Chemical Compatibility and Installation Information for CPVC Products

CPVC domestic water and industrial piping systems are designed for use in new construction, re-pipe and repair applications due to their outstanding corrosion resistance. Reasonable care needs to be taken to insure that products coming into contact with CPVC systems are chemically compatible. If a product coming into contact with CPVC is not listed, it is recommended that chemical compatibility be confirmed with the manufacturer of the product. If chemical compatibility with CPVC is in question, it is recommended to isolate the suspect product from contact with CPVC pipe or fittings.

The products listed below are NOT COMPATIBLE with Charlotte® CPVC systems and should NOT be used. Chemically incompatible products are added to this list as they are brought to our attention. A product's absence from this list does not imply or ensure CPVC chemical compatibility. **Always consult http://www.charlottepipe.com for the most up-to-date chemical compatibility listings.**

NOTICE: This information 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.

NOTICE

All pipe thread sealants must conform to the requirements of IAPMO's PS 36 and with the thread sealant manufacturer to confirm that these sealants are chemically compatible with ABS, CPVC, and PVC. Incompatible pipe thread sealants may result in the degradation of plastic pipe or fittings resulting in product failure and property damage.

- Verify that paints, thread sealants, lubricants, plasticized PVC products, foam insulations, caulks, leak detectors, insecticides, termiticides, antifreeze solutions, pipe sleeve, firestop materials or other materials are chemically compatible with ABS, CPVC, or PVC.
- Do not use edible oils such as Crisco® for lubricant.
- Read and follow chemical manufacturer's literature before using with piping materials.
- Confirm compatibility of pipe marking adhesive tape with the manufacturer of the tape to ensure chemical compatibility with CPVC pipe and fittings.

Products NOT Compatible with Charlotte® CPVC Systems:

Caulks

(Manufacturer)	(Product Name)
British Gypsum	• Gyproc Sealant
DAP Products, Inc.	• Alex Plus Acrylic Latex Caulk Plus Silicone
	• Kwik Seal Tube & Tile Adhesive Caulk
	• DAP Concrete & Masonry Sealant
GP Gypsum, LLC	• DensDefy™ Liquid Flashing
HUBER Engineered Woods	• ZIP System™ Liquid Flash
Intumescent Systems, Ltd.	• AM Acrylic Acoustic Intumescent Mastic
ITW Polymers Sealants	• Permathane SM7108 Polyurethane Sealant
John Wagner Associates	• Grabber Acoustical Sealant GSCS
Knauf	• Knauf Sealant
Master Builders-Admixtures, US, LLC	• MaxFlash Flashing Membrane
No Nonsense Limited	• Nemesis Fire Rated Hybrid Sealant 290 ML
OSI Sealants (Dartworth Company) / (Ohio Sealants)	• Polyseamseal All Purpose Adhesive Caulk
	• Polyseamseal Tub & Tile Adhesive Caulk
	• Pro Series PC-158 Caulk
Pecora	• AC-20 Acrylic Latex Caulk & Silicone
Polyseam Ltd	• Protecta FR Acrylic Caulk • Protecta FR Graphite Caulk
Red Devil, Inc.	• Red Devil 3000 Blacktop & Roof Repair Sealant
Silka Corporation	• Silkaflex® Self-Leveling Sealant
Tremco®	• Dymonic® 100
United States Gypsum	• Sheetrock Brand Acoustical Sealant
White Lightning	• 3006 All Purpose Adhesive Caulk

Fire Stopping Systems

3M	• Fire Barrier 2003 Silicone • Fire Barrier CP25WB+
	• Fire Barrier Sealant FD 150+
	• Fire Barrier Tuck-in-Wrap Strips
	• FireDam Spray 200
Bostik Limited	• Bostik Intucrylic Sealant White
BritChem Limited	• FR Intumescent & Acoustic Acrylic Sealant
Everbuild	• Everbuild Fire Mate Sealant C3
Firetherm	• Intumastic HP
Fireus Ltd.	• Safire Intumescent Mastic
Fischer	• Fischer FFB-ES Elastoseal
Flame Stop	• Flame Stop V
Hilti	• CP506 Smoke and Acoustic Sealant
	• CP606 Flexible Firestop Sealant
	• Hilti CP 672 Speed Spray
	• CFS-SP WB (DINP)
No Nonsense Limited	• No Nonsense Intumescent Acrylic Sealant
Passive Fire Protection Partners	• 4100NS

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Products NOT Compatible with Charlotte CPVC Systems

Fire Stopping Systems (continued)

(Manufacturer)	(Product Name)
Promat	• Grafitex
Proset	• Proseal Plug, Black
	• Proseal Plug, Red
Rockwool	• FirePro Acoustic Intumescent Sealant
Speedline	• Speedline Intumescent Fire Protection & Acoustic Sealant
USG	• Firecode® Smoke-Sound Sealant

Leak Detector

(Manufacturer)	(Product Name)
Federal Process Company	• Gasoila Leak Tech
G.F. Thompson Co. Ltd.	• Masters Leak Detector
Radnor Welding Products	• Radnor® Leak Test Regulator Temperature
Rector Seal®	• RectorSeek™ Low Temp
Unipak A/S	• Multitec Leak Detecting Spray

Mold Cleaners/Inhibitors

Anabec Systems	• Anabec Advanced Cleaning Solution • Anasphere Plus™
Betco Corporation, LTD	• Betco ph7Q Dual
Coating Systems Laboratories, Inc.	• Zoonocide
Daycon Products Company, Inc.	• MDRO/MRSA One Step Disinfectant
	• Spectra System 4 404 1:28 Neutral Disinfectant
Fiberlock Technologies, Inc.	• Shock Wave (Disinfectant)
	• IAQ Advanced Peroxide Cleaner No. 8314
	• Fiberlock IAQ200
Fire Retardant Coatings of Texas	• FX Lumberguard
Great Lakes Laboratories	• Clean 'n Etch
H.B. Fuller Construction Products	• Foster First Defense 40-80 Disinfectant
Legend Brands	• ODORx-9-D-9
Microban Systems	• Microban QCG
ProRestore Products	• Mediclean Germicidal Cleaner Concentrate
	• Dri-EAz Milgo Plus • Microban Milgo Plus
	• ProRestore QGC • MediClean QGC
Red Devil, Inc.	• Red Devil Painter's Caulk
Serum Products, LLC	• Serum 1000
ServiceMaster Clean	• Odorgo Smoke Odor Counteractant
	• Sanimaster 6
Waxie Sanitary Supply	• Waxie HP Disinfectant Cleaner
Wepak National	• Non-Acid Bath Disinfectant
X-M Industries	• Structure-Guard Mold and Mildew Resistant Coating

Miscellaneous Materials

Carlisle HVAC Products	• CCWI Duct Sealant
Various Sources	• Peppermint Oil • Roofing Tar •Vaseline • Vegetable Oils

Pipe Clamps

Naylon Products	• Naylon Vinyl-Coated Wire Pipe Hangers

Pipe Tape

Christy's	• Pipe Wrap Tape
Pasco	• All Weather PVC Pipe Wrap
Pro Pak, Inc.	• Pipe Wrap Tape (black)
Wonder	• No. 413 Pipe Wrap Tape

Thread Sealants

Allied Rubber and Gasket Co. (ARGCO)	• Super Dope
Anti-Sieze Technologies	• TFE Paste
Devcon	• Super Lock Hi-Strength, Stud Lock Grade 2271
G.F. Thompson Co. Ltd.	• Masters™ Pro-Dope™ with Teflon®
General Sealant	• GS-600
Hercules	• Brush-On/Blue Block
Hernon Mfg., Inc.	• Powerseal #932
J.C. Whitlam Mfg. Co	• Seal Unyte Thread & Gasket Sealer
Jet Lube, Inc.	• Jet Lube V-2
Jomar	• Tighter-than-Tite
Loctite	• Threadlocker 242 • Loctite 577
National Starch & Chemical Permabond Division	• Permabond LH-050, Permabond LH-054
Permabond Engineering Adhesives, Ltd.	• Permabond A1044
Permatex Company, Inc.	• Permatex 14H
Rule	• High Performance Teflon Thread Sealing Compound
Saf-T-Lok Chemical	• Saf-T-Lok TPS Anaerobic Adhesive/Sealant, Indus. Grade TPS
SOS Products	• Teflon Pipe Dope
Swagelock Company	• SWAK

Waterproofing

PROSOCO, Inc.	• R-Guard® FastFlash® Roller Grade
	• R-Guard® Cat 5® Rain Screen
Tremco	• TREMproof 250GC single component polyurethane

OTHER CHEMICAL COMPATIBILITY CONCERNS and INSTALLATION INFORMATION

NOTICE

Prior to installation, check with the manufacturer of the HVAC equipment to confirm the compatibility of residual oils and refrigerants with ABS, CPVC, or PVC.

Prior to installing CPVC or PVC piping in hydronic applications, it is important to flush the interior of the heat exchangers and the exterior of the evaporator coils thoroughly with a mild ionic detergent solution to remove incompatible oils. Failing to do so could result in system failure and property damage.

Verify that all boiler cleaning and sealing chemicals used in hydronic radiant heating systems are compatible with CPVC or PVC. Failure to do so could result in system failure and property damage.

Equipment leaks in refrigeration or HVAC systems may release POE oils or other contaminants into the piping system. These oils and contaminants are incompatible with CPVC or PVC and such exposure may result in pipe or fitting failure regardless of flushing.

NOTICE

To reduce risk of property damage from chemical incompatibility with CPVC read and follow these instructions before using any chemical with pipe or fittings.

Acetone in Primers, Cleaning and Solvent Cements:

- Primers, cleaners, and solvent cements containing appreciable amounts of acetone may cause rapid environmental stress cracking of CPVC metal insert parts during installation at freezing temperatures. Contact your primer/cleaner/solvent cement manufacturer for more information or recommendation of alternatives.

Adhesives:

- Pipe sleeves, insulation and tapes manufactured with adhesives may contain incompatible chemicals which can harm CPVC systems. Consult with the manufacturer of these products to determine if the adhesives used are compatible with CPVC systems.

Antifreeze, Glycerin from Biodiesel:

- Crude glycerin from biodiesel manufacturing is not recommended for use as an antifreeze or heat transfer fluid in CPVC piping systems. Crude glycerin from biodiesel manufacturing may be contaminated with the biodiesel, its intermediary chemicals, and/or waste products from the biodiesel manufacturing process.

Cleaning CPVC Pipe:

- While common ordinary soaps are not detrimental to CPVC, most modern dishwashing liquids contain synthetic detergents, some of which may cause environmental stress cracking of fittings. A mild ionic detergent solution to remove incompatible oils or chemicals is recommended. A rinse with clean water to completely clean the system is advisable as a final flushing. Contact your dishwasher detergent manufacturer for more information or a recommendation of alternatives.

Flexible Wire and Cable:

- Direct contact with flexible wire and cable jacketing that utilize insulation containing plasticizers is not recommended. Section 334.30 of the National Electric Code (2002 Edition) requires wire and cable to be secured by staples, cable ties, straps, or hangers. Air ducts, pipes and ceiling grid are not acceptable supports for wire and cable. Also see section titled "Rubber and Flexible Materials Containing Plasticizers."

Fragrances–Perfumes:

- Scented products such as cologne, perfumes, or essential oils (peppermint oil, orange oil, spearmint oil, etc.) should not be put into a CPVC piping system for the purpose of being able to detect leaks by odor. Most fragrance chemicals and essential oils are strong solvents and/or environmental stress cracking agents for CPVC.

Fungicides and Mold Inhibitors:

- When performing repairs to leaks in existing systems, care should be taken to isolate CPVC pipe from direct contact with heavy concentrations of fungicide products which may be applied during cleanup of water damage. Vinyl piping materials such as PVC or CPVC may be damaged by fungicides when fungicides are sprayed on surrounding drywall and wood framing to prevent the growth of mold and mildew in the affected area. Common sense precautions will prevent problems with repairs to existing systems. When repairs are made to an existing system, and the possibility exists that fungicides will be applied to treat damp drywall and wood framing surrounding the repair site, exposed piping should be sleeved with a compatible plastic sleeving or pipe insulation material to prevent direct contact of the fungicide with the plumbing systems.

Grease and Cooking Oils:

- When CPVC pipe is installed in kitchen areas the pipe must be protected from contact with grease or cooking oils. Consideration must be given to not only protecting the pipe from direct contact with grease or oil as well as contact that may occur from airborne grease or oil.

Hoses:

- Hoses used for filling and/or testing piping systems may contain plasticizers or other contaminates that are incompatible with CPVC. It is therefore a good practice to flush hoses with clean water for at least one minute before connecting them to CPVC systems for filling or testing the system.

Insulation:

- Tubing insulation for use with CPVC should be fiberglass, mineral wool, foamed polyolefin (polyethylene), foamed polyisocyanurate or phenolic. Foamed rubber tubing insulation may contain incompatible plasticizers and is not preferred. Foamed polyolefin, foamed plyisocyanurate and phenolic insulations should not have any oil lubrication applied to the interior surface.

Leak Detectors (Soaps Used):

- While common ordinary soaps are not detrimental to CPVC, most modern dishwashing liquids contain synthetic detergents, some of which may cause environmental stress cracking of CPVC.

Mastics for Use with Pipe and Duct Insulation:

- Some mastic products have a thin paint-like consistency and can be applied with a spray gun, brush, or roller in thin coats similar to paint. For these type of mastic products, follow our paint guidance.
- Other mastic products are thicker pastes or caulk-like products that are applied with brushes, trowels or caulking guns. While Charlotte Pipe is not aware of any pipe or fitting failures that have been directly attributable to insulation mastics, a review of formulation information indicates that some of these products contain ingredients that are incompatible with CPVC.
- Always confirm compatibility with the mastic manufacturer.

Metal Piping Connected to or Installed Alongside CPVC Piping:

- CPVC may be damaged by torches and/or chemicals used to install metal piping. When metal piping is installed in proximity to CPVC piping systems, care should be taken to protect the CPVC from burning with torches or contact with molten solder or solder flux, as well as incompatible thread sealants, leak detectors, lubricants, or other chemical products which may be used on metal piping.
- Transitions from metal pipe to CPVC pipe can be made through a variety of methods such as threaded connections, flanges, and grooved adapters. Occasionally the metal pipe may contain residual oils that were used to aid in the cutting process. Some of the oils used for this purpose, especially those marketed as "environmentally friendly" or "vegetable based" may be incompatible with CPVC. If a cutting oil is used, consult with the manufacturer of the cutting oils for a specific recommendation as to compatibility with CPVC.
- Dye penetrants used to test the quality of welds in metal piping may contain plasticizers or other chemicals incompatible with CPVC. Dye penetrants left on the inside surface of welded metal pipes may later wash into CPVC piping connected to it. This situation could create environmental stress cracking in CPVC wherever collections of the penetrant chemical might lodge. These penetrants should be removed from the metal pipe prior to connecting to CPVC, or the manufacturer of the dye penetrant should be consulted with regard to recommending a proper penetrant to use with metal/CPVC systems.

Paint:

- Water-based acrylic latex paint is the preferred and recommended paint to use on CPVC pipe and fittings. Oil or solvent-based paints may be chemically incompatible.

Polyurethane (Spray-on) Foams:

- In understanding spray polyurethane foams, there are two general areas of concern for CPVC pipe and fittings; (1) chemical compatibility and (2) potential damage to pipe and fittings due to high temperatures generated as a result of the exothermic chemical reaction during the installation and curing process. It is possible to apply polyurethane foam insulation properly without damage to CPVC pipe and fittings. However, the use of polyurethane foam insulation in conjunction with CPVC has resulted in the failure of CPVC pipe and fittings and property damage. Therefore, Charlotte Pipe and Foundry does not recommend the use of polyurethane spray-on foam insulation in conjunction with its CPVC pipe and fittings.

Products Containing Plasticizers:

- CPVC is not compatible with some rubber and flexible vinyl materials containing certain types of plasticizers. Incompatible plasticizers include, but are not limited to, phthalates, adipates, trimellitates, dibenzoates, etc. Compatibility should be confirmed before selecting rubber for flexible vinyl materials for direct contact with CPVC. Examples of materials which may contain incompatible plasticizers include, but are not limited to, caulks, rubbery hanger padding, vinyl dip coating on metal parts, rubber gaskets, electrical wire jacketing, electrical tape, flexible hose or tube, etc. Further, plasticizers may leach from rubber or flexible vinyl materials, such as hoses or tank linings, into the process fluid which contacts them. Plasticizer contamination in the process fluid may also cause environmental stress cracking of CPVC used elsewhere in the system. This can include both CPVC process piping, through which contaminated fluid may flow, or CPVC ducting drawing fumes from contaminated fluid. Tapes or labels with a plasticized vinyl body (e.g., electrical tape) should not be used.

Residual Oils with HVAC Applications:

- Some heat exchangers or condenser coils may contain residual oils from the manufacturing process which can cause cracking of CPVC. Caution should be exercised when installing CPVC in combination hot/air handling units or as condensate-drain lines from air conditioning systems. Confirm the compatibility of CPVC with residual oils prior to installation. The interior of heat exchangers or the exterior of condenser coils may be thoroughly flushed with mild detergent solution to remove incompatible oils prior to piping installation. A rinse with clean water to completely clean the system is advisable as a final flushing. Some refrigerant systems contain oils that may damage CPVC and such exposure may result in pipe or fitting failure regardless of cleaning or flushing the system.

Sleeving Materials:

- In situations where sleeving is required, the pipe should be protected with a compatible sleeving material extending at least 12" above and below the soil. The top of the sleeving should be securely taped to the pipe with a compatible tape product. Backfill over underground piping prior to termiticide spraying.

Spray-on Coatings:

- Certain types of spray-on coatings which form a peelable film to protect fixtures during construction may be incompatible with CPVC. Care should be used to protect exposed piping from overspray when this type of protective coating is applied.

Steel Pipe with Antimicrobial Coating:

- Contractors should not use steel pipe with antimicrobial coating, such as Allied's ABF 11, in conjunction with CPVC pipe and fittings, unless the factory-applied coated steel pipe has been approved by the pipe manufacturer.

Stretch Wrap or Shrink Wrap:

- Polyethylene stretch wrap is not compatible with CPVC. PVC stretch wrap is plasticized and often incompatible with CPVC. Contact with PVC stretch wrap should be avoided.

Termiticides and Insecticides:

- When performing an under-slab installation, or where the presence of insecticides or termiticides is likely, care should be taken to isolate CPVC pipe from direct contact with large quantities of these chemicals. Vinyl piping materials such as PVC or CPVC may be damaged when termiticides or insecticides are injected into the annular space between the pipe wall and sleeving material trapping the termiticide against the pipe wall. Termiticide applications per label instructions in an open-air environment, such as slab pretreat applications, should not pose a problem. However, puddling of termiticides on or near CPVC may cause failure. In areas where puddling is more likely, such as near tub boxes and retreat applications, extra care should be taken to avoid puddling of termiticides. Exercising caution and common sense should prevent installation problems. For more information, review your manufacturer's installation guide.
- Additional precautions need to be taken when retreat applications are required. Termiticide retreatment is usually required when the concrete slab has been broken to relocate a pipe. The following recommendations should be followed in retreat applications:
  - Remove all the plastic barrier material that was installed prior to the initial concrete pour from the area to be retreated. Do not reinstall the plastic barrier material.
  - After the pipe has been relocated, the soil should be pretreated before it is placed in hole around the pipe. Do not apply termiticide directly to the retreat area.
  - Termiticides that contain cypermethrin should not be used in retreat applications.
- Note: Many insecticides and termiticides are incompatible with CPVC. Assume that all are aggressive and not compatible with CPVC pipe and fittings.
- When installing CPVC where the presence of insecticides or termiticides is likely, confirm compatibility prior to application. Exercise caution. For more information, review your manufacturer's installation guide.

Installation Notes:

- Use CTS CPVC male threaded adapters for cold water only.
- Protect CPVC from long term exposure to direct sunlight.
- Space CPVC more than 6 inches from gas flue.
- Allow for thermal expansion and contraction.