	-/-
Water: Ammonium Nitrate: Urea	50 10 40	-	-	-	-	49/49	-	-	-	-/-	-/-
Water: Ammonium Nitrate: Urea	50 30 20	-	-	-	-	49/49	-	-	-	-/-	-/-
Water: Ammonium Nitrate: Urea	21 44 35	-	-	-	-	-/-	-	49	-	-/-	-/-
Water: Ammonium Nitrate: Urea (URAN fertilizer, ammonium nitrate composition)	20.3 44.3 35.4	66	-	-	49	-/-	-	49	-	-/-	-/-
Water: Ammonium Thiosulfate: Ammonium Thiocyanate (ammonium sulfate = 2.3% of concentration)	88 5.5 4	-	-	-	-	54/54	54	54	43	54/43	-/-
Water: Aniline Hydrochloride: Hydrogen Bromide (hydrochloric acid = 1.5% and bromine = 1% of concentration)	78 15 4.5	-	-	-	-	60/60	60	60	60	-/-	-/-
Water: Benzene Sulfonic Acid: Sulfuric Acid	5 88 7	-	-	-	-	60/60	60	60	60	60/60	-/-
Water: Benzene: Dimethylformamide (tetrahydrofuran = 5% of concentration)	50 40 5	-	NR	NR	NR	NR/NR	NR	NR	32	NR/NR	NR/NR
Water: Bromine	95 5	-	-	-	-	82/82	93	-	-	-/-	-/-
Water: Chlorine: Hydrochloric Acid (chlorinated organics)		-	-	-	-	NR/NR	-	27	-	-/-	-/-
Water: Diethylene Triamine: Sodium Hydroxide (ethylenediamine = 10% of concentration)	70 10 10	-	-	-	-	-/-	-	-	60	-/-	-/-
Water: Hydrochloric Acid: Sulfuric Acid (nitric acid = 10% of concentration)	40 30 20	-	-	-	-	-/-	-	32	-	-/-	-/-
Water: Hydrochloric Acid: Terephthalic Acid (dimethylformamide = 7% of concentration)	51 28 14	-	-	-	-	-/-	-	38	38	-/-	-/-
Water: Hydroxylammonium Acid Sulfate: Propionic Acid	10 89 1	-	-	-	-	-/-	-	79	-	-/-	-/-
Water: Hydroxylammonium Acid Sulfate: Sulfuric Acid .Footnote 4	14 11 75	-	-	-	-	-/-	-	38	-	-/-	-/-
Water: Hydroxylammonium Acid Sulfate: Sulfuric Acid .Footnote 4	20 20 60	-	-	-	-	-/-	-	38	-	-/-	-/-
Water: Methyl Alcohol	20 80	-	38	38	38	NR/NR	38	38	66	32/27	32/32
Water: Methyl Alcohol, 60% (dissolved heavy organics, traces of heptane, zinc chloride and hydrochloric acid. Organics - 2 phases) **.Footnote 17**		-	-	-	-	-/-	-	60	-	-/-	-/-
Water: Monochlorotoluene	50 50	-	-	-	-	-/-	-	-	93	-/-	-/-
Water: Nitrogen: Carbon Dioxide (by volume, oxygen = 5% of concentration, trace of sulfur dioxide)	14 70 12	-	-	-	-	-/-	-	49	-	-/-	-/-
Water: Nitromethane, (tris- hydroxymethyl) (trace of formaldehyde, pH 3)	49 51	-	-	-	-	49/49	49	49	-	-/-	-/-
Water: Organic Acid, Contaminated	96.5 1.5 2	-	-	-	-	NR/NR	-	66	-	66/NR	-/-
Water: Phosphoric Acid: Sulfuric Acid (sodium hydroxide = 2% of concentration, trace of trisodium phosphate)	82 14 2	-	-	-	-	-/-	-	38	-	-/-	-/-
Water: Phosphoric Acid: Sulfuric Acid (sodium hydroxide = 2% of concentration, trace of trisodium phosphate)	75 20 2.5	-	-	-	-	-/-	-	38	-	-/-	-/-
Water: Pigment Slurry: Hydrochloric Acid (trace of sodium chloride)	88 8 3	-	-	-	-	-/-	-	93	-	-/-	NR/-
Water: Sulfuric Acid: Dodecylbenzene Sulfonic Acid (oil = 1% of concentration)	4 10 85	66	66	66	66	-/-	-	66	-	-/-	66/-
Water, City (10 - 60 psi)	100	-	104	104	-	82/82	104	82	-	71/66	82/-
Water, Condensate (buffered)		-	-	-	-	-/-	-	38	-	-/-	-/-
Water, Condensate (zero hardness, pH 8.5 - 9.5)	100	-	-	-	-	LS93/LS93	-	93	-	-/-	-/-
Water, Condensate (geyser)		-	-	-	-	-/-	-	-	-	52/-	-/-
Water, Condensate		-	-	-	-	-/-	-	-	-	52/-	-/-
Water, Cooling (pH 5.5 - 7) **.Footnote 10**		-	-	-	-	77/77	77	82	-	66/54	-/-
Water, Cooling (20 ppm of chromate)		-	-	-	-	82/82	82	82	-	82/71	-/-
Water, Cooling Tower		-	49	49	-	49/49	49	49	32	49/49	32/32
Water, Deionized .Footnote 6	100	82	104	104	82	82/82	104	82	-	66/49	-/-

See page 13 for footnotes.

See page 11 for list of trademarks and product names.

TEMPERATURE (°C) FOR RESIN TYPES

CHEMICAL ENVIRONMENT	CONCEN-TRATION %	High Performance Epoxy Vinyl Ester Resins				Epoxy Vinyl Ester Resins					Fume Service
		HETRON 942/35	HETRON 980/35	HETRON FR998/35	HETRON 970/35	HETRON 922/FR992	HETRON 980	HETRON 197-3	HETRON 800	AROPOL 7241/7334	HETRON 92/99P
Water, Deionized (high purity, 1.5 umho/cm) . . . . . **Footnote 11**	100	-	32	32	32	32/32	32	-	-	32/NR	-/-
Water, Demineralized	100	82	104	104	82	99/99	104	99	-	82/49	38/38
Water, Distilled	100	82	104	104	104	93/93	104	99	93	71/60	71/-
Water, Geothermal		-	-	-	-	-/-	-	-	-	52/-	-/-
Water, Ground (Organic (1.310 ppm) contaminated, untreated, pH 6.7) . . . . . **Footnote 18**		-	-	-	-	-/-	-	43	-	-/-	-/-
Water, Irrigation		-	32	32	-	32/32	32	32	32	32/32	32/-
Water, Light (FC195)	100	-	-	-	-	-/-	-	71	-	-/-	71/-
Water, Light (FC203)	100	-	-	-	-	NR/NR	-	49	-	49/49	NR/-
Water, Light (FC206A)	100	-	NR	NR	-	NR/NR	NR	49	-	49/49	NR/NR
Water, Steam Condensate	100	-	82	82	82	82/82	82	99	-	71/66	93/-
Water, Vapor & Condensate		-	-	-	-	-/-	-	99	-	-/-	82/-
Water, Vapor: Hydrochloric Acid, Vapor: Methyl Alcohol, Vapor . . . . . **Footnote 17**	5 2 93	-	-	-	-	NR/NR	NR	LS66	38	-/-	-/-
Water, Vapors: Benzene, Vapors (trace of hydrochloric acid)		-	-	-	38	-/-	-	79	-	-/-	-/-
Water, Waste (with solids, oils and grease, also trickling filters)		-	-	-	-	27/27	27	32	27	27/-	32/-
Water, Waste (with pine oil, kerosene, methoxychlor, malathion, xylene, detergents, chlorophyll, surface active agents and other oils)		-	-	-	-	27/27	27	27	27	27/-	-/-
Water, White		-	-	-	-	-/-	-	32	-	-/-	-/-
Water, White (splash and spills)		-	-	-	-	-/-	-	43	-	-/-	43/-
Water, Scrubber (incinerator)		-	-	-	-	-/-	-	82	-	-/-	-/-
Water-Oil Separation		-	-	-	-	-/-	-	32	-	32/32	32/-
Wax, Chlorinated	100	-	-	-	-	82/82	93	-	-	-/-	-/-
Whey		-	-	-	-	-/-	-	-	-	79/-	-/-
Whiskey		-	NR	NR	NR	27/27	27	-	-	-/-	-/-
White Liquor (pulp mill)		-	82	82	82	66/66	66	-	-	-/-	-/-
Wine (storage, fermentation and winery waste) . . . . . **Footnote 6**		-	NR	NR	NR	-/-	-	-	-	32/-	-/-
Wire Pickling Fumes		-	-	-	-	-/-	-	60	-	-/-	-/-
Xylene	100	-	38	38	49	NR/NR	38	38	107	32/NR	NR/32
Xylene: ADOGEN 381	75 25	-	-	-	-	-/-	-	38	-	-/-	-/-
Xylene: Amyl Acetate	70 30	-	-	-	-	-/-	49	NR	49	-/-	-/-
Xylene: 68% Chlorinated Camphene	10 90	-	-	-	-	-/-	-	49	49	-/-	-/-
Xylene: Fatty Nitrogen Compounds	75 25	-	-	-	-	-/-	-	38	-	-/-	-/-
Xylene: Hydrochloric Acid, 28% (hydrochloric acid with inhibitor)	50 50	-	-	-	-	24/24	24	-	-	-/-	-/-
Xylene: Kerosene: Phosphoric Acid, 85%	33 33 35	-	-	-	-	-/-	-	38	-	-/-	-/-
Xylene: Toxaphene	10 90	-	-	-	-	-/-	-	49	49	-/-	-/-
ZIMMITE, Mud Remover	2	-	-	-	-	-/-	-	38	-	-/-	38/-
Zinc Casting Fumes		-	-	-	-	-/-	-	149	-	-/-	-/-
Zinc Chloride	70	-	-	-	-	-/-	-	121	-	-/-	-/-
Zinc Chloride (sat'd.)		-	99	99	154	99/99	99	129	-	82/66	93/93
Zinc Chloride: Sodium Chloride: Ammonium Chloride (zinc chloride plating bath, concentration in oz/gal, pH 4.8 - 5.2)	18 31 3	-	-	-	-	-/-	-	32	-	-/-	-/-
Zinc Cyanides, Metal Plating (9% zinc cyanide, 4% sodium cyanide, 9% sodium hydroxide)		-	-	-	-	71/71	71	NR	-	-/-	NR/32
Zinc Dimethyldithiocarbonate	3.5	-	-	-	-	-/-	-	-	-	-/-	60/-
Zinc Electrolytic Cells		-	-	-	66	-/-	-	60	-	-/-	-/-
Zinc Fluoborate . . . . . **Footnote 1**	50	-	99	99	-	99/99	99	-	-	-/-	-/-
Zinc Hydrosulfite (sat'd.)		-	-	-	-	-/-	-	71	-	-/-	71/71
Zinc Nitrate (sat'd.)		-	99	99	121	99/99	99	82	-	82/66	-/82
Zinc Phosphate		-	-	-	-	-/-	-	93	-	-/-	-/-
Zinc Sulfate	100	-	99	99	121	99/99	99	121	121	82/66	93/93
Zinc Sulfate: Sodium Sulfate: Sulfuric Acid (saturated with hydrogen sulfite, traces of carbon sulfite and amines)	3 8 4	-	-	-	-	-/-	-	85	-	-/-	85/-
Zinc Sulfate: Sulfuric Acid: Sodium Sulfate	8 10 20	-	-	-	-	35/35	35	-	-	-/-	-/-
Zinc Sulfate: Sulfuric Acid: Sodium Sulfate	3 5 5	-	96	96	-	96/96	96	-	-	-/-	-/-
Zinc Sulfite (sat'd.)		-	82	82	-	82/82	82	-	-	66/38	-/66
Zinc: Nickel Hydrophosphate: Hydrofluoric Acid: Fluosilicic Acid (sat'd.) . . . . . **Footnote 1**		-	-	-	-	-/-	-	27	-	-/-	-/-

See page 13 for footnotes.

See page 11 for list of trademarks and product names.

TEMPERATURE (°C) FOR RESIN TYPES

CHEMICAL ENVIRONMENT		High Performance Epoxy Vinyl Ester Resins				Epoxy Vinyl Ester Resins					Fume Service
	CONCEN-TRATION %	HETRON 942/35	HETRON 980/35	HETRON FR998/35	HETRON 970/35	HETRON 922/FR992	HETRON 980	HETRON 197-3	HETRON 800	AROPOL 7241/7334	HETRON 92/99P

Notes

Responsible Care*

Ashland has a strong commitment to our customers, our employees, and to the communities in which we operate and do business.

We believe in maintaining our operations in a totally safe and an environmentally responsible manner. We've focused our efforts on conserving resources and minimizing hazardous materials in both our working environment and at our customers'. In addition, we also participate in the industry's Responsible Care* initiative of the Chemical Manufacturers Association.

A Responsible Care* Company

* Responsible Care is a Service Mark of the Chemical Manufacturers Association

The Source for Composite Resins Solutions

Not only does Ashland manufacture resins for corrosion resistant and flame retardant composites, we also sell everything a fabricator needs to make reinforced composites including materials, supplies and equipment.

Quality Plus℠

Batch to batch uniformity of Ashland's HETRON & AROPOL resin systems not only means easier molding but also consistent performance and quality.

Ashland adopted a continuous improvement process called Quality Plus in the early 1980s. Ashland became a quality leader in many industries we serve; continuous improvement has become an important part of every employee's training and thinking. Driven from the top down, this process still guides all of our operations and activities, and the way we do business.

Product Stewardship

In support of the Responsible Care initiative, we at Ashland work with our customers, suppliers and shippers to provide health, safety and environmental information. We will not manufacture or sell any product or use any raw material that cannot be developed, handled, stored, transported, used or disposed of safely.

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