AOC®
World Leader in Resin Technology

Vipel®
CORROSION
RESISTANT RESINS

Corrosion Resistant Resin Guide

For Using Corrosion Resistance Vipel® Resins

www.corrosionresins.com

Introduction

AOC corrosion resistant resins are designed to meet the demands of the fiber-reinforced polymer (FRP) composite industry when corrosion resistance performance is critical. This guide is designed to assist the fabricator of FRP components in selecting the appropriate resin for parts which will be exposed to highly corrosive environments.

This data is the result of years of extensive laboratory testing and actual field exposure in North America and Europe.

The term resistance is used in the sense which is commonly used in the trade, not as the complete retention of all optical and mechanical characteristics. Refer to ASTM G 15 and ASME/ANSI RTP-1 for common corrosion definitions.

Resin System Selection

Resin system selection is governed by the chemical service and environment to which the equipment will be exposed, end user specifications and preferences, or fabricator recommendation.

User specified:

Frequently the user will specify the resin system and laminate construction for particular applications. The requirement may be based on past experience, resin manufacturer recommendations, the supplier of the chemicals being handled, or the manufacturer of an equipment package. The fabricator should always confirm the source of selection and the acceptability of equivalent alternate systems.

Fabricator recommendation:

When the user depends on the fabricator to recommend aresin system, it is important to be certain that the user states allaspects of the application and service.
The following information should be clearly defined:

- The common name and, when possible, the chemical name. For example, muriatic is a common name for hydrochloric acid. This information is generally contained in the Material Safety Data Sheet for the medium.
- Concentration of each of the chemical components.
- Specific gravity of each chemical solution or mixture.
- pH, if it is an aqueous system.
- Normal operating temperature range. Also include any anticipated temperature excursions due to process upset or other abnormal condition.
- Maximum use temperature - (not maximum design temperature).
- Pressure and/or vacuum conditions. For tanks it is also important to know if filling will be by pressure such as from a tank wagon.
- Use in food and drug applications should be identified where applicable.
- Length of exposure to the medium if less that continuous. In unusual cases, only a short period of exposure is to be expected. For example, the laminate may need to withstand only occasional splashes.
- Process description - where a reaction such as neutralization takes place in the tank.
- Fire retardancy, where applicable, including flame spread rating and smoke requirements.

Resin Selection:

Normally a suitable resin can be selected from the Corrosion Resistance Resins Guide based on the above information. The temperature data presented in the guide represents the highest temperature at which the individual product has demonstrated acceptable service life in a laboratory environment or in actual field use. Testing of coupons is ongoing, and environments not tested may be done at customer request. Serviceability should not be interpreted to mean the full retention of all visual and mechanical properties, but rather an expectation of how a properly designed and fabricated structure will perform. Short exposure periods at higher temperatures usually do not affect product integrity if the heat distortion temperature of the cured resin is not exceeded. However, the highest temperature reached and the exposure duration at this temperature should be indicated when making inquiries.

The resistance of Vipel® resins to chemical environments listed in this guide has been established according to ASTM C581 and the ASME/ANSI RTP-1 standard coded "Reinforced Thermoset Plastic Corrosion Resistant Equipment."

This list does not apply to mixtures of different media unless we have explicitly stated. It contains chemically declared media and some brand name chemicals, which were not precisely identified with respect to chemical composition. When the concentration is listed as less than 100%, the remaining product is water unless specifically stated otherwise.

Caution: Many of the applications and chemical services listed in the guide make reference to NOTES in the column adjacent to the chemical. These notes are an integral part of the listing recommendation and must be strictly followed. The notes will indicate those applications requiring different veil materials, cure systems, liner construction or thickness and post curing requirements.

In those instances where the specific application is not listed, the fabricator is encouraged to contact AOC. The above information should be included and should be directed to:

Corrosion Product Leader
AOC
950 Highway 57 East
Collierville, TN 38017
Phone: (901) 854-2800
Fax: (901) 854-2895
E-mail: Corrosion@aoc-resins.com

Chemical Listings

Vipel®
CORROSION
RESISTANT RESINS

CONCENTRATIONS AND RECOMMENDED MAXIMUM CONTINUOUS EXPOSURE TEMPERATURE - DEGREES F

CHEMICAL	CONC.%	NOTES	F010 F013 K022	F007 F015	F080	F083 K023	F085 F086 K095	F282	K190	F701 F707 F764 F774	F737	Hood & Duct K733
			TEMPERATURE									
ACETALDEHYDE	100		NR	NR	NR	NR	NR	NR	NR	NR	NR	
ACETIC ACID	10		200		210	210	200	200	210	130		150
ACETIC ACID	25		200		210	210	200	200	210	130		125
ACETIC ACID	50		160		180	180	180	130	180	120		90
ACETIC ACID	75		140		150	150	150	100	150	NR	NR	NR
ACETIC ACID	85			NR					80	NR	NR	NR
ACETIC ACID GLACIAL	100		NR	NR	NR	NR	80	NR	80	NR	NR	NR
ACETONE	1			NR	150	NR	150	150	NR	NR	NR	NR
ACETONE	100		NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
ACETONE : MEK : MIBK	6			NR	NR	NR	105		NR	NR	NR	NR
ACETONITRILE	ALL		NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
ACRYLAMIDE	50			100	80	100	100		80			NR
ACRYLIC ACID	10		100	100	100	100	100	100	100	100	NR	NR
ACRYLIC ACID	25		100	NR	100	100	100	100	100	100	NR	NR
ACRYLIC LATEX	ALL		180	125	180	180	180	180	100			
ACRYLONITRILE	100		NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
ADIPIC ACID	100		180	180	180	180	180	180	200			
ADIPONITRILE	100		120	100	120	120	120	120	160			
ALKYL BENZENE SULPHONIC ACID	ALL		140	140	180		140	140	100			
ALKYLAMINOPOLYGLYCOLETHER	ALL		NR	80	80	80	80	80	90			
ALKYLARYL SULFONATE SALTS	ALL		140	120	140	140	140	140	150			80
ALKYLARYL SULFONIC ACID	ALL		140	120	140	140	140	140	160			
ALKYLARYLAMMONIUM SALT	ALL		180	180	180	180	180	180	180			80
ALKYLBENZENEAMMONIUM SALT	ALL		180	180	180	180	180	180				80
ALKYLBENZENESULFONIC ACID	ALL		140	120	140	140	140	140	150			80
ALKYLNAPHTOLOPOLYGLYCOLETHER	ALL		140	120	140	140	140	140	150			NR
ALKYLOLAKOXYLATE	ALL		140	120	140	140	140	140	150			
ALKYLOLETHERPHOSPHATE	ALL		80	80	80	80	80	80	90			80
ALKYLOLETHERSULFATE	ALL		140	120	140	140	140	140	150			80
ALKYLOLSULFATES AND SALTS	ALL		140	120	140	140	140	140	150			80
ALKYLPHENOLPOLYGLYCOLETHER	ALL			80	80	80	80	80	80			
ALKYLPHENOLPOLYGLYCOLETHERSULFATES AND SALTS	ALL		140	120	140	140	140	140	150			80

Notes

1 Synthetic veil recommended
2 Double synthetic veil recommended
3 Double C-glass veil recommended
4 Double C-glass veil recommended. The thickness of the chemical resistance barrier (veil plus chopped glass fibers) should be ≈0.200 inches thick
5 Carbon Veil is recommended for improved service life.
6 Acid resistant (ECR) glass recommended in chopped glass layer behind the veil layer(s)
7 BPO/DMA or BPO/DEA curing system is recommended for improved service life.
8 Post cure recommended for improved service life.
9 Satisfactory up to maximum stable temperature of component.
10 Contact Corrosion Product Leader (see page 3)
11 Vipel® F764 or Vipel® F774 are recommended as the preferred products over Vipel® F701.
12 Only F010, F007, F013, F015, F701, F764, F774 and F737 are suitable for FDA/USDA applications.
13 Vipel® F013 is recommended as the preferred product over F010
NR Not recommended.
"**ALL**" in concentration column refers to concentrations in water.
"**100**" in concentration column refers to the pure chemical.

Fahrenheit to Centigrade Conversions

300°F= 149°C	230°F= 110°C	160°F= 71°C	100°F= 38°C
290°F= 143°C	220°F= 104°C	150°F= 66°C	90°F= 32°C
280°F= 138°C	210°F= 99°C	140°F= 60°C	80°F= 27°C
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260°F= 127°C	190°F= 88°C	120°F= 49°C	70°F= 21°C
250°F= 121°C	180°F= 82°C	110°F= 44°C	60°F= 16°C
240°F= 116°C	170°F= 77°C		

Room temperature is assumed to be 77°F

CONCENTRATIONS AND RECOMMENDED MAXIMUM CONTINUOUS EXPOSURE TEMPERATURE - DEGREES F

CHEMICAL	CONC.%	NOTES	F010 F013 K022	F007 F015	F080	F083 K023	F085 F086 K095	F282	K190	F701 F707 F764 F774	F737	Hood & Duct K733
			TEMPERATURE									
ALKYLSULFONATE	ALL		140	120	140	140	140	140	150			80
ALKYLSULFONIC ACID AND SULFONATES	ALL		140	120	140	140	140	140	150			80
ALLYL ALCOHOL	100		NR	NR	NR	NR	80	NR	NR	NR	NR	NR
ALLYL CHLORIDE	100		NR	80	80	80	80		80		NR	
ALPHA METHYLSTYRENE	100		NR	NR	NR	NR	120	NR	NR	NR	NR	NR
ALUM	ALL		200	190	200	200	210	210	220	170	150	180
ALUMINUM CHLORIDE	ALL		200	190	200	200	210	210	220	170	100	180
ALUMINUM CHLOROHYDRATE	100		200	190	200	200	210	210	170	170	100	180
ALUMINUM CHLOROHYDROXIDE	50		200	190	200	200	210	210		170	100	180
ALUMINUM CITRATE	ALL		200	190	200	200	210	210	220	170	100	180
ALUMINUM FLUORIDE	100	**2**	115	90	90	90	115	115	90	90	90	90
ALUMINUM HYDROXIDE	100	**2**	160	160	200		180	160				
ALUMINUM NITRATE	SAT'D		160	180	180	180	180	160	190	150	130	80
ALUMINUM POTASSIUM SULPHATE	ALL		195	190	210	210	210	210	210	170	140	160
ALUMINUM SULFATE/ACETIC ACID	ALL	**10**	140	100	180	180	180	180	200			
ALUMINUM SULPHATE	ALL		195	180	210	210	210	210	210	170	140	170
AMINO ACIDS	100		105	80	130	130	105	105	140			80
AMINOSULPHONIC ACID	ALL		180	120	180	180	180	180	190			80
AMMONIA (DRY GAS)	100		100	100	100	100	100	100	100	80	NR	90
AMMONIA VAPORS (WET)	100		180	180	180	180	180	180	NR	NR		NR
AMMONIA, LIQUIFIED GAS	100		NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
AMMONIUM ACETATE	ALL		80	80	80	80	100	80				NR
AMMONIUM BENZOATE	ALL		180	180	180	180	180	180	120			80
AMMONIUM BICARBONATE	ALL		160	160	160	160	160	160		NR	NR	140
AMMONIUM BICARBONATE	SAT'D		160	160	160	160	160	160	NR	NR	NR	NR
AMMONIUM BIFLUORIDE	ALL		150	150	150		150	150				NR
AMMONIUM BISULPHITE BLACK LIQUOR	ALL		180	140	180	180	180	180	180	NR	NR	
AMMONIUM BROMATE	ALL		200	170	210	210	210	210	210	180	120	160
AMMONIUM BROMIDE	ALL		200	170	210	210	210	210	210	180	120	160
AMMONIUM CARBONATE	ALL		150	150	150	150	150	150	NR	NR	NR	NR
AMMONIUM CHLORIDE	ALL		200	170	210	210	210	210	200	180	160	180
AMMONIUM CITRATE	ALL		150	150	150	150	160	160		120		80
AMMONIUM FLUORIDE	ALL	**2**	150	150	150	150	150	170		NR	NR	
AMMONIUM HYDROXIDE (AQUEOUS AMMONIA)	1	**2**	180	150	180			175	NR	NR	NR	140
AMMONIUM HYDROXIDE (AQUEOUS AMMONIA)	5	**2**	180	100	180			160	NR	NR	NR	90
AMMONIUM HYDROXIDE (AQUEOUS AMMONIA)	10	**2**	160	100	180		120	150	NR	NR	NR	90
AMMONIUM HYDROXIDE (AQUEOUS AMMONIA)	20	**2**	150		150		100	140	NR	NR	NR	NR
AMMONIUM HYDROXIDE (AQUEOUS AMMONIA)	29	**2**	100		100			100	NR	NR	NR	NR
AMMONIUM LAURYL SULPHATE	ALL		120	100	120		120	120	120			
AMMONIUM LIGNOSULPHONATE	50		180	150	180	180	180					
AMMONIUM MOLYBDATE	ALL		150	120	110	110	120	150	NR			NR

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			TEMPERATURE									
AMMONIUM NITRATE	ALL		200	150	210	210	210	210	200	160	140	160
AMMONIUM OXALATE	ALL		150	150	110		100	120	NR			
AMMONIUM PENTABORATE	ALL		120	120	110		100	100	NR			
AMMONIUM PERSULPHATE	ALL		200	200	200	200	200	200	150	NR	NR	150
AMMONIUM PHOSPHATE, DIBASIC	ALL		200	180	210	210	210	210	150	NR	NR	150
AMMONIUM PHOSPHATE, MONOBASIC	ALL		200	180	210	210	210	210		150	130	NR
AMMONIUM POLYSULPHIDE	ALL		120	80	140		150	120	NR			
AMMONIUM SULPHATE	ALL		200	180	210	210	210	210	210	170	120	160
AMMONIUM SULPHIDE	ALL		120	80	120	120	120	100	120			
AMMONIUM SULPHITE	10		150	120	120	120	150	150	NR	NR	NR	
AMMONIUM THIOCYANATE	20		200	180	210	210	210	210	200	170	130	
AMMONIUM THIOCYANATE	50		120	80	120	120	120	120	120	100	80	100
AMMONIUM THIOSULFATE	ALL		120	80	120	120	120	120	120	NR	NR	NR
AMYL ACETATE	100		NR	NR	100	100	120	100	90	NR	NR	90
AMYL ALCOHOL (SEC-)	ALL	**11**	120	120	140	140	150	150	150	100	NR	NR
AMYL ALCOHOL (SEC-)	VAPORS	**11**	120	150	150	150	210	210	210	100	NR	NR
AMYL ALCOHOL (TERT-)	100	**11**	120	120	140	140	150	150	150	100	NR	NR
AMYL ALCOHOL (TERT-)	VAPORS	**11**	120	150	150	150	210	210	210	100	NR	NR
AMYL CHLORIDE	100		120	120	120	120	120	120	80	NR	NR	NR
ANILINE	100		NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
ANILINE HYDROCHLORIDE	ALL		180	160	180	180	180	180				
ANILINE SULPHATE	ALL		200	170	210	210	210	210	200	NR	NR	140
ANTIMONY PENTACHLORIDE	100		100	80	90	100	100	100	90			90
ANTIMONY TRICHLORIDE	100		100	80	90	100	100	100	90			160
AQUA REGIA (HCL:HNO3 = 3:1)	100		NR	NR	NR	NR	NR	NR	130	NR	NR	NR
ARSENIC ACID	ALL		180				180	180		NR	NR	
ARSENIOUS ACID	ALL		180	150	180	180	180	180				
BARIUM ACETATE	ALL		180	180	180	180	180	180	180	NR	NR	NR
BARIUM BROMIDE	ALL		200	200	200	200	200	200				
BARIUM CARBONATE	100		180	180	180	180	180	180	180	100	NR	180
BARIUM CHLORIDE	ALL		200	200	200	200	210	210	200	170	130	180

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			TEMPERATURE									
BARIUM CYANIDE	ALL		150	120	150	150	150	150				
BARIUM HYDROXIDE	ALL		150	110	150	150	150	150	NR	NR	NR	NR
BARIUM NITRATE	ALL		190	180	210	210	210	210	200			160
BARIUM SULPHATE	ALL		190	180	210	210	210	210	180	170	120	150
BARIUM SULPHIDE	ALL		180	180	180	180	180	180		NR	NR	NR
BEER	100	**12**	120	120	NR	NR	NR	120	NR	90	NR	NR
BEER SUGAR LIQUOR	ALL	**12**	180	180	180	180	200	180	180	120	80	100
BENZALDEHYDE	100		NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
BENZENE	100		NR	NR	NR	NR	100	NR	90	NR	NR	90
BENZENE	VAPORS	**11**	NR	80	NR	NR	120	NR	90	90	NR	NR
BENZENE SULPHONIC ACID	50		150	120	150	150	150	150	150	NR	NR	140
BENZENE: ETHYL BENZENE	100		NR	NR			80	NR	80		NR	NR
BENZOIC ACID	ALL		200	180	210	210	210	210	210	170	100	180
BENZOQUINONES	100		150	120	180	180	180	180	150			140
BENZOYLBENZOIC ACID (2-)	ALL		200	180	210	210	210	210	210			150
BENZOYLBENZOIC ACID (4-)	ALL		200	180	210	210	210	210	210			150
BENZYL ALCOHOL	100	**11**	NR	80	80	80	100	100	100		NR	NR
BENZYL CHLORIDE	100		NR	NR					NR	NR	NR	NR
BENZYLTRIMETHYLAMMONIUM CHLORIDE	100		100	100	100	100	100	100	100			80
BLACK LIQUOR (PULP MILL)	ALL		200	150	180	180	200	180		NR	NR	
BLEACH, CHLORINE DIOXIDE, WET	SAT'D	**9,10**	150	120	180	180	180	180	180	NR	NR	NR
BLEACH, CHLORINE WATER	SAT'D		180	120	180	180	200	180	140	NR	NR	NR
BLEACH, CHLORITE (10 w/w% Sodium chlorite and 10 w/w% Sodium nitrate)	10		100		120	130	120	120	140	NR	NR	NR
BLEACH, (SODIUM HYPOCHLORITE, pH >11, ACTIVE CHLORINE <18%)		**2,7,8,9,10**	150	150	150			120		NR	NR	
BLEACH, (CALCIUM HYPOCHLORITE, pH >11, ACTIVE CHLORINE <18%)		**2,7,8,9,10**	180		160	160	100	150	NR	NR	NR	NR
BORAX	100		200	180	210	210	210	210	180	170	120	
BORIC ACID	ALL		200	180	210	210	210	210	210	180	120	140
BRINE CHLORINATED	ALL		210	180	210	210	210	210	210			
BRINE, SALT	ALL	**12**	210	180	210	210	210	210	210	150	140	140
BROMINE GAS, DRY	100		100	100	100	100	100	100	100	NR	NR	140
BROMINE GAS, WET	100		100	100	90	90	100	100	100	NR	NR	80
BROMINE LIQUID	100		NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
BROMINE WATER	5		180	150	180	180	180	150		NR	NR	NR
BUTANEDIOL (1,3-)	ALL		100	150	180	180	180	180	190	175		
BUTANEDIOL (1,4-)	ALL		100	150	180	180	180	180	190	175		140
BUTANEDIOL (2,3-)	ALL		100	150	180	180	180	180	190	175		140
BUTOXYDIETHYLENE GLYCOL	100			80	80	80	100	100	100	NR	NR	100
BUTOXYETHANOL (2-)	100		80	100	100	100	100	100	100			80
BUTOXYETHOXYETHANOL (2,2-)	100		80	100	100	100	100	100	100	NR	NR	80

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			TEMPERATURE									
BUTYL ACETATE (N-)	100		NR		80	80	80	90			NR	
BUTYL ACETATE (SEC)	100		NR		80	80	80	90		NR	NR	
BUTYL ACETATE (TERT)	100		NR		80	80	80	90		NR	NR	
BUTYL ACRYLATE	100		NR		80	80	80	80		NR	NR	
BUTYL ALCOHOL (N-)	ALL	**11**	100	120	120	120	150	120	100	80	NR	160
BUTYL ALCOHOL (SEC-)	ALL	**11**	100	120	120	120	150	140	100	80	NR	160
BUTYL ALCOHOL (TERT-)	ALL	**11**	100	120	120	120	150	140	100	80	NR	160
BUTYL AMINE (N-)	50		NR	NR						NR	NR	
BUTYL AMINE (N-)	100		NR				NR	NR		NR	NR	
BUTYL AMINE (SEC-)	50		80				80	80		NR	NR	
BUTYL AMINE (SEC-)	100		NR	NR	NR	NR	NR	NR		NR	NR	
BUTYL AMINE (TERT-)	50		80				80	80		NR	NR	
BUTYL AMINE (TERT-)	100		NR	NR	NR	NR	NR	NR		NR	NR	
BUTYL BENZOATE	100						100	100		NR	NR	
BUTYL BENZYL PHTHALATE	100		180	160	210	210	210	200	200			120
BUTYL CARBITOL	100			80	80	80	100	100	100			
BUTYL CELLOSOLVE	100			80	80	80	100	100	100		NR	90
BUTYL DIGLYCOL	100		80	100	120	120	120	120	130		NR	80
BUTYL STEARATE (5% IN MINERAL SPIRITS)	ALL		100	100			100	80	80	NR	NR	
BUTYLALDEHYDE	100		NR				100	80		NR	NR	
BUTYLENE GLYCOL	100		160	180	180	180	180	180	160	160	120	140
BUTYLENE OXIDE	100		NR	NR	NR	NR	NR	NR		NR	NR	NR
BUTYRIC ACID	50		200	180	180	180	200	150	120	130		120
BUTYRIC ACID	85		80	100	100	100	120	100	90	NR	NR	
BUTYRIC ACID	100		80	100	100	100	120	NR	90	NR	NR	NR
CADMIUM CHLORIDE	ALL		200	200	210	210	200	200	210	140	100	160
CALCIUM BISULPHITE	ALL		200	200	210	210	210	200		170	80	160
CALCIUM BROMIDE	ALL		200	200	200	210	210	210		140	80	140
CALCIUM CARBONATE SLURRY	ALL		180	180	180	180	180	180		100	80	160
CALCIUM CHLORATE	ALL		200	200	210	210	210	210	210	140	100	180
CALCIUM CHLORIDE	ALL		200	200	200	210	210	210	210	180	130	180

Notes

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12 Only F010, F007, F013, F015, F701, F764, F774 and F737 are suitable for FDA/USDA applications.
13 Vipel® F013 is recommended as the preferred product over F010
NR Not recommended.
"**ALL**" in concentration column refers to concentrations in water.
"**100**" in concentration column refers to the pure chemical.

Fahrenheit to Centigrade Conversions

300°F= 149°C	230°F= 110°C	160°F= 71°C	100°F= 38°C
290°F= 143°C	220°F= 104°C	150°F= 66°C	90°F= 32°C
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260°F= 127°C	190°F= 88°C	120°F= 49°C	70°F= 21°C
250°F= 121°C	180°F= 82°C	110°F= 44°C	60°F= 16°C
240°F= 116°C	170°F= 77°C		

Room temperature is assumed to be 77°F

CONCENTRATIONS AND RECOMMENDED MAXIMUM CONTINUOUS EXPOSURE TEMPERATURE - DEGREES F

CHEMICAL	CONC.%	NOTES	F010 F013 K022	F007 F015	F080	F083 K023	F085 F086 K095	F282	K190	F701 F707 F764 F774	F737	Hood & Duct K733
			TEMPERATURE									
CALCIUM HYDROXIDE	ALL	**2**	180	120	160		100	180	NR	NR	NR	80
CALCIUM HYPOCHLORITE, pH >11, ACTIVE CHLORINE <18%		**2,7,8,9,10**	180		160	160	100	150	NR	NR	NR	NR
CALCIUM NITRATE	ALL		200	200	210	210	210	210	210	180	130	160
CALCIUM SULPHATE	ALL		200	200	210	210	210	210	210	180	130	180
CALCIUM SULPHITE	ALL		200	180	200	200	200	200				
CALCIUM THIOSULFATE	ALL		120	120	120	180	180	180		90	90	90
CANE SUGAR LIQUOR & SWEET WATER	ALL	**12**	180	180	180	180	200	180	180	120	80	100
CAPRIC ACID	100		180	150	160	160	180	180	180	140	80	
CAPROLACTAM	50		100	100			100	100				
CAPRYLIC ACID	100		200	170	200	210	210	210	140	160	80	160
CARBON DIOXIDE GAS			325	350	250	250	400	250	200	190	140	180
CARBON DISULPHIDE	100		NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
CARBON MONOXIDE GAS			325	350	250	250	400	250	200	190	140	180
CARBON TETRACHLORIDE	100		150	180	150	180	180	120	130	80	NR	NR
CARBONIC ACID	ALL		160									80
CARBOWAX, POLYETHYLENE GLYCOL	100		150	180	160	160	180	180	160			160
CARBOXY ETHYLCELLULOSE	10		150	150	150	150	150	150				
CARBOXY METHYLCELLULOSE	ALL		150	150	150	150	150	150				
CASHEW NUT OIL	ALL	**12**	150	150	150	150	200	200	180	140	100	140
CASTOR OIL	100		160	160	120	120	160	160	160	140		180
CHLORIC ACID	CONC.		80				80	80		NR	NR	
CHLORINATED BRINE, PH<2.5	ALL		180	180	180	180	200	160				
CHLORINATED WAXES	100		180	180	180	180	180	180	180	140	100	180
CHLORINE	LIQUID		NR	NR	NR	NR	NR	NR	100	NR	NR	NR
CHLORINE DIOXIDE <1G/LITER	0.01	**9,10**	140	140	180	180	180	160	90	NR	NR	NR
CHLORINE GAS, DRY	100	**4**	210	200	250	250	250	210	270	180		
CHLORINE GAS, WET	100	**4**	210	200	250	250	250	210	220	NR	NR	
CHLORINE WATER	SAT'D	**10**										
CHLORINE/HYDROCHLORIC ACID, WET			160	150	180	180	180	200	140			NR
CHLOROACETIC ACID	50		100	100	100	100	100	100	100	NR	NR	NR
CHLOROACETIC ACID	80		NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
CHLOROACETIC ACID	100		NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
CHLOROBENZENE	100		NR	NR	80	80	100	NR	NR	NR	NR	NR
CHLOROCHOLINCHLORIDE	75		160	160	160	160	160	140	160		NR	
CHLOROETHYLENE (1,1,1-)	100		100	100			120	100		NR	NR	NR
CHLOROFORM	100		NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
CHLOROPARAFFIN	100		180	180	180	180	180	180	180	140	100	180
CHLOROPROPIONIC ACID (-2)	ALL		80	80			80	80		NR	NR	NR
CHLOROPROPIONIC ACID (-2)	50		80	80			80	80		NR	NR	NR
CHLOROPROPIONIC ACID (-3)	ALL		80	80			80	80		NR	NR	NR
CHLOROPROPIONIC ACID (-3)	50		80	80			80	80		NR	NR	NR

Chemical Listings

Vipel®
CORROSION
RESISTANT RESINS

CONCENTRATIONS AND RECOMMENDED MAXIMUM CONTINUOUS EXPOSURE TEMPERATURE - DEGREES F

CHEMICAL	CONC.%	NOTES	F010 F013 K022	F007 F015	F080	F083 K023	F085 F086 K095	F282	K190	F701 F707 F764 F774	F737	Hood & Duct K733
			TEMPERATURE									
CHLOROPYRIDINE (TETRA)	100		80	80			120	NR		NR	NR	NR
CHLOROSULPHONIC ACID	10		NR	NR	NR	NR	NR	NR		NR	NR	NR
CHLOROSULPHONIC ACID	100		NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
CHLOROTOLUENE	10		80		NR		80	NR		NR	NR	NR
CHLOROTOLUENE	100		NR	NR	NR		NR	NR	NR		NR	NR
CHROME PLATING SOLUTION	10		120	120	110	100	150	120	100	NR	NR	NR
CHROMIC ACID	10	**8**	150	100	150	150	150	150	180	100	NR	NR
CHROMIC ACID	20	**8**	120		120	120	150	100	150	100	NR	NR
CHROMIC ACID	30	**8**	NR	NR	NR	NR	NR	NR	120	NR	NR	NR
CHROMIC ACID	40	**8**	NR	NR	NR	NR	NR	NR	90	NR	NR	NR
CHROMIC/SULPHURIC ACID (2.5% / 13.7%)	16.2	**8**	NR				NR	NR		NR	NR	NR
CHROMIC/SULPHURIC ACID, MAX. CONC. MIX. 10%	10	**8**	120	120	110	100	150	120	100			NR
CHROMIUM SULPHATE	ALL		200	150	200	200	200	200	150	NR	NR	140
CHROMOUS SULPHATE	ALL		200	150	200	200	200	200	150	NR	NR	140
CINNAMALDEHYDE	100		80				80	NR				
CITRIC ACID	ALL		200	170	210	210	210	210	200	180	80	160
COBALT CHLORIDE	ALL		210	210			210	210	160			160
COBALT CITRATE	100		180	180			180	180	190			160
COBALT NITRATE	100		210	210	210	210	210	210	210			160
COCONUT FATTY ACID	100		200	200	200	200	200	200	210			180
COCONUT OIL	ALL	**12**	180	200	180	180	200	200	200	140	100	180
COD LIVER OIL	ALL	**12**	100	100	100	100	100	100	100	80		180
COPPER ACETATE	ALL		180	180	180	180	180	180	190	140	NR	120
COPPER AMMONIUM CHLORIDE	ALL		180	180	180	180	180	180	190			120
COPPER CYANIDE	100		200	200	220	210	210	210	200	90	NR	90
COPPER(I) CHLORIDE	ALL		200	200	210	210	210	210	210	180	140	180
COPPER(I) SULPHATE	ALL		200	200	210	210	210	210	210	180	100	180
COPPER(II) CHLORIDE	ALL		200	200	210	210	210	210	210	180	140	180
COPPER(II) NITRATE	ALL		200	200	210	210	210	210	210	160	100	180
COPPER(II) SULPHATE	ALL		200	200	210	210	210	210	210	180	100	180
CORN OIL	ALL	**12**	180	210	200	210	210	210	210	150	100	180
CORN STARCH SLURRY	ALL	**12**	200	210	210	210	210	210	210	120	100	180

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CONCENTRATIONS AND RECOMMENDED MAXIMUM CONTINUOUS EXPOSURE TEMPERATURE - DEGREES F

CHEMICAL	CONC.%	NOTES	F010 F013 K022	F007 F015	F080	F083 K023	F085 F086 K095	F282	K190	F701 F707 F764 F774	F737	Hood & Duct K733
			TEMPERATURE									
CORN SUGAR	ALL	**12**	200	200	210	210	210	210	210	120	100	180
COTTONSEED OIL	ALL	**12**	200	210	200	210	210	210	100	100		180
CRESOL (M-)	10		NR				80	NR				NR
CRESOL (O-)	10		NR				80	NR				NR
CRESOL (P-)	10		NR				80	NR				NR
CRUDE OIL, SOUR AND SWEET	100	**11**	200	210	210	210	210	210		180	100	180
CYCLOHEXANE	100	**11**	120	150	150	150	150	120	140	120	NR	
CYCLOHEXANOL	100	**11**	100	100			120	120			NR	
CYCLOHEXANONE	100	**11**	NR				80	NR		NR	NR	NR
CYCLOHEXYLAMINE	100						80	NR			NR	NR
DECALIN	100		140	120	140	140	140	140				
DECANES	100		180	180	180	180	180	180	180			140
DECANOL	100	**11**	120	150	150	150	180	180	140	100	NR	
DECENES	100		180				200	200				
DEIONIZED WATER	100	**11, 12**	180	180	180	180	180	180	180	150	100	
DEMINERALIZED WATER	100	**11, 12**	180	180	180	180	180	180	180	150	100	140
DETERGENTS, SULPHONATED	100		160	180	180	180	200	200		160	80	140
DI 2-ETHYL HEXYL PHOSPHORIC ACID (IN KEROSENE)	20						210	210	210			
DIACETONE ALCOHOL	100		NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
DIALLYL PHTHALATE	100	**11**	180	210	210	210	210	180	210	160	110	140
DIAMMONIUM PHOSPHATE	ALL		200	210	200	210	200	200	210			140
DIBROMOPHENOL	100		NR				100	NR	NR	NR	NR	NR
DIBROMOPROPANOL	100		NR	NR	NR	NR	100	NR	NR	NR	NR	NR
DIBUTYL ETHER	100		NR	100	100	100	150	150	80	80	NR	80
DIBUTYL PHTHALATE	100		180	180	200	200	210	210	90	90	NR	80
DIBUTYL SEBACATE	100		120	150	150	150	150	150	90	140	NR	80
DIBUTYLAMINE (N-)	50		80				80	80				
DICHLOROACETIC ACID	80		NR				80	NR				NR
DICHLOROBENZENE (M-)	100		NR				110		NR		NR	NR
DICHLOROBENZENE (O-)	100		NR				100			NR	NR	NR
DICHLOROBENZENE (P-)	100		NR				100		NR		NR	NR
DICHLOROETHANE	100		NR	NR	NR	NR	80	NR	NR	NR	NR	NR
DICHLOROETHYLENE	100		NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
DICHLOROMETHANE	0.2		80				80	80			NR	
DICHLOROMETHANE	100		NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
DICHLOROPROPANE	100		NR		NR	NR	80	NR	NR	NR	NR	NR
DICHLOROPROPENE	100		NR	NR	NR	NR	80	NR	NR	NR	NR	NR
DICHLOROPROPIONIC ACID	100		NR		NR	NR	NR	NR				NR
DICHLOROTOLUENE	80		80	80	80	80	120	80				

Chemical Listings

Vipel®
CORROSION
RESISTANT RESINS

CONCENTRATIONS AND RECOMMENDED MAXIMUM CONTINUOUS EXPOSURE TEMPERATURE - DEGREES F

CHEMICAL	CONC.%	NOTES	F010 F013 K022	F007 F015	F080	F083 K023	F085 F086 K095	F282	K190	F701 F707 F764 F774	F737	Hood & Duct K733
			TEMPERATURE									
DICHLOROTOLUENE	100		80	80	80	80	120	80				
DIESEL FUEL, NO AROMATICS, NO METHANOL	100		180	190	200	200	200	200	175	175	120	100
DIESEL FUEL, AROMATICS, METHANOL	100	**11**						90		90	NR	
DIETHANOL AMINE	100		120	120	120	120	150	120	110			90
DIETHYL AMINE	ALL		NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
DIETHYL ANILINE N,N	100		NR	NR	NR	NR	80	80				NR
DIETHYL BENZENE	100		80	120	80	80	150	NR	100	NR	NR	
DIETHYL CARBONATE	100		NR	80			100	NR			NR	
DIETHYL ETHER	100		NR	NR	NR	NR	NR	NR		NR	NR	
DIETHYL FORMAMIDE	100		NR	NR	NR	NR	100	NR	NR	NR	NR	NR
DIETHYL KETONE	100		NR	NR	NR		80	NR		NR	NR	NR
DIETHYL MALEATE	100		NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
DIETHYL PHTHALATE	100	**11**	140	140			180	140	140	100	80	100
DIETHYL SULPHATE	100		100	120	100	100	120	100	100			
DIETHYLENE GLYCOL	100		180	210	210	210	210	210	250	180	80	180
DIETHYLENE GLYCOL DIMETHYL ETHER	100		NR				80	NR				NR
DIETHYLENE GLYCOL MONOBUTYL ETHER	100						80					NR
DIETHYLENETRIAMINE	100		NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
DIISOBUTYL KETONE	100		NR	NR	NR	NR	120	NR	80			NR
DIISOBUTYL PHTHALATE	100	**11**	150	150	150	150	160	180	90	110		80
DIISOBUTYLENE	100	**11**	80	100	100	100	100	NR	100	80	NR	
DIISOPROPANOL AMINE	100		100	120	120	120	150	100				
DIISOPROPYLAMINE	100		100	120			120	NR				
DIMETHYL ACETAMIDE	100		NR				NR	NR	150			
DIMETHYL AMINE	100		NR	NR	NR	NR	80	80	NR	NR	NR	NR
DIMETHYL ANILINE	100						100	80				NR
DIMETHYL FORMAMIDE	100		NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
DIMETHYL MORPHOLINE (2,6-)	100		80				100	NR		NR	NR	
DIMETHYL PHTHALATE	100		150	180	150		180	180			NR	NR
DIMETHYL SULPHATE	100		NR				NR	N.R				
DIMETHYL SULPHIDE	100		NR				70	NR		NR	NR	
DIMETHYL SULPHOXIDE	20		80				100	NR				

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CONCENTRATIONS AND RECOMMENDED MAXIMUM CONTINUOUS EXPOSURE TEMPERATURE - DEGREES F

CHEMICAL	CONC.%	NOTES	F010 F013 K022	F007 F015	F080	F083 K023	F085 F086 K095	F282	K190	F701 F707 F764 F774	F737	Hood & Duct K733
			TEMPERATURE									
DIMETHYL SULPHOXIDE	100		NR				NR	NR				NR
DINONYL PHTHALATE	100		140				200	140				
DIOCTYL PHTHALATE	100		150	190	150	150	210	140				NR
DIOCTYLSULFOSUCCINATE SODIUM SALT	ALL		180	160	180	180	180	180	180			80
DIOXANE (1,4-)	ALL		NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
DIPHENYL ETHER	100		80	100	80	80	120	80	80	NR	NR	NR
DIPIPERAZINE SULPHATE SOLUTION	ALL		105	80	105	105	105	105				NR
DIPOTASSIUM PHOSPHATE	ALL		210	210	200	200	210	200	200	100	80	140
DIPROPYLAMINE (N-)	50		80				80	80				NR
DIPROPYLENE GLYCOL	100		180	210	210	210	210	210	210	160	NR	160
DISPERSIONS, COPOLYMER VINYL ACETATE/VINYL VERSATATE	50		80				80	80				
DIVINYL BENZENE	100		80	100	120	120	120	NR	90			
DODECANOL	100	**11**	140	160	160	160	180	160	180	120	NR	
DODECENE	100	**11**	140	160	160	160	180	160	180	140	NR	
DODECYL BENZENE SULPHONIC ACID	ALL	**11**	180	200	210	210	210	210	210	80	NR	180
DODECYL GUANIDINE HYDROCHLORIDE	ALL	**11**	180	180	180	180	175	175	180	80	NR	140
DOWANOL DB GLYCOL ETHER	ALL		80	100	80	80	100	80	80			
EMBALMING FLUID	100		100				120	120				
EPICHLOROHYDRIN	100		NR				80	NR		NR	NR	
EPOXIDIZED CASTOR OIL	ALL	**12**	100	100	100	100	100	100	100	80		180
EPOXIDIZED SOYBEAN OIL	ALL	**12**	150	150	150	150	150	150	150	100	80	180
EPOXIDIZED VEGETABLE OILS	100		100	100			150	150				180
ESTERS, FATTY ACID	100		180	180	180	180	180	180	120	100	80	80
ETHANOLAMINE	100	**10**	80	90			100	80	80	NR	NR	
ETHYL ACETATE	100		NR	NR	NR	NR	80	NR	NR	NR	NR	NR
ETHYL ACRYLATE	100		NR	NR	NR	NR	80	NR	NR	NR	NR	NR
ETHYL ALCOHOL	10	**11**	80	120	120	120	150	150		80	NR	
ETHYL ALCOHOL	50	**11**	NR	80			150	120	150	90	NR	
ETHYL ALCOHOL	96	11	NR	80			100	100	100	90	NR	
ETHYL AMINE	40		NR				80	80				NR
ETHYL BENZENE	100		NR	NR	NR		100	NR	NR	NR	NR	NR
ETHYL BROMIDE	100		NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
ETHYL CHLORIDE	100		NR	NR	NR	NR	80	NR	90	NR	NR	NR
ETHYL ETHER	100		NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
ETHYL SULPHATE	100		NR	100	100	100	100	100	100			
ETHYLENE CHLORIDE	100		NR	NR	NR	NR	80	NR	NR	NR	NR	NR
ETHYLENE CHLOROHYDRIN	100		100	100	100	100	100	100	100			
ETHYLENE DIAMINETETRAACETIC ACID, EDTA	ALL		180	180			180	180				
ETHYLENE DICHLORIDE	100		NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
ETHYLENE GLYCOL	ALL	**11**	210	210	210	210	210	210	250	180	130	180

Chemical Listings

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			TEMPERATURE									
ETHYLENE GLYCOL MONOBUTYL ETHER	100		100	100	100	100	100	80	80		NR	90
ETHYLENE OXIDE	100		NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
ETHYLHEXANOL -2	100		160				180	160		100		
ETHYLHEXYLACRYLATE -2	100		80				80	80				
EUCALYPTUS OIL	ALL	**12**	140	140	140	140	160	150	150	120	NR	170
FATTY ACIDS (C12 OR HIGHER)	ALL	**12**	200	250	210	210	250	210	250	180	130	180
FERRIC ACETATE	ALL		180	180	180	180	180	180	180			120
FERRIC CHLORIDE	ALL		200	180	210	210	210	210	210	180	120	140
FERRIC CHLORIDE / FERROUS CHLORIDE (5%/20%)	25		200	180	220	210	210	210	210	180		140
FERRIC CHLORIDE / FERROUS CHLORIDE/HYDROCHLORIC ACID (48/2/2)	52		200	180	220	210	210	210	210		NR	140
FERRIC CHLORIDE / HYDROCHLORIC ACID (29%/18.5%)	47.5		180	160	180	180	210	210	180		NR	140
FERRIC NITRATE	ALL		200	180	210	210	210	210	210	180	120	180
FERRIC SULPHATE	ALL		200	180	210	210	210	210	200	180	120	180
FERRIC SULPHATE / SULPHURIC ACID	SAT'D/10		180	130	180	180	180	180	180		NR	120
FERROUS CHLORIDE	ALL		200	180	210	210	210	210	210	160	120	180
FERROUS CHLORIDE / FERRIC CHLORIDE (20%/5%)	25		200	170	210	210	210	210	210	140		140
FERROUS CHLORIDE-HYDROCHLORIC ACID	ALL	**6**	120	80	120	120	120	120	150			100
FERROUS NITRATE	ALL		210	210	210	210	210	210	210	160	120	160
FERROUS SULPHATE	ALL		210	210	210	210	210	210	210	160	120	180
FERROUS SULPHATE / MAGNESIUM OXIDE (20%/10%)	30		200	180	210	210	210	210	210			180
FERTILIZER UREA (Phosphoric acid + Ammonia + Uran + Potash + Borax)			140	150	150	150	150	140		80		100
FERTILIZER, 8-8-8			140	140	150	150	140	140		80	NR	100
FERTILIZER, UREAAMMONIUM 35.4% UREA			140	140	150	150	140	140		80		100
FLUE GAS, WET	ALL		180	210	200	200	200	180	210			
FLUOBORIC ACID	10	**2**	180	180	180	180	180	180	200			180
FLUOBORIC ACID	15	**2**	100	100	100	100	100	100	100			120
FLUOBORIC ACID	25	**2**	100	100	100	100	100	100	100			100
FLUOBORIC ACID	SAT'D	**2**	100	80	100	100	100	100	100	80	NR	100
FLUORIDE SALTS / HYDROCHLORIC ACID (30%/10%)	40	**2**	120	80	120	120	120	120	120			
FLUORINE GAS		**2**					70					
FLUOROCARBON 11	100	**1**	110				110	110				

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250°F= 121°C	180°F= 82°C	110°F= 44°C	60°F= 16°C
240°F= 116°C	170°F= 77°C		

Room temperature is assumed to be 77°F

CONCENTRATIONS AND RECOMMENDED MAXIMUM CONTINUOUS EXPOSURE TEMPERATURE - DEGREES F

CHEMICAL	CONC.%	NOTES	F010 F013 K022	F007 F015	F080	F083 K023	F085 F086 K095	F282	K190	F701 F707 F764 F774	F737	Hood & Duct K733
			TEMPERATURE									
FLUOSILICIC ACID	10	**2**	150	150	150	180	180	150	180	80	NR	100
FLUOSILICIC ACID	25	**2**	100	100	100	100	100	100	100	NR	NR	90
FLUOSILICIC ACID	35	**2**	80		100	100	100	80	100	NR	NR	NR
FORMALDEHYDE	50		120	120			150	120				NR
FORMAMIDE	100		80	120	100		150	120	100			NR
FORMIC ACID	30		120	120			150	120		NR	NR	
FORMIC ACID	50		120	120	120	120	120	100	100	NR	NR	90
FORMIC ACID	85		80	80			80					
FORMIC ACID	98		NR				NR	NR		NR	NR	
FREON 11	100		80				100	80				
FUEL OIL	100	**11**	180	210	200	200	210	90		90	NR	
FURFURAL IN WATER	5		100	120	120	120	120	120	120		NR	90
FURFURAL	100		NR	NR	NR	NR	NR	NR		NR	NR	NR
FURFURYL ALCOHOL	100		NR	NR			80			NR	NR	
GALLIC ACID	ALL		180	180			180	180	180			
GASOLINE FUEL	100	**10,11**								120		
GLUCONIC ACID	ALL		140		125		175	140	125	120	100	120
GLUCONIC ACID	50		120	120	120		180	120	120	80		120
GLUCOSE	ALL	**12**	180	180	180	180	210	210	180	160	120	180
GLUTARALDEHYDE	50		120	120			120	80	120	80	NR	
GLUTARIC ACID	ALL		120	120			120	120		140		
GLYCERINE	100		200	210	220		210	210	200	180	130	180
GLYCERINE TRIACETATE	ALL		80				80	NR		80	NR	
GLYCOLIC ACID	35		140		140	140	140	140	140	140	80	140
GLYCOLIC ACID	70		80	80	100	100	100	100	100	80	NR	120
GLYME			NR				NR	NR		NR	NR	
GLYOXAL	40		100	100			100	100		NR	NR	
GREEN LIQUOR (PULP MILL)			180	140	180	180	180	180	NR	NR	NR	
GYPSUM SLURRY			180	180			180	180		NR	NR	
HEPTANE	100		200	210	200	200	210	200	200	180	NR	120
HEPTENE	100		200				210	200				
HEXACHLOROCYCLOPENTADIENE	100						120	120			NR	
HEXAMETHYLENETETRAMINE	60		100				120	120				
HEXANE	100		160	160	160	160	160	160	160	140	140	
HEXANEDIOL	ALL		180				180	180				
HEXENE	100		140				160	140				
HEXENE (2-)	100		140				160	140				
HEXENE (2-TRANS-)	100		140				160	140				
HEXENE (3-TRANS-)	100		140				160	140				

Chemical Listings

Vipel®
CORROSION
RESISTANT RESINS

CONCENTRATIONS AND RECOMMENDED MAXIMUM CONTINUOUS EXPOSURE TEMPERATURE - DEGREES F

CHEMICAL	CONC.%	NOTES	F010 F013 K022	F007 F015	F080	F083 K023	F085 F086 K095	F282	K190	F701 F707 F764 F774	F737	Hood & Duct K733
			TEMPERATURE									
HYDRAULIC FLUID, ALKALINE	100		80				80	80		NR	NR	
HYDRAULIC FLUID, NEUTRAL	100	**11**	180	180			180	180		80	NR	
HYDRAZINE	50		NR				70	NR		NR	NR	
HYDRAZINE	100		NR				NR	NR		NR	NR	
HYDRAZINE HYDRATE	16		80				80	80				
HYDROBROMIC ACID	18		180	160	180	180	180	180	180	160	80	160
HYDROBROMIC ACID	26		180	140	180	180	180	180	180	160		
HYDROBROMIC ACID	48		150	150	150	150	150	150	150	100	NR	160
HYDROBROMIC ACID	62		100				100	100				
HYDROCHLORIC ACID	10	**3,6**	180	210	210	210	210	210	210	160	120	180
HYDROCHLORIC ACID	18	**3,6**	180	200	200	200	210	180	210	100	80	
HYDROCHLORIC ACID	21	**4,6**	150	180	180	180	210	180	180	100	80	
HYDROCHLORIC ACID	25	**4,6**	150	180	180	180	200	180	180	140		150
HYDROCHLORIC ACID	37	**4,6**	100	100	100	100	120	90	100	NR	NR	
HYDROCHLORIC ACID, FUMES	100		210				250	250	250	NR	NR	NR
HYDROCHLORIC ACID AND TRACE ORGANICS		**4,6**	NR					NR	80			
HYDROCYANIC ACID, SATURATED			210		210	210	210	200	200	80	NR	180
HYDROFLUORIC ACID	10	**2,10**	120	120	100	100	150	100	100	80	NR	100
HYDROFLUORIC ACID	20	**2,10**	100	100		80	100	NR	90	NR	NR	NR
HYDROFLUOSILICIC ACID	10	**2,10**	180	150	150	180	180	150	180	80	NR	
HYDROFLUOSILICIC ACID	25	**2,10**	100		110	100	100	100	140	NR	NR	
HYDROFLUOSILICIC ACID	35	**2,10**	80		100	100	100	80	100	NR	NR	NR
HYDROGEN BROMIDE GAS, DRY	ALL		180		180	180	180	180	200	90	NR	90
HYDROGEN BROMIDE GAS, WET	ALL		180		180	180	180	180	180	90	NR	
HYDROGEN CHLORIDE GAS, DRY	ALL	**6**	200	200	220	250	250	210	250	120	NR	
HYDROGEN CHLORIDE GAS, WET	ALL	**6**	200	200	220	220	210	210	210	120	NR	120
HYDROGEN FLUORIDE GAS, DRY	ALL	**2,10**					180	100				
HYDROGEN PEROXIDE	5		150		150	150	150	150	150	150	NR	
HYDROGEN PEROXIDE	30		80	80	80	80	100	80	100	NR	NR	
HYDROGEN PEROXIDE	50								100			
HYDROGEN SULPHIDE, DRY GAS	5		200				350	250		140	77	
HYDROGEN SULPHIDE, DRY GAS	100		200	190	220	210	210	210	250	140	77	180

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			TEMPERATURE									
HYDROXYACETIC ACID	35		100		100	100	150	140	140	120		140
HYDROXYACETIC ACID	70		100		100	100	100	100	100		NR	120
HYDROXYBENZENESULFONIC ACID	ALL		140				140	140		70		
HYPOCHLOROUS ACID	10		80		100		100	100	100		NR	105
HYPOPHOSPOROUS ACID	50		120	80	90	90	120	120	110			
IODINE	CRISTALS		150	150			150	150				
IODINE	VAPOUR		150	150			180		180			180
ISOAMYL ALCOHOL	100	**11**	120	140	120	120	150	100	100	70		
ISOBUTYL ALCOHOL	ALL	**11**	120				150	120		120	NR	
ISODECANOL	20	**11**	140				150	150		140	NR	
ISODECANOL	100	**11**	120	120	180	180	180	150	150	140	NR	
ISONONYL ALCOHOL	100	**11**	150	150			150	150		140	NR	
ISOOCTYL ADIPATE	100		120	120			150	150			NR	
ISOOCTYL ALCOHOL	100	**11**	140	150			150	140		140	NR	
ISOPROPYL ALCOHOL	100	**11**	100	120			120	120		80	NR	
ISOPROPYL AMINE	100		NR	NR	NR	NR	70	NR	NR			
ISOPROPYL MYRISTATE	100		200	230			230	210				
ISOPROPYL PALMITATE	100		200	220	220		230	210		120	NR	180
ISOPROPYL SULFATE	ALL						80	80				
ITACONIC ACID	40		140				140	140				
ITACONIC ACID	SAT'D		120				120	120			NR	
JET FUEL AV GAS	100	**10,11**	140	140	120	120	140	120		120		
JET FUEL A AND A1	100	**10,11**	140	140	120	120	140	120		120		
JET FUEL B	100	**10,11**	100	140	120	120	140	120		120		
JET FUEL JP-4	100	**10,11**	100	120	120	120	120	120		120		
JET FUEL JP-8	100	**10,11**	100	120	120	120	120	120		120		
JET FUEL JP-10	100	**10,11**	100	120	120	120	120	120		120		
JOJOBA OIL	100		180				180	180				
KEROSENE	100	**10,11**	180	180	180	180	180	180	180	180	120	120
LACTIC ACID	10		180				180	180		140	120	
LACTIC ACID	80		80				80	80		80	80	
LATEX, ALKALINE	ALL		80				80	80				
LATEX, PAINT EMULSION	ALL		120	120			120	120			NR	
LATEX, PVA EMULSION	ALL		100	100			120	120				
LATEX, RUBBER EMULSION	ALL		100		100	120	120	120			NR	
LAURIC ACID	ALL		200	200	210		210	210		180	120	
LAUROYL ALCOHOL	100	**11**	200	200			200	200		80		
LAUROYL CHLORIDE	100		120				120	120				
LAURYL ALCOHOL	ALL	**11**	150	180	120	180	180	180	120	80		
LAURYL CHLORIDE	100		210	210			210	210	210			

Chemical Listings

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CONCENTRATIONS AND RECOMMENDED MAXIMUM CONTINUOUS EXPOSURE TEMPERATURE - DEGREES F

CHEMICAL	CONC.%	NOTES	F010 F013 K022	F007 F015	F080	F083 K023	F085 F086 K095	F282	K190	F701 F707 F764 F774	F737	Hood & Duct K733
			TEMPERATURE									
LAURYL ETHER SULFATE	100		140				140	140		80	NR	
LAURYL MERCAPTAN	100		180	150			200	200	120			
LEAD ACETATE	ALL	**11**	210	160	210	210	210	180	160	160	100	160
LEAD CHLORIDE	SAT'D		200		210	210	210	210				
LEAD NITRATE	ALL		200	180	210	210	210	210		120	90	
LEVULINIC ACID	ALL		200	220	210	210	230	210		160		
LIGNIN SULPHATE, PH 3-7	ALL		180	180			180	180				
LIGNINSULFONATE SODIUM SALT	ALL		180				180	180				
LINOLEIC ACID	100		200				210	210		160		
LINOLENIC ACID	100		200				210	210				
LINSEED OIL	100	**11**	210	210	220	220	230	210	200	180	120	
LIQUID SUGAR	ALL	**12**	180	180	180	180	210	210	180	160	120	180
LITHIUM BROMIDE	ALL		210	210	210	210	210	210	180	140		
LITHIUM CARBONATE	ALL		180	180	150	180	180	180	180			
LITHIUM CHLORIDE	ALL		210	210	210	210	210	210	210	140		
LITHIUM HYDROXIDE	ALL	**2,10**	180	180	150		100	170	NR			
LITHIUM HYPOCHLORITE	ALL	**2,7,8,9,10**	180	180			100	100				
LITHIUM SULPHATE	ALL		200		210	210	210	210	200			
MAGNESIUM BICARBONATE	ALL		180	180	180	180	180	180	180	140	100	150
MAGNESIUM BISULPHITE	ALL		180	180	180	180	180	180	180			
MAGNESIUM CARBONATE	15		180	180			180	180	160	180		
MAGNESIUM CARBONATE	SAT'D		180	180	180	180	180	180	160	150	100	160
MAGNESIUM CHLORIDE	ALL		210	210	210	210	210	210	210	100	80	180
MAGNESIUM FLUOSILICATE	37.5	**2**	180	180			180	180				
MAGNESIUM HYDROXIDE	ALL		200	210	210		210	210			NR	
MAGNESIUM NITRATE	ALL		200	210	210	210	210	210		140	100	160
MAGNESIUM SILICOFLUORIDE	37.5	**2**	100	100			140	140			NR	
MAGNESIUM SULPHATE	ALL		210	210	210	210	210	210	200	180	120	180
MALEIC ACID	ALL		180	180			210	210		140	80	
MALEIC ANHYDRIDE	100		200	200			210	210		140		
MANGANESE SULPHATE/SULPHURIC ACID (90%/10%)	100		180				210	210	180		NR	
MANGANESE(II)CHLORIDE	ALL		210	210			210	210		140	100	

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CONCENTRATIONS AND RECOMMENDED MAXIMUM CONTINUOUS EXPOSURE TEMPERATURE - DEGREES F

CHEMICAL	CONC.%	NOTES	F010 F013 K022	F007 F015	F080	F083 K023	F085 F086 K095	F282	K190	F701 F707 F764 F774	F737	Hood & Duct K733
			TEMPERATURE									
MANGANESE(II)NITRATE	ALL		210	210			210	210			NR	
MANGANESE(II)SULPHATE	ALL		210	210			210	210		140	100	
MAPLE SYRUP	ALL	**12**	180	180	180	180	180	180	180	180	120	180
MELAMINE RESINS	ALL		100	120			100	100	80			
MERCAPTOACETIC ACID	ALL		NR	NR			100	80			NR	
MERCAPTOPROPIONIC -2	10		180				180	180	NR			
MERCURIC CHLORIDE	ALL		210	210	210	210	210	210	210	170	120	180
MERCURIC NITRATE	ALL		200				210	210			NR	
MERCUROUS CHLORIDE	ALL		200	200	210	210	210	210	210	170	120	180
MERCURY	100		200	250	220		250	210	250	180	120	180
METHACRYLIC ACID	40		100				120	100	100		NR	
METHANE SULPHONIC ACID	ALL		NR				100	100			NR	
METHANOL = METHYL ALCOHOL	5		80	100			120	100				
METHANOL = METHYL ALCOHOL	100	**10, 11**	NR	NR			100	100	100	90	NR	90
METHOXYETHYLACETATE	100		NR				NR	NR		NR	NR	
METHYL ACETATE	100		NR	NR			NR	NR		NR		
METHYL BROMIDE, GAS	10		80	80			80	80		NR	NR	
METHYL ETHYL KETONE	100		NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
METHYL ISOBUTYL KETONE	100		NR	NR	NR	NR	120	NR	NR	NR	NR	NR
METHYL METHACRYLATE	100		NR				80	NR		NR	NR	
METHYL STYRENE	100		NR		NR	NR	120	NR	NR	NR	NR	
METHYL-2-PENTANEDIOL-2,4	100	**11**	200				200	180		120		
METHYLAMINE	100		NR				NR	NR		NR	NR	
METHYLANILINE	100		NR				NR	NR				
METHYLCELLOSOLVE	100		NR				NR	NR		NR	NR	
METHYLCHLOROPHENOXYACETIC ACID (MCPA)	100		80				80					
METHYLCHLOROPHENOXYPROPIONIC ACID (MCPP)	100		80				80					
METHYLDIETHANOLAMINE	100		120				150	80				
METHYLENE BROMIDE	100		NR				NR	NR		NR	NR	
METHYLENE CHLORIDE	0.2		80				80	80				
METHYLENE CHLORIDE	100		NR				NR	NR		NR	NR	
METHYLENEBLUE SALTS PH 2-5.5, AQ	ALL		140				140	140		100		
METHYLPENTANOL-2 (ETHYLHEXANOL)	100		180				180	180				
MILK AND MILK PRODUCTS	ALL	**12**	160	160	180	180	180	180	160	160	100	160
MINERAL OILS	100	**11**	210	230	210	250	250	210	220	180	140	180
MINERAL SPIRITS	100		180	210	220	220	210	210	210	180	140	
MOLASSES (2<PH<9)	ALL	**12**	180	180	180	180	180	180	180	140	100	160
MOLYBDIC ACID	100		170				170	170			NR	
MONOCHLOROACETIC ACID	50		120				120	120	90		NR	
MONOCHLOROACETIC ACID	80		NR				100	NR				
MONOCHLOROACETIC ACID	100		NR				NR	NR				

Chemical Listings

Vipel®
CORROSION
RESISTANT RESINS

CONCENTRATIONS AND RECOMMENDED MAXIMUM CONTINUOUS EXPOSURE TEMPERATURE - DEGREES F

CHEMICAL	CONC.%	NOTES	F010 F013 K022	F007 F015	F080	F083 K023	F085 F086 K095	F282	K190	F701 F707 F764 F774	F737	Hood & Duct K733
			TEMPERATURE									
MONOCHLOROBENZENE	100		N.R				100	NR	NR	NR	NR	NR
MONOETHANOL AMINE	100		NR				NR	NR	NR	NR	NR	
MONOMETHYLHYDRAZINE	100		NR				NR	NR		NR	NR	
MORPHOLINE	100		NR				80	NR	100		NR	
MOTOR OIL	100	**11**	210	250	220	220	250	210		180	110	
MURIATIC ACID (SEE HYDROCHLORIC ACID)												
MUSTARD	ALL	**12**	180	180	180	180	210	210	180	150	100	160
MYRISTIC ACID	100		210	210	210	210	250	210				
NAPHTALENE	100		210	210	200	210	210	210	90	150	100	130
NAPHTENOIC ACID (1-)	ALL		180	180			210	210				
NAPHTENOIC ACID (2-)	ALL		180	180			210	210				
NAPHTHA, ALIPHATIC	100	**11**	180	210			210	200		120	140	
NAPHTHA, AROMATIC	100	**11**		120			120	120		120		
NAPHTHYLAMINE-1-SULPHONIC ACID (2-)	ALL						210					
NEOPENTYL GLYCOL	80		180	180			180	180				
NEOPENTYL GLYCOL	100	**11**	180	180			180	180		140	100	
NICKEL CHLORIDE	ALL		210	210	210	210	210	210	210	180	100	180
NICKEL NITRATE	ALL		210	210	210	210	210	210	210	180	100	180
NICKEL SULFAMATE	ALL		180	180			180	180	180			
NICKEL SULPHATE	ALL		210	210	210	210	210	210	210	180	100	180
NICOTINIC ACID	ALL		120				120	120			NR	
NITRIC ACID	2		150	150		150	180	200	210			
NITRIC ACID	10		150	140	140	150	150	150	150		NR	
NITRIC ACID	20		120	120	120	120	150	120	140		NR	
NITRIC ACID	30		100	80	100	100	100	100	140		NR	
NITRIC ACID	50		NR	NR	NR	NR	NR	80	110		NR	
NITRIC ACID	60		NR	NR			NR	NR		NR	NR	
NITRIC ACID	FUMES	**8**	180	180	180	180	180	180	180		NR	
NITRIC ACID / CHROMIC ACID (15%/3%)	18	**2,8,10**	NR					NR				
NITRIC ACID / HYDROFLUORIC ACID (8%/4%)	12	**2,8,10**							80			
NITROBENZENE	100		NR	80	NR	NR	100	NR		NR	NR	

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NR Not recommended.
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Fahrenheit to Centigrade Conversions

300°F= 149°C	230°F= 110°C	160°F= 71°C	100°F= 38°C
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CONCENTRATIONS AND RECOMMENDED MAXIMUM CONTINUOUS EXPOSURE TEMPERATURE - DEGREES F

CHEMICAL	CONC.%	NOTES	F010 F013 K022	F007 F015	F080	F083 K023	F085 F086 K095	F282	K190	F701 F707 F764 F774	F737	Hood & Duct K733
			TEMPERATURE									
NITROGEN TETROXIDE	100		NR				NR	NR		NR	NR	
NITROPHENOL			NR	80			100					
NITROUS ACID	10		80				80	80	90			90
N-METHYL-2-PYRROLIDONE	10						NR	NR				
N-METHYL-2-PYRROLIDONE	100		NR				NR	NR				
NONANES	100		200				210	200				
NONENES	100		200				210	200				
OCTANE	100		200				210	200				
OCTANOIC ACID (SEE CAPRYLIC ACID)	100		180	180	180	180	210	210	140	160	80	
OCTANOL (1-)	100		180				180	180		140		
OCTANOL (2-)	100		180				180	180		140		
OCTANOL (N-)	100		180				180	180		140		
OCTENE	100		200				210	200				
OCTYLAMINE (2-)	100						120	120				
OCTYLAMINE (N-)	100						120	120				
OCTYLAMINE (TERT-)	100						120	120				
OIL, SOUR AND SWEET CRUDE	100	**11**	200	200			210	210		180	100	
OILS (GREASE, LUBE, VEGETABLE)	100		210	220			250	200		120	90	
OLEIC ACID	ALL		210	180	210	210	210	210	200	170	120	180
OLEUM (FUMING SULPHURIC ACID)			NR	NR	NR	NR	NR	NR		NR	NR	NR
OLIVE OIL	ALL	**12**	210	250	210	250	250	210	140	170	120	160
ORANGE OIL	ALL	**12**	180	180	180	180	180	180	140	160	120	160
OXALIC ACID	ALL		120	120	120	120	120	120	120	100	120	180
OZONE GAS	ALL		NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
PALM OIL	ALL	**12**	180	180	180	180	210	180	140	160	120	160
PALMITIC ACID	100		210	210	210	210	210	210		170	120	160
PALMITOYL CHLORIDE	100	**10**	120				120	120				
PARAFFIN WAX	100		200	220			250	200		180	140	
PEANUT OIL	ALL	**12**	180	180	180	180	200	200	180	170	80	160
PENTANE	100						120	120				
PENTANEDIOIC ACID	50		120	120			120	120				
PENTASODIUM TRIPHOSPHATE	10		200				210	210				
PENTENE	100		80				80	80				
PERCHLORIC ACID	10		150	140	150		150	150	150	NR	NR	
PERCHLORIC ACID	30		100	80	80		100	100	100	NR	NR	
PERCHLORIC ACID	70		80				80	80	85	NR	NR	
PERCHLOROETHYLENE	100		80	110	100	100	120	100	100	NR	NR	NR
PHENOL	<1		80	80	100	100	120	120	180	NR	NR	
PHENOL	<5		NR	NR	80	80	120	NR	120	NR	NR	

Chemical Listings

Vipel®
CORROSION
RESISTANT RESINS

CONCENTRATIONS AND RECOMMENDED MAXIMUM CONTINUOUS EXPOSURE TEMPERATURE - DEGREES F

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			TEMPERATURE									
PHENOL	>5		NR				120	NR		NR	NR	
PHENOLFORMALDEHYDE RESIN	100		100	120			120	100				
PHENOLSULPHONIC ACID	ALL		80	80			80	80				
PHOSPHORIC ACID	ALL		210	210	210	210	210	210	210	100	NR	
PHOSPHORIC ACID (P2O5, HCL, H2S, SO2)	FUMES	**10**					210		210			
PHOSPHORIC ACID, (POLYMERIC 115% PHOSPHOROIC ACID)			200				210	210			NR	
PHOSPHORIC ACID, (SUPER 105% PHOSPHORIC ACID)			210	210			210	210		90	NR	
PHOSPHOROUS ACID	70		180	180			180	180				
PHOSPHOROUS TRICHLORIDE	100		NR	NR	NR	NR	NR	NR	NR			NR
PHOSSY WATER							NR	NR		NR	NR	
PHTHALATES/PHTHALATE ESTERS	100		140	140			140	140	140		NR	
PHTHALIC ACID	100	**13**	210	210	210	210	210	210				
PHTHALIC ANHYDRIDE	100		210	210	220		210	210	100	150	80	150
PICRIC ACID	10	**13**	80	80	80	80	150	120	100	NR	NR	100
PINE OIL	100		180	190			200	200				
PINE OIL DISINFECTANT	100		120	110			120	120				
PIPERAZINE DIHYDROCHLORIDE	ALL						120	120				
PLATING SOLUTION, CADMIUM	14.4		140	140			140	140				
(3.2% Cadmium oxide + 10% Sodium cyanide + 1.2% Sodium hydroxide)												
PLATING SOLUTION, CHROME	19.11	**2**	120	80	100	100	120	NR	120			
(18.5% Chromic acid + 0.6% Sodium fluorosilicate + 0.01% Sodium sulphate)												
PLATING SOLUTION, COPPER			120	120	120	120	180	180	180			
PLATING SOLUTION, GOLD	23.8		180	180	200	200	210	210	200			
(22.8% Potassium ferrocyanide + 0.2% Potassium gold cyanide + 0.8% Sodium cyanide)												
PLATING SOLUTION, LEAD	9.2	**2**	180	150	180		210	210	NR			
(8% Lead + 0.8% Fluoboric acid + 0.4% Boric acid)												
PLATING SOLUTION, NICKEL			200	180	200	200	210	210				
1. (11.3% Nickel sulphate + 1.4% Nickel chloride + 1.1% Boric acid)	13.8											
2. (43.7% Nickel sulphate + 3.5% Ammonium chloride + 3.5% Boric acid)	50.7											
PLATING SOLUTION, PLATINUM			180	180			210	180				
PLATING SOLUTION, SIVER		**2**	200	180	200	180	210	210	NR			

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			TEMPERATURE									
PLATING SOLUTION, TIN	37.2	**2**	180	160	180	180	210	180	180			
(18.3% Stannous fluoborate + 7.4% Metallic tin + 9.1% Fluoboric acid + 2.3% Boric acid + 0.1% Naphtol)												
PLATING SOLUTION, ZINC	59.3	**2**	160	140	160		210	210	NR			
(49% Zinc fluoborate + 4.4% Ammonium chloride + 5.9% Ammonium fluoborate)												
PLURONIC SURFACTANT 25R-2	ALL		140	140			140	140				
POLYACRYLAMIDE	ALL		180	180			180	180	NR			
POLYESTER RESINS	100		NR				100	80				
POLYETHYLENE GLYCOL	100		200	200			210	210		140		
POLYOLS	100		180				180	180				
POLYVINYL ACETATE EMULSION	ALL		100	100	120	120	120	120	100			100
POLYVINYL ALCOHOL	ALL	**11**	180	180	180	180	180	180	80	80		90
POTASSIUM ALUMINUM SULPHATE	ALL		210	220	210	210	230	210	180	180	130	160
POTASSIUM AMYL XANTHANE	5						140	150		140		
POTASSIUM BICARBONATE	ALL	**2**	180	180	160	150	180	160	90	100	80	90
POTASSIUM BROMATE	ALL		180				210	210				
POTASSIUM BROMIDE	ALL		210	210	160	160	210	210		140	100	
POTASSIUM CARBONATE	ALL	**2**	180	180	180	180	140	140	110	90		90
POTASSIUM CHLORATE	ALL		200				210	210				
POTASSIUM CHLORIDE	ALL		210	210	210	210	210	210	210	180	120	180
POTASSIUM CHROMATE	ALL		200				210	210				
POTASSIUM CYANIDE	ALL		140				140	140				
POTASSIUM DICHROMATE	ALL		210	210	210		210	210	200	180	120	
POTASSIUM FERRICYANIDE	ALL		210	180	210	210	210	210		180	130	180
POTASSIUM FERROCYANIDE	ALL		210	180	210	210	210	210	200	180	130	180
POTASSIUM FLUORIDE	ALL	**2**	180	180	150		140	140	150			
POTASSIUM GOLD CYANIDE	12		210	210	210	210	210	210	210	180		
POTASSIUM HYDROXIDE	1	**2,8**	150	140			140	150		NR	NR	
POTASSIUM HYDROXIDE	10	**2,8**	150	110	150	NR	100	120	NR	NR	NR	
POTASSIUM HYDROXIDE	25	**2,8**	150	110	150	NR	100	120	NR	NR	NR	
POTASSIUM HYDROXIDE	45	**2,8**	150	110	150	NR	100	120	NR	NR	NR	
POTASSIUM HYDROXIDE	CONC	**2,8**	150	110	150		100	120		NR	NR	
POTASSIUM IODIDE	ALL		150	140	150	150	150	150		NR	NR	
POTASSIUM NITRATE	ALL		210	210	210	210	210	210	210	170	120	200
POTASSIUM NITRITE	ALL		200	200			210	210				
POTASSIUM OXALATE	AL		150	150			150	150				
POTASSIUM PERMANGANATE	ALL		210	210	210	210	210	210	150	120	NR	150

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			TEMPERATURE									
POTASSIUM PERSULPHATE	ALL		210	210	210	210	210	210	90	90		90
POTASSIUM PHOSPHATE (TRIBASIC)	100		180				180	180				
POTASSIUM PYROPHOSPHATE	60		120	140	100	150	150	150	100			
POTASSIUM SILICOFLUORIDE	ALL	**2**	100	100			100	100				
POTASSIUM SULPHATE	ALL		210	210	210	210	210	210	210	180	100	180
PROPANE	100		140	140	140	140	140	140	140	100	80	
PROPANOL (1-)	100		100	120			120	120				
PROPANOL (2-)	100		100	120			120	120				
PROPIONIC ACID	40		180	180			180	180				
PROPIONIC ACID	100		NR	NR			100	NR		NR	NR	
PROPYLAMINE N OR ISO	40		80				80			NR		
PROPYLENE GLYCOL 1,2	ALL		210	210	220	210	210	210	180	170	130	170
PYRIDINE	20		100	100			100	100				
PYRIDINE	100		NR				NR	NR		NR	NR	
QUARTERNARY AMMONIUM SALTS	25		175				175	150				
QUARTERNARY AMMONIUM SALTS	>25		180				180	180				
QUINOLINE	100		NR	NR	NR		NR	NR	NR	NR	NR	
RAYON SPIN BATH							140	140				
REF. FUEL C (ISOOCTANE/TOLUENE)	100	**11**					80			80	NR	
ROSIN SIZES			180				200	180				
SALICYLALDEHYDE	100		80				80				NR	
SALICYLIC ACID	ALL		160	160	160		150	150				
SALT BRINE (SEE SODIUM CHLORIDE)	ALL		210	210	210	210	210	210		180	140	
SELENIOUS ACID	ALL		210	210	210	120	210	180				
SEWAGE MUNICIPAL	ALL	**10**	100	100	100	100	100	100	90	100	80	90
SILICONE OILS OR GREASES	100		200	200			200	200		180	120	
SILVER CYANIDE	ALL		200	200	210		210	210				
SILVER NITRATE	ALL		210	210	210	210	210	210	210	170	120	180
SOAPS	ALL		160	180			200	180				
SODIUM ACETATE	ALL		210	210	210	210	210	210	200	150		150
SODIUM ALKYL ARYL SULPHONATE	ALL		180	180	120		180	180	180			
SODIUM ALUMINATE	ALL		160	160	160		120	150	NR	NR	NR	NR

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			TEMPERATURE									
SODIUM BENZOATE	ALL		180	180	180	180	180	180	180	110		140
SODIUM BICARBONATE	ALL	**2**	180	180	180	180	180	180	140	140		
SODIUM BICARBONATE / SODIUM CARBONATE (15%/20%)	35	**2**	180	180	180	180	150	140	140			
SODIUM BIFLUORIDE	ALL	**2**	120	120			120	120				
SODIUM BISULPHATE	ALL		210	210	210	210	210	210	200	170	120	180
SODIUM BISULPHITE	ALL		210	210	210	210	210	210	200	170	120	180
SODIUM BORATE	ALL		210	210	210	210	210	210	170	170	120	170
SODIUM BOROHYDRIDE / SODIUM HYDROXIDE (12%/48%)	60							110		NR	NR	
SODIUM BROMATE	ALL		210	210			195	195		80	NR	
SODIUM BROMIDE	ALL		210	210	210	210	210	210	210	170	120	180
SODIUM BROMIDE / SODIUM BROMATE (20%/20%)	40		210	210	210	210	210	210	170	160	100	140
SODIUM BUTYL XANTHANE	5		150	150			150	150				
SODIUM CARBONATE	10	**2**	180	180	180	180	150	180	160	100	NR	
SODIUM CARBONATE	35	**2**	160	160	160	180	140	140	90	90	NR	
SODIUM CHLORATE	ALL		210	210	210	210	210	210	200	130	110	
SODIUM CHLORIDE	ALL	**12**	210	210	210	210	210	210	210	180	140	180
SODIUM CHLORITE PH>6	10	**9**	180				180	180			NR	
SODIUM CHROMATE	50		210	210	210	210	210	210	180			
SODIUM CYANIDE	5		210	210	210	210	210	210	210	120		
SODIUM CYANIDE	15		180	180			180	180	180	100	NR	
SODIUM DICHROMATE	ALL		210	210	210	210	210	210		140		
SODIUM DIHYDROGEN PHOSPHATE	ALL		210	210	210	210	210	210	210	100		
SODIUM DIPHOSPHATE	100		210	210	210	210	210	210		160		
SODIUM DODECYL BENZENE SULPHONATE	ALL		100	100			160	160	120			
SODIUM ETHYL XANTHANE	5							150		140		
SODIUM FERRICYANIDE	ALL		210	210	210		210	210	210	170		180
SODIUM FERROCYANIDE	ALL		210	210	210		210	210	180	170		180
SODIUM FLUORIDE	ALL	**2**	180	180	180	180	180	180		80	NR	
SODIUM FLUOSILICATE	ALL	**2**	120	120	120	120	120	120				
SODIUM HEXAMETAPHOSPHATE	ALL		180	180	150	150	180	180	150			
SODIUM HYDROSULPHIDE	ALL		180	180	140	150	180	180	160			
SODIUM HYDROSULPHITE	ALL		100	100			100	100				
SODIUM HYDROXIDE	1	**1,5,8,10,13**	180	160	180	180	120	120	NR	NR	NR	180
SODIUM HYDROXIDE	5	**2,5,8,10,13**	120	100	100	NR	100	120	NR	NR	NR	180
SODIUM HYDROXIDE	25	**2,5,8,10,13**	150	150	140		100	150	NR	NR	NR	
SODIUM HYDROXIDE	50	**2,5,8,10,13**	180	150	150	150	100	150	NR	NR	NR	
SODIUM HYPOCHLORITE (pH >11, ACTIVE CHLORINE <18%)		**2,7,8,9,10**	150	150	150			120		NR	NR	
SODIUM LAURYL SULFATE	ALL		140		160	160	160	160	100			
SODIUM MONOPHOSPHATE	ALL		210	210	210	210	210	210		170		150

Chemical Listings

Vipel®
CORROSION
RESISTANT RESINS

CONCENTRATIONS AND RECOMMENDED MAXIMUM CONTINUOUS EXPOSURE TEMPERATURE - DEGREES F

CHEMICAL	CONC.%	NOTES	F010 F013 K022	F007 F015	F080	F083 K023	F085 F086 K095	F282	K190	F701 F707 F764 F774	F737	Hood & Duct K733
			TEMPERATURE									
SODIUM NITRATE	ALL		210	210	210	210	210	210	210	150	120	180
SODIUM NITRITE	ALL		210	210	210	210	210	210	180	150	120	
SODIUM ORTHOPHOSPHATE (SEE TRISODIUM PHOSPHATE)	ALL		210	210	210	210	210	210	180	NR	NR	
SODIUM OXALATE	ALL		210	210	210	210	210	210	200	150	120	140
SODIUM PERSULPHATE	ALL		210	210	210	210	210	210	210	150	120	140
SODIUM PHOSPHATE	ALL		210	210	210	210	210	210	200	150	120	140
SODIUM POLYACRYLATE	ALL		180	180	150	180	180	180	180			
SODIUM SILICATE	ALL	**1**	210	210	210	210	210	210	160	NR	NR	
SODIUM SULPHATE	ALL		210	210	210	210	210	210	210	100	120	140
SODIUM SULPHHYDRATE	ALL		180	180	140		180	180	160	100	100	
SODIUM SULPHIDE	ALL		210	210	210		210	210	140	140	100	
SODIUM SULPHITE	ALL		210	210	210	210	210	210	210	90		
SODIUM TARTRATE	ALL		210	210		210	210	210	210	150		
SODIUM TETRABORATE	ALL		180	180	180	180	180	180	180	100		140
SODIUM THIOCYANATE	ALL		180	180	180	180	180	180	180	160	100	140
SODIUM THIOSULPHATE	ALL		180	180	180	180	180	180	180	160	100	140
SODIUM TRIDECYLSULPHATE	ALL		180	180	180	180	190	180	160	140	120	140
SODIUM TRIPHOSPHATE	ALL		210	210	210	210	210	210	160	140	120	140
SODIUM TRIPOLYPHOSPHATE	ALL		210	210	210	210	210	210	100	140	120	140
SODIUM XYLENE SULPHONATE	ALL		160	160	160	160	160	160	150	80	NR	
SORBITOL SOLUTIONS	ALL		160	160	150	150	180	150	170	120	100	140
SOY SAUCE	ALL	**8,12**	160	160	160	160	160	160	160	140	NR	120
SOYA OIL	ALL	**11,12**	210	210	180	210	210	200	170	170	120	160
SOYBEAN OIL	ALL	**12**	210	210	210	210	210	210	170	170	120	180
SPEARMINT OIL	100		100	100			200	200				
STANNIC CHLORIDE	ALL		210	210	210	210	210	210	180	170	100	180
STANNOUS CHLORIDE	ALL		210	210	210	210	210	210	210	170	100	180
STANNOUS SULFATE	ALL		200	200	200	200	210	210	160	140	120	140
STARCH 4 < PH < 9	ALL	**12**	200	200	200	200	210	210	180	160	120	180
STEARIC ACID	100		210	210	210	210	210	210	250	170	120	180
STYRENE	100		NR		80	80	120	NR	NR	NR	NR	NR
SUCCINIC ACID	ALL		180	180			180	180	140	100		

Notes

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NR Not recommended.
"**ALL**" in concentration column refers to concentrations in water.
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Fahrenheit to Centigrade Conversions

300°F= 149°C	230°F= 110°C	160°F= 71°C	100°F= 38°C
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250°F= 121°C	180°F= 82°C	110°F= 44°C	60°F= 16°C
240°F= 116°C	170°F= 77°C		

Room temperature is assumed to be 77°F

CONCENTRATIONS AND RECOMMENDED MAXIMUM CONTINUOUS EXPOSURE TEMPERATURE - DEGREES F

CHEMICAL	CONC.%	NOTES	F010 F013 K022	F007 F015	F080	F083 K023	F085 F086 K095	F282	K190	F701 F707 F764 F774	F737	Hood & Duct K733
			TEMPERATURE									
SUCCINONITRIL (AQUEOUS)	ALL		80	100	100	100	100	100		NR	NR	
SUCROSE	ALL	**12**	210	210	210	210	210	210	200	140	100	180
SULPHAMIC ACID	10		210	210			210	210		150	80	
SULPHAMIC ACID	25		150	150			150	150		100		
SULPHANILIC ACID	ALL	**13**	210	210	210	210	210	210				
SULPHATED DETERGENTS	ALL		160	180			180	180		80	NR	
SULPHITE/SULPHATE LIQUORS (PULP MILL)			200	200	200	200	200	200	160			160
SULPHONATED DETERGENTS	ALL		160	160			180	180		80	NR	
"SULPHONYL CHLORIDE, AROMATIC"	ALL		NR				NR	NR	80	NR	NR	
SULPHUR	100						150					
SULPHUR CHLORIDE	ALL		NR		NR	NR	NR	NR	NR	NR	NR	
SULPHUR DICHLORIDE	100		NR				NR	NR		NR	NR	
SULPHUR DIOXIDE GAS, DRY	ALL		220	240	220	220	250	220	220	150		
SULPHUR DIOXIDE GAS, WET	ALL		180	210	200	200	210	180	210	100	NR	
SULPHUR TRIOXIDE GAS, DRY GAS		**10**	210	210	220	220	250	220	90		NR	
SULPHURIC ACID	1		210	180	210	210	210	210	210	170	120	180
SULPHURIC ACID	5		210	210	210	210	210	210	210	170	120	180
SULPHURIC ACID	10		210	210	210	210	210	210	210	150	100	
SULPHURIC ACID	25		210	210	210	210	210	210	210	150	100	180
SULPHURIC ACID	50		210	210	200	200	210	210	200	120	NR	180
SULPHURIC ACID	70		180	180	180	180	180	180	190	NR	NR	150
SULPHURIC ACID	75		100	100	100	100	120	100	100	NR	NR	
SULPHURIC ACID	93		NR	NR	NR	NR	NR	NR		NR	NR	
SULPHURIC ACID	FUMING		NR	NR	NR	NR	NR	NR	NR	NR	NR	
SULPHURIC ACID / FERROUS SULPHATE	10:SAT'D		200				210	210	180			
SULPHURIC ACID / PHOSPHORIC ACID (10%/20%)	30		180				180	180	100			
SULPHUROUS ACID	10		120	120	100	120	120	120	140	NR	NR	90
SULPHURYL CHLORIDE	100		NR				NR	NR		NR	NR	
SUPERPHOSPHORIC ACID (76% P2O5)	100		210	210	210	210	210	210		80	NR	
TALL OIL	100	**11**	200	220	150	150	210	210	200	140		
TANNIC ACID	ALL		210	210	210		210	210	210	170	120	180
TARTARIC ACID	ALL		210	210	210	210	210	210	210	140	NR	160
TETRACHLOROETHANE	100		100	120			120	100		NR	NR	
TETRACHLOROETHYLENE	100		80	100			120	100		NR	NR	
TETRACHLOROPENTANE	100						80	NR		NR	NR	
TETRACHLOROPYRIDINE	100		80	120			120	100	100	NR	NR	
TETRAETHYLENEGLYCOL DIMETHYLETHER	100											
TETRAPOTASSIUM PYROPHOSPHATE	5		200	200	150		210	210	180	120		
TETRAPOTASSIUM PYROPHOSPHATE	60		120	150	100		150	120	120	90	NR	120
TETRASODIUM ETHYLENEDIAMINETETRAACETATE	ALL		180	180	150	150	150	150	100			

Chemical Listings

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			TEMPERATURE									
TETRASODIUM PYROPHOSPHATE	5		200	200	150		210	210	180	120	NR	125
TETRASODIUM PYROPHOSPHATE	60		120	150	100		150	120	120	90	NR	
THIOGLYCOLIC ACID	10		120		100		120	120				
THIOGLYCOLIC ACID	80		NR				80	NR				
THIOGLYCOLIC ACID	100		NR				80	NR				
THIONYL CHLORIDE	100		NR				NR	NR	150			
TOBIAS ACID	ALL		210	210	210	210	210	210				
TOLUENE	100		NR	80			120	80	90	NR	NR	90
TOLUENE DIISOCYANATE	100		80		80		80	NR	150	NR	NR	NR
TOLUENE SULPHONIC ACID	ALL		180	180	210	210	210	210				
TRANSFORMER OILS	100	**11**	120	150			150	210		80	NR	
TRI-(2-CHLOROETHYL) PHOSPHATE	ALL		80				80	80				
TRIBUTYL PHOSPHATE	100		120	140	150	150	140	140				
TRIBUTYLAMINE -N	100		80				120	120				
TRICHLOROACETALDEHYDE	100		NR				NR	NR				
TRICHLOROACETIC ACID	50		100	100	100	100	100	100	100	NR	NR	NR
TRICHLOROBENZENE	100		80				80		NR	NR	NR	
TRICHLOROETHANE	100		NR				100	NR	NR	NR	NR	
TRICHLOROETHYLENE	100		NR		NR	NR	NR	NR	NR	NR	NR	
TRICHLOROMONOFLUORMETHANE	100	**2**	NR				80	80				
TRICHLOROPHENOL	100		NR				NR	NR				
TRICRESYL PHOSPHATE	100		160	160	120	120	160	140				
TRIDECYLBENZENE SULPHONATE	100		200	200			210	210	120			
TRIETHANOL AMINE	100		120	120			150	120				
TRIETHANOL AMINE LAURYL SULPHATE	ALL							100				
TRIETHYL AMINE	100		120	120	120	120	120	120				
TRIETHYLENE GLYCOL	100	**11**	200	210			210	210	180	140		
TRIMETHYL AMINE	100		80	80			100	80				
TRIMETHYL AMINE HYDROCHLORIDE	SAT'D		100	100			120	100	100	NR	NR	
TRIMETHYLENE CHLOROBROMIDE	100		NR				NR	NR				
TRIPHENYL PHOSPHATE	100		140	140			140	140	120	80		90
TRIPHENYL PHOSPHITE	100		140	140			140	140				

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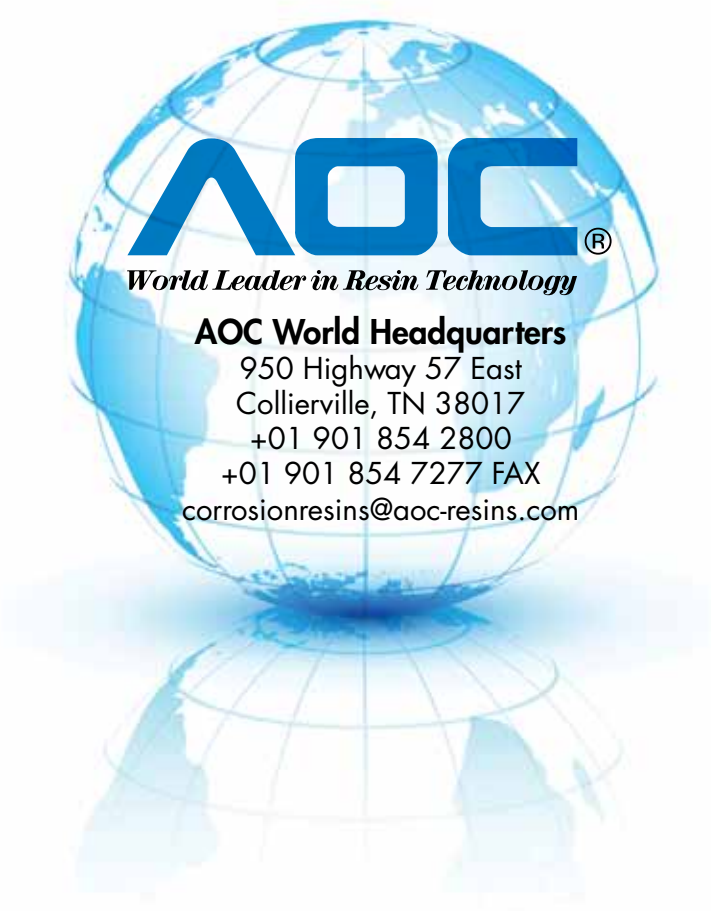
			TEMPERATURE									
TRIPROPYL AMINE -N	ALL		80				80	80				
TRIPROPYLENE GLYCOL	100		210	210	210	210	210	210	250	180	130	180
TRISODIUM PHOSPHATE	ALL		210	210	210	210	210	210	150	NR	NR	
TRITOLYL PHOSPHATE	ALL		140				140	140				
TUNA OIL	ALL	**12**	200	210	200	200	210	210	200	160	120	180
TURPENTINE	100	**11**	150	210	150	120	210	150		80		90
TWEEN SURFACTANT	100		150				170	150				
URANIUM EXTRACTION			180	180	180	180	180	180	180	180	120	120
UREA	ALL		160	160	160	160	160	160	160	150		90
UREA / AMMONIUM NITRATE / WATER (35%/44%/21%)	100		150	150			150	150	120			
UREA FERTILIZER			150	150			150	150	120	120		
UREA FORMALDEHYDE RESINS PH<7	ALL		100	120			120	100	80			
VARSOL SOLVENT	100	**11**	180	210			210	200	200	120	NR	
VEGETABLE OILS	ALL	**12**	200	200	200	200	210	210	200	160	80	160
VINEGAR	ALL	**12**	210	210	210	210	210	200	200	130	120	150
VINYL ACETATE	100		NR				NR	NR				
VINYL CHLORIDE	100		NR				NR	NR	90			
VINYL TOLUENE	100		NR	80	80	80	120	NR	80	NR	NR	
WATER, DEIONISED	100		180	170	180	180	180	180	180	150	120	
WATER, DEMINERALIZED	100		180	180	180	180	180	180	180	150	120	
WATER, DISTILLED	100		180	180	180	180	180	180	180	140	120	
WATER, SEA	100		180	180	180	180	180	180	180	150	140	140
WATER, STEAM CONDENSATE	100		180	180	180	180	180	180	180	150	120	
WHISKEY								110	NR	80	NR	
WHITE LIQUOR (PULP MILL)		**10**	180	180	150	180	100	190				
WINE								110		80	NR	
XYLENE	100	**11**	NR	80	100	100	120	120	100	90	NR	90
XYLENE (M-)	100	**11**	NR	80	100	100	120	120		90	NR	
XYLENE (O-)	100	**11**	NR	80	100	100	100	120		90	NR	
XYLENE (P-)	100	**11**	NR	80	100	100	100	120		90	NR	
ZEOLITE	ALL							210				
ZINC CHLORATE	ALL		200	180			210	210				
ZINC CHLORIDE	ALL		210	210			210	210	210	170	120	
ZINC CYANIDE	ALL		180	180	160	180	180	175	NR			90
ZINC NITRATE	ALL		210	210	210	210	210	210	180	170	120	180
ZINC SULPHATE	ALL		210	210	210	210	210	210	210	170	120	180
ZINC SULPHITE	ALL		200	160	180	180	210	210		140	100	150

Acknowledgments
End-use application photos courtesy of:
US Composites
Containment Solutions
Channeline
Bay Products



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The World of AOC

AOC is a leading producer of unsaturated polyester and vinyl ester resins and is the world leader in innovative resin technology. AOC manufactures its products in facilities strategically located throughout North America and Europe. AOC owned facilities are ISO 9001:2000 certified and use AOC's proprietary process control technology to guarantee batch to batch consistency.

From isophthalic polyesters, and terephthalics, to epoxy novolac and bisphenol A vinyl esters, AOC offers local availability, worldwide, of a broad range of proven Vipel resins through its network of distributors and plants. Please contact the AOC Corrosion Specialists for Vipel resins that meet your corrosion resistant specifications, and put the technology and service of the AOC Corrosion Team to work for you.

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