

You can't beat the system.®

Submittal Package

PVC Schedule 40

DWV System

[Updated October 17, 2019]

SUBMITTAL PACKAGE

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SUBMITTAL FOR CHARLOTTE PIPE® PVC SCHEDULE 40 SOLID WALL PIPE AND PVC DWV FITTING SYSTEM

Date: _____

Job Name: _____

Location: _____

Engineer: _____

Contractor: _____

Scope:

This specification covers PVC Schedule 40 solid wall pipe and PVC DWV fittings used in sanitary drain, waste and vent (DWV), sewer and storm drainage applications. This system is intended for use in non-pressure applications where the operating temperature will not exceed 140° F.

Specification:

Pipe shall be manufactured from virgin rigid PVC (polyvinyl chloride) vinyl compounds with a cell class of 12454 as identified in ASTM D 1784. PVC Schedule 40 pipe shall be Iron Pipe Size (IPS) conforming to ASTM D 1785 and ASTM D 2665. Injection molded PVC DWV fittings shall conform to ASTM D 2665. Fabricated PVC DWV fittings shall conform to ASTM F 1866. All pipe and fittings shall be manufactured in the United States. All systems shall utilize a separate waste and vent system. Pipe and fittings shall conform to NSF International Standard 14.

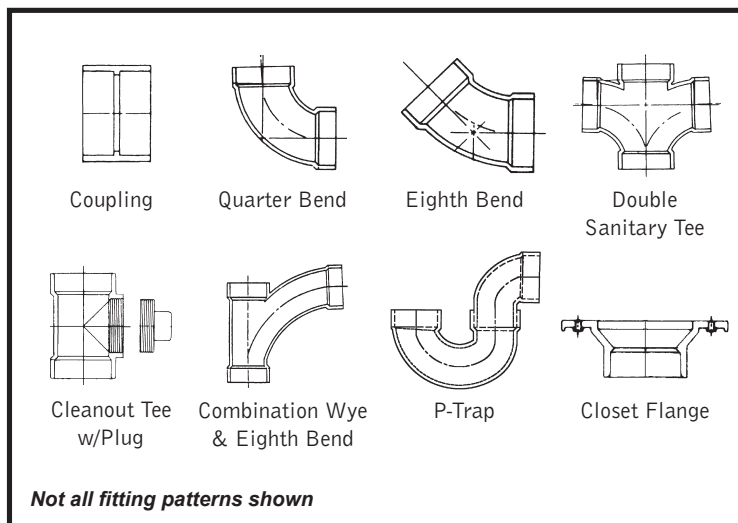
Installation:

Installation shall comply with the latest installation instructions published by Charlotte Pipe and Foundry and shall conform to all applicable plumbing, fire, and building code requirements. Buried pipe shall be installed in accordance with ASTM D 2321 and ASTM F 1668. Solvent cement joints shall be made in a two-step process with primer conforming to ASTM F 656 and solvent cement conforming to ASTM D 2564. The system shall be protected from chemical agents, fire-stopping materials, thread sealant, plasticized-vinyl products or other aggressive chemical agents not compatible with PVC compounds. The system shall be hydrostatically tested after installation.

WARNING! Never test with or transport/store compressed air or gas in PVC pipe or fittings. Doing so can result in explosive failures and cause severe injury or death.

Referenced Standards:

- ASTM D 1784: Rigid Vinyl Compounds
- ASTM D 1785: PVC Plastic Pipe, Schedule 40
- ASTM D 2665: PVC Drain, Waste and Vent Pipe and Fittings
- ASTM D 2564: Solvent Cements for PVC Pipe and Fittings
- ASTM D 2321: Underground Installation of Thermoplastic Pipe (non-pressure applications)
- ASTM F 656: Primers for PVC Pipe and Fittings
- ASTM F 1668: Procedures for Buried Plastic Pipe
- ASTM F 1866: Fabricated PVC DWV Fittings
- NSF Standard 14: Plastic Piping Components and Related Materials



| PVC Schedule 40 DWV Pipe | | | | | | |
|---|--------------|------------------|------------------|------------------|--------------------|---------------------------|
| PVC Schedule 40 DWV Pipe NSF | | | | | | |
| PVC SCHEDULE 40 (WHITE) | | PLAIN END | | PVC 1120 | | ASTM D 2665 |
| PART NO. | NOM. SIZE | UPC # 611942- | QTY. PER SKID | AVG. OD (IN.) | MIN. WALL (IN.) | WT. PER 100 FT. (LBS.) |
| PVC 7100* | 1 1/4" x 10' | 03945 | 2120' | 1.660 | .140 | 42.4 |
| PVC 7100* | 1 1/4" x 20' | 03946 | 4240' | 1.660 | .140 | 42.4 |
| PVC 7112* | 1 1/2" x 10' | 03947 | 1650' | 1.900 | .145 | 51.8 |
| PVC 7112* | 1 1/2" x 20' | 03948 | 3300' | 1.900 | .145 | 51.8 |
| PVC 7200* | 2" x 10' | 03949 | 1110' | 2.375 | .154 | 69.5 |
| PVC 7200* | 2" x 20' | 03950 | 2220' | 2.375 | .154 | 69.5 |
| PVC 7300* | 3" x 10' | 03951 | 1130' | 3.500 | .216 | 144.2 |
| PVC 7300* | 3" x 20' | 03952 | 1000' | 3.500 | .216 | 144.2 |
| PVC 7400† | 4" x 10' | 03953 | 670' | 4.500 | .237 | 205.5 |
| PVC 7400† | 4" x 20' | 03954 | 1340' | 4.500 | .237 | 205.5 |
| PVC 7500† | 5" x 20' | 04837 | 760' | 5.563 | .258 | 272.5 |
| PVC 7600† | 6" x 10' | 03955 | 330' | 6.625 | .280 | 361.2 |
| PVC 7600† | 6" x 20' | 03956 | 660' | 6.625 | .280 | 361.2 |
| PVC 7800† | 8" x 10' | 13087 | 180' | 8.625 | .322 | 543.6 |
| PVC 7800† | 8" x 20' | 03958 | 360' | 8.625 | .322 | 543.6 |
| PVC 7910† | 10" x 20' | 03959 | 220' | 10.750 | .365 | 770.7 |
| PVC 7912† | 12" x 20' | 03961 | 120' | 12.750 | .406 | 1019.0 |
| PVC 7914† | 14" x 20' | 04862 | 60' | 14.000 | .437 | 1205.0 |
| PVC 7916† | 16" x 20' | 04918 | 60' | 16.000 | .500 | 1575.7 |

* Dual Marked ASTM D 1785 & ASTM D 2665.
† Triple Marked ASTM D 1785 & ASTM D 2665 & ASTM F 480.

Product Certification



This is to certify that all Plastic Pipe and Fittings manufactured by Charlotte Pipe and Foundry Company are manufactured in the United States and conform to the following standards:

PVC SCH. 40 SOLID WALL PIPE

ASTM D 1784, ASTM D 1785, ASTM D 2665
FHA UM 79a
FEDERAL SPECIFICATION L-P-320a
NSF STANDARD 14 AND 61

PVC SCH. 40 DWV CELLULAR CORE PIPE

ASTM D 4396, ASTM F 891
NSF STANDARD NO. 14

PVC SCH. 40 DWV FITTINGS

ASTM D 1784, ASTM D 2665, ASTM D 3311,
ASTM F1866
FHA UM 79a
FEDERAL SPECIFICATION L-P-320a
NSF STANDARD NO. 14

ConnecTite® PUSH-FIT DWV FITTINGS

ASME A112.4.4, IAPMO IGC 334
NSF STANDARD NO. 14

PVC SDR-21 AND SDR-26 PRESSURE PIPE

ASTM D 1784, ASTM D 2241
NSF STANDARD NO. 14 AND 61

PVC SCH. 40 PRESSURE FITTINGS

ASTM D 1784, ASTM D 2466
NSF STANDARD 14 AND 61

PVC SCH. 40 WELL CASING PIPE

ASTM D 1784, ASTM F 480
NSF STANDARD NO. 14 AND 61

PVC SCH. 80 PIPE

ASTM D 1784, ASTM D 1785
NSF STANDARD NO. 14 AND 61

PVC SCH. 80 FITTINGS

ASTM D 1784, ASTM D 2467
ASTM D 2464 ASTM F 1970
NSF STANDARD NO. 14 AND 61

PVC SDR 35 SEWER MAIN PIPE

ASTM D 1784, ASTM D 3034, SDR 35
ASTM D 3212, ASTM F 477

PVC SEWER AND DRAIN PIPE

ASTM D 1784, ASTM D 2729

PVC THIN WALL PIPE & FITTINGS

ASTM D 1784, ASTM D 2949
NSF STANDARD NO. 14

CPVC FLOWGUARD GOLD® CTS PIPE & FITTINGS

ASTM D 1784, ASTM D 2846
FHA UM-61a
NSF STANDARD NO. 14 AND 61
CSA LISTED ON SPECIFIED ITEMS

CPVC CHEMDRAIN® SCH. 40 PIPE & FITTINGS

ASTM D 1784, ASTM F 2618
NSF STANDARD 14

ABS SCH. 40 DWV CELLULAR CORE PIPE

ASTM D 3965, ASTM F 628
NSF STANDARD NO. 14

ABS PLUS® SCH. 40 DWV CELLULAR CORE PIPE

ASTM D 3965, ASTM D 4396, ASTM F 1488

ABS SCH. 40 DWV FITTINGS

ASTM D 3965, ASTM D 2661, ASTM D 3311
FHA UM 79a
FEDERAL SPECIFICATION L-P-322b
NSF STANDARD NO. 14

CHARLOTTE PIPE AND FOUNDRY COMPANY

Physical Properties of Charlotte Pipe® ABS and PVC Materials*

| PROPERTY | UNITS | ABS | ASTM NO. | PVC | ASTM NO. |
|---|------------------------|------------------------|----------|------------------------|----------|
| Specific Gravity | g/cc | 1.05 | D 792 | 1.40 | D 792 |
| Tensile Strength (73°F) Minimum | Psi | 4,500 | D 638 | 7,000 | D 638 |
| Modulus of Elasticity in Tension (73°F) Minimum | Psi | 240,000 | D 638 | 400,000 | D 638 |
| Flexural Strength (73°F) | Psi | 10,585 | D 790 | 14,000 | D 790 |
| Izod Impact (notched at 73°F) Minimum | ft lb/ in. of notch | 6.00 | D 256 | 0.65 | D 256 |
| Hardness (Durometer D) | | 70 | D 2240 | 80 ± 3 | D 2240 |
| Hardness (Rockwell R) | | 100 | D 785 | 110 - 120 | D 785 |
| Compressive Strength (73°F) | Psi | 7,000 | D 695 | 9,600 | D 695 |
| Hydrostatic Design Stress | Psi | N/A | | 2,000 | D 1598 |
| Coefficient of Linear Expansion | in./ in./ °F | 5.5 x 10 ⁻⁵ | D 696 | 3.0 x 10 ⁻⁵ | D 696 |
| Heat Distortion Temperature at 264 psi Minimum | degrees F | 180 | D 648 | 158 | D 648 |
| Coefficient of Thermal Conductivity | BTU/ hr/sq ft/ °F/ in. | 1.1 | C 177 | 1.2 | C 177 |
| Specific Heat | BTU/ °F/lb | 0.35 | D 2766 | 0.25 | D 2766 |
| Water Absorption (24 hrs at 73°F) | % weight gain | 0.40 | D 570 | .05 | D 570 |
| Cell Classification - Pipe | | 42222 | D 3965 | 12454 | D 1784 |
| Cell Classification - Fittings | | 32222 | D 3965 | 12454 | D 1784 |
| Burning Rate | | | | Self Ext. | D 635 |

*Above data is based upon information provided by the raw material manufacturers. It should be used only as a recommendation and not as a guarantee of performance.

Solvent Cements

| Pipe and Fitting System | Diameter (in.) | Solvent Cement Standard | Cement Color (common usage, check local code) | Description | Primer (common usage, check local code) |
|-----------------------------|----------------|-------------------------|---|--------------------------|--|
| ABS DWV | 1½ - 6 | ASTM D 2235 | Black | Regular or Medium-Bodied | Not Recommended |
| ABS Plus® Foam Core Pipe | 1½ - 4 | ASTM D 2235 | Black | Regular or Medium-Bodied | Not Recommended |
| FlowGuard Gold® CTS CPVC | ½ - 2 | ASTM F 493 | Yellow | Regular-Bodied | Optional |
| CPVC Sch. 80 | ½ - 2 | ASTM F 493 | IPS 714 or Oatey CPVC Heavy Duty Orange | Heavy-Bodied | IPS P-70 or Oatey Industrial Grade |
| CPVC Sch. 80 | 2½ - 8 | ASTM F 493 | IPS 714 or Oatey CPVC Heavy Duty Orange | Heavy-Bodied | IPS P-70 or Oatey Industrial Grade |
| CPVC Sch. 40 ChemDrain | 1¼ - 8 | ASTM F 493 | ChemDrain Mustard Yellow (Required) | Heavy-Bodied | 6" and larger: IPS P-70 or Oatey Industrial Grade required |
| PVC DWV or Sch. 40 Pressure | ½ - 4 | ASTM D 2564 | Clear | Regular or Medium-Bodied | Required ASTM F 656 |
| PVC DWV or Sch. 40 Pressure | 6 - 16 | ASTM D 2564 | Clear or Grey | Medium or Heavy-Bodied | Required ASTM F 656 |
| PVC Sch. 80 | ¼ - 2 | ASTM D 2564 | Grey | Medium or Heavy-Bodied | Required ASTM F 656 |
| PVC Sch. 80 | 2½ - 16 | ASTM D 2564 | Grey | Heavy-Bodied | IPS P-70 or Oatey Industrial Grade |

NOTICE: Aerosol or spray-on type primers/solvent cements are not recommended. The practice of aggressively scouring the pipe and fittings with both primer and solvent cement is an integral part of the joining process. Not working the primer or solvent cement into the pipe or fitting could cause potential system failure or property damage.

WARNING

Primers and cements are extremely flammable and may be explosive. Do not store or use near open flame or elevated temperatures, which may result in injury or death.

- Solvent fumes created during the joining process are heavier than air and may be trapped in newly installed piping systems.
- Ignition of the solvent vapors caused by spark or flame may result in injury or death from explosion or fire.
- Read and obey all manufacturers' warnings and any instructions pertaining to primers and cements.
- Provide adequate ventilation to reduce fire hazard and to minimize inhalation of solvent vapors when working with cements, primers and new piping systems.

Applicator Types

| Nominal Pipe Size (in.) | Applicator Type | | |
|-------------------------|-----------------|-------------------|-------------------|
| | Dauber | Brush Width (in.) | Swab Length (in.) |
| ¼ | A | ½ | NR |
| ⅜ | A | ½ | NR |
| ½ | A | ½ | NR |
| ¾ | A | 1 | NR |
| 1 | A | 1 | NR |
| 1¼ | A | 1 | NR |
| 1½ | A | 1 - 1½ | NR |
| 2 | A | 1 - 1½ | NR |
| 2½ | NR | 1½ - 2 | NR |
| 3 | NR | 1½ - 2½ | NR |
| 4 | NR | 2 - 3 | 3 |
| 6 | NR | 3 - 5 | 3 |
| 8 | NR | 4 - 6 | 7 |
| 10 | NR | 6 - 8 | 7 |
| 12 | NR | 6 - 8 | 7 |
| 14 | NR | 7 - 8 | 7 |
| 16 | NR | 8+ | 8 |

A = Acceptable

NR = Not Recommended

NOTICE: Rollers are not recommended.

Chemical Resistance

The following table gives the chemical resistance of ABS, PVC and CPVC thermoplastic piping materials and three commonly used seal materials. The information shown is based upon laboratory tests conducted by the manufacturers of the materials, and it is intended to provide a general guideline on the resistance of these materials to various chemicals.

NOTICE: This table is not a guarantee, and any piping systems using products made of these materials should be tested under actual service conditions to determine their suitability for a particular purpose. See website for most current data: www.charlottepipe.com

CAUTION

PVC, ABS and CPVC piping systems have very different chemical resistance. Review manufacturer's literature for all chemicals coming into contact with the piping materials prior to use.

Number = Maximum Recommended Temp. (°F)** CF = Consult Factory NR = Not Recommended • • = Incomplete Data

| Chemical Name | Pipe & Fitting Materials Recommended Max. Temp (°F) | | | Seal Materials Recommended Max. Temp. (°F) | | |
|---|--|------|------|---|------|----------|
| | ABS | PVC | CPVC | Viton ® | EPDM | Neoprene |
| Acetaldehyde | NR | NR | NR | NR | 200 | NR |
| Acetamide | 120 | • • | • • | NR | 200 | NR |
| Acetate Solvent, Crude | NR | NR | NR | NR | 200 | NR |
| Acetate Solvent, Pure | NR | NR | NR | NR | 200 | NR |
| Acetic Acid, 10% | 120 | 140‡ | 180‡ | 73 | 200 | NR |
| Acetic Acid, 20% | NR | 140‡ | 180‡ | NR | 200 | NR |
| Acetic Acid, 50% | NR | NR | NR | NR | 140 | NR |
| Acetic Acid, 80% | NR | NR | NR | NR | 140 | NR |
| Acetic Acid, Glacial | NR | NR | NR | NR | 73 | NR |
| Acetic Anhydride | NR | NR | NR | NR | NR | 73 |
| Acetone | NR | NR | NR | NR | 200 | NR |
| Acetonitrile | NR | NR | NR | NR | NR | 73 |
| Acetophenone | NR | NR | NR | NR | 140 | NR |
| Acetyl Chloride | NR | NR | NR | 185 | NR | NR |
| Acetylene | 140§ | 140§ | 180§ | 200 | 200 | 73 |
| Acetyl Nitrile..... | NR | NR | NR | NR | NR | NR |
| Acrylic Acid | NR | NR | NR | NR | NR | NR |
| Acrylonitrile..... | NR | 73 | NR | NR | 100 | NR |
| Adipic Acid (Sat'd) | • • | 140 | 180 | 160 | 140 | 140 |
| Alcohol, Allyl | NR | NR | NR | 73 | 73 | 73 |
| Alcohol, Amyl..... | NR | NR | NR | 160 | 200 | 140 |
| Alcohol, Benzyl | NR | NR | NR | 140 | NR | NR |
| Alcohol, Butyl | NR | 100 | NR | 200 | 140 | 140 |
| Alcohol, Diacetone | NR | NR | NR | NR | 70 | NR |
| Alcohol, Ethyl (Ethanol) Up to 5% | 73 | 140 | 180 | 200 | 200 | 160 |
| Alcohol, Ethyl (Ethanol) Over 5%..... | NR | 140 | 180 | NR | 200 | 140 |
| Alcohol, Hexyl (Hexanol) | NR | 100 | NR | 200 | NR | NR |
| Alcohol, Isopropyl (Isopropanol)..... | NR | 140 | NR | 160 | 160 | 73 |
| Alcohol, Methyl (Methanol)..... | NR | 140 | 140 | NR | 160 | 160 |
| Alcohol, Octyl (1-n-Octanol) | NR | 100 | 73 | 73 | NR | NR |
| Alcohol, Propyl (Propanol)..... | NR | 140 | NR | 200 | 200 | 140 |
| Allyl Alcohol | NR | NR | NR | 100 | 70 | 73 |
| Allyl Chloride | NR | NR | NR | NR | NR | NR |
| Alums | 140 | 140 | 180 | 200 | 100 | 100 |
| Aluminum Acetate..... | 140 | • • | 180 | NR | 200 | NR |

Acrylonitrile-Butadiene-Styrene Polyvinyl Chloride Type 1 Grade 1 Chlorinated Polyvinyl Chloride Type IV Grade 1

Flouorcarbon Elastomer (Viton ® is a registered trademark of the DuPont Co.) Ethylene Propylene Diene Monomer

** Maximum recommended temperature, for chemical resistance, under normal conditions. § Non-pressure, vent-only, applications when chemical is in gas form.

‡ Must use solvent cement specially formulated for hypochlorite or caustic chemical service (IPS Weld-On 724 or equal).

Chemical Resistance

The following table gives the chemical resistance of ABS, PVC and CPVC thermoplastic piping materials and three commonly used seal materials. The information shown is based upon laboratory tests conducted by the manufacturers of the materials, and it is intended to provide a general guideline on the resistance of these materials to various chemicals.

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| Chemical Name | Pipe & Fitting Materials Recommended Max. Temp (°F) | | | Seal Materials Recommended Max. Temp. (°F) | | |
|---------------------------------------|--|------|------|---|------|----------|
| | ABS | PVC | CPVC | Viton ® | EPDM | Neoprene |
| Aluminum Ammonium | •• | 140 | 180 | 200 | 200 | 160 |
| Aluminum Chloride..... | 140 | 140 | 180 | 200 | 200 | 160 |
| Aluminum Chrome | •• | 140 | 180 | 200 | 200 | 160 |
| Aluminum Fluoride | NR | 73 | 180 | 200 | 200 | 160 |
| Aluminum Hydroxide | 140 | 140‡ | 180‡ | 200 | 200 | 100 |
| Aluminum Nitrate | 140 | 140 | 180 | 100 | 200 | 100 |
| Aluminum Oxychloride | 140 | 140 | 180 | NR | •• | •• |
| Aluminum Potassium Sulfate | 140 | 140 | 180 | 200 | 200 | 160 |
| Aluminum Sulfate | 140 | 140 | 180 | 185 | 200 | 140 |
| Amines, General | NR | NR | NR | NR | NR | NR |
| Ammonia, Aqueous..... | NR | 140 | NR | NR | 175 | 150 |
| Ammonia, Gas | 140§ | 140§ | NR | NR | 140 | 140 |
| Ammonia, Aqua, 10% | •• | 73 | NR | NR | 140 | •• |
| Ammonia, (25% Aqueous Solution) | 140 | NR | NR | NR | 140 | •• |
| Ammonia Hydroxide | 73 | 100‡ | NR | NR | 175 | 150 |
| Ammonia Liquid (Concentrated) | NR | NR | NR | NR | 140 | 73 |
| Ammonium Acetate | •• | 140 | 180 | 73 | 140 | 140 |
| Ammonium Benzoate..... | •• | •• | 180 | •• | •• | •• |
| Ammonium Bifluoride | •• | 140 | 180 | 200 | 200 | •• |
| Ammonium Bisulfide..... | 140 | 140 | 180 | •• | •• | •• |
| Ammonium Carbonate | 140 | 140 | 180 | 200 | 200 | 140 |
| Ammonium Chloride | 120 | 140 | 180 | 200 | 200 | 160 |
| Ammonium Citrate | 120 | •• | 180 | NR | 73 | 73 |
| Ammonium Dichromate | 120 | 73 | •• | NR | 73 | 100 |
| Ammonium Fluoride, 10% | 120 | 140 | 180 | 140 | 200 | 100 |
| Ammonium Fluoride, 25% | 120 | 73 | 180 | 140 | 200 | 73 |
| Ammonium Hydroxide, <10% | 73 | 140‡ | NR | 70 | 200 | 160 |
| Ammonium Hydroxide, >10% | 73 | 73‡ | NR | NR | 200 | 150 |
| Ammonium Metaphosphate..... | 120 | 140 | 180 | 200 | 200 | •• |
| Ammonium Nitrate | 120 | 140 | 180 | 100 | 200 | 160 |
| Ammonium Persulphate | 120 | 140 | 73 | •• | 200 | 73 |
| Ammonium Phospate | 120 | 140 | 73 | 185 | 200 | 140 |
| Ammonium Sulfamate | 120 | •• | 180 | •• | •• | •• |
| Ammonium Sulfate | 120 | 140 | 180 | 200 | 200 | 160 |
| Ammonium Sulfide | 120 | 73 | 180 | 200 | 200 | •• |

Acrylonitrile-Butadiene-Styrene Polyvinyl Chloride Type 1 Grade 1 Chlorinated Polyvinyl Chloride Type IV Grade 1
Fluorocarbon Elastomer (Viton ® is a registered trademark of the DuPont Co.) Ethylene Propylene Diene Monomer

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Chemical Resistance

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| Chemical Name | Pipe & Fitting Materials Recommended Max. Temp (°F) | | | Seal Materials Recommended Max. Temp. (°F) | | |
|--|--|-----|------|---|------|----------|
| | ABS | PVC | CPVC | Viton® | EPDM | Neoprene |
| Ammonium Thiocyanate | 120 | 140 | 180 | 185 | •• | 73 |
| Ammonium Tartrate..... | 120 | 140 | 180 | •• | •• | •• |
| Amyl Acetate | NR | NR | NR | NR | 73 | NR |
| Alcohol, Amyl..... | NR | NR | NR | 185 | 200 | 140 |
| Amyl Chloride | NR | NR | NR | 200 | NR | NR |
| Aniline | NR | NR | NR | NR | 140 | NR |
| Aniline Chlorohydrate..... | NR | NR | •• | •• | •• | •• |
| Aniline Hydrochloride..... | NR | NR | NR | 185 | •• | NR |
| Anthraquinone Sulfonic Acid..... | •• | 140 | •• | 200 | •• | •• |
| Anti-Freeze (See Alcohols, Glycols & Glycerin) | | | | | | |
| Antimony Trichloride | •• | 140 | 180 | 185 | 140 | 140 |
| Aqua Regia..... | NR | NR | 73 | 100 | NR | NR |
| Aromatic Hydrocarbons | NR | NR | NR | 73 | NR | NR |
| Argon..... | •• | •• | •• | 200 | 200 | 100 |
| Arsenic Acid | •• | 140 | 73 | 200 | 185 | NR |
| Aryl Sulfonic Acid | •• | 140 | •• | 185 | 140 | •• |
| Asphalt | NR | NR | NR | 180 | NR | NR |
| Barium Carbonate | 120 | 140 | 180 | 200 | 200 | 160 |
| Barium Chloride | 120 | 140 | 180 | 200 | 200 | 160 |
| Barium Hydroxide | 120 | 140 | 180 | 200 | 180 | 150 |
| Barium Nitrate..... | 120 | 73 | 180 | 200 | 200 | 160 |
| Barium Sulfate..... | 120 | 140 | 180 | 200 | 200 | 160 |
| Barium Sulfide | 120 | 140 | 180 | 200 | 140 | 160 |
| Beer | 120 | 140 | 180 | 200 | 200 | 140 |
| Beet Sugar Liquids | 120 | 140 | 180 | 185 | 200 | 160 |
| Benzaldehyde | NR | NR | NR | NR | 200 | NR |
| Benzalkonium Chloride..... | NR | NR | NR | •• | •• | •• |
| Benzene | NR | NR | NR | 150 | NR | NR |
| Benzene, Benzol | NR | NR | NR | 200 | 200 | •• |
| Benzene Sulfonic Acid | NR | NR | NR | 185 | NR | 100 |
| Benzoic Acid, (Sat'd) | 140 | 140 | 73 | •• | NR | 160 |
| Benzyl Chloride | NR | NR | NR | 200 | NR | NR |
| Benzyl Alcohol | NR | NR | NR | 140 | NR | NR |
| Biodiesel Fuel..... | NR | 73 | NR | 200 | NR | NR |
| Bismuth Carbonate | 140 | 140 | 180 | •• | •• | 73 |

Acrylonitrile-Butadiene-Styrene Polyvinyl Chloride Type 1 Grade 1 Chlorinated Polyvinyl Chloride Type IV Grade 1
Fluorocarbon Elastomer (Viton® is a registered trademark of the DuPont Co.) Ethylene Propylene Diene Monomer

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Number = Maximum Recommended Temp. (°F)** CF = Consult Factory NR = Not Recommended •• = Incomplete Data

| Chemical Name | Pipe & Fitting Materials Recommended Max. Temp (°F) | | | Seal Materials Recommended Max. Temp. (°F) | | |
|--|--|------|------|---|------|----------|
| | ABS | PVC | CPVC | Viton ® | EPDM | Neoprene |
| Black Liquor | 73 | 140 | 180 | 200 | 180 | 73 |
| Bleach (12.5% Sodium Hypochlorite) | NR | 73‡ | 180‡ | 200 | 140 | 140 |
| Bleach (5.5% Sodium Hypochlorite) | 73 | 140‡ | 140‡ | 200 | 140 | 140 |
| Borax | 140 | 140 | 180 | 185 | 140 | 140 |
| Boric Acid | 140 | 140 | 180 | 185 | 140 | 140 |
| Breeders Pellets, Deriv. Fish..... | 140 | 140 | 180 | •• | •• | •• |
| Brine, Acid | 73 | 73 | 180 | 200 | 200 | 160 |
| Bromic Acid | 73 | 140 | 180 | 73 | 73 | •• |
| Bromine | NR | NR | NR | 73 | NR | NR |
| Bromine, Liquid | NR | NR | NR | 73 | NR | NR |
| Bromine, Vapor 25%..... | NR | 140 | •• | •• | NR | •• |
| Bromine, Water..... | NR | 73 | 73 | 185 | NR | NR |
| Bromine, Water, (Sat'd)..... | NR | 73 | 73 | •• | •• | •• |
| Bromobenzene | NR | NR | NR | 150 | NR | NR |
| Bromotoluene..... | NR | NR | NR | NR | NR | NR |
| Butadiene..... | NR | 140 | 73 | 185 | NR | 140 |
| Butane | NR | 140 | •• | 185 | NR | 73 |
| Butanol, Primary..... | NR | NR | NR | •• | •• | •• |
| Butanol, Secondary | NR | NR | NR | •• | •• | •• |
| Butyl Acetate | NR | NR | NR | NR | 140 | NR |
| Butyl Alcohol | 73 | 100 | NR | 75 | 200 | 140 |
| Butyl Carbitol..... | •• | •• | NR | •• | •• | •• |
| Butyl Cellosolve (2-butoxyethanol) | NR | 73 | NR | NR | 140 | •• |
| Butynediol..... | NR | 73 | •• | •• | •• | •• |
| Butylene | NR | 73 | •• | 100 | NR | NR |
| Butyl Phenol | NR | 73 | •• | •• | •• | NR |
| Butyl Pthalate | NR | NR | NR | 73 | •• | •• |
| Butyl Stearate..... | NR | 73 | 73 | 200 | NR | NR |
| Butyric Acid | NR | NR | NR | 73 | 140 | NR |
| Cadmium Acetate | •• | •• | 180 | •• | •• | •• |
| Cadmium Chloride..... | •• | •• | 180 | •• | •• | •• |
| Cadmium Cyanide..... | •• | 140 | 180 | •• | •• | 73 |
| Cadmium Sulfate..... | •• | •• | 180 | •• | •• | •• |
| Caffeine Citrate | •• | 73 | •• | •• | •• | •• |
| Calcium Acetate | NR | 73 | 180 | •• | R | •• |

Acrylonitrile-Butadiene-Styrene Polyvinyl Chloride Type 1 Grade 1 Chlorinated Polyvinyl Chloride Type IV Grade 1
 Fluorocarbon Elastomer (Viton ® is a registered trademark of the DuPont Co.) Ethylene Propylene Diene Monomer
 ** Maximum recommended temperature, for chemical resistance, under normal conditions. § Non-pressure, vent-only, applications when chemical is in gas form.
 ‡ Must use solvent cement specially formulated for hypochlorite or caustic chemical service (IPS Weld-On 724 or equal).

CAUTION

PVC, ABS and CPVC piping systems have very different chemical resistance. Review manufacturer's literature for all chemicals coming into contact with the piping materials prior to use.

Chemical Resistance

The following table gives the chemical resistance of ABS, PVC and CPVC thermoplastic piping materials and three commonly used seal materials. The information shown is based upon laboratory tests conducted by the manufacturers of the materials, and it is intended to provide a general guideline on the resistance of these materials to various chemicals. **NOTICE:** This table is not a guarantee, and any piping systems using products made of these materials should be tested under actual service conditions to determine their suitability for a particular purpose. See website for most current data: www.charlottepipe.com

Number = Maximum Recommended Temp. (°F)** CF = Consult Factory NR = Not Recommended •• = Incomplete Data

| Chemical Name | Pipe & Fitting Materials Recommended Max. Temp (°F) | | | Seal Materials Recommended Max. Temp. (°F) | | |
|--|--|------|------|---|------|----------|
| | ABS | PVC | CPVC | Viton ® | EPDM | Neoprene |
| Calcium Bisulfide | NR | NR | 180 | 185 | •• | •• |
| Calcium Bisulfite | NR | 140 | 180 | 185 | NR | 73 |
| Calcium Carbonate | 140 | 140 | 180 | 200 | 200 | 73 |
| Calcium Chlorate | 140 | 140 | 180 | 185 | 140 | 73 |
| Calcium Chloride | 140 | 140 | 180 | 200 | 200 | 160 |
| Calcium Hydroxide | 140 | 140‡ | 180‡ | 200 | 200 | 70 |
| Calcium Hypochlorite | 140 | 140‡ | 180‡ | 185 | 73 | •• |
| Calcium Nitrate | 140 | 140 | 180 | 200 | 200 | 100 |
| Calcium Oxide | 140 | 140 | 180 | •• | 200 | 160 |
| Calcium Sulfate | 140 | 140 | 180 | 200 | 200 | 160 |
| Camphor Crystals | NR | 73 | •• | 200 | 200 | NR |
| Cane Sugar Liquors | 120 | 140 | 180 | 200 | 200 | 160 |
| Caprolactam | NR | •• | NR | •• | •• | •• |
| Caprolactone | NR | •• | NR | •• | •• | •• |
| Caprylic Acid | NR | •• | NR | •• | •• | •• |
| Carbitol™ | NR | NR | NR | 73 | 140 | 73 |
| Carbon Bisulfide | NR | NR | NR | •• | •• | •• |
| Carbon Dioxide, Wet | 140 | 140 | 180 | 200 | 200 | 160 |
| Carbon Dioxide, Dry | 140 | 140 | 180 | 200 | 200 | 160 |
| Carbon Disulfide | NR | NR | NR | 200 | NR | NR |
| Carbonic Acid | •• | 140 | 180 | 200 | 200 | 73 |
| Carbon Monoxide | 140 | 140 | 180 | 200 | 200 | 73 |
| Carbon Tetrachloride | NR | NR | NR | 185 | NR | NR |
| ♠Castor Oil | NR | 140 | NR | 200 | NR | 200 |
| Caustic Potash | 140 | 140 | CF | NR | 140 | 160 |
| Caustic Soda | NR | 73‡ | CF | NR | 70 | 100 |
| Cellosolve | NR | 73 | NR | NR | 140 | •• |
| Cellosolve Acetate | NR | •• | NR | NR | 140 | NR |
| Chloracetic Acid | 73 | 73 | 180 | NR | 73 | •• |
| Chloracetyl Chloride | NR | 73 | •• | •• | •• | •• |
| Chloral Hydrate | •• | 140 | 180 | NR | NR | 73 |
| Chloramine | NR | 73 | •• | NR | NR | NR |
| Chloric Acid, 20% | •• | 140 | 180 | 140 | •• | 140 |
| Chlorinated Solvents, Wet or Dry | NR | NR | NR | 200 | NR | NR |
| Chlorinated Water, by Cl ₂ Gas, Up to 3500 ppm .. | 140 | 140 | CF | 185 | 100 | NR |

Acrylonitrile-Butadiene-Styrene Polyvinyl Chloride Type 1 Grade 1 Chlorinated Polyvinyl Chloride Type IV Grade 1

Fluorocarbon Elastomer (Viton ® is a registered trademark of the DuPont Co.) Ethylene Propylene Diene Monomer

** Maximum recommended temperature, for chemical resistance, under normal conditions. § Non-pressure, vent-only, applications when chemical is in gas form.

♠Castor oil may cause environmental stress cracking in high-stress areas such as plastic threaded connections.

‡ Must use solvent cement specially formulated for hypochlorite or caustic chemical service (IPS Weld-On 724 or equal).

Chemical Resistance

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Number = Maximum Recommended Temp. (°F)** CF = Consult Factory NR = Not Recommended •• = Incomplete Data

| Chemical Name | Pipe & Fitting Materials Recommended Max. Temp (°F) | | | Seal Materials Recommended Max. Temp. (°F) | | |
|---|--|------|------|---|------|----------|
| | ABS | PVC | CPVC | Viton ® | EPDM | Neoprene |
| Chlorinated Water, by Cl ₂ Gas, Above 3500 ppm | R NR | NR | 185 | NR | NR | |
| Chlorinated Water, by Sodium Hypochlorite | 140 | 140 | 200 | 200 | 200 | 200 |
| Chlorine Gas, Dry | NR | NR | NR | 185 | NR | NR |
| Chlorine Gas, Wet | NR | NR | NR | 185 | NR | NR |
| Chlorine, Liquid (See Sodium Hypochlorite) | | | | | | |
| Chlorine, trace in air..... | •• | •• | 180§ | •• | •• | •• |
| Chlorine Dioxide (sat'd aqueous sol.)..... | •• | •• | 180 | •• | •• | •• |
| Chlorine Water, (Sat'd)..... | •• | 140 | 180 | 200 | 73 | •• |
| Chlorobenzene | NR | NR | NR | 73 | NR | NR |
| Chlorobenzene Chloride..... | NR | NR | NR | 200 | •• | •• |
| Chloroform..... | NR | NR | NR | 73 | NR | NR |
| Chloropicrin | NR | NR | NR | •• | •• | •• |
| Chlorosulfonic Acid..... | •• | 73 | 73 | NR | NR | NR |
| Chromic Acid, 10% | 73 | 140‡ | 180‡ | 140 | 70 | NR |
| Chromic Acid, 30% | NR | 73‡ | 180‡ | 140 | NR | NR |
| Chromic Acid, 40% | NR | 73‡ | 180‡ | 140 | NR | NR |
| Chromic Acid, 50% | NR | 73‡ | 140‡ | 140 | NR | NR |
| Chromium Nitrate | •• | •• | 180 | •• | •• | •• |
| Chromium Potassium Nitrate | 73 | 73 | 73 | 200 | 140 | 160 |
| Citric Acid (Sat'd) | 140 | 140 | 180 | 200 | 200 | 140 |
| Citrus Oils | •• | •• | NR | •• | •• | •• |
| Coconut Oil | NR | 140 | NR | 185 | NR | 100 |
| Coke Oven Gas | NR | NR | NR | 185 | 70 | •• |
| Copper Acetate, (Sat'd) | 73 | 73 | 73 | 140 | 100 | 160 |
| Copper Carbonate..... | 120 | 140 | 180 | 185 | 200 | •• |
| Copper Chloride | 73 | 140 | 180 | 200 | 200 | 160 |
| Copper Cyanide | 73 | 140 | 180 | 185 | 200 | 160 |
| Copper Fluoride | 73 | 140 | 180 | 185 | 200 | 140 |
| Copper Nitrate | 120 | 140 | 180 | 200 | 200 | 160 |
| Copper Salts..... | 140 | 140 | 180 | •• | •• | •• |
| Copper Sulfate | 140 | 140 | 180 | 200 | 200 | 160 |
| Corn Oil | 73 | 140 | NR | 200 | NR | NR |
| Corn Syrup..... | 120 | 140 | 180 | 185 | •• | 100 |
| Cottonseed Oil | 120 | 140 | NR | 185 | NR | •• |
| Creosote..... | NR | NR | NR | 73 | NR | NR |

Acrylonitrile-Butadiene-Styrene Polyvinyl Chloride Type 1 Grade 1 Chlorinated Polyvinyl Chloride Type IV Grade 1
 Fluorocarbon Elastomer (Viton ® is a registered trademark of the DuPont Co.) Ethylene Propylene Diene Monomer
 ** Maximum recommended temperature, for chemical resistance, under normal conditions. § Non-pressure, vent-only, applications when chemical is in gas form.
 ‡ Must use solvent cement specially formulated for hypochlorite or caustic chemical service (IPS Weld-On 724 or equal).

Chemical Resistance

The following table gives the chemical resistance of ABS, PVC and CPVC thermoplastic piping materials and three commonly used seal materials. The information shown is based upon laboratory tests conducted by the manufacturers of the materials, and it is intended to provide a general guideline on the resistance of these materials to various chemicals. **NOTICE:** This table is not a guarantee, and any piping systems using products made of these materials should be tested under actual service conditions to determine their suitability for a particular purpose. See website for most current data: www.charlottepipe.com

Number = Maximum Recommended Temp. (°F)** CF = Consult Factory NR = Not Recommended •• = Incomplete Data

| Chemical Name | Pipe & Fitting Materials Recommended Max. Temp (°F) | | | Seal Materials Recommended Max. Temp. (°F) | | |
|--|--|-----|------|---|------|----------|
| | ABS | PVC | CPVC | Viton ® | EPDM | Neoprene |
| Cresol | NR | NR | NR | 100 | NR | NR |
| Cresylic Acid, 50% | NR | 140 | NR | 185 | NR | NR |
| Crotonaldehyde..... | NR | NR | NR | NR | NR | 73 |
| Crude Oil | NR | 73 | 180 | 200 | NR | NR |
| Cumene | •• | •• | •• | 200 | NR | NR |
| Cupric Fluoride..... | 73 | 140 | 180 | •• | 200 | •• |
| Cupric Sulfate | 140 | 140 | 180 | 200 | 200 | 160 |
| Cuprous Chloride..... | 73 | 140 | 180 | 200 | 200 | 70 |
| Cyclohexane | NR | NR | NR | 185 | NR | NR |
| Cyclohexanol | NR | NR | NR | 185 | NR | NR |
| Cyclohexanone | NR | NR | NR | NR | 73 | NR |
| Decalin..... | NR | NR | NR | •• | •• | •• |
| D-Limonene..... | •• | •• | NR | •• | •• | •• |
| Desocyphehdrine | •• | 73 | •• | •• | •• | •• |
| Detergents w/non-ionic surfactants | 73 | 140 | NR | 200 | 200 | 160 |
| Dextrine | •• | 140 | 180 | 200 | NR | •• |
| Dextrose | 120 | 140 | 180 | 200 | 140 | 160 |
| Diacetone Alcohol | NR | NR | NR | NR | 73 | NR |
| Diazo Salts..... | •• | 140 | 180 | •• | •• | •• |
| Dibutoxy Ethyl Phthalate..... | NR | NR | NR | 200 | 73 | NR |
| Dibutyl Ethyl Phthalate..... | NR | NR | NR | 200 | 73 | NR |
| Dibutyl Phthalate | NR | NR | NR | NR | 73 | NR |
| Dibutyl Sebacate | NR | NR | NR | NR | 73 | NR |
| Dichlorobenzene | NR | NR | NR | 200 | NR | NR |
| Dichloroethylene..... | NR | NR | NR | 200 | NR | NR |
| Diesel Fuels | NR | 73 | NR | 200 | NR | NR |
| Diethylamine | NR | NR | NR | NR | 73 | •• |
| Diethyl Cellosolve | NR | •• | NR | 200 | NR | 100 |
| Diethyl Ether..... | NR | NR | NR | NR | NR | •• |
| Diglycolic Acid | NR | 140 | •• | 73 | 73 | •• |
| Dill Oil | •• | •• | NR | •• | •• | •• |
| Dimethylamine | NR | 140 | NR | NR | 140 | NR |
| Dimethylformamide | NR | NR | NR | NR | NR | NR |
| Dimethyl Hydrazine | NR | NR | NR | NR | •• | •• |
| Diocyl Phthalate (DEHP)..... | NR | NR | NR | 73 | 73 | NR |

Acrylonitrile-Butadiene-Styrene Polyvinyl Chloride Type 1 Grade 1 Chlorinated Polyvinyl Chloride Type IV Grade 1
Fluorocarbon Elastomer (Viton ® is a registered trademark of the DuPont Co.) Ethylene Propylene Diene Monomer
** Maximum recommended temperature, for chemical resistance, under normal conditions. § Non-pressure, vent-only, applications when chemical is in gas form.

Chemical Resistance

The following table gives the chemical resistance of ABS, PVC and CPVC thermoplastic piping materials and three commonly used seal materials. The information shown is based upon laboratory tests conducted by the manufacturers of the materials, and it is intended to provide a general guideline on the resistance of these materials to various chemicals.

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| Chemical Name | Pipe & Fitting Materials Recommended Max. Temp (°F) | | | Seal Materials Recommended Max. Temp. (°F) | | |
|--|--|-----|------|---|------|----------|
| | ABS | PVC | CPVC | Viton ® | EPDM | Neoprene |
| Dioxane | NR | NR | NR | NR | 73 | NR |
| Dioxane, 1.4 | NR | NR | NR | NR | 73 | •• |
| Disodium Phosphate | 120 | 140 | 180 | •• | 200 | •• |
| Distilled Water | 140 | 140 | 180 | 200 | 200 | 160 |
| Divinylbenzene..... | NR | NR | NR | 200 | NR | •• |
| Dry Cleaning Fluid..... | NR | NR | NR | 200 | NR | NR |
| Dursban TC | NR | •• | NR | •• | •• | •• |
| EDTA, Tetrasodium, Aqueous Solution..... | 140 | 140 | 180 | 200 | 200 | 160 |
| Epsom Salt | 120 | 140 | 180 | •• | 200 | •• |
| Epichlorohydrin..... | NR | NR | NR | •• | •• | •• |
| Esters | NR | NR | NR | •• | •• | •• |
| Ethanol, Up to 5% | NR | 140 | 180 | •• | 200 | 160 |
| Ethanol, Over 5%..... | NR | 140 | NR | •• | 200 | 160 |
| Ethers | NR | NR | NR | NR | •• | NR |
| Ethyl Acetate | NR | NR | NR | NR | 73 | NR |
| Ethyl Acetoacetate | NR | NR | NR | NR | 100 | •• |
| Ethyl Acrylate..... | NR | NR | NR | NR | 73 | NR |
| Ethyl Benzene | NR | NR | NR | 73 | NR | NR |
| Ethyl Chloride | NR | NR | NR | 140 | 73 | 73 |
| Ethyl Chloroacetate..... | NR | NR | NR | •• | •• | •• |
| Ethylene Bromide | NR | NR | NR | 73 | NR | NR |
| Ethylene Chloride | NR | NR | NR | 70 | •• | •• |
| Ethylene Chlorohydrin | NR | NR | NR | NR | 73 | 73 |
| Ethylene Diamine | NR | NR | NR | •• | 73 | 100 |
| Ethylene Dichloride | NR | NR | NR | 120 | NR | NR |
| Ethyl Ether | NR | NR | NR | NR | NR | NR |
| Ethylene Glycol, Up to 50% | 73 | 140 | 180 | 200 | 200 | 160 |
| Ethylene Glycol, Over 50% | 73 | 140 | NR | 200 | 200 | 160 |
| Ethylene Oxide | NR | NR | NR | NR | NR | NR |
| Fatty Acids..... | 140 | 140 | 73 | 185 | NR | 140 |
| Ferric Acetate | NR | 73 | 180 | •• | •• | •• |
| Ferric Chloride..... | 120 | 140 | 180 | 200 | 200 | 160 |
| Ferric Hydroxide | 140 | 140 | 180 | 180 | 180 | 100 |
| Ferric Nitrate..... | 140 | 140 | 180 | 200 | 200 | 160 |
| Ferric Sulfate..... | 140 | 140 | 180 | 185 | 200 | 140 |

Acrylonitrile-Butadiene-Styrene Polyvinyl Chloride Type 1 Grade 1 Chlorinated Polyvinyl Chloride Type IV Grade 1
 Fluorocarbon Elastomer (Viton ® is a registered trademark of the DuPont Co.) Ethylene Propylene Diene Monomer
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| Chemical Name | Pipe & Fitting Materials Recommended Max. Temp (°F) | | | Seal Materials Recommended Max. Temp. (°F) | | |
|---|--|------|------|---|------|----------|
| | ABS | PVC | CPVC | Viton ® | EPDM | Neoprene |
| Ferrous Chloride..... | 140 | 140 | 180 | 200 | 200 | •• |
| Ferrous Hydroxide..... | 140 | 73 | 180 | 180 | 180 | •• |
| Ferrous Nitrate..... | 140 | 73 | 140 | 200 | 180 | 160 |
| Ferrous Sulfate..... | 140 | 140 | 180 | 200 | 200 | 160 |
| Fish Solubles | 140 | 140 | 180 | 73 | NR | •• |
| Fluorine Gas..... | NR | NR | NR | NR | NR | NR |
| Fluoboric Acid..... | •• | 140 | 73 | 140 | 140 | 160 |
| Fluorosilicic Acid, 30%..... | 73 | 140 | 73 | 200 | 140 | 100 |
| Formaldehyde, 35% | NR | 140 | NR | NR | 140 | 140 |
| Formalin (37% to 50% Formaldehyde)..... | NR | 140 | NR | NR | 140 | 140 |
| Formic Acid, Up to 25% | •• | 73 | 180 | NR | 200 | 140 |
| Formic Acid, Anhydrous | •• | 73 | NR | NR | •• | 100 |
| Freon F- 11..... | •• | 140§ | 73§ | 73 | NR | NR |
| Freon F-12..... | •• | 140§ | 73§ | NR | NR | 130 |
| Freon F-21..... | •• | NR | NR | NR | NR | NR |
| Freon F-22 | •• | NR | NR | NR | NR | 130 |
| Freon F-113..... | •• | 140§ | •• | 130 | NR | 130 |
| Freon F-114..... | •• | 140§ | •• | NR | NR | 73 |
| Fructose..... | 120 | 140 | 180 | 200 | 175 | 160 |
| Fruit Juices..... | 73 | 140 | 180 | 200 | 200 | 200 |
| Furfural | NR | NR | NR | NR | 140 | 73 |
| Gallic Acid | •• | 140 | 73 | 185 | 73 | 73 |
| Gas, Manufactured | NR | 73§ | NR | •• | •• | •• |
| Gas, Natural..... | NR | 140§ | •• | 185 | NR | 140 |
| Gasoline, Unleaded | NR | NR | NR | 200 | NR | NR |
| Gasoline, Sour..... | NR | NR | NR | 73 | NR | NR |
| Gelatin | 120 | 140 | 150 | 200 | 200 | 160 |
| Gin..... | NR | 140 | NR | •• | •• | •• |
| Glucose | 120 | 140 | 180 | 200 | 200 | 160 |
| Glycerine..... | 120 | 140 | 180 | 200 | 200 | 160 |
| Glycerine, Glycerol | 120 | 140 | 180 | 200 | 200 | •• |
| Glycol, Ethylene, Up to 50% | 73 | 140 | 180 | 200 | 200 | 200 |
| Glycol, Ethylene, Over 50% | 73 | 140 | NR | 200 | 200 | 200 |
| Glycol, Polyethylene (Carbowax) | •• | 140 | 140 | 200 | 180 | 73 |
| Glycol, Polypropylene..... | 73 | NR | NR | 200 | 200 | 200 |

Acrylonitrile-Butadiene-Styrene Polyvinyl Chloride Type 1 Grade 1 Chlorinated Polyvinyl Chloride Type IV Grade 1
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| Chemical Name | Pipe & Fitting Materials Recommended Max. Temp. (°F) | | | Seal Materials Recommended Max. Temp. (°F) | | |
|-------------------------------------|---|------|------|---|------|----------|
| | ABS | PVC | CPVC | Viton® | EPDM | Neoprene |
| Glycol, Propylene, Up to 25% | 73 | 140 | 180 | 200 | 200 | 73 |
| Glycol, Propylene, Up to 50% | 73 | 140 | NR | 200 | 200 | 73 |
| Glycolic Acid | •• | 140 | NR | NR | •• | 73 |
| Glycol Ethers..... | NR | 140 | NR | •• | •• | •• |
| Grape Sugar, Juice | 73 | 140 | 180 | 185 | 200 | 160 |
| Green Liquor | 140 | 140 | 180 | •• | 150 | 70 |
| Halocarbons Oils | NR | NR | NR | 200 | NR | NR |
| Heptane | 73 | 140 | NR | 185 | NR | 73 |
| Hexane..... | NR | 73 | 73 | 73 | NR | 73 |
| Hexanol | NR | 100 | NR | 160 | NR | 73 |
| Hydraulic Oil | NR | 73 | •• | 200 | NR | 73 |
| Hydrazine..... | NR | NR | NR | NR | 70 | •• |
| Hydrobromic Acid, Dilute..... | 73 | 140 | 180 | 185 | 200 | 73 |
| Hydrobromic Acid, 20% | 73 | 140 | 73 | 185 | 140 | 73 |
| Hydrobromic Acid, 50% | NR | 140 | 73 | 185 | 140 | 73 |
| Hydrochloric Acid, Dilute..... | 73 | 140 | 180 | 200 | 140 | 73 |
| Hydrochloric Acid, 20%..... | NR | 140‡ | 180‡ | 200 | 140 | 73 |
| Hydrochloric Acid Conc., 37% | NR | 140‡ | 180‡ | 160 | 100 | 73 |
| Hydrocyanic Acid, 10% | 140 | 140 | •• | 185 | 200 | •• |
| Hydrofluoric Acid, <10% | NR | 140 | 140 | 150 | 73 | 100 |
| Hydrofluoric Acid, 30% | NR | 73 | 140 | 200 | NR | NR |
| Hydrofluoric Acid, 40% | NR | 73 | NR | 100 | NR | NR |
| Hydrofluoric Acid, 50% | NR | NR | NR | 73 | NR | NR |
| Hydrofluoric Acid, 100% | NR | NR | NR | NR | NR | NR |
| Hydrofluosilicic Acid, 50% | NR | 140 | 140 | 200 | 140 | •• |
| Hydrogen | 140§ | 140§ | 73§ | 200 | 200 | 160 |
| Hydrogen Cyanide..... | •• | 140 | •• | •• | •• | 73 |
| Hydrogen Fluoride..... | NR | NR | NR | NR | 73 | NR |
| Hydrogen Peroxide, Dilute | 73 | 140 | 73 | 200 | 73 | NR |
| Hydrogen Peroxide, 36% | NR | 140 | 73 | 200 | NR | NR |
| Hydrogen Peroxide, 50% | NR | 140 | 73 | 200 | NR | NR |
| Hydrogen Peroxide, 90% | NR | NR | NR | 200 | NR | NR |
| Hydrogen Phosphide | •• | 140 | •• | •• | 73 | •• |
| Hydrogen Sulfide, Dry | •• | 140 | 180 | 140 | 100 | NR |
| Hydrogen Sulfide, Aqueous Sol. | •• | 140 | 180 | 140 | 100 | NR |

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| Chemical Name | Pipe & Fitting Materials Recommended Max. Temp (°F) | | | Seal Materials Recommended Max. Temp. (°F) | | |
|------------------------------|--|-----|------|---|------|----------|
| | ABS | PVC | CPVC | Viton® | EPDM | Neoprene |
| Hydroquinone | •• | 140 | •• | 185 | NR | NR |
| Hydroxylamine Sulfate | •• | 140 | •• | •• | 73 | 73 |
| Hypochlorous Acid | 73 | 140 | CF | 73 | 73 | •• |
| Iodine | NR | NR | NR | 73 | 73 | NR |
| Iodine Solution, 10%..... | NR | NR | NR | 200 | 150 | •• |
| Iodine in Alcohol | NR | NR | NR | •• | •• | •• |
| Iron Salts..... | •• | •• | 180 | •• | •• | •• |
| Isopropanol | NR | 140 | NR | •• | •• | •• |
| Isopropyl Alcohol..... | NR | 140 | 140 | 160 | 160 | 73 |
| Isopropyl Ether | NR | NR | NR | NR | NR | NR |
| Isooctane | NR | NR | NR | 185 | NR | 73 |
| Jet Fuel..... | NR | NR | NR | 200 | NR | NR |
| Kerosene | NR | NR | NR | 200 | NR | 73 |
| Ketones | NR | NR | NR | NR | NR | NR |
| Kraft Liquor..... | 73 | 140 | 180 | 100 | •• | 73 |
| Lactic Acid, 25%..... | NR | 140 | 100 | 200 | 140 | 73 |
| Lactic Acid, 80%..... | NR | 100 | 73 | 200 | 140 | 73 |
| Lard Oil | 73 | 140 | NR | 185 | NR | 73 |
| Lauric Acid | •• | 140 | •• | 100 | •• | •• |
| Lauryl Chloride | •• | 140 | •• | 200 | 140 | •• |
| Lead Acetate | •• | 140 | 180 | NR | 200 | 160 |
| Lead Chloride..... | •• | 140 | 180 | 140 | NR | 73 |
| Lead Nitrate..... | •• | 140 | 180 | 200 | 175 | 140 |
| Lead Sulfate..... | •• | 140 | 180 | 200 | 200 | 140 |
| Lemon Oil | •• | 140 | NR | 200 | NR | 73 |
| Ligroine | NR | NR | NR | 100 | •• | 73 |
| Lime Sulfur..... | •• | 140 | 180 | 185 | 200 | 100 |
| Limonene | •• | •• | NR | •• | •• | •• |
| Linoleic Acid..... | •• | 140 | 180 | 140 | 73 | •• |
| Linoleic Oil..... | •• | 140 | 180 | 73 | •• | •• |
| Linseed Oil | 73 | 140 | NR | 200 | 73 | 73 |
| Linseed Oil, Blue | 73 | 73 | NR | 200 | •• | •• |
| Liqueurs..... | NR | 140 | NR | •• | 200 | 160 |
| Lithium Bromide (Brine)..... | •• | 140 | 180 | 200 | •• | •• |
| Lithium Chloride | •• | 140 | 180 | 140 | 100 | •• |

Acrylonitrile-Butadiene-Styrene Polyvinyl Chloride Type 1 Grade 1 Chlorinated Polyvinyl Chloride Type IV Grade 1
Fluorocarbon Elastomer (Viton® is a registered trademark of the DuPont Co.) Ethylene Propylene Diene Monomer
** Maximum recommended temperature, for chemical resistance, under normal conditions. § Non-pressure, vent-only, applications when chemical is in gas form.

Chemical Resistance

The following table gives the chemical resistance of ABS, PVC and CPVC thermoplastic piping materials and three commonly used seal materials. The information shown is based upon laboratory tests conducted by the manufacturers of the materials, and it is intended to provide a general guideline on the resistance of these materials to various chemicals.

NOTICE: This table is not a guarantee, and any piping systems using products made of these materials should be tested under actual service conditions to determine their suitability for a particular purpose. See website for most current data: www.charlottepipe.com

Number = Maximum Recommended Temp. (°F)** CF = Consult Factory NR = Not Recommended •• = Incomplete Data

CAUTION

PVC, ABS and CPVC piping systems have very different chemical resistance. Review manufacturer's literature for all chemicals coming into contact with the piping materials prior to use.

| Chemical Name | Pipe & Fitting Materials Recommended Max. Temp (°F) | | | Seal Materials Recommended Max. Temp. (°F) | | |
|---------------------------------------|--|------|------|---|------|----------|
| | ABS | PVC | CPVC | Viton ® | EPDM | Neoprene |
| Lithium Sulfate | •• | 140 | 180 | •• | •• | •• |
| Lubricating Oil,Petroleum Based | NR | 140 | 180 | 160 | NR | NR |
| Lux Liquid..... | •• | NR | •• | •• | •• | •• |
| Lye Solutions..... | •• | 140 | 180 | •• | •• | •• |
| Machine Oil..... | NR | 140 | 180 | 140 | NR | NR |
| Magnesium Carbonate | 120 | 140 | 180 | 200 | 170 | 140 |
| Magnesium Chloride | 120 | 140 | 180 | 170 | 170 | 160 |
| Magnesium Citrate | 120 | 140 | 180 | 200 | 175 | •• |
| Magnesium Fluoride | 120 | •• | 180 | 200 | 140 | •• |
| Magnesium Hydroxide | 120 | 140 | 180 | 200 | 200 | •• |
| Magnesium Nitrate..... | 120 | 140 | 180 | •• | 200 | •• |
| Magnesium Oxide | 120 | •• | 180 | •• | 140 | 160 |
| Magnesium Salts, Inorganic..... | 120 | •• | 180 | 200 | 160 | 160 |
| Magnesium Sulfate..... | 120 | 140 | 180 | 200 | 180 | 180 |
| Maleic Acid..... | 140 | 140 | 180 | 200 | NR | 73 |
| Maleic Acid (Sat'd) | 140 | 140 | 180 | 200 | 73 | NR |
| Malic Acid | 140 | 140 | 180 | •• | •• | •• |
| Manganese Sulfate | 120 | 140 | 180 | 200 | 175 | 160 |
| Mercuric Acid | •• | •• | 180 | •• | •• | •• |
| Mercuric Chloride..... | •• | 140 | 140 | 185 | 200 | 140 |
| Mercuric Cyanide | •• | 140 | 180 | 73 | 73 | 73 |
| Mercuric Sulfate | •• | 140 | 180 | 73 | 73 | •• |
| Mercurous Nitrate..... | •• | 140 | 180 | 73 | 73 | NR |
| Mercury..... | •• | 140 | 180 | 185 | 200 | 140 |
| Methane..... | 140§ | 140§ | 180§ | 185 | NR | 73 |
| Methanol..... | NR | 140 | 140 | NR | 160 | 160 |
| Methoxyethyl Oleate | NR | 73 | •• | •• | •• | •• |
| Methyl Amine..... | NR | NR | NR | 100 | 73 | 73 |
| Methyl Bromide..... | NR | NR | NR | 185 | NR | NR |
| Methyl Cellosolve | NR | NR | NR | NR | NR | NR |
| Methyl Chloride..... | NR | NR | NR | 73 | NR | NR |
| Methyl Chloroform | NR | NR | NR | 73 | NR | NR |
| Methyl Ethyl Ketone | NR | NR | NR | NR | NR | NR |
| Methyl Formate..... | NR | •• | NR | NR | 100 | 73 |
| Methyl Isobutyl Ketone | NR | NR | NR | NR | NR | NR |

Acrylonitrile-Butadiene-Styrene Polyvinyl Chloride Type 1 Grade 1 Chlorinated Polyvinyl Chloride Type IV Grade 1
 Fluorocarbon Elastomer (Viton ® is a registered trademark of the DuPont Co.) Ethylene Propylene Diene Monomer
 ** Maximum recommended temperature, for chemical resistance, under normal conditions. § Non-pressure, vent-only, applications when chemical is in gas form.

Chemical Resistance

The following table gives the chemical resistance of ABS, PVC and CPVC thermoplastic piping materials and three commonly used seal materials. The information shown is based upon laboratory tests conducted by the manufacturers of the materials, and it is intended to provide a general guideline on the resistance of these materials to various chemicals. **NOTICE:** This table is not a guarantee, and any piping systems using products made of these materials should be tested under actual service conditions to determine their suitability for a particular purpose. See website for most current data: www.charlottepipe.com

Number = Maximum Recommended Temp. (°F)** CF = Consult Factory NR = Not Recommended •• = Incomplete Data

| Chemical Name | Pipe & Fitting Materials Recommended Max. Temp (°F) | | | Seal Materials Recommended Max. Temp. (°F) | | |
|-----------------------------------|--|------|------|---|------|----------|
| | ABS | PVC | CPVC | Viton ® | EPDM | Neoprene |
| Methyl Methacrylate | NR | NR | NR | NR | NR | NR |
| Methyl Sulfate..... | NR | 73 | 73 | •• | •• | •• |
| Methyl Sulfuric Acid | •• | 140 | 73 | NR | 73 | 73 |
| Methylene Bromide..... | NR | NR | NR | 73 | NR | NR |
| Methylene Chloride..... | NR | NR | NR | 73 | NR | NR |
| Methylene Chlorobromide | NR | NR | NR | NR | NR | NR |
| Methylene Iodine | NR | NR | NR | •• | 200 | •• |
| Methylisobutyl Carbinol | NR | NR | NR | 73 | 73 | 73 |
| Milk..... | 140 | 140 | 73 | 200 | 200 | 200 |
| Mineral Oil..... | 73 | 140 | 180 | 200 | NR | 73 |
| Molasses | 120 | 140 | 180 | 185 | 100 | 150 |
| Monochloroacetic Acid, 50% | 73 | 140 | 73 | 70 | NR | NR |
| Monoethanolamine | NR | NR | NR | 185 | 70 | NR |
| Motor Oil | 73 | 140 | 180 | 200 | NR | NR |
| Muriatic Acid, Up to 37% HCl..... | NR | 140 | 180 | 160 | 100 | 73 |
| Naphtha..... | NR | NR | NR | 150 | NR | NR |
| Naphthalene..... | NR | NR | NR | 180 | NR | NR |
| n-Heptane | NR | NR | NR | 200 | NR | 73 |
| Natural Gas..... | NR | 140§ | •• | 185 | NR | 140 |
| Nickel Acetate..... | 73 | 73 | 180 | NR | 73 | •• |
| Nickel Chloride..... | 73 | 140 | 180 | 200 | 200 | 160 |
| Nickel Nitrate | 73 | 140 | 180 | 200 | 180 | •• |
| Nickel Sulfate | 73 | 140 | 180 | 200 | 200 | 160 |
| Nicotine | NR | 140 | •• | •• | •• | NR |
| Nicotinic Acid | NR | 140 | 180 | •• | 73 | 140 |
| Nitric Acid, 10% | NR | 140‡ | 140‡ | NR | 73 | 73 |
| Nitric Acid, 30% | NR | 140‡ | 140‡ | NR | NR | NR |
| Nitric Acid, 40% | NR | 140‡ | 140‡ | NR | NR | NR |
| Nitric Acid, 50% | NR | 73‡ | 100‡ | NR | NR | NR |
| Nitric Acid, 70% | NR | NR | 73‡ | NR | NR | NR |
| Nitric Acid, 100% | NR | NR | NR | NR | NR | NR |
| Nitric Acid, Fuming..... | NR | NR | NR | NR | NR | NR |
| Nitrobenzene | NR | NR | NR | 73 | NR | •• |
| Nitroglycerine | NR | NR | NR | •• | •• | •• |
| Nitrous Acid, 10%..... | NR | 73 | •• | 100 | •• | •• |

Acrylonitrile-Butadiene-Styrene Polyvinyl Chloride Type 1 Grade 1 Chlorinated Polyvinyl Chloride Type IV Grade 1
Fluorocarbon Elastomer (Viton ® is a registered trademark of the DuPont Co.) Ethylene Propylene Diene Monomer
** Maximum recommended temperature, for chemical resistance, under normal conditions. § Non-pressure, vent-only, applications when chemical is in gas form.
‡ Must use solvent cement specially formulated for hypochlorite or caustic chemical service (IPS Weld-On 724 or equal).

Chemical Resistance

The following table gives the chemical resistance of ABS, PVC and CPVC thermoplastic piping materials and three commonly used seal materials. The information shown is based upon laboratory tests conducted by the manufacturers of the materials, and it is intended to provide a general guideline on the resistance of these materials to various chemicals.

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Number = Maximum Recommended Temp. (°F)** CF = Consult Factory NR = Not Recommended •• = Incomplete Data

| Chemical Name | Pipe & Fitting Materials Recommended Max. Temp (°F) | | | Seal Materials Recommended Max. Temp. (°F) | | |
|-------------------------------------|--|------|------|---|------|----------|
| | ABS | PVC | CPVC | Viton ® | EPDM | Neoprene |
| Nitrous Oxide | 73§ | 73§ | •• | 73 | •• | NR |
| Nitroglycol | NR | NR | •• | •• | •• | 73 |
| Nonionic Surfactants | 140 | 140 | NR | 200 | 200 | 160 |
| 1-Octanol | NR | •• | NR | •• | •• | •• |
| Ocenol | NR | •• | •• | •• | •• | •• |
| Oils, Vegetable..... | NR | 140 | NR | 200 | NR | •• |
| Oleic Acid..... | 140 | 140 | 180 | 185 | 73 | 73 |
| Oleum | NR | NR | NR | NR | NR | NR |
| Olive Oil | 73 | 140 | NR | 150 | NR | NR |
| Oxalic Acid (Sat'd) | •• | 140 | 140 | 100 | 150 | 100 |
| Oxalic Acid, 20%..... | 73 | 140 | 180 | 100 | 150 | 100 |
| Oxalic Acid, 50%..... | •• | 140 | 73 | 100 | 150 | 100 |
| Oxygen | 140§ | 140§ | 180§ | 185 | 200 | 140 |
| Ozonated Water..... | •• | 73 | 73 | NR | 73 | 73 |
| Ozone..... | 140§ | 140§ | 180§ | 185 | 200 | NR |
| Palm Oil..... | •• | •• | •• | 73 | NR | •• |
| Palmitic Acid, 10% | 73 | 140 | 73 | 185 | 73 | NR |
| Palmitic Acid, 70% | NR | NR | 73 | 185 | •• | NR |
| Paraffin..... | 73 | 140 | •• | 200 | NR | 140 |
| Peanut Oil | •• | •• | •• | 150 | NR | •• |
| Pentachlorophenol | NR | NR | NR | 200 | NR | NR |
| Peppermint Oil | NR | 73 | 73 | 73 | 73 | 73 |
| Peracetic Acid, 40% | NR | NR | NR | •• | •• | •• |
| Perchloric Acid, 10%..... | NR | 73 | 180 | 200 | 73 | 140 |
| Perchloric Acid, 70%..... | NR | NR | 180 | 200 | 73 | 73 |
| Perchloroethylene | NR | NR | NR | 200 | NR | NR |
| Perphosphate..... | •• | 140 | 170 | 73 | 73 | •• |
| Petrolatum | •• | 140 | 180 | •• | •• | •• |
| Petroleum Oils, Sour..... | •• | 73 | 180 | 200 | NR | •• |
| Petroleum Oils, Refined..... | 73 | 140 | 180 | 200 | NR | •• |
| Phenol..... | NR | NR | NR | 200 | 73 | NR |
| Phenylhydrazine | NR | NR | NR | NR | NR | •• |
| Phenylhydrazine Hydrochloride | NR | NR | NR | •• | •• | •• |
| Phosgene, Liquid | NR | NR | NR | NR | 73 | •• |
| Phosgene, Gas | NR | NR | NR | NR | 73 | •• |

Acrylonitrile-Butadiene-Styrene Polyvinyl Chloride Type 1 Grade 1 Chlorinated Polyvinyl Chloride Type IV Grade 1
Fluorocarbon Elastomer (Viton ® is a registered trademark of the DuPont Co.) Ethylene Propylene Diene Monomer

** Maximum recommended temperature, for chemical resistance, under normal conditions. § Non-pressure, vent-only, applications when chemical is in gas form.

Chemical Resistance

The following table gives the chemical resistance of ABS, PVC and CPVC thermoplastic piping materials and three commonly used seal materials. The information shown is based upon laboratory tests conducted by the manufacturers of the materials, and it is intended to provide a general guideline on the resistance of these materials to various chemicals. **NOTICE:** This table is not a guarantee, and any piping systems using products made of these materials should be tested under actual service conditions to determine their suitability for a particular purpose. See website for most current data: www.charlottepipe.com

Number = Maximum Recommended Temp. (°F)** CF = Consult Factory NR = Not Recommended •• = Incomplete Data

| Chemical Name | Pipe & Fitting Materials Recommended Max. Temp (°F) | | | Seal Materials Recommended Max. Temp. (°F) | | |
|--------------------------------------|--|------|------|---|------|----------|
| | ABS | PVC | CPVC | Viton ® | EPDM | Neoprene |
| Phosphoric Acid, 10% | 73 | 140‡ | 180‡ | 200 | 140 | 140 |
| Phosphoric Acid, 50% | NR | 140‡ | 180‡ | 160 | 160 | 160 |
| Phosphoric Acid, 85% | NR | 140‡ | 180‡ | 160 | 160 | 160 |
| Phosphoric Anhydride | •• | 73 | 73 | •• | •• | •• |
| Phosphorous Pentoxide | •• | 73 | 180 | 200 | 200 | •• |
| Phosphorous, Red | NR | 70 | •• | •• | •• | •• |
| Phosphorus Trichloride | NR | NR | NR | •• | •• | NR |
| Phosphorous, Yellow | NR | 73 | •• | •• | •• | •• |
| Photographic Solutions | •• | 140 | 180 | 185 | •• | 100 |
| Phthalic Acid, 10% | 73 | 73 | •• | 140 | •• | NR |
| Picric Acid | NR | NR | NR | 140 | 140 | 70 |
| Pine Oil | NR | NR | NR | 73 | NR | NR |
| Plating Solutions, Brass..... | •• | 140 | 180 | 140 | 73 | 140 |
| Plating Solutions, Cadmium..... | •• | 140 | 180 | 180 | 180 | 140 |
| Plating Solutions, Chrome | •• | 140 | 180 | 180 | 180 | NR |
| Plating Solutions, Copper | •• | 140 | 180 | 180 | 180 | 140 |
| Plating Solutions, Gold | •• | 140 | 180 | 180 | 73 | 73 |
| Plating Solutions, Indium | •• | •• | •• | 140 | 73 | 140 |
| Plating Solutions, Lead..... | •• | 140 | 180 | 180 | 180 | 140 |
| Plating Solutions, Nickel | •• | 140 | 180 | 180 | 180 | 140 |
| Plating Solutions, Rhodium..... | •• | 140 | 180 | 73 | 120 | 73 |
| Plating Solutions, Silver | •• | 140 | 180 | 140 | 120 | 140 |
| Plating Solutions, Tin | •• | 140 | 180 | 140 | 180 | 140 |
| Plating Solutions, Zinc | •• | 140 | 180 | 140 | 73 | 180 |
| POE Oils (Polyolester)..... | NR | NR | NR | NR | NR | NR |
| Polyethylene Glycol (Carbowax) | •• | 140 | 140 | 200 | 180 | 73 |
| Polypropylene Glycol..... | 73 | NR | NR | 200 | 200 | 200 |
| Potash..... | 140 | 140 | 180 | 200 | 170 | 160 |
| Potassium Acetate | •• | •• | 180 | •• | •• | •• |
| Potassium Alum | •• | 140 | 180 | 200 | 200 | 160 |
| Potassium Aluminum Sulfate | •• | 140 | 180 | 200 | 200 | 160 |
| Potassium Amyl Xanthate | •• | 73 | •• | •• | •• | •• |
| Potassium Bicarbonate | 140 | 140 | 180 | 200 | 170 | 160 |
| Potassium Bichromate | 140 | 140 | 180 | 200 | 170 | •• |
| Potassium Bisulfate, Sat'd | •• | 140 | 180 | 200 | 180 | 73 |


Acrylonitrile-Butadiene-Styrene Polyvinyl Chloride Type 1 Grade 1 Chlorinated Polyvinyl Chloride Type IV Grade 1
Fluorocarbon Elastomer (Viton ® is a registered trademark of the DuPont Co.) Ethylene Propylene Diene Monomer
** Maximum recommended temperature, for chemical resistance, under normal conditions. § Non-pressure, vent-only, applications when chemical is in gas form.
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Chemical Resistance

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CAUTION

PVC, ABS and CPVC piping systems have very different chemical resistance. Review manufacturer's literature for all chemicals coming into contact with the piping materials prior to use.

| Chemical Name | Pipe & Fitting Materials Recommended Max. Temp (°F) | | | Seal Materials Recommended Max. Temp. (°F) | | |
|-------------------------------------|--|------|------|---|------|----------|
| | ABS | PVC | CPVC | Viton ® | EPDM | Neoprene |
| Potassium Borate | 140 | 140 | 180 | 200 | 200 | •• |
| Potassium Bromate..... | 140 | 140 | 180 | 200 | •• | 140 |
| Potassium Bromide..... | 140 | 140 | 180 | 200 | 170 | 160 |
| Potassium Carbonate | 140 | 140 | 180 | 200 | 170 | 160 |
| Potassium Chlorate..... | 140 | 140 | 180 | 140 | 140 | 100 |
| Potassium Chloride..... | 140 | 140 | 180 | 200 | 200 | 160 |
| Potassium Chromate..... | 140 | 140 | 180 | 200 | 170 | 70 |
| Potassium Cyanide..... | 140 | 140 | 180 | 185 | 140 | 160 |
| Potassium Dichromate | 140 | 140 | 180 | 200 | 170 | •• |
| Potassium Ethyl Xanthate..... | •• | 73 | •• | •• | •• | •• |
| Potassium Ferricyanide..... | 140 | 140 | 180 | 140 | 140 | 150 |
| Potassium Ferrocyanide | 140 | 140 | 180 | 140 | 140 | 150 |
| Potassium Fluoride | 140 | 140 | 180 | 200 | 140 | •• |
| Potassium Hydroxide, 25% | 73 | 140‡ | 180‡ | NR | 180 | 140 |
| Potassium Hydroxide, 50% | 73 | 140‡ | 180‡ | NR | 180 | NR |
| Potassium Hypochlorite | •• | 73‡ | 180‡ | 73 | NR | •• |
| Potassium Iodide | •• | 73 | 180 | 180 | 140 | 160 |
| Potassium Nitrate..... | 140 | 140 | 180 | 200 | 200 | 140 |
| Potassium Perborate..... | 140 | 140 | 180 | 73 | 73 | 73 |
| Potassium Perchlorate, (Sat'd)..... | 140 | 140 | 180 | 150 | 140 | •• |
| Potassium Permanganate, 10%..... | 140 | 140 | 180 | 140 | 200 | 100 |
| Potassium Permanganate, 25%..... | 140 | 140 | 180 | 140 | 140 | 100 |
| Potassium Persulphate, (Sat'd)..... | 73 | 140 | 180 | 200 | 200 | 140 |
| Potassium Phosphate | 73 | •• | 180 | 180 | 180 | 180 |
| Potassium Sulfate..... | 73 | 140 | 180 | 200 | 200 | 140 |
| Potassium Sulfite..... | 73 | 140 | 180 | 200 | 200 | 140 |
| Potassium Triphosphosphate | •• | •• | 180 | 100 | •• | 73 |
| Propane | 140§ | 140§ | 73§ | 73 | NR | 73 |
| Propanol | NR | 140 | NR | 200 | 200 | 140 |
| Propargyl Alcohol..... | NR | 140 | NR | 140 | 140 | NR |
| Propionic Acid, Up to 2% | NR | •• | 180 | •• | •• | NR |
| Propionic Acid, Over 2%..... | NR | •• | NR | •• | •• | NR |
| Propyl Alcohol..... | NR | 140 | NR | 200 | 200 | 140 |
| Propylene Dichloride..... | NR | NR | NR | 73 | NR | NR |
| Propylene Glycol, Up to 25% | 73 | 140 | 180 | 200 | 200 | 73 |

Acrylonitrile-Butadiene-Styrene Polyvinyl Chloride Type 1 Grade 1 Chlorinated Polyvinyl Chloride Type IV Grade 1

Fluorocarbon Elastomer (Viton ® is a registered trademark of the DuPont Co.) Ethylene Propylene Diene Monomer

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| Chemical Name | Pipe & Fitting Materials Recommended Max. Temp (°F) | | | Seal Materials Recommended Max. Temp. (°F) | | |
|-----------------------------------|--|------|------|---|------|----------|
| | ABS | PVC | CPVC | Viton ® | EPDM | Neoprene |
| Propylene Glycol, Up to 50% | 73 | 140 | NR | 200 | 200 | 73 |
| Propylene Oxide..... | NR | NR | NR | NR | 73 | NR |
| Pyridine | NR | NR | NR | NR | 73 | NR |
| Pyrogallia Acid..... | •• | 73 | •• | •• | •• | 73 |
| Quaternary Ammonium Salts | NR | 140 | NR | 73 | •• | 73 |
| Radon Gas..... | 140§ | 140§ | 140§ | 200 | 200 | 200 |
| Rayon Coagulating Bath | •• | 140 | NR | •• | •• | •• |
| Reverse Osmosis Water | 140 | 140 | 180 | 200 | 200 | 200 |
| Salicylic Acid..... | •• | 140 | 180 | 185 | 200 | NR |
| Sea Water..... | 140 | 140 | 180 | 200 | 200 | 200 |
| Selenic Acid | •• | 140 | •• | NR | 73 | 73 |
| Silicic Acid..... | •• | 140 | •• | 200 | 140 | 140 |
| Silicone Oil..... | •• | 100 | 180 | 200 | 140 | 200 |
| Silver Chloride | 140 | •• | 180 | 73 | 73 | 73 |
| Silver Cyanide | 140 | 140 | 180 | 140 | 140 | 73 |
| Silver Nitrate | 140 | 140 | 180 | 200 | 200 | 160 |
| Silver Sulfate | 140 | 140 | 180 | 200 | 170 | 73 |
| Soaps..... | 140 | 140 | 180 | 200 | 200 | 140 |
| Sodium Acetate | 120 | 140 | 180 | NR | 170 | NR |
| Sodium Aluminate..... | 120 | •• | 180 | 200 | 200 | 140 |
| Sodium Alum | 120 | 140 | 180 | 200 | 170 | 140 |
| Sodium Arsenate | 120 | 140 | 180 | 200 | 140 | 73 |
| Sodium Benzoate..... | 120 | 140 | 180 | 200 | 200 | NR |
| Sodium Bicarbonate | 120 | 140 | 180 | 200 | 200 | 160 |
| Sodium Bichromate | 120 | 140 | 180 | 200 | 140 | 73 |
| Sodium Bisulfate..... | 120 | 140 | 180 | 200 | 200 | 140 |
| Sodium Bisulfite..... | 120 | 140 | 180 | 200 | 200 | 140 |
| Sodium Borate | 120 | 73 | 180 | 140 | 140 | 100 |
| Sodium Bromide..... | 120 | 140 | 180 | 200 | 200 | 73 |
| Sodium Carbonate..... | 120 | 140 | 180 | 200 | 140 | 140 |
| Sodium Chlorate..... | 120 | 73 | 180 | 100 | 140 | 140 |
| Sodium Chloride..... | 120 | 140 | 180 | 200 | 140 | 160 |
| Sodium Chlorite | 120 | NR | 180 | NR | NR | •• |
| Sodium Chromate..... | 120 | 140 | 180 | 140 | 140 | 73 |
| Sodium Cyanide..... | 120 | 73 | 180 | 140 | 140 | 140 |

Acrylonitrile-Butadiene-Styrene Polyvinyl Chloride Type 1 Grade 1 Chlorinated Polyvinyl Chloride Type IV Grade 1
Fluorocarbon Elastomer (Viton ® is a registered trademark of the DuPont Co.) Ethylene Propylene Diene Monomer

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| Chemical Name | Pipe & Fitting Materials Recommended Max. Temp (°F) | | | Seal Materials Recommended Max. Temp. (°F) | | |
|--|--|------|------|---|------|----------|
| | ABS | PVC | CPVC | Viton ® | EPDM | Neoprene |
| Sodium Dichromate | 120 | 140 | 180 | 200 | 140 | NR |
| Sodium Ferricyanide..... | 120 | 140 | 180 | 140 | 140 | •• |
| Sodium Ferrocyanide..... | 120 | 140 | 180 | 140 | 140 | •• |
| Sodium Fluoride..... | 120 | 73 | 140 | 140 | 140 | 73 |
| Sodium Formate..... | •• | •• | 180 | •• | •• | •• |
| Sodium Hydroxide, 15%..... | 120 | 140‡ | CF | NR | 180 | 160 |
| Sodium Hydroxide, 30%..... | 73 | 73‡ | CF | NR | 140 | 160 |
| Sodium Hydroxide, 50%..... | 73 | 73‡ | CF | NR | 140 | 160 |
| Sodium Hydroxide, 70%..... | NR | 73‡ | CF | NR | 140 | 160 |
| Sodium Hypobromite..... | •• | •• | 180 | •• | •• | •• |
| Sodium Hypochlorite, Sat'd, 12.5%..... | NR | 73‡ | 180‡ | 140 | NR | NR |
| Sodium Iodide..... | •• | •• | 180 | 140 | 140 | 140 |
| Sodium Metaphosphate..... | 120 | 73 | 180 | 73 | 73 | •• |
| Sodium Nitrate..... | 120 | 140 | 180 | 200 | 200 | 140 |
| Sodium Nitrite..... | 120 | 140 | 180 | 200 | 170 | 140 |
| Sodium Palmitate..... | •• | 140 | 180 | •• | •• | •• |
| Sodium Perborate..... | 120 | 140 | 180 | 73 | 73 | 73 |
| Sodium Perchlorate..... | 120 | 140 | 180 | •• | •• | •• |
| Sodium Peroxide..... | NR | 140 | 180 | 185 | 140 | 73 |
| Sodium Phosphate, Alkaline..... | 73 | 140 | 180 | 200 | 170 | 140 |
| Sodium Phosphate, Acid..... | 73 | 140 | 180 | 200 | 170 | 140 |
| Sodium Phosphate, Neutral..... | 73 | 140 | 180 | 200 | 170 | 140 |
| Sodium Silicate..... | •• | •• | 180 | 200 | 200 | 140 |
| Sodium Sulfate..... | 73 | 140 | 180 | 200 | 140 | 140 |
| Sodium Sulfide..... | 73 | 140 | 180 | 200 | 140 | 140 |
| Sodium Sulfite..... | 73 | 140 | 180 | 200 | 140 | 140 |
| Sodium Thiosulfate..... | 73 | 140 | 180 | 200 | 200 | 160 |
| Sodium Tripolyphosphate..... | •• | •• | 180 | •• | •• | •• |
| Solicaldehyde..... | NR | NR | •• | •• | •• | •• |
| Sour Crude Oil..... | NR | 73 | 180 | 200 | NR | NR |
| Soybean Oil..... | NR | 140 | 180 | 200 | NR | 73 |
| Soybean Oil, Epoxidized..... | NR | NR | NR | 200 | NR | NR |
| Stannic Chloride..... | 120 | 140 | 180 | 200 | 100 | NR |
| Stannous Chloride..... | 120 | 140 | 180 | 200 | 73 | 160 |
| Stannous Sulfate..... | •• | •• | 180 | •• | •• | •• |

Acrylonitrile-Butadiene-Styrene Polyvinyl Chloride Type 1 Grade 1 Chlorinated Polyvinyl Chloride Type IV Grade 1
 Fluorocarbon Elastomer (Viton ® is a registered trademark of the DuPont Co.) Ethylene Propylene Diene Monomer
 ** Maximum recommended temperature, for chemical resistance, under normal conditions. § Non-pressure, vent-only, applications when chemical is in gas form.
 ‡ Must use solvent cement specially formulated for hypochlorite or caustic chemical service (IPS Weld-On 724 or equal).

Chemical Resistance

The following table gives the chemical resistance of ABS, PVC and CPVC thermoplastic piping materials and three commonly used seal materials. The information shown is based upon laboratory tests conducted by the manufacturers of the materials, and it is intended to provide a general guideline on the resistance of these materials to various chemicals. **NOTICE:** This table is not a guarantee, and any piping systems using products made of these materials should be tested under actual service conditions to determine their suitability for a particular purpose. See website for most current data: www.charlottepipe.com

Number = Maximum Recommended Temp. (°F)** CF = Consult Factory NR = Not Recommended •• = Incomplete Data

| Chemical Name | Pipe & Fitting Materials Recommended Max. Temp (°F) | | | Seal Materials Recommended Max. Temp. (°F) | | |
|----------------------------|--|------|------|---|------|----------|
| | ABS | PVC | CPVC | Viton ® | EPDM | Neoprene |
| Starch..... | 140 | 140 | 180 | 200 | 170 | 160 |
| Stearic Acid..... | •• | 140 | 73 | 100 | NR | 73 |
| Stoddard's Solvent..... | NR | NR | NR | 185 | NR | NR |
| Strontium Chloride..... | •• | •• | 180 | •• | •• | •• |
| Styrene Monomer..... | NR | NR | NR | NR | NR | NR |
| Succinic Acid..... | •• | 140 | •• | 73 | 73 | •• |
| Sugar Syrup..... | 73 | 140 | 180 | 180 | 180 | •• |
| Sulfamic Acid..... | NR | NR | 180 | NR | NR | 73 |
| Sulfate Liquors..... | •• | •• | •• | 73 | 73 | •• |
| Sulfite Liquor..... | •• | •• | 180 | 140 | 140 | 73 |
| Sulfur..... | •• | 140 | 73 | 200 | •• | 73 |
| Sulfur Chloride..... | NR | NR | 180 | 140 | NR | NR |
| Sulfur Dioxide, Dry..... | 73§ | 140§ | NR | 100 | 73 | NR |
| Sulfur Dioxide, Wet..... | 73§ | 73§ | NR | 140 | 140 | •• |
| Sulfur Trioxide..... | •• | 140 | 180 | 140 | 73 | NR |
| Sulfur Trioxide, Gas..... | 140§ | 140§ | •• | 140 | 73 | NR |
| Sulfuric Acid, 10%..... | 120 | 140‡ | 180‡ | 200 | 140 | 160 |
| Sulfuric Acid, 20%..... | 120 | 140‡ | 180‡ | 200 | 140 | 160 |
| Sulfuric Acid, 30%..... | NR | 140‡ | 180‡ | 200 | 200 | 160 |
| Sulfuric Acid, 50%..... | NR | 140‡ | 180‡ | 200 | 200 | 160 |
| Sulfuric Acid, 60%..... | NR | 140‡ | 180‡ | 200 | 200 | 73 |
| Sulfuric Acid, 70%..... | NR | 140‡ | 180‡ | 200 | NR | NR |
| Sulfuric Acid, 80%..... | NR | 73‡ | 180‡ | 180 | NR | NR |
| Sulfuric Acid, 90%..... | NR | NR | 140‡ | 160 | NR | NR |
| Sulfuric Acid, 93%..... | NR | NR | 73‡ | 160 | NR | NR |
| Sulfuric Acid, 98%..... | NR | NR | 73‡ | 160 | NR | NR |
| Sulfuric Acid, 100%..... | NR | NR | NR | 160 | NR | NR |
| Sulfurous Acid..... | NR | 140 | 180 | NR | NR | NR |
| Surfactants, Nonionic..... | 140 | 140 | NR | 200 | 200 | 160 |
| Tall Oil..... | •• | 140 | 180 | 73 | NR | 73 |
| Tannic Acid, 10%..... | NR | 140 | 180 | 100 | 73 | 100 |
| Tannic Acid, 30%..... | NR | •• | 73 | •• | •• | •• |
| Tanning Liquors..... | 140 | 140 | 180 | 200 | •• | 73 |
| Tar..... | NR | NR | NR | 185 | NR | 73 |
| Tartaric Acid..... | 140 | 140 | 73 | 73 | NR | 73 |

Acrylonitrile-Butadiene-Styrene Polyvinyl Chloride Type 1 Grade 1 Chlorinated Polyvinyl Chloride Type IV Grade 1

Fluorocarbon Elastomer (Viton ® is a registered trademark of the DuPont Co.) Ethylene Propylene Diene Monomer

** Maximum recommended temperature, for chemical resistance, under normal conditions. § Non-pressure, vent-only, applications when chemical is in gas form.

‡ Must use solvent cement specially formulated for hypochlorite or caustic chemical service (IPS Weld-On 724 or equal).

Chemical Resistance

The following table gives the chemical resistance of ABS, PVC and CPVC thermoplastic piping materials and three commonly used seal materials. The information shown is based upon laboratory tests conducted by the manufacturers of the materials, and it is intended to provide a general guideline on the resistance of these materials to various chemicals.

NOTICE: This table is not a guarantee, and any piping systems using products made of these materials should be tested under actual service conditions to determine their suitability for a particular purpose. See website for most current data: www.charlottepipe.com

Number = Maximum Recommended Temp. (°F)** CF = Consult Factory NR = Not Recommended •• = Incomplete Data

CAUTION

PVC, ABS and CPVC piping systems have very different chemical resistance. Review manufacturer's literature for all chemicals coming into contact with the piping materials prior to use.

| Chemical Name | Pipe & Fitting Materials Recommended Max. Temp (°F) | | | Seal Materials Recommended Max. Temp. (°F) | | |
|----------------------------------|--|-----|------|---|------|----------|
| | ABS | PVC | CPVC | Viton ® | EPDM | Neoprene |
| Terpenes..... | NR | •• | NR | •• | •• | •• |
| Tetrachloroethylene..... | NR | NR | NR | 200 | NR | NR |
| Tetraethyl Lead..... | NR | 73 | •• | 73 | NR | •• |
| Tetrahydrodurane..... | NR | NR | NR | •• | •• | •• |
| Tetrahydrofuran..... | NR | NR | NR | NR | NR | NR |
| Tetralin..... | NR | NR | NR | NR | NR | NR |
| Tetra Sodium Pyrophosphate..... | •• | 140 | 180 | •• | •• | •• |
| Texanol..... | •• | •• | NR | •• | •• | •• |
| Thionyl Chloride..... | NR | NR | NR | •• | •• | NR |
| Thread Cutting Oils..... | 73 | 73 | •• | 73 | NR | •• |
| Titanium Tetrachloride..... | NR | NR | NR | 185 | NR | NR |
| Toluene, Toluol..... | NR | NR | NR | 73 | NR | NR |
| Toluene-Kerosene, 25%-75%..... | NR | NR | NR | 73 | NR | NR |
| Tomato Juice..... | 73 | 73 | 73 | 200 | 200 | 140 |
| Toxaphene-Xylene, 90%-100%..... | NR | NR | NR | 73 | NR | NR |
| Transformer Oil..... | NR | 140 | 180 | 200 | NR | 73 |
| Transmission Fluid, Type A..... | NR | NR | 180 | 200 | NR | 73 |
| Tributyl Phosphate..... | NR | NR | NR | NR | 73 | NR |
| Tributyl Citrate..... | NR | NR | NR | NR | 73 | 73 |
| Trichloroacetic Acid, ≤ 20%..... | NR | 140 | NR | NR | NR | NR |
| Trichloroethane..... | NR | NR | NR | 185 | NR | NR |
| Trichloroethylene..... | NR | NR | NR | 185 | NR | NR |
| Triethanolamine..... | 73 | 73 | 73 | NR | 160 | NR |
| Triethylamine..... | NR | 73 | NR | 200 | 160 | 73 |
| Trimethylpropane..... | NR | 73 | •• | •• | 180 | 160 |
| Trisodium Phosphate..... | 73 | 140 | 180 | 185 | 73 | 73 |
| Turpentine..... | NR | 140 | NR | 150 | NR | NR |
| Urea..... | 73 | 140 | 180 | 185 | 200 | 140 |
| Urine..... | 140 | 140 | 180 | 73 | 200 | 140 |
| Vaseline..... | NR | NR | NR | 73 | NR | 140 |
| Vegetable Oil..... | 73 | 140 | NR | 200 | NR | 73 |
| Vinegar..... | 73 | 140 | 180 | 200 | 140 | NR |
| Vinyl Acetate..... | NR | NR | NR | NR | 73 | NR |
| Water..... | 140 | 140 | 180 | 200 | 200 | 160 |
| Water, Acid Mine..... | 140 | 140 | 180 | •• | 200 | 200 |

Acrylonitrile-Butadiene-Styrene Polyvinyl Chloride Type 1 Grade 1 Chlorinated Polyvinyl Chloride Type IV Grade 1
 Fluorocarbon Elastomer (Viton ® is a registered trademark of the DuPont Co.) Ethylene Propylene Diene Monomer
 ** Maximum recommended temperature, for chemical resistance, under normal conditions. § Non-pressure, vent-only, applications when chemical is in gas form.

Chemical Resistance

The following table gives the chemical resistance of ABS, PVC and CPVC thermoplastic piping materials and three commonly used seal materials. The information shown is based upon laboratory tests conducted by the manufacturers of the materials, and it is intended to provide a general guideline on the resistance of these materials to various chemicals. **NOTICE:** This table is not a guarantee, and any piping systems using products made of these materials should be tested under actual service conditions to determine their suitability for a particular purpose. See website for most current data: www.charlottepipe.com

Number = Maximum Recommended Temp. (°F)** CF = Consult Factory NR = Not Recommended • • = Incomplete Data

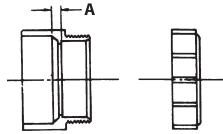
| Chemical Name | Pipe & Fitting Materials Recommended Max. Temp (°F) | | | Seal Materials Recommended Max. Temp. (°F) | | |
|----------------------------|--|-----|------|---|------|----------|
| | ABS | PVC | CPVC | Viton ® | EPDM | Neoprene |
| Water, Deionized | 140 | 140 | 180 | 200 | 200 | 200 |
| Water, Demineralized | 140 | 140 | 180 | 200 | 200 | 200 |
| Water, Distilled | 140 | 140 | 180 | 200 | 200 | 200 |
| Water, Potable..... | 140 | 140 | 180 | 200 | 200 | 200 |
| Water, Salt..... | 140 | 140 | 180 | 200 | 200 | 200 |
| Water, Sea | 140 | 140 | 180 | 200 | 200 | 200 |
| Water, Sewage | 140 | 140 | 180 | 200 | 200 | 200 |
| Water, Spa | NR | 140 | 180 | 200 | 200 | 200 |
| Water, Swimming Pool | 140 | 140 | 180 | 200 | 200 | 200 |
| WD 40 | NR | • • | NR | • • | • • | • • |
| Whiskey | NR | 140 | 180 | 140 | 200 | 140 |
| White Liquor..... | 73 | 140 | 180 | 180 | 200 | 140 |
| Wines..... | NR | 140 | 180 | 140 | 170 | 140 |
| Xylene..... | NR | NR | NR | 150 | NR | NR |
| Zinc Acetate..... | • • | 140 | 180 | 73 | 180 | 160 |
| Zinc Bromide | • • | 140 | 180 | • • | • • | • • |
| Zinc Carbonate..... | 120 | • • | 180 | 73 | 73 | 73 |
| Zinc Chloride..... | 120 | 140 | 180 | 200 | 180 | 180 |
| Zinc Nitrate | 120 | 140 | 180 | 200 | 180 | • • |
| Zinc Phosphate..... | • • | • • | 180 | 73 | 73 | 73 |
| Zinc Sulfate | • • | 140 | 180 | 200 | 180 | 140 |
| | | | | | | |
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Acrylonitrile-Butadiene-Styrene Polyvinyl Chloride Type 1 Grade 1 Chlorinated Polyvinyl Chloride Type IV Grade 1
 Fluorocarbon Elastomer (Viton ® is a registered trademark of the DuPont Co.) Ethylene Propylene Diene Monomer
 ** Maximum recommended temperature, for chemical resistance, under normal conditions. § Non-pressure, vent-only, applications when chemical is in gas form.

PART NO. 104W

Trap Adapter—Female, with Washer & PVC Nut

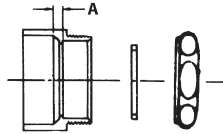
| DWV HUB X TUBULAR SLIP WITH PVC NUT | |
|-------------------------------------|------|
| SIZE | A |
| 1 1/4 (ABS) | 3/16 |
| 1 1/2 x 1 1/4 | 5/16 |
| 1 1/2 | 3/16 |
| 2 (PVC) | 9/64 |



PART NO. 104X

Trap Adapter—Female, with Washer & Chrome Nut

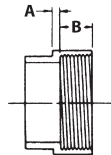
| DWV HUB X TUBULAR SLIP | |
|------------------------|------|
| SIZE | A |
| 1 1/4 (PVC) | 3/16 |
| 1 1/2 x 1 1/4 (PVC) | 5/16 |
| 1 1/2 | 3/16 |
| 2 | 9/64 |



PART NO. 105

Fitting Cleanout Adapter

| SPIGOT X FPT | | |
|-------------------------|-------|--------|
| SIZE | A | B |
| 1 1/4 (PVC) | 3/16 | 3/4 |
| 1 1/2 (PVC) | 5/32 | 5/8 |
| 1 1/2 (ABS) | 3/16 | 23/32 |
| 2 (PVC) | 5/32 | 5/8 |
| 2 (ABS) | 1/16 | 27/32 |
| 3 (PVC) | 7/32 | 3/4 |
| 3 (ABS) | 7/32 | 19/32 |
| 4 (PVC) | 1/4 | 7/8 |
| 4 (ABS) | 7/32 | 19/32 |
| 6 (PVC) | 5/16 | 17/16 |
| 8 (PVC) | 3/8 | 1 1/2 |
| 10 ^(F) (PVC) | 15/16 | 2 1/4 |
| 12 ^(F) (PVC) | 1 1/8 | 2 7/16 |

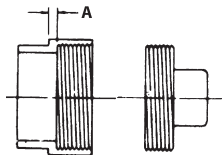


PART NO. 105X

Fitting Cleanout Adapter with Cleanout Plug

| SPIGOT X FPT | |
|--------------|---|
| SIZE | A |
| | |

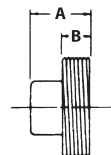
For dimensions see part numbers 105 and 106.



PART NO. 106

Cleanout Plug

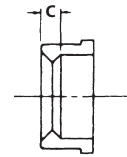
| MPT | | |
|-------------|---------|---------|
| SIZE | A | B |
| 1 1/2 | 1 3/8 | 5/8 |
| 2 | 1 3/8 | 5/8 |
| 2 1/2 (ABS) | 1 1/2 | 3/4 |
| 3 | 1 3/4 | 3/4 |
| 4 | 1 7/8 | 7/8 |
| 6 (PVC) | 2 | 1 |
| 6 (ABS) | 1 7/8 | 31/32 |
| 8 (PVC) | 2 3/8 | 1 3/8 |
| 10 (PVC) | 2 7/16 | 1 7/16 |
| 12 (PVC) | 2 17/32 | 1 17/32 |



PART NO. 107

Flush Bushing

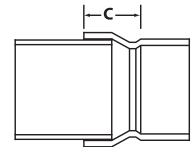
| SPIGOT X HUB | |
|-----------------|---------|
| SIZE | C |
| 1 1/2 x 1 1/4 | 3/16 |
| 2 x 1 1/4 | 5/16 |
| 2 x 1 1/2 (PVC) | 5/16 |
| 2 x 1 1/2 (ABS) | 1/8 |
| 3 x 1 1/2 (PVC) | 1 |
| 3 x 1 1/2 (ABS) | 25/32 |
| 3 x 2 (PVC) | 7/8 |
| 3 x 2 (ABS) | 23/32 |
| 4 x 2 (PVC) | 1 1/8 |
| 4 x 2 (ABS) | 1 3/16 |
| 4 x 3 (PVC) | 1/2 |
| 4 x 3 (ABS) | 1/4 |
| 6 x 4 (PVC) | 1 3/4 |
| 6 x 4 (ABS) | 1 21/32 |
| 8 x 4 (PVC) | 2 7/8 |
| 8 x 6 (PVC) | 1 5/8 |
| 10 x 4** (PVC) | 4 7/16 |
| 10 x 6** (PVC) | 3 5/32 |
| 10 x 8 (PVC) | 1 1/2 |
| 12 x 4** (PVC) | 5 5/32 |
| 12 x 6** (PVC) | 4 5/32 |
| 12 x 8 (PVC) | 2 1/2 |
| 12 x 10 (PVC) | 1 1/2 |



PART NO. PVC 107

Concentric Reducer Bushing

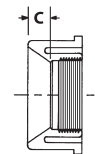
| SPIGOT X HUB | |
|------------------------------|--------------------|
| SIZE | C |
| 14 x 4 ^(F) (PVC) | 8 |
| 14 x 6 ^(F) (PVC) | 8 ^{63/64} |
| 14 x 8 ^(F) (PVC) | 9 7/16 |
| 14 x 10 ^(F) (PVC) | 9 5/8 |
| 14 x 12 ^(F) (PVC) | 7 3/8 |
| 16 x 4 ^(F) (PVC) | 8 3/4 |
| 16 x 6 ^(F) (PVC) | 9 1/4 |
| 16 x 8 ^(F) (PVC) | 10 1/4 |
| 16 x 10 ^(F) (PVC) | 10 7/8 |
| 16 x 12 ^(F) (PVC) | 10 5/8 |
| 16 x 14 ^(F) (PVC) | 9 1/4 |



PART NO. 108

Flush Bushing (Cleanout Adapter)

| SPIGOT X FPT | |
|-----------------------------|---------|
| SIZE | C |
| 2 x 1 1/2 | 5/16 |
| 8 x 6 ^(CP) (PVC) | 1 5/8 |
| 10 x 8 (PVC) | 1 1/2 |
| 12 x 8 (PVC) | 1 13/16 |



^(F) Fabricated

** Assembled from two molded components

^(CP) PVC 108, 8"x6" is available only as a component part of PVC 444X.

Note: If PVC or ABS is not listed for a specific size, that size fitting is available in PVC and ABS materials, and the dimensions listed are the same for both materials.

LIMITED WARRANTY

Charlotte Pipe and Foundry Company® (Charlotte Pipe®) Products are warranted to be free from manufacturing defects and to conform to currently applicable ASTM standards for a period of five (5) years from date of delivery. Buyer's remedy for breach of this warranty is limited to replacement of, or credit for, the defective product. This warranty excludes any expense for removal or reinstallation of any defective product and any other incidental, consequential, or punitive damages. **This limited warranty is the only warranty made by seller and is expressly in lieu of all other warranties, express and implied, including any warranties of merchantability and fitness for a particular purpose.** No statement, conduct or description by Charlotte Pipe or its representative, in addition to or beyond this Limited Warranty, shall constitute a warranty. This Limited Warranty may only be modified in writing signed by an officer of Charlotte Pipe.

This Limited Warranty will not apply if:

- 1) The Products are used for purposes other than their intended purpose as defined by local plumbing and building codes, and the applicable ASTM standard.
- 2) The Products are not installed in good and workmanlike manner consistent with normal industry standards; installed in compliance with the latest instructions published by Charlotte Pipe and good plumbing practices; and installed in conformance with all applicable plumbing, fire and building code requirements.
- 3) This limited warranty does not apply when the products of Charlotte Pipe are used with the products of other manufacturers that do not meet the applicable ASTM or CISPI standards or that are not marked in a manner to indicate the entity that manufactured them.
- 4) In hubless cast iron installations, this warranty will not apply if products are joined with unshielded hubless couplings. Charlotte Pipe requires that its hubless cast iron pipe and fittings be joined only with shielded hubless couplings manufactured in accordance with CISPI 310, ASTM C 1277 and certified by NSF® International or with Heavy Duty Couplings meeting ASTM C 1540.
- 5) The Products fail due to defects or deficiencies in design, engineering, or installation of the piping system of which they are a part.
- 6) The Products have been the subject of modification; misuse; misapplication; improper maintenance or repair; damage caused by the fault or negligence of anyone other than Charlotte Pipe; or any other act or event beyond the control of Charlotte Pipe.

- 7) The Products fail due to the freezing of water in the Products.
- 8) The Products fail due to contact with chemical agents, fire stopping materials, thread sealant, plasticized vinyl products, or other aggressive chemical agents that are not compatible.
- 9) Pipe outlets, sound attenuation systems or other devices are permanently attached to the surface of Charlotte® PVC, ABS or CPVC products with solvent cement or adhesive glue.

Charlotte Pipe products are manufactured to the applicable ASTM or CISPI standard. Charlotte Pipe and Foundry **cannot** accept responsibility for the performance, dimensional accuracy, or compatibility of pipe, fittings, gaskets, or couplings not manufactured or sold by Charlotte Pipe and Foundry.


Any Charlotte Pipe products alleged to be defective **must** be made available to Charlotte Pipe at the following address for verification, inspection and determination of cause:

Charlotte Pipe and Foundry Company
Attention: Technical Services
2109 Randolph Road
Charlotte, North Carolina 28207

Purchaser must obtain a return materials authorization and instructions for return shipment to Charlotte Pipe of any product claimed defective or shipped in error.

Any Charlotte Pipe product **proved** to be defective in manufacture will be replaced F.O.B. point of original delivery, or credit will be issued, at the discretion of Charlotte Pipe.


4/24/15



WARNING

Testing with or use of compressed air or gas in PVC / ABS / CPVC / Cast Iron pipe or fittings can result in explosive failures and cause severe injury or death.

AIR/GAS



- NEVER test with or transport/store compressed air or gas in PVC / ABS / CPVC / Cast Iron pipe or fittings.
- NEVER test PVC / ABS / CPVC / Cast Iron pipe or fittings with compressed air or gas, or air over water boosters.
- ONLY use PVC / ABS / CPVC / Cast Iron pipe or fittings for water or approved chemicals.
- Refer to warnings on PPPA's website and ASTM D 1785.

Charlotte and Charlotte Pipe are registered trademarks of Charlotte Pipe and Foundry Company.

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