

LabWaste™ CPVC Technical Information & Installation Guide

Typical Physical Properties of Spears® LabWaste™ CPVC Material

Property	Test Method	Typical Value
Mechanical Properties @ 73°F		
Specific Gravity	ASTM D792	1.49
Tensile Strength, psi	ASTM D638	8010
Tensile Modulus, psi	ASTM D638	495,000
Flexural Strength	ASTM D790	13,000
Izod Impact (notched @73°F)	ASTM D256	
Fittings		3.0
Pipe		5.5
Thermal Properties		
Heat Deflection Temperature 264 psi	ASTM D648	
Fitting		213°F
Pipe		230°F
Thermal Conductivity, BTU/hr/sq ft/°F/in	ASTM C177	.95
Coefficient of Linear Expansion, in/in/°F	ASTM D696	3.4 x 10 ⁻⁵
Flammability		
Limiting Oxygen Index	ASTM D2863	60
UL 94 Rating	UL 94	V-0, 5VB
Flame & Smoke Rating ¹	CAN/ULC S 102.2	
Pipe: Flame Spread		0
Smoke Developed		5 - 30
Fittings: Flame Spread		5 - 10
Smoke Developed		15 - 50
Solvent Cement	ASTM F493	Heavy Body; Mustard Yellow Color

Typical Physical Properties data is based on information from material suppliers. It is provided as a guideline for service and is not to be considered a warranty of performance.

1- Based on test of physical product, including solvent cement welded pipe and fittings assemblies, as opposed to test of material only.

Fire Resistance

Material used in Spears® LabWaste™ CPVC systems has a UL94 flammability rating of V-0, 5VB. Pipe and fittings have been Listed and rated based on fire tests, as opposed to a material test only, for surface burning characteristics of flame spread and smoke density developed by Underwriters Laboratories of Canada under standard test method CAN/ULC S102.2-M88. The ULC pipe and fitting components ratings are below the 25 maximum flame spread and 50 maximum smoke density developed typically required for exposed air plenum installation. Check local codes for acceptability. Use of approved plenum wrap or transition connectors to other material may be used if required.

Independent Product Certifications, Approvals & Evaluations

Spears® LabWaste™ CPVC Corrosive Waste Drainage System is a complete system of pipe, fittings and solvent cement. Since specific ASTM Standards have not been developed for CPVC corrosive waste systems, Spears® LabWaste™ CPVC pipe, fittings, and solvent cement have been independently (3rd party) tested, evaluated and certified by the following laboratories and agencies. Each of these approvals is routinely monitored through an ongoing program of periodic inspection and testing by the certifying/approving agency.

- NSF Standard 14 - Certified for corrosive waste end use by NSF International in accordance with NSF Standard 14 as specified in Specification for A Special Engineered Product, CPVC Corrosive Waste Drainage System (NSF-cw S.E.).
- Uniform Plumbing Code - Certified for use in accordance with the Uniform Plumbing Code (UPC) by NSF International as specified in IAPMO Interim Guide Criteria for (CPVC), IGC 210 (NSF-U.P.Code). LabWaste™ LW-5 Solvent Cement is approved under IAPMO IGC 221, Interim Guide Criteria

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Approved for use in accordance with the International Plumbing Code (IPC) by the International Codes Council Evaluation Services (ICC-ES) in accordance with Acceptance Criteria for CPVC Systems of Pipe, Fittings and Solvent Cement Used in Chemical Waste Systems, AC252. See ICC-ES Evaluation Report No. ESR-1214 at www.icc-es.org.

Evaluated for Flame Spread and Smoke Density by Underwriters Laboratories of Canada in accordance with Standards Test Method for Surface Burning Characteristics of Floor Coverings, and Miscellaneous Materials and Assemblies, CAN/ULC S102.2-M88 (ULC Listed).

Spears® LabWaste™ CPVC fitting configurations are produced to applicable DWV patterns of ASTM D 3311, Standard Specification for Drain, Waste, and Vent (DWV) Plastic Fitting Patterns, plus various specialty patterns and manufacture specified configurations not included in D 3311. All drainage fittings with 90° angles (sanitary tees, elbows, etc.) have socket pitch to maintain approximately 1/4" per foot drainage. LabWaste™ CPVC pipe is produced to Schedule 40 dimensions as specified in ASTM F 441, Standard Specification for Chlorinated Poly (Vinyl Chloride)(CPVC) Plastic Pipe, Schedule 40 and 80.

Pipe Diameter	1-1/2	2	3	4	6	8	10	12	14	16	18	20	24
Avg. O.D.	1.900	2.375	3.500	4.500	6.625	8.625	10.750	12.750	14.000	16.000	18.000	20.000	24.000
Avg. I.D.	1.592	2.049	3.042	3.998	6.031	7.943	9.976	11.889	13.073	14.940	16.809	18.743	22.544
Min. Wall	.145	.154	.216	.237	.280	.322	.365	.406	.437	.500	.562	.593	.687

Spears® LabWaste™ CPVC products, like all piping materials, expand and contract with changes in temperature. If the coefficient of linear expansion is 3.2 x10-5 inch /inch-°F, a 25°F change in temperature will cause an expansion of 1 inch for a 100-foot straight length. For most operating and installation conditions, expansion and contraction can be accommodated at changes of direction, or simple expansion loops can be used. For underground installations, snaking the pipe in the trench can be used where necessary to accommodate expansion and contraction.

Thermal expansion change in length (<L) in inches is calculated from length of pipe, the expected change in temperature, and the Coefficient of Linear Thermal Expansion for CPVC expressed as inches of expansion for each 10° change per 100 feet:

$$\Delta L = \frac{Y(\Delta T)}{10} \times \frac{L}{100}$$

Where: Y = Expansion Coefficient for CPVC = 0.408
 ΔT = Temperature Change in °F
 L = Length of Run in feet

Example:

How much will a 50 ft. run Spears® LabWaste™ pipe expand if the expected ambient temperature will range from 45°F to 85°F?

$$\Delta L = 0.408 \frac{(85-45)}{10} \times \frac{50}{100} = 0.408 \times 4 \times 0.5 = 0.816 \text{ inches}$$

The following Thermal Expansion Table is provided for quick reference in identifying expansion length change in different run lengths of pipe at various anticipated changes in temperature.

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Length of Run (L) in feet	Length Change in Inches (ΔL) for Specified Change in Temperature (ΔT)								
	20°F	30°F	40°F	50°F	60°F	70°F	80°F	90°F	100°F
10	.08	.12	.16	.20	.24	.29	.33	.37	.41
20	.16	.24	.41	.51	.61	.71	.82	.92	1.02
40	.33	.49	.65	.82	.98	1.14	1.31	1.47	1.63
50	.41	.61	.83	1.02	1.22	1.43	1.63	1.84	2.04
70	.57	.86	1.14	1.43	1.71	2.00	2.28	2.57	2.86
90	.73	1.10	1.47	1.84	2.20	2.57	2.94	3.30	3.67
120	.98	1.47	1.96	2.45	2.94	3.43	3.92	4.41	4.90

Spears® LabWaste™ CPVC pipe and fittings are easily joined using Spears® LW-5 One-Step Solvent Cement that has been specially formulated for corrosive/acid waste applications and manufactured in accordance with ASTM F-493, Standard Specification for Solvent Cements for Chlorinated Poly (Vinyl Chloride)(CPVC) Plastic Pipe and Fittings. When cured, this cement provides a fused joint that maintains the same physical and chemical resistance properties as the CPVC components in the system. Spears® LW-5 is a “one-step” cement and does not require the use of primer. Spears® LabWaste™ CPVC systems may be additionally joined using threaded (NPT) or flanged connections where removal or connection to supplementary equipment is required. Special transition couplings are available for joining to Polypropylene, PVDF, glass or Duriron systems.

Store below 90°F (33°C). Stir and use as is. If jelled, replace. Use within 2 yrs. of date stamped on can. This cement is designed for use without a Primer. Check local code requirements before using Spears® LW-5 cement.

1. Cut pipe square, deburr and chamfer (bevel 10° to 15°). Clean and dry joining surfaces.
2. Check dry fit. For interference fit, pipe should push 1/4 to 3/4 way into fitting snugly.
3. Use a suitable applicator at least 1/2 size of pipe diameter; for larger sizes use brush or roller.
4. Apply a full even layer of cement on the pipe equal to the socket depth. Coat the fitting socket with a medium layer. Avoid excess and puddling. If necessary, apply a second full layer on pipe.
5. Assemble while cement is wet. If not wet, recoat all parts before assembly. Insure pipe bottoms into fitting socket. Assure pipe bottoms into fitting socket using a 1/8 to 1/4 turns twist. To avoid push out and allow for initial set, hold for about 30 seconds. Wipe off excess. Handle newly assembled joints carefully.

An Initial Set time is recommended to provide good handling strength after which the joint will handle normal stresses of installation. Cure Time is the recommended waiting period prior to placing the joint into service and before any pressure testing of the system. Set and cure time are relative to temperature at time of installation. Best results are obtained at temperatures between 40° and 110°F. Due to the many field variables, these should be used as a general guide only.

60°F - 100°F	30 min.	1 hr.
40°F - 60°F	1 hr.	2 hrs.
0°F	2 hrs.	4 hrs.

In moist or humid conditions (relative humidity above 60%) allow 50% more cure time.

1-1/2	2	3	4	6	8	10	12	14	16
90	60	40	30	10	5	2-3	1-2	3/4	1/2-3/4

Estimate based on laboratory tests. Due to many field variables, these figures should be used as a general guide only.

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Spears® Manufacturing Company highly recommends the use of Spears® BLUE 75™ thread sealant, which has been tested for compatibility with Spears® products. Please follow the sealant Manufacturer's Application/Installation instructions. Choice of another appropriate thread sealant is at the discretion of the installer.

Some pipe joint compounds or pastes may contain substances that could cause stress cracks in CPVC. For transitions to metal threaded systems, all cutting oils must be removed and the metal pipe thoroughly flushed and degreased prior to assembly with CPVC systems.

1. Apply joint sealant to the male pipe threads ONLY.
2. Thread joint hand tight for initial assembly
3. Using commercial strap wrenches tighten 1 to 2 turns beyond hand tight; avoid over tightening. DO NOT use conventional pipe wrenches that can damage plastic fittings.

If a tape sealant is used:

1. Use TFE tape no less than 25 mil thick.
2. Initial wrap must fully cover the thread end.
3. Wrap clockwise with standard pipe threads.
4. Use only 2-3 wraps of tape.



DO NOT use combination of paste and tape sealants.

Solvent cement flange hub to pipe according to preceding instructions. Use full faced, 1/8" thick gaskets of a material suitable for the intended application having a Shore "A" durometer of approximately 60. Use of well lubricated bolts and flat washers is required. Bolts must be tightened in a 180° opposing pattern to the recommended torque values.

1-1/2	12	
2-4	25	
6-8	40	
10	64	
12	95	
14-16	110	

Special transition couplings provide different types of mechanical joints for direct connection to other piping materials on one end, with solvent cement connections for the CPVC system on the other.

Transition Coupling: Provides elastomer compression joint connection to other plastic systems such as PP or PVDF and solvent cement socket connection to CPVC system. A grooving tool is available through Spears® for placing a retaining groove on PP or PVDF pipe to prevent accidental pullout separation of the joint.

Duriron Transition Fitting (mechanical joint): Allows mechanical connection to Duriron (siliconized iron) pipe. Fitting consists of Duriron pipe diameter spigot (male pipe end) for use with Duriron mechanical connector and CPVC pipe diameter spigot end for solvent cement connection. This requires use of Duriron Mechanical Joint connector purchased from others.

Duriron Transition Coupling (caulk-joint): Allows caulk-joint connection to Duriron systems. Coupling consists of Duriron pipe diameter male caulk-joint end for mating to Duriron belled caulk-joint pipe end and CPVC pipe diameter spigot end for solvent cement connection. This requires use of plastic "rope caulk" purchased from others. DO NOT use hot lead for this type of caulk-joint.

Glass Transition Coupling: Allows mechanical connection to conventional glass drainage pipe. Coupling consists of typical glass drainage pipe-end for use with glass pipe mechanical connectors and CPVC pipe diameter spigot end for solvent cement connection. This requires use of the glass system's mechanical connector purchased from others.

Please contact Spears® for special construction of any system transition connection needs not specified.

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Support Spacing

Spears® LabWaste™ CPVC systems should be properly supported to avoid stress caused by sagging and system component loads. Support should be given to concentrated system loads, such as flanges and where changes in direction occur. Such support should be made as close to fittings as possible, yet allow for movement due to expansion and contraction.

Conventional pipe hangers and brackets can be used. However, hangers must NOT be used to pull the piping system into position or over-tightened to either restrict necessary movement or cut into pipe. Hangers should be smooth, free of burrs and provide as much load-bearing surface as possible.

Systems should be supported in accordance with applicable plumbing codes. Check local codes for additional requirements. The following chart shows recommended horizontal support spacing for un-insulated continuous spans with no concentrated loads. This information is provided as a general guideline. Local codes, engineering specifications, and system installation conditions may require significant variations.

Recommended Hanger Spacing (feet)

Pipe Diameter	1-1/2	2	3	4	6	8	10	12	14	16
Hanger Spacing	6	6	7	7-1/2	8	9	10	10-1/2	11	12

Underground Installation

Spears® LabWaste™ CPVC systems may be installed underground in a smooth, uniform trench bottom that supports the pipe over its entire length, free of rocks and debris. Subsoil should be stable to provide physical protection for the pipe and fittings. Where large boulders are not removed, trench should be padded with sand or fine-grained soil. Trench should be wide enough to provide room for joining pipe in the trench and to allow snaking from side-to-side to provide slack for future expansion-contraction. Install a larger size pipe as a sleeve where piping must pass through masonry walls. Use only solvent cement connection in underground piping. System should be tested in accordance with local plumbing codes prior to back filling. Pipe should be surrounded with an initial backfill material having a particle size of 1/2" or less, free of sharp rock or debris and uniformly compacted in layers. Refer to ASTM D2774, Underground Installation of Thermoplastic Pressure Piping, for additional information on underground installations.

Acid Neutralization/Dilution Tanks for Use With LabWaste™ CPVC Systems

Neutralization or dilution tanks are required by codes for the purpose of neutralizing corrosive wastes. Corrosive liquids, spent acids or other harmful chemicals that destroy or injure a drain, sewer, soil or waste pipe, or create noxious or toxic fumes or interfere with sewage treatment processes are prohibited from discharge into the plumbing system without being neutralized or treated. A variety of system designs and treatment methods can be used for neutralization and dilution. For proper performance, Spears® recommends use of professional assistance in analysis of the application, neutralization system design, equipment selection, and specific maintenance requirements.

Spears® offers a standard selection of HDPE in 5 gallon to 3000 gallon capacities and CPVC tanks in 5 gallon to 55 gallon capacities with a variety of connection and vent options, plus convenient 1-gallon Dilution Tank designed for under-sink installation. Tanks can also be custom produced in virtually any size, shape, or connection configurations, including custom double-containment tanks. Contact Spears® Technical Services with desired specifications for custom quotation. See Price Schedule LWNT-1, "Spears® LabWaste™ Standard CPVC & HDPE Neutralization Tanks", for pricing, additional information, selection detail and available options such as venting, tank extensions, manhole ports, pedestrian and traffic covers.

Installation Considerations - Except for under-sink installations, tank should be located on the lowest floor or basement room. It is recommended that the tank be in a concrete vault on a smooth flat surface. Where necessary, tanks may be installed on sturdy sheeting or directly into the ground. In all cases, the surface must be capable of uniformly supporting the tank weight, including effluent and neutralization medium.

Tanks may be installed directly into the ground provided appropriate burial procedures are utilized. Excavated area must be smooth and free of rocks and debris. A minimum of 6" of sand or a concrete base should be used. The top of the tank must remain accessible for servicing and clean out either directly or by manhole cover. Tanks may be installed under foot or light vehicle traffic with use of appropriate covers and support. Tanks themselves are not to be used to support traffic loading. Backfilling should be made with a minimum of 6" thick sand around side; tanks should be water filled prior to backfilling.

Avoid strain when installing the pipe to tank fitting connections. Tanks must NOT be supported by the inlet, outlet, or vent piping.

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The following recommendation from the American Society of Plumbing Engineers (ASPE) may be used as a guideline for sizing tanks according to the number of lab sinks.

Neutralization Tank Sizing Table

Number of Lab Sinks	Tank Size, Gal (L)		Number of Lab Sinks	Tank Size, Gal (L)	
2	5	(18.9)	60	200	(757.0)
4	15	(56.8)	75	275	(1040.9)
8	30	(113.6)	110	360	(1362.6)
16	55	(208.2)	150	500	(1898.5)
22	75	(283.9)	175	550	(2081.8)
27	90	(340.7)	200	650	(2460.3)
30	108	(408.8)	300	1200	(4542)
40	150	(567.8)	500	2000	(7570)
50	175	(662.4)	600	3000	(11355)

Limestone Chips for Acid Neutralization Tanks - Most state and local codes require the addition of a neutralization medium in acid waste tanks with the addition of water for dilution prior to discharge into in a sanitary sewer system. Limestone must be 1" to 3" in diameter with a calcium carbonate content of at least 90%. Spears® offers high grade Limestone Chips having a calcium carbonate content of approximately 95%. The use of Limestone Chips is generally one of the best and least expensive means of acid neutralization, but may be used in conjunction with more sophisticated chemical treatments if necessary.

How Much Limestone to Use - The following is a guideline for pounds of Limestone Chips to use for one (1) tank filling (charge). It is recommended that sufficient quantity be ordered for more than one filling.

Tank Size Gallons	Approx. Pounds	Tank Size Gallons	Approx. Pounds
5	50	300	3,200
15	100	350	4,000
30	200	500	5,000
55	500	550	7,500
100	1,000	650	9,000
150	1,750	1200	11,000
175	1,900	2000	16,000
200	2,500	3000	25,000
275	3,200		

General Tank Maintenance Guidelines - Tanks should be inspected routinely for accumulation of precipitated sludge and debris that must be cleaned out (usually scooped out) and for periodic addition of limestone and water if necessary. While once every one to three months may be sufficient, professional assistance should be sought to establish a proper schedule based on actual use. Note: Tank must be filled with water prior to carefully adding Limestone Chips to charge the system. Request instruction sheet.

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System Pressure Testing

Spears® LabWaste™ CPVC systems should be tested with water as follows, or according to local plumbing codes. Test only after sufficient joint cure (see “Recommended Set & Cure Time”). The system may be tested in its entirety or isolated at each floor or in sections for testing.

Close all openings tight except the highest opening and fill the system to the point of overflow. Fill the system slowly, being sure to allow all air to escape. A minimum of ten (10) foot (3048 mm) head should be used for entire system or section tested. Allow the system/section under test to set 15 minutes before inspection for leaks.

Drain each section after inspection. Any leaking solvent cement joints should be cut from the system, replaced and retested after proper joint cure. Check any leaking mechanical joints for proper installation, applicable tightening, and presence of any debris in the joint. Reassemble and retest.

Supplemental Equipment Not Specified in this Manual

A variety of supplemental equipment including, pump stations, laboratory workstations, and fume hoods are built to customer specifications. Standard Laboratory fixtures, floor drains, wall drains and traps plus manual or actuated valves are also available. Spears® can custom fabricate virtually any LabWaste™ system component. Contact Spears® for additional needs or a custom quotation.

System Integrity

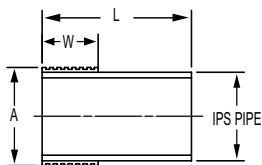
Spears® LabWaste™ products have been developed and designed to be used as a total system consisting of pipe, fittings, accessories, solvent cement and thread sealant. All-Spears® LabWaste™ components should be used in order to insure a sound piping system. Substitution of other products for Spears® LabWaste™ pipe, fittings, or solvent cement may be detrimental to system integrity and is not recommended. The Spears® Limited Warranty (located at end of this manual) does not cover problems occurring within the piping system as the direct result of non-use of Spears® LabWaste™ system products.

Sample Engineering Specification

Special drainage systems for corrosive chemical or acid waste shall be manufactured from CPVC Type IV, ASTM Cell Classification 23447. All pipe shall be Schedule 40 CPVC manufactured to dimensional requirements of ASTM F441. All pipe shall be CAN/ULC S102.2 Listed for flame spread and smoke development with rating designated on the pipe marking. All pipe markings shall be accompanied by a yellow stripe for identification of CPVC chemical waste system. All fittings shall be CPVC drainage patterns meeting the requirements of ASTM D3311 and specialty patterns according to the manufacturer's specifications. All molded fittings shall be CAN/ULC S102.2 Listed for flame spread and smoke development and rating designated on the original package labeling. Joining method for pipe and fittings shall be solvent cement welding. Solvent cement shall be a “one-step” primerless type CPVC cement designated by the system manufacturer, specially formulated for resistance to corrosive chemicals and manufactured in accordance with ASTM F493. Mechanical connections for special equipment connection or transition to other system materials shall be as specified by the CPVC system manufacturer. All pipe, fittings, and cement shall be supplied together as a complete system certified by NSF international for use in corrosive waste drainage systems as a Special Engineered (SE) Product. Installation shall be in accordance with the manufacturer's instructions and all applicable codes. Special drainage system to be Spears® LabWaste™ CPVC Corrosive Waste Drainage Systems manufactured by Spears® Manufacturing Company.

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P095 Duriron Transition Fitting Mechanical Joint x Pipe Size



For connection to Duriron system. Requires duriron mechanical joint coupling.

Part Number	Size	A	L	W
P095-015C	1-1/2	1-3/16	4	1-3/8
P095-020C	2	2-5/8	4	1-1/2
P095-030C	3	3-3/4	4	1-7/8
P095-040C	4	4-3/4	4	2-5/16

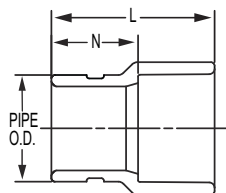
P098 Glass Transition Coupling Spig x Clamp



For connection to glass system. Requires use of clamp from glass system manufacturer.

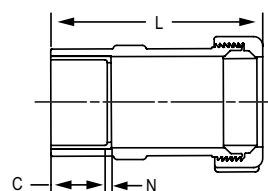
Part Number	Size	A	L	W
P098-015C	1-1/2	2-1/16	4	1/4
P098-020C	2	2-1/16	5	1/4
P098-030C	3	3-11/16	6	5/16
P098-040C	4	4-27/32	6	5/16
P098-060C	6	7-1/8	6	1/2

P096 Grooved Coupling Grv x Soc



Part Number	Size	L	N
P096-015C	1-1/2	2-15/16	1-1/2
P096-020C	2	3-1/16	1-9/16
P096-030C	3	3-9/16	1-11/16
P096-040C	4	4-1/2	2-1/4
P096-060C	6	5-3/8	2-3/8

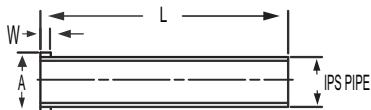
P099 Transition Coupling H x Compression



For connection to PP or PVDF systems. Requires Safety Retaining Groove Tool. Contact Spears®.

Part Number	Size	C	L	N
P099-015C	1-1/2	1-3/8	5-1/8	3/32
P099-020C	2	1-1/2	5-3/4	1/8
P099-030C	3	1-7/8	10-5/16	3/16
P099-040C	4	2-1/4	11-5/32	7/32
P099-060C	6	3	13-3/8	9/32

P097 Duriron Transition Coupling Spig x Caulk Joint

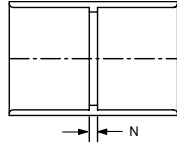


For connection to Duriron system. Requires packing and plastic lead. Warning: Do not use hot lead.

Part Number	Size	A	L	W
P097-015C	1-1/2	2-1/4	12	1/2
P097-020C	2	2-7/8	12	1/2
P097-030C	3	4-3/16	12	1/2
P097-040C	4	5-1/4	12	1/2

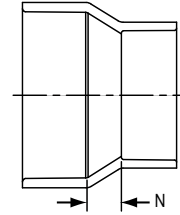
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P100 Coupling
H x H



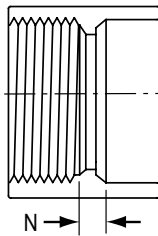
Part Number	Size	N
P100-015C	1-1/2	1/8
P100-020C	2	1/8
P100-030C	3	3/16
P100-040C	4	1/4
P100-060C	6	1/4
P100-080C	8	1/4
P100-100C	10	3/8
P100-120C	12	3/8
P100-140C	14	3/8

P102 Increaser Reducer
H x H



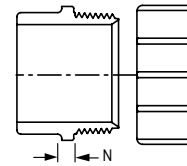
Part Number	Size	N
P102-251C	2x1-1/2	23/32
P102-337C	3x1-1/2	1-3/32
P102-338C	3x2	1
P102-420C	4x2	1-3/8
P102-422C	4x3	15/16
P102-530C	6x3	1-15/16
P102-532C	6x4	1-11/16

P101 Female Adapter
FPT x H



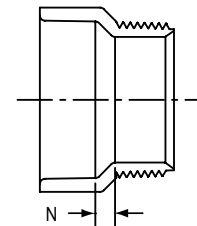
Part Number	Size	N
P101-015C	1-1/2	1/4
P101-020C	2	1/4
P101-030C	3	5/16
P101-040C	4	15/32
P101-060C	6	15/32

P103P Trap Adapter - Male
Spig x Slip with Plastic Nut



Part Number	Size	N
P103P-015C	1-1/2	3/16
P103P-020C	2	3/16

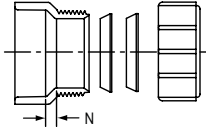
P104 Trap Adapter - Female
H x SLIP



Part Number	Size	N
P104-015C	1-1/2	1/4

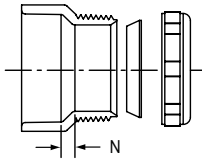
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P104R Trap Adapter - Female
w/1-1/2 Plastic Nut & Washer
and 1-1/2x1-1/4 Washer
H x Slip w/Plastic Nut



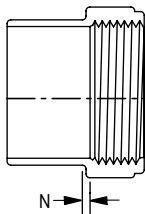
Part Number	Size	N
P104R-015C	1-1/2	3/16

P104X Trap Adapter - Female
H x Slip w/ Chrome Nut & Washer



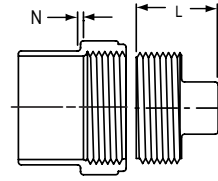
Part Number	Size	N
P104X-015C	1-1/2	3/16

P105 Cleanout Adapter
Spig x FPT



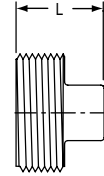
Part Number	Size	N
P105-015C	1-1/2	5/32
P105-020C	2	5/32
P105-030C	3	7/32
P105-040C	4	1/4
P105-060C	6	11/32
P105-080C	8	13/32

P105X Cleanout Adapter with Square Head Plug
Spig x FPT



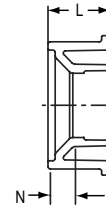
SEE PART NO. P105 AND P106

P106 Square Head Cleanout Plug
MPT



Part Number	Size	L
P106-015C	1-1/2	1-3/8
P106-020C	2	1-3/8
P106-030C	3	1-25/32
P106-040C	4	1-7/8
P106-060C	6	1-15/16
P106-080C	8	2-1/8

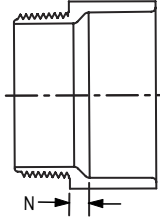
P107 Flush Bushing
Spig x H



Part Number	Size	L	N
P107-251C	2x1-1/2	1-1/16	3/16
P107-337C	3x1-1/2	1-3/4	1
P107-338C	3x2	1-1/2	5/8
P107-420C	4x2	2	1-1/8
P107-422C	4x3	2	1/2
P107-530C	6x3	3-23/32	2-11/32
P107-532C	6x4	3-15/32	1-3/4
P107-582C	8x4	4-5/8	2-7/8
P107-585C	8x6	4-9/16	1-5/8

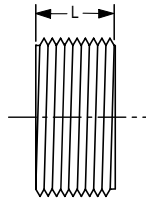
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P109 Male Adapter
MPT x H



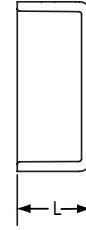
Part Number	Size	N
P109-169C	1-1/4x1-1/2	3/16
P109-015C	1-1/2	3/16
P109-020C	2	3/16
P109-030C	3	3/8
P109-040C	4	3/8
P109-060C	6	5/16

P110 Counter Sunk Cleanout Plug
MPT



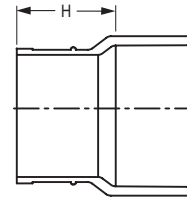
Part Number	Size	L
P110-015C	1-1/2	5/8
P110-020C	2	5/8
P110-030C	3	3/4
P110-040C	4	7/8
P110-060C	6	1

P116 Cap Socket



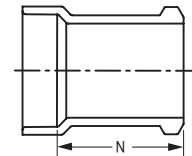
Part Number	Size	L
P116-015C	1-1/2	15/16
P116-020C	2	1
P116-030C	3	1-3/4
P116-040C	4	2
P116-060C	6	3-9/32
P116-080C	8	6-3/8

P119 No-Hub Adapter
S x H



Part Number	Size	H
P119-015C	1-1/2	1-9/16
P119-020C	2	1-5/8
P119-030C	3	1-13/16
P119-040C	4	1-7/8

P123 Hub Adapter
H x S

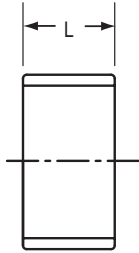


Part Number	Size	N
P123-020C	2	4-5/8
P123-030C	3	5-5/8

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P130 Repair Coupling

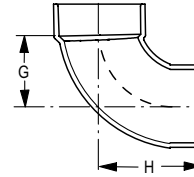
H x H



Part Number	Size	L
P130-040C	4	3-13/16

P302 1/4 Bend, Street (90° Street Ell)

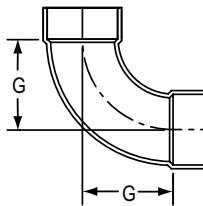
H x Spig



Part Number	Size	G	H
P302-015C	1-1/2	1-3/4	2-5/16
P302-020C	2	2-1/4	3-1/16
P302-030C	3	3-3/16	4-9/16
P302-040C	4	3-7/8	5-5/8
P302-060C	6	5	8-11/32
P302-080C	8	6	10-1/2
P302-100C	10	9-29/32	15-3/8
P302-120C	12	10-15/16	17-3/8

P300 1/4 Bend (90° Ell)

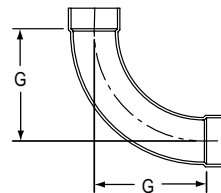
H x H



Part Number	Size	G
P300-015C	1-1/2	1-3/4
P300-020C	2	2-5/16
P300-030C	3	3-3/16
P300-040C	4	3-7/8
P300-060C	6	5
P300-080C	8	6
P300-100C	10	9-29/32
P300-120C	12	10-29/32

P304 1/4 Bend, Long Sweep (90° LS Ell)

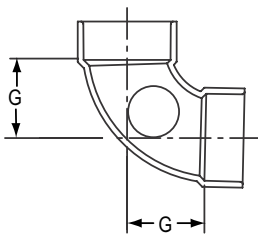
H x H



Part Number	Size	G
P304-015C	1-1/2	2-3/4
P304-020C	2	3-9/32
P304-030C	3	4-1/8
P304-040C	4	5-1/32
P304-060C	6	12

P300S 1/4 Bend w/Side Inlet (90° Ell)

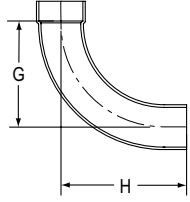
All Hub



Part Number	Size	G
P300S-338C	3x3x2	3-11/32

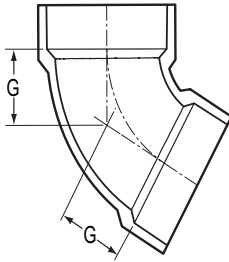
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P309 Long Sweep 1/4 Bend, Street
(90° LS Street Ell)
H x Spig



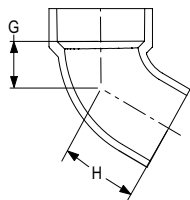
Part Number	Size	G	H
P309-015C	1-1/2	2-3/4	3-11/32
P309-020C	2	3-9/32	4-3/32
P309-030C	3	4-1/8	5-23/32
P309-040C	4	5-1/32	6-7/16

P319 1/6 Bend (60° Ell)
H x H



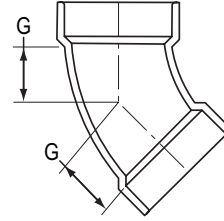
Part Number	Size	G
P319-015C	1-1/2	1-1/16
P319-020C	2	1-3/8
P319-030C	3	1-11/16
P319-040C	4	2-5/32
P319-060CF	6	4-9/16

P320 1/6 Bend, Street (60° Street Ell)
H x Spig



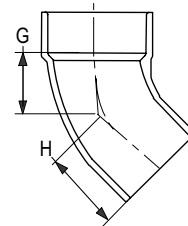
Part Number	Size	G	H
P320-015C	1-1/2	1-1/16	1-3/4
P320-020C	2	1-5/8	2-1/4
P320-030C	3	1-11/16	3-1/16
P320-040C	4	2-5/32	3-19/32

P321 1/8 Bend (45° Ell)
H x H



Part Number	Size	G
P321-015C	1-1/2	1-1/8
P321-020C	2	1-9/16
P321-030C	3	1-23/32
P321-040C	4	2-1/8
P321-060C	6	2-1/16
P321-080C	8	3-1/8
P321-100C	10	2-5/8
P321-120C	12	3-1/8

P323 1/8 Bend, Street (45° Street Ell)
H x Spig

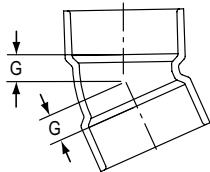


Part Number	Size	G	H
P323-015C	1-1/2	1-1/8	1-13/16
P323-020C	2	1-1/2	2-15/32
P323-030C	3	1-11/16	3-1/4
P323-040C	4	2-3/16	3-15/16
P323-060C	6	2-1/16	5-5/8
P323-080C	8	3-1/8	6-1/2

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P324 1/16 Bend (22-1/2° Ell)

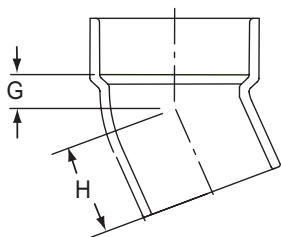
H x H



Part Number	Size	G
P324-015C	1-1/2	1/2
P324-020C	2	11/16
P324-030C	3	13/16
P324-040C	4	1
P324-060C	6	1-5/16
P324-080C	8	1-11/32

P326 1/16 Bend, Street (22-1/2° Street Ell)

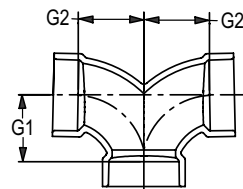
H x Spig



Part Number	Size	G	H
P326-015C	1-1/2	1/2	1-1/4
P326-020C	2	11/16	1-1/2
P326-030C	3	13/16	2-5/16
P326-040C	4	1	2-3/4
P326-060C	6	1-3/8	4-1/2
P326-080C	8	1-3/4	5-5/8

P327 Double 1/4 Bend (3 Way Ell)

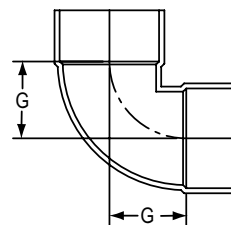
All Hub



Part Number	Size	G1	G2
P327-015C	1-1/2	1-3/4	1-3/4
P327-020C	2	2-5/16	2-5/16
P327-030C	3	3-1/16	3-1/16
P327-241C	2x1-1/2x1-1/2	1-3/8	4-1/2

P331 Vent Ell

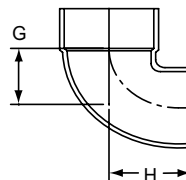
H x H



Part Number	Size	G
P331-015C	1-1/2	1-3/16
P331-020C	2	1-1/2
P331-030C	3	1-7/8
P331-040C	4	2-5/16
P331-060C	6	3-15/32

P333 Vent Ell, Street

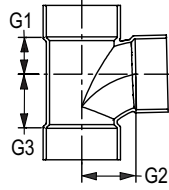
H x Spig



Part Number	Size	G	H
P333-015C	1-1/2	1-3/16	2-15/32
P333-030C	3	1-7/8	3-5/8
P333-040C	4	4-3/16	4-7/16

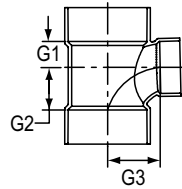
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P400 Sanitary Tee
All Hub



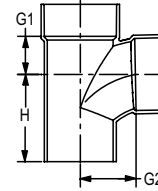
Part Number	Size	G1	G2	G3
P400-015C	1-1/2	1	1-3/4	1-3/4
P400-020C	2	1-3/8	2-5/16	2-5/16
P400-030C	3	1-3/4	3-1/16	3-1/16
P400-040C	4	2-1/4	3-15/16	3-15/16
P400-060C	6	3-7/16	5-1/32	5-1/32
P400-080C	8	4-13/32	6-1/16	6-1/16
P400-100C	10	5-17/32	9-31/32	9-29/32
P400-120C	12	6-1/2	10-31/32	11-1/32

P401 Sanitary Tee, Reducing
All Hub



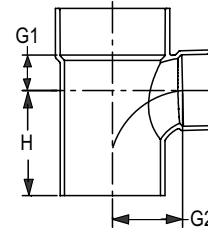
Part Number	Size	G1	G2	G3
P401-241C	2x1-1/2x1-1/2	1-3/16	1-5/16	2-1/4
P401-251C	2x2x1-1/2	1-5/32	1-15/16	2-3/16
P401-257C	2x1-1/2x2	1-13/32	2-5/16	2-3/8
P401-337C	3x3x1-1/2	15/16	1-3/4	2-1/2
P401-338C	3x3x2	1-1/8	2-1/8	2-7/8
P401-420C	4x4x2	1-1/8	2-3/16	3-5/16
P401-422C	4x4x3	1-11/16	3	3-1/2

P403 Sanitary Tee, Street
S x H x H



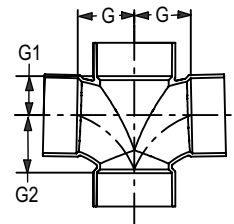
Part Number	Size	G1	G2	H
P403-080C	8	4-3/8	5-31/32	9-13/32
P403-100C	10	5-19/32	9-1/2	14-19/32
P403-120C	12	6-15/32	11-1/32	16-9/32

P404 Sanitary Tee, Street, Reducing
S x H x H



Part Number	Size	G1	G2	H
P404-241C	2x1-1/2x1-1/2	1-1/8	2-5/32	2-5/8
P404-251C	2x2x1-1/2	1-3/32	2-1/8	2-21/32
P404-337C	3x3x1-1/2	13/16	2-15/32	2-15/16
P404-338C	3x3x2	1-1/16	2-3/4	3-7/32

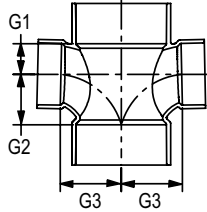
P428 Double Sanitary Tee
All HUB



Part Number	Size	G	G1	G2
P428-015C	1-1/2	1-3/4	1	1
P428-020C	2	2-7/8	1-25/32	1-25/32
P428-030C	3	3-1/16	1-13/16	1-13/16
P428-040C	4	3-7/8	2-1/4	2-1/4

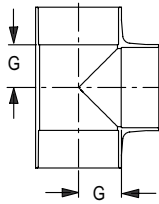
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P429 Double Sanitary Tee, Reducing
All Hub



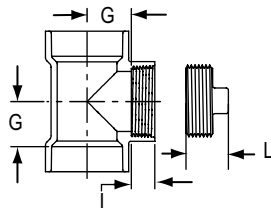
Part Number	Size	G1	G2	G3
P429-241C	2x1-1/2x1-1/2x1-1/2	1-3/16	1-7/8	2-1/16
P429-251C	2x2x1-1/2x1-1/2	1-3/16	1-15/16	2-3/16
P429-337C	3x3x1-1/2x1-1/2	15/16	1-3/4	4
P429-338C	3x3x2x2	1-3/16	2-1/8	2-7/8
P429-419C	4x4x1-1/2x1-1/2	1-1/16	2	5-1/16
P429-420C	4x4x2x2	1-1/8	2-1/16	5-1/16
P429-422C	4x4x3x3	1-3/4	3	5-1/16

P441 Vent Tee
All Hub



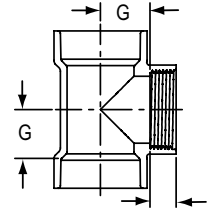
Part Number	Size	G
P441-030C	3	1-29/32
P441-040C	4	2-3/8

P444X Cleanout Tee w/Plug
H x H x FPT



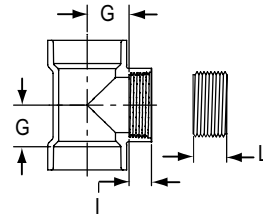
SEE PART NO. P445 AND P106

P445 Cleanout Tee
H x H x FPT



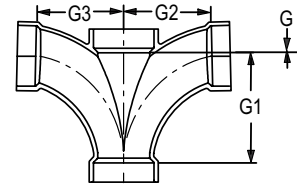
Part Number	Size	G	I
P445-015C	1-1/2	1-3/16	5/8
P445-020C	2	1-13/32	5/8
P445-030C	3	1-7/8	3/4
P445-040C	4	2-7/16	7/8
P445-060C	6	3-1/2	1-1/4

P445X Cleanout Tee with Counter Sunk Plug
H x H



SEE PART NO. P445 AND P110

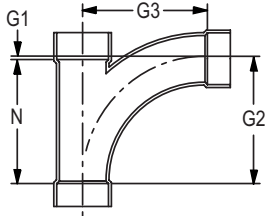
P500 Double Fixture Fitting
All Hub



Part Number	Size	G	G1	G2	G3
P500-241C	2x1-1/2x1-1/2x1-1/2	3/8	3-1/8	2-7/8	2-7/8
P500-251C	2x2x1-1/2x1-1/2	3/8	3-5/32	2-27/32	2-27/32
P500-338C	3x2x3x3	1/2	6-9/32	4-7/8	4-7/8
P500-030C	3x3x3x3	1/2	6-9/32	4-29/32	4-29/32

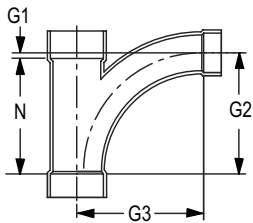
LabWaste™ CPVC Technical Information & Installation Guide

P501 Combination Wye + 1/8 Bend (Long Turn Tee Wye)
All Hub



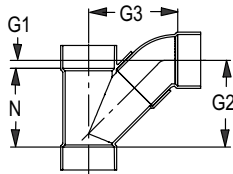
Part Number	Size	G1	G2	G3	N
P501-015C	1-1/2	3/8	3-7/8	3-7/8	3-1/2
P501-020C	2	1-1/16	5-1/8	5-1/8	4-7/16
P501-030C	3	1-1/16	7-9/16	7-9/16	6-1/2
P501-040C	4	1-7/16	10	10	8-1/2

P502 Combination Wye + 1/8 Bend, Reducing (Long Turn Tee Wye)
All Hub



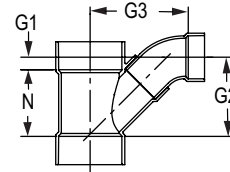
Part Number	Size	G1	G2	G3	N
P502-251C	2x2x1-1/2	7/16	3-15/16	4-3/16	3-1/2
P502-337C	3x3x1-1/2	7/16	3-15/16	4-3/4	3-1/2
P502-338C	3x3x2	11/16	5-1/8	5-11/16	4-7/16
P502-420C	4x4x2	5/8	5-1/8	6-1/8	4-1/2
P502-422C	4x4x3	1-1/16	7-9/16	8-1/16	6-1/2

P503 Combination Wye and 1/8 Bend (Two Piece)
All Hub



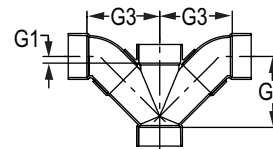
Part Number	Size	G1	G2	G3	N
P503-060C	6	31/32	10-31/32	11-11/32	10
P503-080C	8	1-1/2	16	16	14-1/2
P503-100C	10	2-1/2	21-7/8	17-15/16	16-9/16

P504 Combination Wye and 1/8 Bend, Reducing (Two Piece)
All Hub



Part Number	Size	G1	G2	G3	N
P504-528C	6x2	15/32	7-9/16	8-27/32	7-3/32
P504-530C	6x3	5/8	7-1/4	8-29/32	7-3/32
P504-532C	6x4	1-5/16	8-3/32	10-3/32	6-27/32
P504-582C	8x4	1-1/4	9-1/4	11-1/8	8
P504-585C	8x6	1	11-5/16	12-7/16	10-7/16
P504-623C	10x3	2-3/8	11-1/16	13-15/16	11-1/16
P504-624C	10x4	1-3/8	12-3/16	14-5/8	10-13/16
P504-626C	10x6	2-1/2	11-3/4	14-1/16	10-13/16
P504-628C	10x8	2-1/2	14-1/2	15-1/2	13-9/16
P504-668C	12x8	3	20-1/8	19-1/8	19-1/8
P504-670C	12x10	3	19-13/16	19-1/2	19-1/8

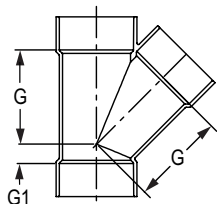
P507 Double Combination Wye and 1/8 Bend
All Hub



Part Number	Size	G1	G2	G3
P507-020C	2	11/16	5-9/16	5-13/16
P507-030C	3	27/32	7-11/32	7-11/32
P507-040C	4	1-1/8	8-31/32	9-7/32
P507-060C	6	1	11-1/32	11-13/32
P507-338C	3x3x2x2	29/32	5-3/4	6-1/2
P507-422C	4x4x3x3	1-1/16	7-1/2	8-1/8
P507-530C	6x6x3x3	1-1/32	10-7/8	10-7/8

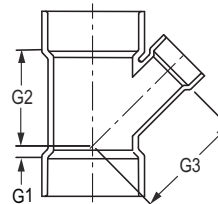
LabWaste™ CPVC Technical Information & Installation Guide

P600 45° Wye
All Hub



Part Number	Size	G	G1
P600-015C	1-1/2	2-7/8	1-1/8
P600-020C	2	3-5/8	7/8
P600-030C	3	5	1-5/8
P600-040C	4	6-3/8	1-7/8
P600-060C	6	8-5/16	1-3/4
P600-080C	8	11-3/4	2-3/8

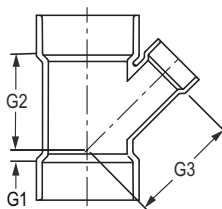
P601 45° Wye, Reducing (continued)
All Hub



Part Number	Size	G1	G2	G3
P601-661C ¹	12x12x2	3	16-3/16	23-1/2
P601-663C ¹	12x12x3	3	16-3/16	22-7/8
P601-664C ¹	12x12x4	3	16-3/16	22-3/8
P601-666C ¹	12x12x6	3	16-3/16	21-1/8
P601-670C ¹	12x12x10	2-15/16	16-3/16	17-3/16

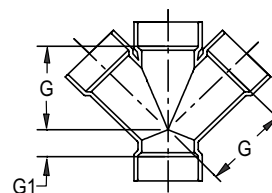
¹ Sized with Bushing

P601 45° Wye, Reducing
All Hub



Part Number	Size	G1	G2	G3
P601-241C	2x1-1/2x1-1/2	15/16	4-1/8	3-5/8
P601-251C	2x2x1-1/2	1-1/16	3-5/16	3-7/16
P601-337C	3x3x1-1/2	1/2	3-3/4	4-5/16
P601-338C	3x3x2	7/8	4-1/8	4-5/8
P601-419C	4x4x1-1/2	3/8	4-11/16	6-1/16
P601-420C	4x4x2	3/8	4-11/16	5-9/16
P601-422C	4x4x3	1-1/16	5-9/16	6
P601-528C	6x6x2	2-31/32	6-5/16	9
P601-530C	6x6x3	7/32	6-7/8	7-3/8
P601-532C	6x6x4	7/32	6-5/8	7-3/8
P601-578C	8x8x2	3/8	7-5/8	9-13/16
P601-580C	8x8x3	7/32	9-1/8	7-11/32
P601-582C	8x8x4	3/8	7-5/8	8-5/8
P601-585C	8x8x6	15/16	9-3/8	9-11/16
P601-626C	10x10x6	9/32	10-31/32	12-13/16
P601-628C	10x10x8	1-1/16	12-3/8	11-27/32

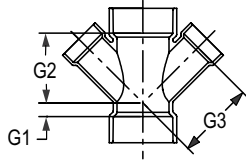
P611 Double Wye
All Hub



Part Number	Size	G	G1
P611-015C	1-1/2	2-7/8	1-1/8
P611-020C	2	3-9/16	1-3/8
P611-030C	3	4-15/16	1-5/8
P611-040C	4	6-11/32	1-27/32
P611-060C	6	8-5/16	1-25/32

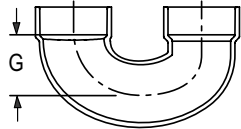
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P612 Double Wye, Reducing
All Hub



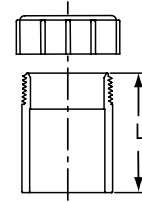
Part Number	Size	G1	G2	G3
P612-241C	2x1-1/2x1-1/2x1-1/2	25/32	3-3/8	4-3/16
P612-251C	2x2x1-1/2x1-1/2	1-1/16	3-5-16	3-7/16
P612-337C	3x3x1-1/2x1-1/2	1/2	3-3/4	4-5/16
P612-338C	3x3x2x2	7/8	4-1/16	4-5/8
P612-420C	4x4x2x2	3/8	4-5/8	5-17/32
P612-422C	4x4x3x3	1-1/2	5-1/32	5-9/32
P612-532C	6x6x4x4	3/16	6-11/16	7-7/16

P700 Return Bend
H x H



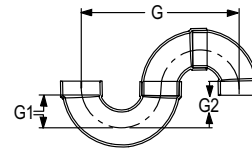
Part Number	Size	G
P700-015C	1-1/2	1-13/32
P700-020C	2	2-13/32
P700-030C	3	3
P700-040C	4	3-3/4
P700-060C	6	5

P704P Tail Piece Adapter
Spig x Slip w/Plastic Nut



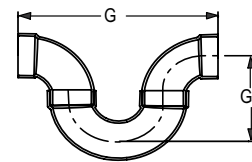
Part Number	Size	L
P704P-015C	1-1/2	2-1/2

P705 S-Trap
H x H



Part Number	Size	G	G1	G2
P705-015C	1-1/2	7-1/2	1-3/4	2-3/8
P705-020C	2	14-1/2	2-3/8	3-13/32
P705-030C	3	15-1/2	3-3/16	4-7/16
P705-040C	4	19-1/16	3-7/8	5-9/16

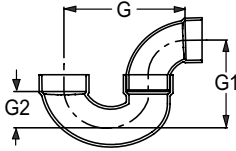
P705R Running Trap
H x H



Part Number	Size	G	G1
P705R-015C	1-1/2	8	3-3/4
P705R-020C	2	12-1/2	5-7/16
P705R-030C	3	17-1/8	7-21/32
P705R-040C	4	20-7/8	9-9/32

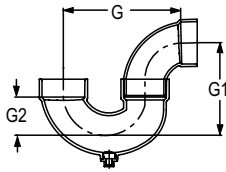
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P706X P-Trap
H x H



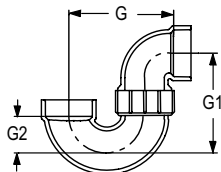
Part Number	Size	G	G1	G2
P706X-015C	1-1/2	4-3/16	3-29/32	1-13/32
P706X-020C	2	6-7/16	4-21/32	2-11/32
P706X-030C	3	9-3/4	7-5/16	3
P706X-040C	4	12-15/16	9-1/8	3-3/4
P706X-060C	6	18-25/32	14-3/4	5-13/16
P706X-080C	8	22	17	6-3/4

P707X P-Trap w/Cleanout
H x H



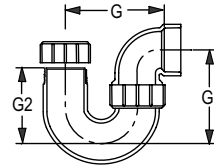
Part Number	Size	G	G1	G2
P707X-015C	1-1/2	4-1/4	4	1-13/32

**P708P P-Trap w/Plastic Nut
(Union Connection)**
H x H



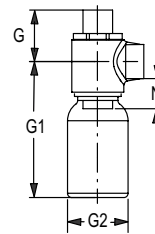
Part Number	Size	G	G1	G2
P708P-015C	1-1/2	4-1/4	3-3/4	1-9/16
P708P-020C	2	7-1/4	4-3/8	2-13/32

**P711P L.A. Pattern P-Trap w/Plastic Nut
(Union Connection w/Slip Joint)**
Slip x H w/Plastic Nut



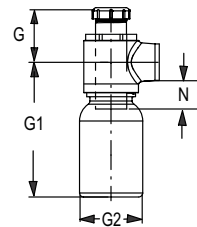
Part Number	Size	G	G1	G2
P711P-015C	1-1/2	4-7/32	3-21/32	3-3/8

P712 Jar Trap
Spig x H



Part Number	Size	G	G1	G2	N
P712-015C	1-1/2	3-1/8	8-1/4	3-7/8	2

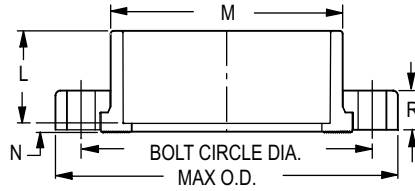
P712P Jar Trap w/Tail Piece Adapter
Slip x H



Part Number	Size	G	G1	G2	N
P712P-015C	1-1/2	3-5/16	8-1/4	3-7/8	1-3/4

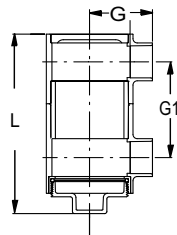
LabWaste™ CPVC Technical Information & Installation Guide

Flange - Van Stone Style Soc



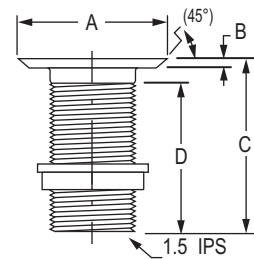
Part Number	Size	L	M	N	R	No. of Bolt Holes	Bolt Circle Dia.	Bolt Size	Min. Bolt Length	Max O.D.
854-015C	1-1/2	1-17/32	2-7/16	3/16	3/4	4	3-7/8	1/2	2-1/2	5
854-020C	2	1-11/16	2-15/16	3/16	13/16	4	4-3/4	5/8	3	6
854-030C	3	2-1/8	4-1/4	1/4	1-1/16	4	6	5/8	3-1/4	7-1/2
854-040C	4	2-1/2	5-1/4	1/4	1-1/8	8	7-1/2	5/8	3-1/2	9
854-060C	6	3-3/8	7-9/16	7/16	1-9/32	8	9-1/2	3/4	4	11
854-080C	8	4-3/8	9-5/16	3/8	1-3/8	8	11-3/4	3/4	4-1/2	13-1/2
854-100C	10	5-11/16	11-3/4	11/16	1-5/8	12	14-1/4	7/8	5	16
854-120C	12	7-1/4	13-3/4	5/8	1-1/2	12	17	7/8	5	19
854-140C	14	7-1/2	15-1/2	1/2	2	12	18-3/4	1	5-1/2	21
854-160C	16	8-3/4	17-3/4	3/4	2-3/8	16	21-1/4	1	6-1/2	23-1/2

P720 Drum Trap H x H



Part Number	Size	G	G1	L
P720-015C	1-1/2	3-5/8	5-11/16	10-5/8
P720-020C	2	3-7/8	5	10-3/8
P720-030C	3	4-1/2	6-3/4	13-7/16
P720-040C	4	4-3/8	8-1/4	15-11/16

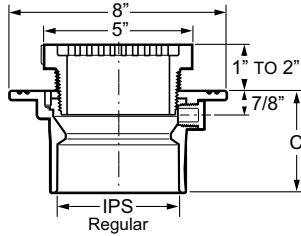
Waste Assembly Sink Outlet



Part Number	Size	A	B	C	D
LWWA-1	1-1/2	2-1/2	1/4	4-1/4	3-5/8

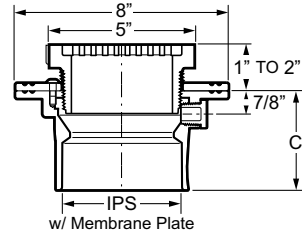
LabWaste™ CPVC Technical Information & Installation Guide

LW1500 Floor Drain with CPVC Adjustable Top w/5" Round Gate



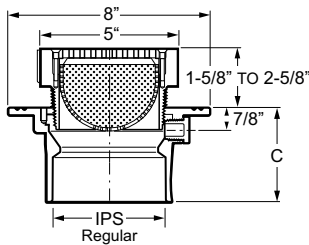
Part Number Regular	Size	IPS	C
LW1500-015C	1-1/2x5	1-1/2	4-3/16
LW1500-020C	2x5	2	4
LW1500-030C	3x5	3	4
LW1500-040C	4x5	4	3-3/4

LW1500 Floor Drain with CPVC Adjustable Top w/5" Round Gate & Membrane Collar



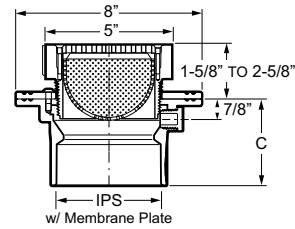
Part Number Membrane Plate	Size	C
LW150M-015C	1-1/2x5	4-3/16
LW150M-020C	2x5	4
LW150M-030C	3x5	4
LW150M-040C	4x5	3-3/4

LW1520 Floor Drain with CPVC Adjustable Top w/ 5" Round Gate & Strainer



Part Number	Size	IPS	C
LW1520-015C	1-1/2x5	1-1/2	4-3/16
LW1520-020C	2x5	2	4
LW1520-030C	3x5	3	4
LW1520-040C	4x5	4	3-3/4

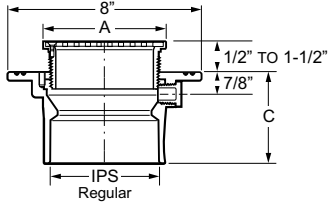
LW152M Floor Drain with CPVC Adjustable Top w/ 5" Round Gate, Strainer & Membrane Collar



Part Number Regular	Size	IPS	C
LW152M-015C	1-1/2x5	1-1/2	4-3/16
LW152M-020C	2x5	2	4
LW152M-030C	3x5	3	4
LW152M-040C	4x5	4	3-3/4

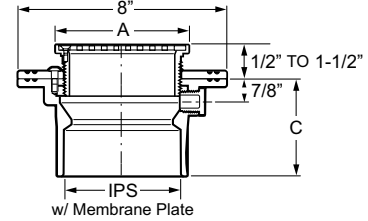
LabWaste™ CPVC Technical Information & Installation Guide

Floor Drain w/Stainless Steel Adjustable Top w/Round Grate



Part Number Regular	Size	A, Nom	IPS	C
LW1500-015S	1-1/2x5	5	1-1/2	4-3/16
LW1600-015S	1-1/2x6	6	1-1/2	4-3/16
LW1700-015S	1-1/2x7	7	1-1/2	4-3/16
LW1800-015S	1-1/2x8	8	1-1/2	4-3/16
LW1500-020S	2x5	5	2	4
LW1600-020S	2x6	6	2	4
LW1700-020S	2x7	7	2	4
LW1800-020S	2x8	8	2	4
LW1500-030S	3x5	5	3	4
LW1600-030S	3x6	6	3	4
LW1700-030S	3x7	7	3	4
LW1800-030S	3x8	8	3	4
LW1500-040S	4x5	5	4	3-3/4
LW1600-040S	4x6	6	4	3-3/4
LW1700-040S	4x7	7	4	3-3/4
LW1800-040S	4x8	8	4	3-3/4

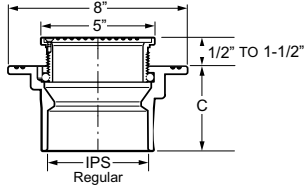
Floor Drain with Stainless Steel Adjustable Top w/ Round Grate & Membrane Collar



Part Number Membrane	Size	A, Nom	IPS	C
LW150M-015S	1-1/2x5	5	1-1/2	4-3/16
LW160M-015S	1-1/2x6	6	1-1/2	4-3/16
LW170M-015S	1-1/2x7	7	1-1/2	4-3/16
LW180M-015S	1-1/2x8	8	1-1/2	4-3/16
LW150M-020S	2x5	5	2	4
LW160M-020S	2x6	6	2	4
LW170M-020S	2x7	7	2	4
LW180M-020S	2x8	8	2	4
LW150M-030S	3x5	5	3	4
LW160M-030S	3x6	6	3	4
LW170M-030S	3x7	7	3	4
LW180M-030S	3x8	8	3	4
LW150M-040S	4x5	5	4	3-3/4
LW160M-040S	4x6	6	4	3-3/4
LW170M-040S	4x7	7	4	3-3/4
LW180M-040S	4x8	8	4	3-3/4

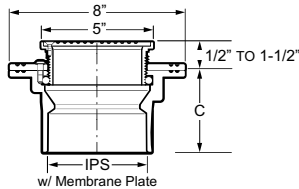
LabWaste™ CPVC Technical Information & Installation Guide

LW1510 Floor Cleanout w/Stainless Steel Adjustable Round Top & Solid Access Cover



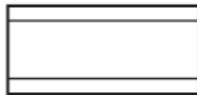
Part Number Regular	Size	IPS	C
LW1510-015S	1-1/2x5	1-1/2	4-3/16
LW1510-020S	2x5	2	4
LW1510-030S	3x5	3	4
LW1510-040S	3x4	4	3-3/4

LW151M Floor Cleanout w/Stainless Steel Adjustable Round Top, Solid Access Cover & Membrane Collar



Part Number Membrane Plate	Size	IPS	C
LW151M-015S	1-1/2x5	1-1/2	4-3/16
LW151M-020S	25	2	4
LW151M-030S	3x5	3	4
LW151M-040S	3x4	4	3-3/4

LW LabWaste Pipe 10' Lengths



Part Number	Pipe Dia. (inches)	Avg. O.D.	Avg. I.D.	Min. Wall
LW-015	1-1/2x10	1.900	1.592	.145
LW-020	2x10	2.375	2.049	.154
LW-030	3x10	3.500	3.042	.216
LW-040	4x10	4.500	3.998	.237
LW-060	6x10	6.625	6.031	.280
LW-080	8x10	8.625	7.943	.322

Solvent Cement Yellow-Heavy Bodies



Part Number	Size
LW5-030	Quart

Average Number of Joints per Quart of Solvent Cement

Pipe Diameter	Number of Joints
1-1/2"	90
2"	60
3"	40
4"	30
6"	10
8"	5

These figures are based on laboratory tests. Due to many field variations, these should be used as a general guide only.

LabWaste™ CPVC Technical Information & Installation Guide

Standard HDPE Round Neutralization/Dilution Tanks
Construction: HDPE – High Density Polyethylene

Tank Capacity US Gallions	Approx. Useable Capacity, US Gallons		Inside Dimension Dia x Ht. (in)	Wall Thickness (in.)	Approx. Weight (lbs)	Standard Inlet & Outlet Connection Size (in.)	Standard Fitting Connection	LabWaste™ Transition Connection Fitting	Optional Vent Connection Size (in.)	Approx. Centerline Height (in.)		
	Without Limestone	With Limestone								Inlet	Outlet	Vent
5	3	1	11 x 14	3/16	10	1-1/2 or 2	Mipt	P101	1-1/2 or 2	11	8	12
15	7	2	18 x 15	3/16	20	1-1/2 or 2	Mipt	P101	1-1/2 or 2	11	8	12
30	19	6	18 x 29	3/16	35	3	Mipt	P101	2 or 3	23	19	25
55	35	12	22 x 36	3/16	50	4	Mipt	P101	3 or 4	27	23	31
100	77	26	28 x 42	1/4	85	4	Mipt	P101	3 or 4	35	31	37
150	105	35	31 x 48	1/4	100	4	Mipt	P101	3 or 4	38	34	42
175	135	45	30 x 60	1/4	125	4	Mipt	P101	3 or 4	51	47	54
200	137	46	36 x 48	1/4	125	4 or 6	Mipt/Flange	P101/854	4 or 6	38	34	42
275	186	62	42 x 48	1/4	160	4 or 6	Mipt/Flange	P101/854	4 or 6	38	34	42
300	230	76	36 x 74	5/16	175	4 or 6	Mipt/Flange	P101/854	4 or 6	61	56	65
350	243	81	48 x 48	5/16	200	4 or 6	Mipt/Flange	P101/854	4 or 6	38	34	42
500	395	132	52 x 60	3/8	225	4 or 6	Mipt/Flange	P101/854	4 or 6	51	47	54
550	447	149	48 x 72	3/8	275	4 or 6	Mipt/Flange	P101/854	4 or 6	64	60	67
650	548	183	48 x 84	3/8	375	4 or 6	Mipt/Flange	P101/854	4 or 6	75	71	76
1200	1052	351	69 x 84	3/8	600	4 or 6	Mipt/Flange	P101/854	4 or 6	74	68	76
2000 ¹	1559	521	84 x 84	1/2	850	4 or 6	Mipt/Flange	P101/854	4 or 6	74	68	76
3000 ¹	2203	735	95 x 97	1/2	1350	4 or 6	Mipt/Flange	P101/854	4 or 6	87	83	91

Standard CPVC Round Neutralization/Dilution Tanks
Construction: Chlorinated Polyvinyl Chloride (CPVC)

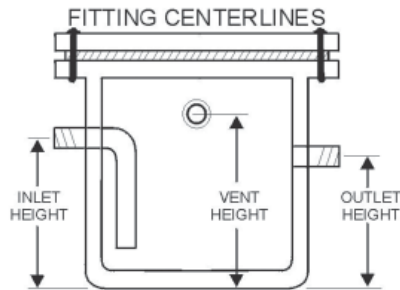
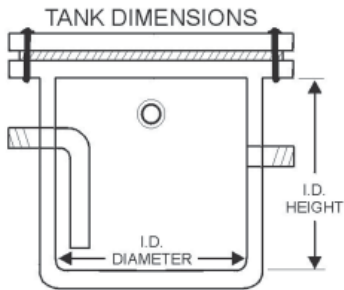
Tank Capacity US Gallions	Approx. Useable Capacity, US Gallons		Inside Dimension Dia x Ht. (in)	Wall Thickness (in.)	Approx. Weight (lbs)	Standard ² Inlet & Outlet Connection Size (in.)	Standard Fitting Connection	LabWaste™ Transition Connection Fitting ³	Optional ⁴ Vent Connection Size (in.)	Approx. Centerline Height (in.) ⁵		
	Without Limestone	With Limestone								Inlet	Outlet	Vent
5	5	3	12-3/8 x 14-11/16	3/16	20	1-1/2 or 2	Soc	direct	1-1/2 or 2	11	8	12
15	15	7	17-11/16 x 17-1/4	3/16	35	1-1/2 or 2	Soc	direct	1-1/2 or 2	11	8	12
30	30	18	17-5/8 x 33	3/16	54	3	Soc	direct	2 or 3	23	18	25
55	55	35	23-1/2 x 38-1/2	1/4	70	4	Soc	direct	3 or 4	27	23	31

Important Notes

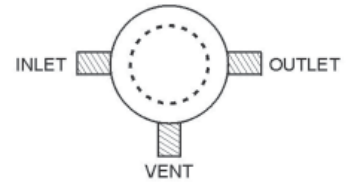
- Larger HDPE tanks may include exterior steel banding or fiberglass reinforcement for additional strength. Special ordered optional inspection manhole ports are recommended for larger tanks (includes cover with neoprene gasket, stainless steel nuts, bolts, and washers).
- All tanks can be special ordered with Mipt, Flanged (150#), and Fipt connections or varying combinations other than standard connections specified. Inlets or vents may also be custom ordered for installation in covers instead of tank sides.
- For transitions from Mipt HDPE tank connections to **LabWaste™** piping use part numbers P101-xxxC, Female Adapter. CPVC tank sockets can be cemented directly to **LabWaste™** piping. For transitions from ALL flanged connections to **LabWaste™** piping use part numbers 854-xxxC, Flange (xxx = size code).
- Venting is required by codes but may be accomplished either at the tank or in-line.
- For direct burial (below ground) installations, it is recommended that custom centerlines be furnished from top of cover down to fitting centerline instead of from tank bottom to center of fitting that is listed. This is critical for below grade installations since tank heights may vary somewhat.

LabWaste™ CPVC Technical Information & Installation Guide

HDPE Tanks

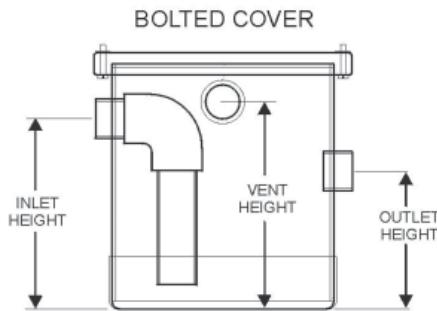
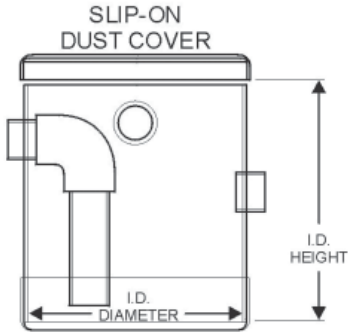


TOP VIEW
STANDARD FITTING LOCATIONS



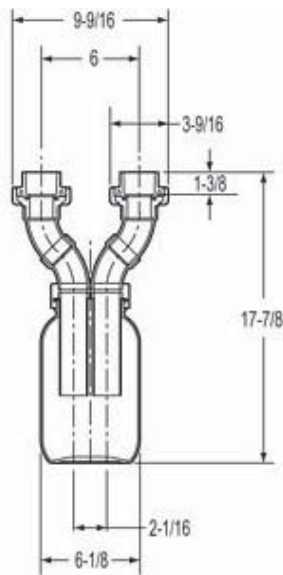
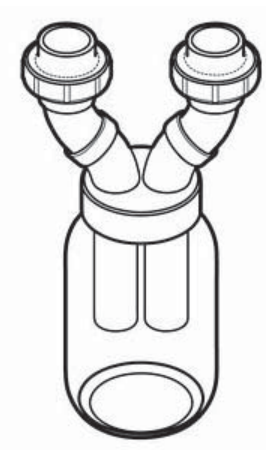
(Advise If You Want Standard Locations Changed)

CPVC Tanks

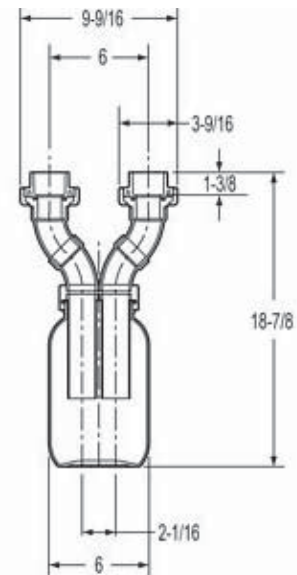


1-Gallon CPVC Dilution Tanks

Provides chemical dilution from water rinse during use. Designed for under-sink installations.
CPVC construction with Glass or PP Jar type tank.



Glass



Polypropylene

LabWaste™ CPVC Technical Information & Installation Guide

Chemical Resistance Information

CPVC is inert to most acids, bases, salts, plus a wide variety of organic compounds. Application conditions including chemical concentration and temperature must be taken into consideration. Due to the many variables involved, final suitability often must be based on in-service testing.

The following Chemical Resistance Table recommendations apply only to non-pressure, laboratory drainage applications, which are those characterized as the routine disposal of a wide variety of hot and cold chemicals in relatively small quantities accompanied by water for the purpose of dilution and flushing. For use of LabWaste™ CPVC products in continuous or dedicated chemical waste drainage systems, chemical resistance data for pressure applications must be followed. Contact Spears® Technical Services for additional information.

In many cases compatibility or solubility data is not available. While specific data may not be available, please note that virtually all aqueous solutions of chemicals used in a laboratory can be safely used with proper dilution and flushing. This includes chemicals that readily disperse in water (such as many fat-soluble vitamins and oils) that can be flushed during disposal.

This information is compiled from commercially available industry sources. It is offered in good faith and believed to be accurate at the time of its preparation, but is offered without any warranty, expressed or implied, by information sources or Spears® Manufacturing Company. These recommendations are guidelines for use and the final decision regarding material suitability must rest with the end-user.

Noted Caution Areas for CPVC

- Disposed chemicals must be properly diluted. Chemicals that individually have no effect may have an effect when used in combination. Due to the wide variety of potential chemical concentrations and combinations, testing under actual service conditions is highly recommended.
- CPVC is not recommended for use with chlorinated solvents. Most solvents are prohibited by law from disposal in drainage systems.
- Chemicals that do not normally affect CPVC may cause cracking when excessive stress is applied. Tests under applied adverse stress conditions indicate that environmental stress cracking may occur when exposed to surfactants, certain oils, or grease. Such stresses include external stresses from expansion/contraction and installation. Special consideration should be taken during design and installation to avoid unusual stresses in the piping system.
- Chemical resistance of plastics tends to decrease with an increase in chemical concentration and/or temperature. As a result, various chemicals may be safely handled in limited concentrations or within certain temperature limits. Most all aqueous solutions of water-soluble chemical not specified in the Chemical Resistance Tables can be used in CPVC drainage systems.
- While LabWaste™ CPVC products are suitable for many continuous commercial and industrial chemical waste applications, the following Chemical Resistance Tables should NOT be used for these applications. Consult chemical resistance data for CPVC pressure piping to determine suitability for continuous chemical waste drainage applications.

LabWaste™ CPVC Technical Information & Installation Guide

Chemical Resistance Tables

Resistance Rating Codes

R = Recommended
C = Use with Caution.
N = Not Recommended.
--- = No data available

IMPORTANT NOTE: Chemical Resistance data is provide for material compatibility information purposes only and in no way addresses the legal discharge of chemicals into any waste system, some of which may be prohibited by law. Nor does the data address the compatibility of chemical mixtures, issues of hazardous decomposition, or other potentially dangerous circumstances that might be involved. Data is applicable to laboratory drainage systems only and may not be suitable for continuous service or pressure applications.

CHEMICAL	RATING	CHEMICAL	RATING	CHEMICAL	RATING
A					
Acacia, Gum Arabic	R	Ammonium Nitrate	R	Bromphenol Blue	R
Acetaldehyde	R	Ammonium Persulfate	R	Bromthymol Blue	R
Acetamide	R	Ammonium Phosphate	R	Butadiene	R
Acetic Acid Vapor 25%	R	Monobasic/Dibasic	R	Butane	R
Acetic Acid 60%	R	Ammonium Sulfate	R	Butyl Acetate	C
Acetic Acid 85%	R	Ammonium Sulfide	R	Butyl Alcohol	C
Acetic Acid Glacial	R	Ammonium Sulfite	R	Butyl Cellosolve	R
Acetic Anhydride	R	Ammonium Thiocyanate	R	n-Butyl Chloride	---
Acetone	R	Amyl Acetate	C	Butylene (C)	---
Acetophenone	C	Amyl Alcohol 1%	R	Butyl Phenol	C
Acetyl Chloride	R	Amyl Alcohol >1%	C	Butyl Phthalate	---
Acetylene	N	n-Amyl Chloride	C	Butyl Stearate	---
Acetylnitrile	R	Aniline	C	Butynediol	---
Acetylsalicylic acid, aspirin	R	Aniline Chlorohydrate	C	Butyric Acid	R
Acrylic Acid	R	Aniline Hydrochloride	C		
Acrylonitrile	R	Antraquinone	R	C	
Adenine, 6-aminopurine	R	Antraquinone	R	Cadium Cyanide	R
Adenosine Triphosphate	R	Sulfonic Acid	R	Calcium Acetate	R
Adipic Acid	R	Antimony Trichloride	R	Calcium Bisulfide	R
Agarose	R	Aqua Regia	---	Calcium Bisulfate	R
Alizarin stain	R	Argon	---	Calcium Carbonate	R
Mordant Red 11	R	Arsenic Acid	R	Calcium Chlorate	R
Alizarin Red S	R	Aryl Sulfonic Acid	R	Calcium Chloride	R
Mordant Red 3	R	Asorbic Acid	R	Calcium Fluoride	R
Alizarin Yellow R	R	L-Asparagine	R	Calcium Hydroxide	R
Mordant Orange 1	R	Asphalt	N	Calcium Hypochlorite	R
Allyl Alcohol	R	B		Calcium Nitrate	R
Allyl Chloride	N	Barium Acetate	R	Calcium Oxide	R
Aluminum Acetate	R	Barium Carbonate	R	Calcium Sulfate	R
Aluminum Ammonium	R	Barium Chloride	R	Camphor	---
Aluminum Chloride	R	Barium Hydroxide	R	Cane Sugar Liquors	R
Aluminum Fluoride	R	Barium Nitrate	R	Caprylic Acid	---
Aluminum Hydroxide	R	Barium Sulfate	R	Carbitol	---
Aluminum Nitrate	R	Barium Sulfide	R	Carbolic Acid	R
Aluminum Oxychloride	R	Beer	R	Carbon Dioxide Dry	R
Aluminum Potassium	R	Beer Sugar Liquors	R	Carbon Dioxide Wet	R
Aluminum Potassium Sulfate, Alum	R	Benzaldehyde	R	Carbon Disulfide	C
Aluminum Sulfate	R	Benzene	C	Carbon Monoxide	R
Ammonia Anhydrous	R	Benzene Sulfonic Acid	R	Carbon Tetrachloride	N
Ammonia Gas	R	Benzoic Acid	R	Carbonic Acid	R
Ammonia Liquid	R	Benzyl Alcohol	R	Castor Oil	C
Ammonia Acetate	R	Bismuth Carbonate	R	Caustic Potash	R
Ammonium Bicarbonate	R	Biuret	R	Caustic Soda	R
Ammonium Bifluoride	R	Black Liquor	R	Cellosolve	C
Ammonium Bisulfide	R	Bleach 5%	R	Cellosolve Acetate	R
Ammonium Bromide	R	Bleach 12%	R	Chloral Hydrate	R
Ammonium Carbonate	R	Blood	R	Chloramine	R
Ammonium Chloride	R	Borax	R	Chloric Acid	R
Ammonium Citrate	R	Boric Acid	R	Chloric Acid 20%	R
Ammonium Dichromate	R	Brake Fluid	---	Chlorine, Aqueous	R
Ammonium Dihydrogen	R	Brine	---	Chlorinated Water 10 PPM	R
Phosphate	R	Brilliant Blue G-250	R	Chlorinated Water Sat'd	R
Ammonium Ferric Sulfate	R	Brilliant Blue R-250	R	Chloroacetic Acid	R
Ammonium Ferrous Sulfate	R	Brilliant Cresyl Blue	R	Chloroacetyl Chloride	---
Ammonium Fluoride 10%	R	Brilliant Green	R	Chlorobenzene	N
Ammonium Fluoride 25%	R	Bromocresal Green	R	Chlorobenzyl Chloride	N
Ammonium Hydroxide	R	Bromocresal purple	R	Chloroform	N
10% - 28%	R	Bromic Acid	R	Chlorophenol Red	R
Ammonium Hydroxide	R	Bromine Liquid	R	Chloropicrin	---
100%	R	Bromine Vapor	R	Chlorosulfonic Acid	R
Ammonimu Iodide	R	Bromine Water	R	Chromic Acid 10%	R
		Bromotoluene	---	Chromic Acid 30%	R
				Chromic Acid 40%	R

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CHEMICAL	RATING
Chromic Acid 50%	C
Chromium	R
Chromium Tetroxide	R
Citric Acid	R
Clayton Yellow	R
Coconut Oil	C
Coffee	R
Congo Red solution	R
Copper Acetate	R
Copper Carbonate	R
Copper Chloride	R
Copper Cyanide	R
Copper Fluoride	R
Copper Nitrate	R
Copper Sulfate	R
Corn Oil	C
Corn Syrup	R
Cottonseed Oil	C
m-Cresal Purple	R
Cresal Red	R
Creosote	N
Cresol	N
Cresylic Acid	R
Croton Aldehyde	R
Crude Oil	R
Cumene	C
Cupric Chloride	R
Cupric Fluoride	R
Cupric Nitrate	R
Cupric Sulfate	R
Cuprous Chloride	R
Cyclohexane	R
Cyclohexanol	R
Cyclohexanone	R
D	
Decahydronaphthalene	R
Detergents	R
Dextrin	R
Dextrose	R
Diacetone Alcohol	R
Diastase of malt	R
Dibutoxyethyl Phthalate	N
Dibutyl Ether	R
Dibutyl Phthalate	N
Dibutyl Sebacate	N
Dichlorobenzene	R
Dichloroethylene	N
2,6 - Dichloroindophenal	R
Diesel Fuels	R
Diethylamine	R
Diethyl Cellosolve	R
Diethyl Ether	R
Diglycolic Acid	R
Dimethylamine	R
Dimethyl Formamide	R
Dimethylhydrazine	R
Dimethyl Phthalate	N
Dimethyl Sulfoxide	R
Diethyl Phthalate	N
Dodecyl Alcohol	R
Dodecyl Sulfate	R
Dioxane	R
Diphenyl Oxide	---
Disodium Phosphate	R
Drierite	R
E	
Eosin Y	R
Enochrome Black T	R
Ether	R
Ethyl Acetate	R
Ethyl Acetoacetate	R
Ethyl Acrylate	R
Ethyl Alcohol	R
Ethyl Benzene	C
Ethyl Chloride	N
Ethyl Chloroacetate	N
Ethylene Bromide	N
Ethylene Chloride	N
Ethylene Chlorohydrin	N
Ethylenediamine	R
Ethylene Dichloride	N
Ethylene Glycol	C
Ethylene Oxide	R

CHEMICAL	RATING
Ethyl Ether	R
Ethyl Formate	R
Ethylene Glycol	R
2-Ethylhexanol	R
Ethyl Mercaptan	R
Ethyl Oxalate	R
F	
Fast Green FCF	R
Fatty Acids	R
Fehlings solution A	R
Fehlings solution B	R
Ferric Ammonium Sulfate	R
Ferric Chloride	R
Ferric Hydroxide	R
Ferric Nitrate	R
Ferric Sulfate	R
Ferrous Chloride	R
Ferrous Hydroxide	R
Ferrous Nitrate	R
Ferrous Sulfate	R
Fish Oil	R
Fluoboric Acid	R
Fluorine Gas (Dry)	R
Fluorine Gas (Wet)	R
Fluosilicic Acid 30%	R
Fluosilicic Acid 50%	R
Formaldehyde Dilute	R
Formaldehyde 35%	R
Formaldehyde 37%	R
Formaldehyde 50%	C
Formic Acid	R
Freon	R
Freon 12	R
Freon 21	---
Freon 22	R
Freon 113	C
Freon 114	---
Fructose	R
Furfural	R
G	
Gallic Acid	R
Gasoline	R
Gasohol	R
Gelatin	R
Glauber's Salt	---
Glucose	R
Glue, PVA	R
Glutathione	R
Glycerine	R
Glycine	R
Glycogen	R
Glycol	C
Glycol Amine	---
Glycolic Acid	R
Glyoxal	R
Grape Sugar	R
Grease	---
Green Liquor	R
H	
Heptane (Type 1)	R
n-Hexane	R
Hexamethylenediamine	R
Hexanol, Tertiary	R
Hydraulic Oil	---
Hydrazine	R
Hydrobromic Acid 20%	R
Hydrobromic Acid 50%	R
Hydrochloric Acid 10%	R
Hydrochloric Acid 30%	R
Hydrocyanic Acid	R
Hydrofluoric Acid Dilute	R
Hydrofluoric Acid 30%	R
Hydrofluoric Acid 50%	R
Hydrofluoric Acid 100%	R
Hydrofluosilicic Acid 50%	R
Hydrogen	R
Hydrogen Cyanide	R
Hydrogen Fluoride	C
Hydrogen Peroxide 50%	R
Hydrogen Peroxide 90%	R
Hydrogen Phosphide	R

CHEMICAL	RATING
Hydrogen Sulfide Dry	R
Hydrogen Sulfide Wet	R
Hydrogen Sulfide, aqueous	R
Hydroquinone, aqueous	R
Hydroxylamine Hydrochloride	R
Hydroxylamine Sulfate	R
Hypochlorous Acid	R
I	
Indigo Carmine	R
Inks	R
Iodine	R
Iodine solution, Lugol's	R
Iron Phosphate	---
Isobutane	C
Isobutyl Alcohol	R
Isooctane	R
Isopropyl Acetate	R
Isopropyl Alcohol	R
Isopropyl Chloride	N
Isopropyl Ether	R
Isophorone	R
J	
Janus Green	R
JP-3 Fuel	R
JP-4 Fuel	R
JP-5 Fuel	R
JP-6 Fuel	R
K	
Kerosene	R
Ketchup	R
Kraft Liquors	R
L	
Lactic Acid 25%	R
Lactic Acid 80%	R
Lactose	R
Lard Oil	C
Latex	---
Lauric Acid	R
Lauryl Chloride	R
Lead Acetate	R
Lead Chloride	R
Lead Nitrate	R
Lead Sulfate	R
Lemon Oil	R
Ligroin	R
Limonene	R
Lime Slurry	R
Lime Sulfur	R
Linoleic Acid	C
Linoleic Oil	---
Linseed Oil	C
Liqueurs	R
Lithium Bromide	R
Lithium Carbonate	R
Lithium Chloride	R
Lithium Hydroxide 50%	R
Lithium Nitrate	R
Lithium Sulfate	R
Lubricating Oil #1	R
Lubricating Oil #2	R
Lubricating Oil #3	R
Ludox	---
Luminol 3-amino Phthalhydrazide	R
DL-lysine Hydrochloride	R
Lysozyme	R
M	
Magnesium Acetate	R
Magnesium Bromide	R
Magnesium Carbonate	R
Magnesium Chloride	R
Magnesium Citrate	R
Magnesium Fluoride	---
Magnesium Hydroxide	R
Magnesium Nitrate	R
Magnesium Oxide	---
Magnesium Sulfate	R
Malachite Green	R

LabWaste™ CPVC Technical Information & Installation Guide

CHEMICAL	RATING	CHEMICAL	RATING	CHEMICAL	RATING
Maleic Acid	R	Orange IV - acid orange 5	R	Potassium Nitrite	R
Malic Acid	R	Orcinol	R	Potassium Perborate	R
Maltose	R	Osmium Tetroxide	R	Potassium Perchlorate	R
Manganese Chloride	R	Oxalic Acid	R	Potassium Permanganate 10%	R
Manganese Nitrate	R	Oxygen Gas	R	Potassium Permanganate 25%	R
Manganese Sulfate	R	Ozone	R	Potassium Persulfate	R
Menthol	R	Ozonized Water	R	Potassium Phosphate	R
Mercuric Chloride	R	P		Potassium Sodium Tartrate	R
Mercuric Cyanide	R			Potassium Sulfate	R
Mercuric Sulfate	R	Palm Oil	R	Potassium Sulfide	R
Mercurous Nitrate	R	Palmitic Acid 10%	R	Potassium Sulfite	R
Mercury	R	Palmitic Acid 70%	R	Potassium Thiocyanate	R
Methane	R	Pancreatin	R	Propane	R
Methanol	R	Papain	R	Propargyl Alcohol	R
DL-methionine	R	Paraffin	R	Propionic Acid	R
Methoxyethyl Oleate	---	Peanut Oil	C	Propyl Acetate	---
Methyl Acetate	R	Pectin	R	Propyl Alcohol	R
Methyl Acetone	R	n-Pentane	C	N-Propyl Bromide	---
Methyl Acrylate	---	Pepsin	R	Propylene Dichloride	N
Methyl Amine	R	Peracetic Acid	R	Propylene Glycol	R
Methyl Bromide	N	Perchloric Acid 15%	R	Propylene Oxide	R
Methyl Cellosolve	R	Perchloric Acid 70%	R	Pyridine	R
Methyl cellulose	R	Perchloroethylene	C	Pyrogallol Acid	R
Methyl Chloride	N	Periodic Acid	R	Pyrrrole	R
Methyl Chloroform	N	Perphosphate	R	Q	
Methyl Ethyl Ketone	R	Phenol	R	Quinine Sulfate	R
Methyl Formate	R	Phenolphthalein	R	Quinine Chloride Dihydrate	R
Methyl Green	R	Phenyl Salicylate	R	Quinone	---
Methyl Isobutyl Carbinol	R	Phenylhydrazine	C	R	
Methyl Isobutyl Ketone	R	Phosphate Esters	---	Rayon Coagulating Bath	R
Methyl Isopropyl Ketone	R	Phosphoric Acid 10%	R	Rennin	R
Methyl Methacrylate	R	Phosphoric Acid 50%	R	Resazurin	R
Methyl Red	R	Phosphoric Acid 85%	R	Ringers Solution	R
Methyl Sulfate	R	Phosphoric Anhydride	R	Rose Bengal Acid Red 94	R
Methyl Violet-2B	R	Phosphorous (Red)	C	S	
Methyl Violet-6B	R	Phosphorous (Yellow)	C	Safranin O	R
Methylene Blue	R	Phosphorous Pentoxide	R	Salicylaldehyde	N
Methylene Bromide	N	Phosphorous Trichloride	R	Salicylic Acid	R
Methylene Chloride	N	Photographic Solutions	R	Selenic Acid, Aq.	R
Methylene Chlorobromide	N	Phthalic Acid	R	Silicic Acid, Aq.	R
Methylene Iodine	N	Picric Acid	R	Silicone Oil	R
Methylsulfuric Acid	R	Pine Oil	C	Silver Acetate	R
Milk	R	Plating Solutions Brass	R	Silver Chloride	R
Mineral Oil	R	Plating Solutions Cadmium	R	Silver Cyanide	R
Molasses	R	Plating Solutions Chrome	R	Silver Nitrate	R
Monochloroacetic Acid	R	Plating Solutions Copper	R	Silver Sulfate	R
Monochlorobenzene	N	Plating Solutions Gold	R	Soaps	R
Monoethanolamine	R	Plating Solutions Lead	R	Sodium Acetate	R
Monosodium Glutamate	R	Plating Solutions Nickel	R	Sodium Alum	R
Motor Oil	R	Plating Solutions Rhodium	R	Sodium Aluminate	R
Morpholine	R	Plating Solutions Silver	R	Sodium Arsenate	R
N		Plating Solutions Tin	R	Sodium Benzoate	R
Naphtha	R	Plating Solutions Zinc	R	Sodium Bicarbonate	R
Naphthalene	C	Polyvinyl Acetate	---	Sodium Bichromate	R
Natural Gas	R	Polyvinyl Alcohol	R	Sodium Bisulfate	R
Neutral Red	R	Potash	R	Sodium Bisulfite	R
Nickel Acetate	R	Potassium Acetate	R	Sodium Borate	R
Nickel Ammonium Sulfate ---		Potassium Alum	R	Sodium Bromide	R
Nickel Chloride	R	Potassium Aluminum	R	Sodium Carbonate	R
Nickel Nitrate	R	Potassium Bicarbonate	R	Sodium Chlorate	R
Nickel Sulfate	R	Potassium Bichromate	R	Sodium Chloride	R
Nicotine	R	Potassium Bisulfate	R	Sodium Chlorite	R
Nicotinic Acid	R	Potassium Bitartrate	R	Sodium Chromate	R
Nitric Acid 10%	R	Potassium Borate	R	Sodium Citrate	R
Nitric Acid 30%	R	Potassium Bromate	R	Sodium Cyanide	R
Nitric Acid 40%	R	Potassium Bromide	R	Sodium Dichromate	R
Nitric Acid 50%	R	Potassium Carbonate	R	Sodium Diphenylamine	
Nitric Acid 70%	R	Potassium Chlorate	R	Sulfonate	R
Nitric Acid 100%	R	Potassium Chloride	R	Sodium Dithionite	R
Nitrobenzene	N	Potassium Chromate	R	Sodium Ferricyanide	R
Nitroethane	C	Potassium Citrate	R	Sodium Ferrocyanide	R
Nitrogen Gas	---	Potassium Cyanide	R	Sodium Fluoride	R
Nitroglycerine	C	Potassium Dichromate	R	Sodium Hexametaphosphate	R
Nitroglycol	---	Potassium Ethyl Xanthate	---	Sodium Hydroxide 15%	R
Nitromethane	C	Potassium Ferricyanide	R	Sodium Hydroxide 30%	R
Nitrous Acid	R	Potassium Ferrocyanide	R	Sodium Hydroxide 50%	R
Nitrous Oxide	R	Potassium Fluoride	R	Sodium Hydroxide 70%	R
O		Potassium Hydrogen Phosphate	R	Sodium Hypochlorite	R
n-Octane	C	Potassium Hydrogen Phthalate	R	Sodium Iodate	R
Octanol	R	Potassium Hydroxide	R	Sodium Iodide	R
Oleic Acid	R	Potassium Hypochlorite	R	Sodium Metabisulfite	R
Oleum	R	Potassium Iodate	R		
Olive Oil	C	Potassium Iodide	R		
Orange G - acid orange 10	R	Potassium Nitrate	R		

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CHEMICAL	RATING
Sodium Metaphosphate	R
Sodium Nitrate	R
Sodium Nitrite	R
Sodium Palmitrate	R
Sodium Perborate	R
Sodium Perchlorate	R
Sodium Periodate	R
Sodium Peroxide	R
Sodium Phosphate Acid	R
Sodium Phosphate Alkaline	R
Sodium Phosphate Neutral	R
Sodium Propionate	R
Sodium Silicate	R
Sodium Sulfate	R
Sodium Sulfide	R
Sodium Sulfite	R
Sodium Thiosulphate	R
Sour Crude Oil	R
Soybean Oil	C
Stannic Chloride	R
Stannous Chloride	R
Stannous Sulfate	R
Starch	R
Stearic Acid	R
Streptomycin Sulfate	R
Strontium Bromide	R
Strontium Chloride	R
Styrene	N
Succinic Acid	R
Sugar	R
Sulfamic Acid	R
Sulfate Liquors	R
Sulfite Liquors	R
Sulfur	R
Sulfur Chloride	R
Sulfur Dioxide Gas Dry	R
Sulfur Dioxide Gas Wet	R
Sulfur Trioxide Gas Dry	--
Sulfur Trioxide Gas Wet	N
Sulfuric Acid Up to 30%	R
Sulfuric Acid 50%	R
Sulfuric Acid 60%	R
Sulfuric Acid 70%	R
Sulfuric Acid 80%	R
Sulfuric Acid 90%	R
Sulfuric Acid 93%	R
Sulfuric Acid 94%	R
Sulfuric Acid 95%	R
Sulfuric Acid 96%	R
Sulfuric Acid 98%	R
Sulfuric Acid 100%	R
Sulfurous Acid	R

T

Tall Oil	R
Tannic Acid	R
Tanning Liquors	R
Tar	C
Tartaric Acid	R
Terpineol	--
Tetrachloroethane	N
Tetrachloroethylene	N
Tetracycline hydrochloride	
Tetraethyl Lead	R
Tetrahydrofuran	R
Tetralin	N
Thiamine Hydrochloride	R
Thionin	R
Thionyl Chloride	R
Thymol	R
Titanium Dioxide	R
Titanium Tetrachloride	R
Toluene	C
Tomato Juice	R
Transformer Oil	R
Transformer Oil DTE/30	R
Tributyl Citrate	--
Tributyl Phosphate	R
Trichloroacetic Acid	R
Trichloroethylene	N
Triethanolamine	R
Triethylamine	R
Trimethylpropane	R
Trisodium Phosphate	R
Trypsin	R
Tung Oil	C
Turpentine	C

CHEMICAL	RATING
U	
Urea	R
Urease	R
Urine	R
V	
Varnish	--
Vaseline	C
Vegetable Oil	C
Vinegar	R
Vinyl Acetate	R
W	
Water, Acid Mine	R
Water, Deionized	R
Water, Distilled	R
Water, Potable	R
Water, Salt	R
Water, Sea	R
Water, Soft	R
Water, Waste	R
Whiskey	R
White Liquor	R
Wine	R
X	
Xylene	C
Z	
Zinc Acetate	R
Zinc Carbonate	R
Zinc Chloride	R
Zinc Nitrate	R
Zinc Stearate	R
Zinc Sulfate	R