LabWaste® CPVC Technical Information & Installation Guide

ENGINEERING GUIDE

Contact Spears® for any Information not found.

LabWaste® Overview

Proven Solvent Cement Joining Eliminates Troublesome Fusion Equipment, Mechanical Joints & Elastomer Problems

NSF® Certified for Corrosive Waste Use & Listed to ASTM F 2618 Specification for CPVC Pipe & Fittings for Chemical Waste Drainage Systems & CSA B181.2-2018 PVC & CPVC Drain, Waste, and Vent Pipe and Pipe Fittings • Listed by ICC-ES PMG 1018 for Compliance with the International Plumbing Code & Uniform Plumbing Code • Listed by ICC-ES PMG 1278 for Compliance with ASTM E84 25/50 Requirements of the International Mechanical Code & Uniform Mechanical Code

- **Complete System of Pipe, Fittings & Adapters**
- **Meets 25/50 Flame & Smoke Requirement for use in Return Air Plenums**
- **Non-Pressure Drainage Service to 220° F**
- **All CPVC Construction in a Full Assortment of Standard DWV Patterns**
- **Accessories including Drains, Neutralization Tanks, and Dilution Traps**
- **Specially Formulated One-Step Solvent Cement Provides Chemical Resistance Equal to System Pipe & Fittings - Now in Special Yellow Color**

Chemical & Corrosion Resistant CPVC

One of the key advantages of Spears® **LabWaste**® CPVC System is its excellent resistance to a broad range of corrosive environments. CPVC is inert to most mineral acids, bases, salts and aliphatic hydrocarbons, and compares favorably to other plastics in these chemical environments.

General Chemical Resistance Overview:

Weak Acids	Excellent	Salts	Excellent
Strong Acids	Excellent	Aliphatic Solutions	Good
Weak Bases	Excellent	Halogens	Good-Fair
Strong Bases	Excellent	Strong Oxidants	Good-Fair

The **LabWaste**® CPVC System has been developed for use in Academic, Research, and Institutional Laboratory chemical waste drainage applications. These plumbing systems are characterized by the routine disposal of a wide variety of hot and cold chemical wastes in accordance with prudent laboratory practices for drainage disposal.

Manufactured to ASTM F 2618 in Full Line of Drainage Pattern Fitting Configurations

Spears® broad line of **LabWaste**® CPVC pipe & fittings are manufactured to ASTM F 2618 Specifications for CPVC Pipe & Fittings for Chemical Waste Drainage Systems and produced in ASTM D 3311 drainage patterns or to manufacturer's specifications. Standard configurations are available in nominal sizes of 1-1/2" through 24" with many specialty fittings and accessories, like dilution traps, (water dilution being critical in the prevention of exothermic chemical interactions within all plumbing systems).

NSF® Certified For Corrosive Waste

Spears® **LabWaste**® Corrosive Water Drainage System of pipe, fittings, and cement is certified for use in corrosive waste systems by NSF International to ASTM F 2618, CSA B181.2-2018 and ICC-ES Listed to PMG-1018, CPVC Chemical Waste Systems, for compliance to the International Plumbing Code and the Uniform Plumbing Code (See PMG Listing No. PMG-1018 at www.icc-es-pmg.org).

Cost Saving Solvent Weld Joining Eliminates the need for Electro-Fusion Joints and for Mechanical Joint Connections in Concealed Spaces

A proven joining method reliably used for over 50 years, Solvent Cement Welding requires no special tools, no costly fusion, easy installation, repairs or alterations. Most importantly, solvent cement joints end problems typical of polypropylene system installation, such as mechanical connector pullout, maintaining mechanically sealed joints, leaks from fusion wire corrosion, and cumbersome fusion joining methods. Saves time, saves cost, saves worry!

A Flame & Smoke Rated Piping System

Spears® **LabWaste**® system components have tested dry Listed by ICC-ES PMG 1278 for Compliance with ASTM E84/UL723 Tests for Surface Burning Characteristics having a flame spread of <25 and a smoke developed index of < 50 meeting the requirements of the International Mechanical Code and Uniform Mechanical Code for use in return air plenums (See PMG Listing No. PMG-1278 at www.icc-es-pmg.org). **LabWaste**® is additionally Listed by Underwriters Laboratories of Canada (ULC®) under CAN/ULC S102.2 for Surface Burning Characteristics of less than 25/50.

Suitable for Oil-Free air handling to 25 psi, not for distribution of compressed air or gas

See Spears® Product Sourcebook for product offerings

Applicable Conformance Standards & Certifications

Spears® **LabWaste®** CPVC Corrosive Waste Drainage System is a complete system of pipe, fittings and solvent cement 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 agency.

• **ASTM F 2618 -** Certified for corrosive waste and use by NSF International (NSF® cw) in accordance with ASTM F 2618, *Standard Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Fittings for Chemical Waste Drainage Systems.*

• **Uniform Plumbing Code -** Certified for use in accordance with the Uniform Plumbing Code (UPC®) by NSF International as specified in IAPMO IGC 210, *Interim Guide Criteria for Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Fittings for Limited Chemical Waste Drainage System. (NSF® U.P.Code).*

• **International Plumbing Code -** Spears® **LabWaste®** CPVC system has been approved for use in accordance with the International Plumbing Code (IPC®) by the International Codes Council Evaluation Services (ICC-ES) in accordance with ICC-ES PMG Listing PMG-1018 for Spears® **LabWaste®** CPVC Corrosive Waste Drainage System (See ICC-ES PMG Listing PMG-1018 at www.icc-es-pmg.org).

• **Uniform Mechanical Code -** Listed by the International Codes Council Evaluation Services (ICC-ES PMG) in accordance with ASTM E84 and UL® 723 for compliance with requirements of the Uniform Mechanical Code® (UMC) for use in return air plenums by having a Flame Spread/ Smoke Development of less than 25/50, respectively, under listing number PMG-1278. (See PMG Listing No. PMG-1278 at www.icc-es-pmg.org).

• **International Mechanical Code -** Listed by the International Codes Council Evaluation Services (ICC-ES PMG) in accordance with ASTM E84 and UL® 723 for compliance with requirements of the International Mechanical Code® (IMC) for use in return air plenums by having a Flame Spread/ Smoke Development of less than 25/50, respectively, under listing number PMG-1278. (See PMG Listing No. PMG-1278 at www.icc-es-pmg.org).

• **Canadian Surface Burning Characteristics -** by Underwriters Laboratory of Canada (ULC®) for evaluation of Flame Spread and Smoke Density in accordance with CAN/ULC S102.2 for finished product having a Flame Spread/ Smoke Development of less than 25/50, respectively.

• **Canadian Standards Association -** Certified for corrosive waste and use by NSF International (NSF®-cw) in accordance with CSA B181.2-2018 - PVC & CPVC Drain, Waste, and Vent Pipe and Pipe Fittings and ASTM F 2618, Standard Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Fittings for Chemical Waste Drainage Systems.

• **UL 2818 Performance Certification -** Certified by Underwriters Laboratories (UL®) for conformance to UL 2818 Certification Program For Chemical Emissions For Building Materials, Finishes And Furnishings. This GREENGUARD GOLD Certification provides eligibility for LEED® credits when installing **LabWaste®** in green building projects.

Flammability & Surface Burning Characteristics

Flammability	UL94	UL94: *Tests for Flammability of Plastic Materials*
Material Rating	V-0	
Flame & Smoke Rating	CAN/ULC S102.2 Listed[1] UL 723/ASTM E 84 Tested[2]	
Flame Spread:	<25	CAN/ULC S102.2: *Surface Burning Characteristics* UL723/ASTM E 84: *Surface Burning Characteristics* (NFPA 255, ANSI/UL 723 and UBC 8-1)
Smoke Developed:	<50	

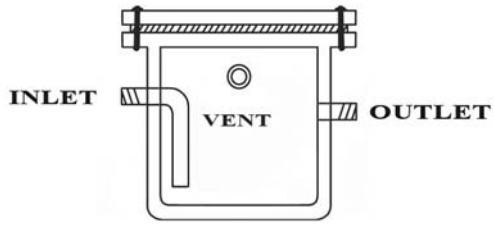
Notes:
1 - ULC® listing based on test of finished product, pipe and fittings solvent cement welded as assemblies.
2 - UL 723/ASTM E 84 test by Southwest Research Institutes™ (SwRI™) Department of Fire Technology under project No. 1.10083.01.269d, September 20, 2004, test of empty (dry) CPVC pipe with dry fit end caps and material in the ceiling position.

Spears® LabWaste® Custom System Accessories

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 being discharged into the plumbing system without being neutralized or treated. Spears® offers a standard selection of HDPE tanks in 5 gallon to 3000 gallon capacities and CPVC tanks in 5 gallon to 55 gallon capacities to meet these needs. Tanks can also be produced in virtually any custom size, shape, or connection configuration. Contact Spears® Technical Services with desired specifications for custom quotation. See Spears® SPS-1, **LabWaste®** Neutralization Tanks & Accessories for additional information on the following features and options.

- CPVC Tanks 5-gallon to 55-gallon
- HDPE Tanks 5-gallon to 3000-gallon
- Optional Vented Tanks
- Socket (CPVC), Thread or Flanged Connection
- Inspection & Manhole Port Options
- Pedestrian or Vehicular Traffic Cover Options
- Tank Extension Options
- Limestone Chip Neutralization Medium



LabWaste® Floor Drains & Cleanouts

Spears® **LabWaste®** CPVC Floor Drains are available for connection to 1-1/2" through 4" drainage pipe. Standard drains have adjustable 5" round CPVC grates and can be ordered with optional CPVC 1/8" perforated sediment strainer to trap debris. CPVC drains also available with adjustable round Stainless Steel grates in 5", 6", 7" or 8" diameters. Standard CPVC Floor Cleanouts have 5" round, adjustable Stainless Steel access covers. All Floor Drains and Floor Cleanouts are available with optional membrane plate for clamping housing to waterproof membranes when used in floor installations.

Suitable for Oil-Free air handling to 25 psi, not for distribution of compressed air or gas
See Spears® Product Sourcebook for product offerings

Typical Physical Properties of Spears® **LabWaste®** CPVC Material

Property	Test Method	Typical Value
Mechanical Properties @ 73°F		
Specific Gravity	ASTM D 792	1.49
Tensile Strength, psi	ASTM D 638	9000
Tensile Modulus, psi	ASTM D 638	420,000
Flexural Strength	ASTM D 790	12,000
Izod Impact (notched @73°F)		
Fittings	ASTM D 256	3.0
Pipe		5.5
Thermal Properties		
Heat Deflection Temperature 264 psi	ASTM D 648	
Fitting		214°F
Pipe		230°F
Thermal Conductivity, BTU/hr/sq ft/°F/in	ASTM C 177	.95
Coefficient of Linear Expansion, in/in/°F	ASTM D 696	3.2 x 10^{-5}
Flammability		
Limiting Oxygen Index	ASTM D 2863	60
UL 94 Rating	UL 94	V-0, 5VB
Flame & Smoke Rating[1]		
Flame Spread	CAN/ULC S 102.2	<25
Smoke Developed	UL 723/ASTM E 84	<50
Solvent Cement	ASTM F 2618/ASTM F 493	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 UL 94 flammability rating of V-0, 5VB. Pipe and fittings have been listed and rated based on *finished product* 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. Additional test of **LabWaste®** pipe with dry fit caps was conducted by Southwest Research Institute™ (SwRI™) Department of Fire Technology under UL 723/ASTM E 84 (modified to test finished product). 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.

LabWaste® Technical Information

Pipe & Fittings

Spears® **LabWaste®** CPVC pipe and fittings are produced to the dimensional and performance requirements of ASTM F 2618, ***Standard Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Fittings for Chemical Waste Drainage Systems.*** ***LabWaste®*** CPVC fitting configurations are produced to applicable DWV patterns of ASTM D 3311, ***Standard Specification for Drain, Waste, and Vent (DWV) Plastic Fittings Patterns,*** plus various specialty patterns and manufactured 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 dimensions specified in ASTM F 2618 with sizes greater than 12" produced to Schedule 40 dimensions of ASTM F 441, ***Standard Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe, Schedule 40 and 80.***

Schedule 40 CPVC Pipe Dimensions (inch)

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

Expansion & Contraction

Spears® **LabWaste®** CPVC products, like all piping materials, expand and contract with changes in temperature. If the coefficient of linear expansion is 3.2 x 10^{-5} in./in. °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 is calculated from Length of Run in feet, expected Change in Temperature and given Coefficient of Linear Thermal Expansion of 3.2 x 10^{-5} in./in. °F for CPVC:

$\Delta L = 12eL (\Delta T)$
Where:
e = 3.2 x 10^{-5} in./in. °F
L = Length of Run in feet
ΔT = Temperature Change in °F

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?
$\Delta L = 12eL (\Delta T)$
$\Delta L = 12 \times .000032 \times 50 \times 40$
$\Delta L = .768$ inches

The following table provides quick reference in identifying expansion length change for different run lengths of pipe at various anticipated temperature changes.

Thermal Expansion Table

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	.15	.19	.23	.27	.31	.35	.38
20	.15	.23	.31	.38	.46	.54	.61	.69	.77
40	.31	.46	.61	.77	.92	1.08	1.23	1.38	1.54
50	.38	.58	.77	.96	1.15	1.34	1.54	1.73	1.92
70	.54	.81	1.08	1.34	1.61	1.88	2.15	2.42	2.69
90	.69	1.04	1.38	1.73	2.07	2.42	2.76	3.11	3.46
120	.92	1.38	1.84	2.30	2.76	3.23	3.69	4.15	4.61

Joining Methods

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,*** as specified in ASTM F 2618. 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.

Solvent Cement Joints - Store below 90°F (33°C). Stir and use as is. If jelled, replace. Use within 2 years 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 1/3 - 2/3 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. 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 times 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.

Recommended Set & Cure Times

Temperature	Initial Set	Cure
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.

Average Number of Joints per Quart of LW-5 One-step Cement

Pipe Diameter	1-1/2	2	3	4	6	8	10	12	14	16
No. of Joints	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.

Threaded Joints - 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.

WARNING: 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.

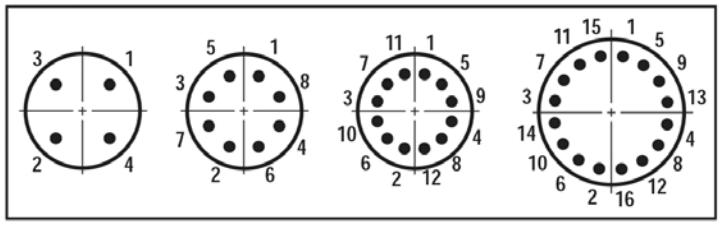
1. Apply joint sealant to the male pipe threads ONLY.
2. Thread joint hand tight for initial assembly.
3. Using commercial strap wrenches tighten 1 to 2 turns beyond hand tight; avoid overtightening. DO NOT use conventional pipe wrenches that can damage plastic fittings.

If a tape sealant is used:

1. Use PTFE tape no less than 3.5 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.

Flanged Connections - 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 70. Use of well lubricated bolts and flat washers is required. Bolts must be tightened in a 180° opposing pattern to the recommended torque values.

Flange Size (in.)	Bolt Torque (ft.-lb.)	Torque Sequence
1-1/2	12	
2-4	25	
6-8	40	
10	64	
12	95	
14-16	110	

LabWaste® Transitions To Other Systems - Spears® **LabWaste®** Corrosive Waste Drainage System provides a complete line of transition fittings for use with other corrosive waste piping materials for system additions and retrofits.

P099 Transition Coupling: Hub x Compression. Allows connection of **LabWaste®** to Polypropylene or PVDF pipe and solvent cement socket connection to CPVC system. A safety groove must be cut into the Polypropylene or PVDF pipe to resist pull out. A groove cutting tool is available from Spears®

P093 Elastomer Transitions Coupling For Glass: IPS Clamp Joint x Glass Clamp Joint. Allows mechanical connection of **LabWaste®** CPVC pipe to plain end Kimax® glass pipe. Consists of high performance fluoroelastomer (FKM) sleeve, an outer stainless steel shear ring and two AISI 301 stainless steel clamping bands.

P098 Glass Transition Coupling: Spigot x Bead Clamp. Allows mechanical connection of **LabWaste®** to beaded-end glass drainage pipe. Coupling consists of a CPVC beaded-end matching glass pipe bead and CPVC pipe diameter spigot end for solvent cement connection. This requires a glass system's mechanical connector, available from Schott Scientific Glass, part# 6650-XXXX Bead-to-Bead end.

P094 Elastomer Transitions Coupling For Duriron®: IPS Clamp Joint x Duriron® Clamp Joint. Allows mechanical connection of **LabWaste®** CPVC pipe to plain end Duriron® pipe. Consists of high performance fluoroelastomer (FKM) sleeve, an outer stainless steel shear ring and two AISI 301 stainless steel clamping bands.

P095 Duriron® Mechanical Transition Fitting: Mechanical Joint x CPVC Pipe Size. Allows mechanical connection of **LabWaste®** to Duriron® (siliconized iron) pipe. Fitting consists of Duriron® pipe diameter spigot (male pipe end) and CPVC pipe diameter spigot end for solvent cement connection. Requires use of Duriron® Mechanical Joint Coupling that consists of an inner sleeve of PTFE surrounded by an outer sleeve of Neoprene rubber held in place by a stainless steel coupling. Duriron® Mechanical Joint Coupling available through Flowserve.

P097 Duriron® Caulk Transition Coupling: Spigot x Caulk Joint. Allows caulk-joint connection of **LabWaste®** pipe to Duriron® borosilicate systems. Coupling consists of Duriron® pipe diameter male end for mating to Duriron® belled pipe end and CPVC pipe diameter spigot end for solvent cement connection. This requires use of special chemical acid-resistant oakum packing available from Flowserve (Red Stripe Sealite A312 Rope) and plastic lead/caulk purchased from others. **DO NOT** use hot lead or oiled Oakum for this type of caulk-joint.

P096 Grooved Coupling Adapter: Groove x Socket. Allows connection of the **LabWaste®** to grooved metal piping systems. Requires use of a Metal Grooved Coupling with gasket. A flexible style grooved coupling must be used for plastic only. **Do not use rigid style couplings.** Use either Victaulic Flexible Grooved Couplings Part # 75 & 77 or Gruvlok Flexible Grooved Couplings Part # 7001 & 7000.

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

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 a 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 overtightened 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 backfilling. 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 D 2321, ***Underground Installation of Thermoplastic Pipe for Sewer and Other Gravity-Flow Applications,*** 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 configuration, including custom double-containment tanks. Contact Spears® Technical Services with desired specifications for custom quotation. See SPS-1 Catalog - **LabWaste®** ***CPVC Waste Drainage Systems,*** for 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.

Neutralization tanks and tank extensions are not warranted for direct burial applications. Tanks must be properly placed and secured with no applied stresses, within a dry concrete vault. However, if direct burial is used without warranty, custom centerlines must be furnished from top of cover down to fitting centerline instead of specified tank bottom to fittings centerline since tank heights can vary. 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.

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

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	
	Gallons	Liters
2	5	18.9
4	15	56.8
8	30	113.6
16	55	208.2
22	75	283.9
27	90	340.7
30	108	408.8
40	150	567.8
50	175	662.4

Number of Lab Sinks	Tank Size	
	Gallons	Liters
60	200	757
75	275	1040.9
110	360	1362.6
150	500	1898.5
175	550	2081.8
200	650	2460.3
300	1200	4542
500	2000	7570
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 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
5	50
15	100
30	200
55	500
100	1,000
150	1,750
175	1,900
200	2,500
275	3,200

Tank Size Gallons	Approx. Pounds
300	3,200
350	4,000
500	5,000
550	7,500
650	9,000
1200	11,000
2000	16,000
3000	25,000

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.

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 pressure test of ten (10) foot (3048 mm) head of water should be conducted 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 ensure 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 Lifetime Warranty (located on the back cover 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, minimum ASTM Cell Classification 23447. System pipe and fittings shall be certified by NSF International to the requirements of ASTM F 2618, The Standard Specification for Chlorinated Polyvinyl Chloride (CPVC) Pipe and Fittings for Chemical Waste Drainage Systems, to the requirements of CSA B181.2 (cNSF-us-cw) for use in Canada and to the requirements of the Uniform Plumbing Code as applicable (NSF-U.P. Code) for use in corrosive waste drainage systems. LabWaste® pipe and fittings tested dry shall be listed by ICC-ES PMG to ASTM E84/UL723 having a flame spread of less than 25 and smoke developed index of less than 50. (See PMG Listing No. PMG-1278 at www.icc-es-pmg.org). **LabWaste**® pipe and fittings tested dry shall be listed by Underwriters Laboratories of Canada to CAN/ULC S102.2 having a flame spread of less than 25 and smoke developed index of less than 50 as designated on the pipe marking or fitting package labeling. **LabWaste**® pipe and fittings shall be approved and listed by ICC-ES PMG approved for use in accordance with the Uniform Plumbing Code (UPC) by the International Codes Council Evaluation Services (ICC-ES), in accordance with PMG Listing Criteria for Chlorinated Poly Vinyl Chloride (CPVC) System of Pipe Fittings and Solvent Cement Used in Chemical Waste Systems, LC1007 (See PMG Listing No. PMG-1018 at www.icc-es-pmg.org.). All pipe markings shall be accompanied by a yellow stripe for identification as CPVC chemical waste drainage system. All LabWaste® pipe shall be certified by Underwriters Laboratories (UL) to UL 2818 GREENGUARD GOLD for low chemical emissions. All fittings shall be CPVC drainage patterns meeting the applicable requirements of ASTM D 3311 or the manufacturers specifications. Joining method for pipe and fittings shall be solvent cement welding. Solvent cement shall be a “one-step” primerless type CPVC cement specially formulated for resistance to corrosive chemicals and manufactured in accordance with ASTM F 2618 and F 493. 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 with a Lifetime Warranty, as Spears® LabWaste® CPVC Corrosive Waste Drainage Systems manufactured by Spears® Manufacturing Company.

Neutralization Tanks

Standard HDPE Round Neutralization/Dilution Tanks

Construction: HDPE - High Density Polyethylene

Tank Capacity US Gallons	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 Liimestone	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

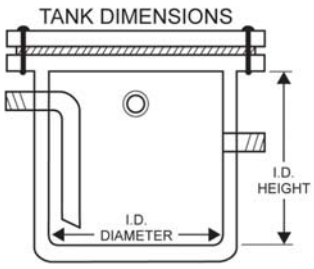
Construction: Chlorinated Polyvinyl Chloride (CPVC)

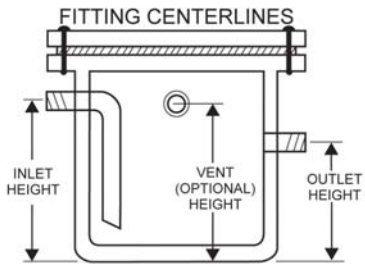
Tank Capacity US Gallons	Approx. Useable Capacity, US Gallons		Inside Dimension Dia. x Ht. (in.)	Wall Thickness (in.)	Approx. Weight (lbs.)	Standard[2] Inlet & Outlet Connection Size (in.)	Standard Fitting Connection	**LabWaste®** Transition Connection Fitting[3]	Optional[4] Vent Connection Size (in.)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

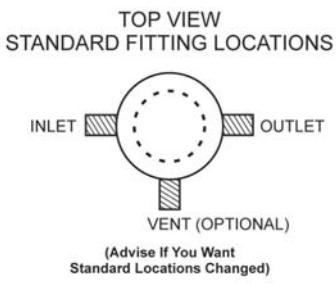
Important Notes

1. 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).
2. All tanks can be special ordered with Mipt, Flanged (CL150), 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.
3. 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).
4. Venting is required by codes but may be accomplished either at the tank or in-line.
5. Neutralization tanks and tank extensions are not warranted for direct burial applications. Tanks must be properly placed and secured with no applied stresses, within a dry concrete vault with use of a protective traffic cover as deemed appropriate. However, if direct burial is used without warranty, custom centerlines must be furnished from top of cover down to fitting centerline instead of specified tank bottom to fitting centerline since tank heights can vary.

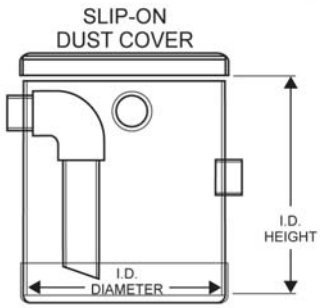
HDPE Tanks

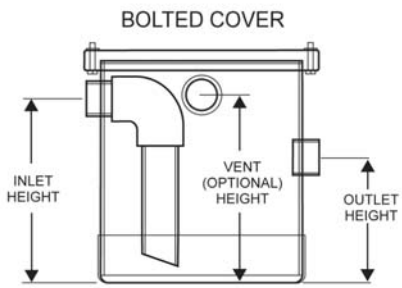






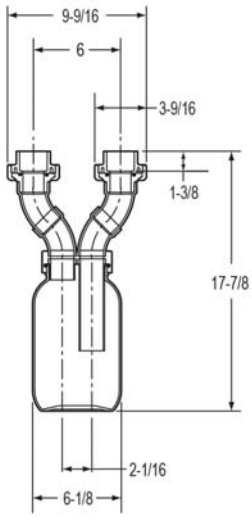
CPVC Tanks



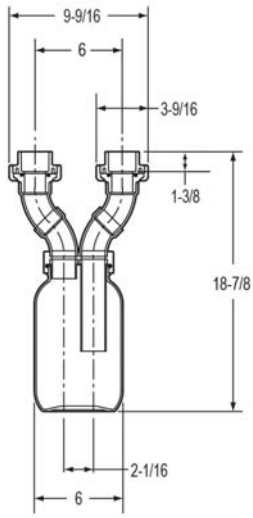


1-Gallon CPVC Dilution Tanks

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



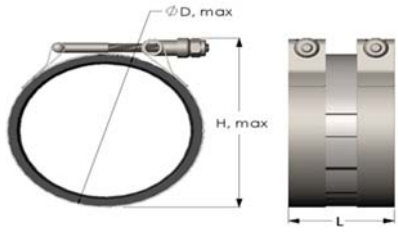
Glass



Polypropylene

P091 Elastomer No-Hub Coupling - IPS Pipe/Metric Pipe

IPS Clamp Joint X Metric Clamp Joint
For connection of IPS pipe systems to Metric pipe systems. Shielded FKM (Fluorocarbon) w/gear clamps.

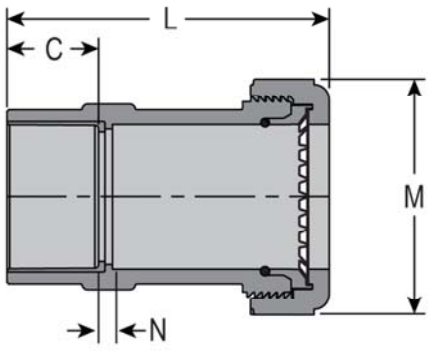


Part Number	Size	D	H	L
P091-015	1-1/2	2-3/8	2-3/4	2-1/8
P091-020	2	2-13/16	3-3/16	2-1/8
P091-02075	2	3-3/8	3-3/4	2-1/8
P091-030	3	3-13/16	4-3/16	2-1/8
P091-040	4	4-13/16	5-1/4	2-1/8
P091-060	6	7	7-7/16	3

Maximum clamp torque value 75 in/lbs.

P092 GripLoc™ Transition Coupling

H x GripLoc™ Compression
WARNING: DO NOT INSERT FINGERS
FKM Gasket
For connection to PP or PVDF systems

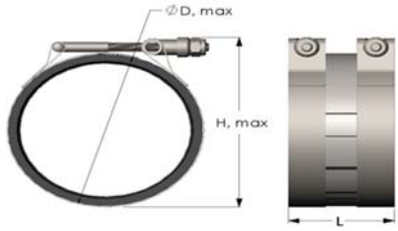


Part Number	Size	C	L	M	N
P092-015C	1-1/2	1-3/8	4-7/8	3-5/16	7/32
P092-020C	2	1-1/2	5-5/16	3-15/16	1/4

For connection to PP, PVDF or other IPS systems

P093 Elastomer No-Hub Coupling - Glass/IPS Pipe

IPS Clamp Joint x IPS Clamp Joint
For connection to plain end Glass or any same-size IPS pipe systems. Shielded FKM (Fluorocarbon) w/gear clamps.

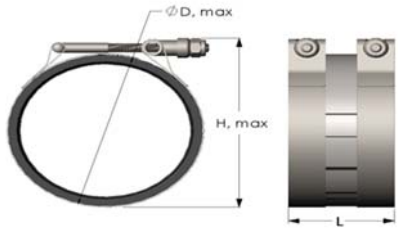


Part Number	Size	D	H	L
P093-015	1-1/2	2-1/4	2-5/8	2-1/8
P093-020	2	2-13/16	3-3/16	2-1/8
P093-030	3	3-13/16	4-3/16	2-1/8
P093-040	4	4-13/16	5-1/4	2-1/8
P093-060	6	7	7-7/16	3
P093-080	8	9-1/16	9-1/2	3-13/16

Maximum clamp torque value 75 in/lbs.

P094 Elastomer No-Hub Coupling- Duriron

IPS Clamp Joint x Duriron Clamp Joint
For connection to Duriron plain end pipe. Shielded FKM (Fluorocarbon) w/gear clamps.



Part Number	Size	D	H	L
P094-015	1-1/2	2-3/8	2-3/4	2-1/8
P094-020	2	2-13/16	3-3/16	2-1/8
P094-030	3	3-15/16	4-3/8	2-1/8
P094-040	4	4-15/16	5-3/8	2-1/8

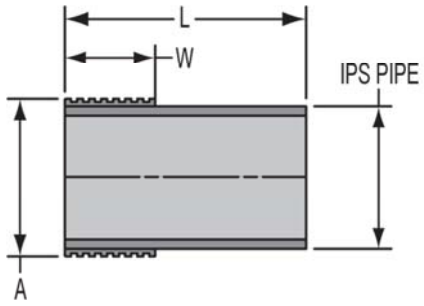
Maximum clamp torque value 75 in/lbs.

Suitable for Oil-Free air handling to 25 psi, not for distribution of compressed air or gas
See Spears® Product Sourcebook for product offerings

P095 Duriron Transition Fitting

Mechanical Joint x Pipe Size

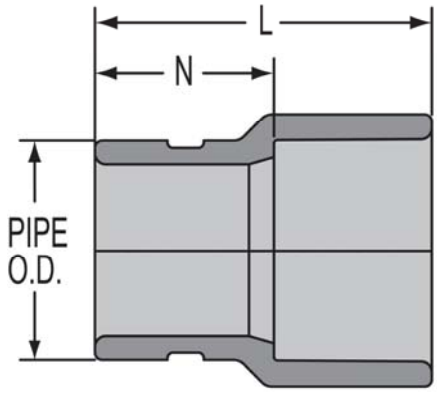
For connection to Duriron system. Requires Duriron mechanical joint coupling.



Part Number	Size	A	L	W
P095-015C	1-1/2	2- 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- 1/4

P096 Grooved Coupling

Grv x Soc

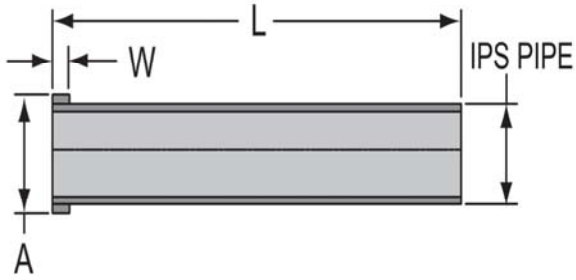


Part Number	Size	L	N
P096-015C	1-1/2	2- 5/16	1- 1/2
P096-020C	2	3- 1/16	1- 9/16
P096-030C	3	3- 9/16	1-11/16
P096-040C	4	4- 1/2	2- 1/4
P096-060C	6	5- 3/8	2- 3/8

P097 Duriron Transition Coupling

Spig x Caulk Joint

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

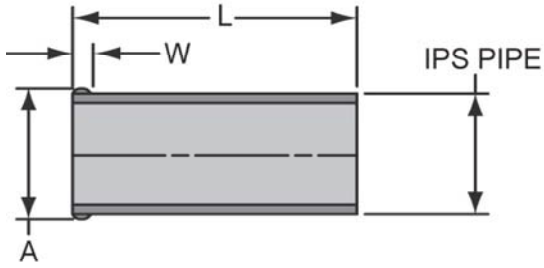


Part Number	Size	A	L	W
P097-015C	1-1/2	2- 1/4	12	1/2
P097-020C	2	2- 7/8	12	1/2
P097-030C	3	4- 3/16	12	1/2
P097-040C	4	5- 1/4	12	1/2

P098 Glass Transition Coupling

Spig x Clamp

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

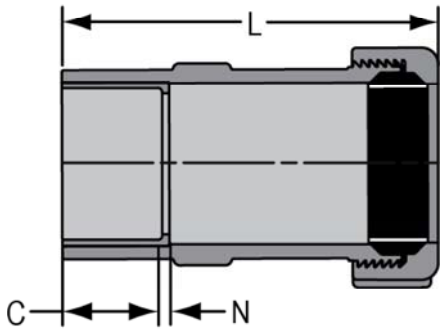


Part Number	Size	A	L	W
P098-015C	1-1/2	2- 1/16	4	1/4
P098-020C	2	2- 9/16	5	1/4
P098-030C	3	3-11/16	6	5/16
P098-040C	4	4-27/32	6	5/16
P098-060C	6	7- 1/8	6	1/2

P099 Transition Coupling

H x Compression

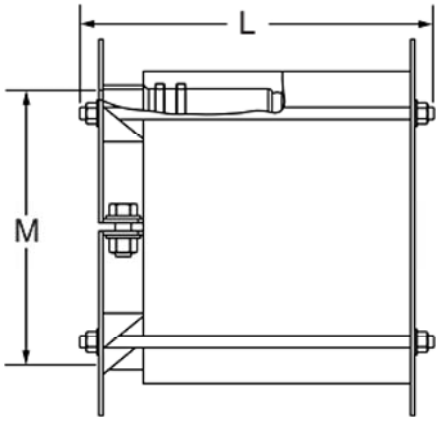
For connection to PP or PVDF systems.
Requires Safety Retaining Groove Tool.
Contact Spears®.



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

P099 Transition Coupling - Bolted Style

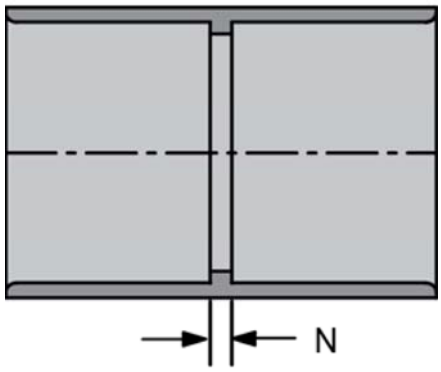
H x Compression



Part Number	Size	L	M
P099-080C	8	11	8-9/16

P100 Coupling

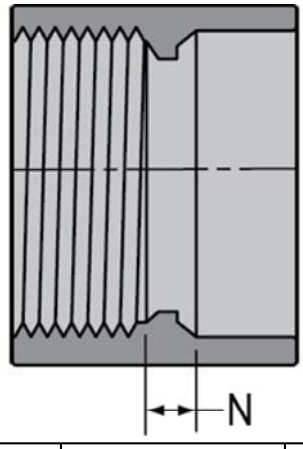
H x H



Part Number	Size	N
P100-015C	1-1/2	1/8
P100-020C	2	1/8
P100-030C	3	1/8
P100-040C	4	1/8
P100-060C	6	1/4
P100-080C	8	1/4
P100-100C	10	3/8
P100-100CF*	10	1-3/4
P100-120C	12	3/8
P100-120CF*	12	2-1/2
P100-140C	14	3/8
P100-140CF*	14	2-1/4
P100-160CF*	16	3-7/8
P100-180CF*	18	3-3/4
P100-200CF*	20	4
P100-240CF*	24	5-1/4

P101 Female Adapter

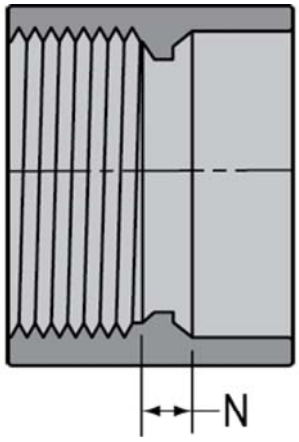
Fpt x H



Part Number	Size	N
P101-015C	1-1/2	1/4
P101-020C	2	1/4

P101 Female Adapter (Continued)

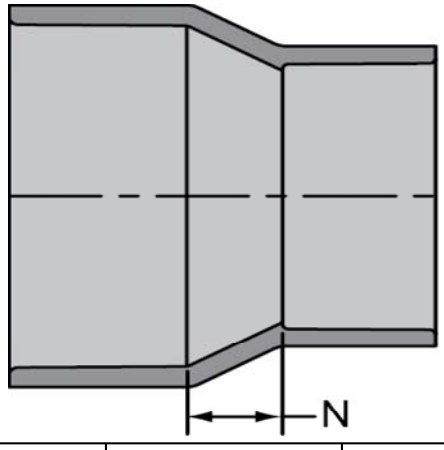
Fpt x H



Part Number	Size	N
P101-030C	3	5/16
P101-040C	4	3/8
P101-060C	6	3/8
P101-080C	8	1/4
P101-100CF*	10	3
P101-120CF*	12	3

P102 Increaser - Reducer

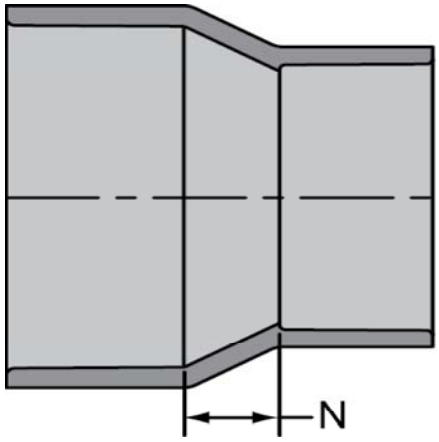
H x H



Part Number	Size	N
P102-251C	2X1-1/2	11/16
P102-337C	3X1-1/2	1- 3/32
P102-338C	3X2	15/16
P102-420C	4X2	1- 3/8
P102-422C	4X3	15/16
P102-528CF*	6X2	6-5/16
P102-530C	6X3	2-1/4
P102-532C	6X4	1- 7/16
P102-578CF*	8X2	10-15/16
P102-580CF*	8X3	10-1/2
P102-582CF*	8X4	8
P102-583CF*	8X5	7

P102 Increaser - Reducer (Continued)

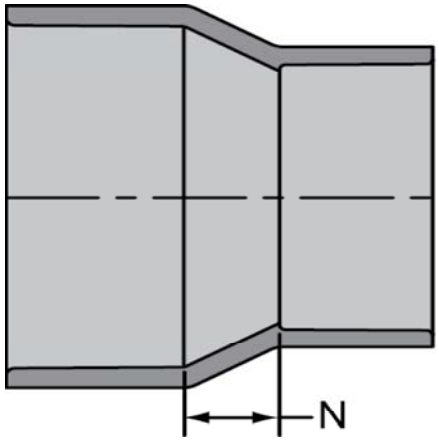
H x H



Part Number	Size	N
P102-582C	8X4	2-3/8
P102-585C	8X6	1-3/8
P102-585CF*	8X6	3-1/2
P102-623CF*	10X3	15-9/16
P102-624C	10X4	3- 3/8
P102-624CF*	10X4	13-1/16
P102-626C	10X6	2- 1/4
P102-626CF*	10X6	8-9/16
P102-628C	10X8	1- 5/16
P102-628CF*	10X8	3-3/8
P102-663CF*	12X3	21-3/16
P102-664CF	12X4	8-11/16
P102-666C	12X6	3- 1/4
P102-666CF*	12X6	14-3/16
P102-668C	12X8	2- 5/16
P102-668CF*	12X8	9
P102-670C	12X10	1-1/4
P102-670CF*	12X10	3-1/2
P102-693CF*	14X3	27-1/16
P102-694CF*	14X4	24-9/16
P102-696CF*	14X6	20-1/16
P102-698CF*	14X8	14-7/8
P102-700CF*	14X10	9-3/8
P102-702CF*	14X12	3-1/8
P102-753CF*	16X3	33-11/16
P102-754CF*	16X4	31-3/16
P102-756CF*	16X6	26-11/16
P102-758CF*	16X8	21-1/2
P102-760CF*	16X10	16
P102-762CF*	16X12	9-3/4
P102-764CF*	16X14	3-1/2
P102-784CF*	18X4	39-3/16
P102-786CF*	18X6	34-11/16
P102-788CF*	18X8	29-1/2
P102-790CF*	18X10	24
P102-792CF*	18X12	17-3/4

P102 Increaser - Reducer (Continued)

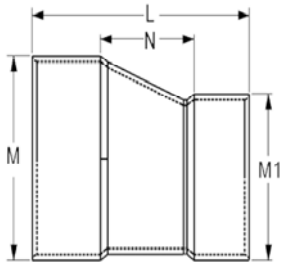
H x H



Part Number	Size	N
P102-794CF*	18X14	11-1/2
P102-796CF*	18X16	4-5/8
P102-814CF*	20X4	47-3/16
P102-816CF*	20X6	42-11/16
P102-818CF*	20X8	37-1/2
P102-820CF*	20X10	32
P102-822CF*	20X12	25-3/4
P102-824CF*	20X14	25-3/4
P102-826CF*	20X16	12-5/8
P102-828CF*	20X18	4-1/4
P102-904CF*	24X4	57-7/16
P102-906CF*	24X6	52-15/16
P102-908CF*	24X8	47-3/4
P102-910CF*	24X10	42-1/4
P102-912CF*	24X12	36
P102-914CF*	24X14	29-3/4
P102-916CF*	24X16	22-7/8
P102-918CF*	24X18	14-1/2
P102-920CF*	24X20	28-3/4

Pipe Increaser-Reducer,Eccentric

Hub X Hub

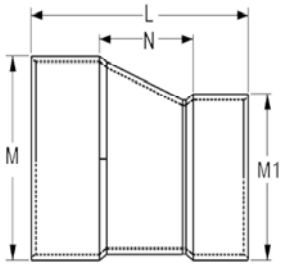


Part Number	Size	L	M	M1	N
P102-420CFE*	4X2	12-1/4	4-15/16	2-7/8	8-1/2
P102-422CFE*	4X3	8-5/8	4-15/16	3-15/16	4-1/8
P102-528CFE*	6X2	19-5/8	7-1/8	2-7/8	14-7/8
P102-530CFE*	6X3	16	7-1/8	3-15/16	10-1/2
P102-532CFE*	6X4	10-13/16	7-1/8	5	5-5/16
P102-578CFE*	8X2	28-5/8	9-3/16	2-7/8	22-7/8
P102-580CFE*	8X3	25	9-3/16	3-15/16	18-1/2
P102-582CFE*	8X4	19-13/16	9-3/16	5	13-5/16
P102-585CFE*	8X6	14-3/8	9-3/16	7-3/16	6-7/8
P102-623CFE*	10X3	34-7/8	11-3/8	3-15/16	27-3/8
P102-624CFE*	10X4	29-11/16	11-3/8	5	22-3/16
P102-626CFE*	10X6	24-1/4	11-3/8	7-3/16	15-3/4
P102-628CFE*	10X8	16-11/16	11-3/8	9-1/4	7-3/16
P102-663CFE*	12X3	44-7/8	13-1/2	3-15/16	36-3/8
P102-664CFE*	12X4	39-11/16	13-1/2	5	31-3/16
P102-666CFE*	12X6	34-1/4	13-1/2	7-3/16	24-3/4
P102-668CFE*	12X8	26-11/16	13-1/2	9-1/4	16-3/16
P102-670CFE*	12X10	18-3/8	13-1/2	11-1/2	6-7/8
P102-702CFE*	14X12	17-5/8	14-13/16	13-9/16	4-3/8
P102-762CFE*	16X12	28-1/2	16-7/8	13-9/16	14-1/4
P102-764CFE*	16X14	21-3/4	16-7/8	14-7/8	6-3/4
P102-792CFE*	18X12	40-7/8	19	13-9/16	25-5/8
P102-794CFE*	18X14	34-1/8	19	14-7/8	18-1/8
P102-796CFE*	18X16	25	19	17	8
P102-814CFE*	20X4	82-5/8	21-1/8	5	70-3/8
P102-816CFE*	20X6	77-3/16	21-1/18	7-3/16	63-15/16
P102-818CFE*	20X8	69-5/8	21-1/8	9-1/4	55-3/8
P102-820CFE*	20X10	61-5/16	21-1/8	11-1/2	46-1/16
P102-822CFE*	20X12	52-5/8	21-1/8	13-9/16	36-3/8
P102-824CFE*	20X14	45-7/8	21-1/8	14-7/8	28-7/8
P102-826CFE*	20X16	36-3/4	21-1/8	17	18-3/4
P102-828CFE*	20X18	26	21-1/8	19-1/8	7
P102-904CFE*	24X4	100-3/8	25-3/16	5	86-1/8
P102-906CFE*	24X6	94-15/16	25-3/16	7-3/16	79-11/16
P102-908CFE*	24X8	87-3/8	25-3/16	9-1/4	71-1/8
P102-910CFE*	24X10	79-1/16	25-3/16	11-1/2	61-13/16
P102-912CFE*	24X12	70-3/8	25-3/16	13-9/16	52-1/8

Suitable for Oil-Free air handling to 25 psi, not for distribution of compressed air or gas
See Spears® Product Sourcebook for product offerings

Pipe Increaser-Reducer,Eccentric (Continued)

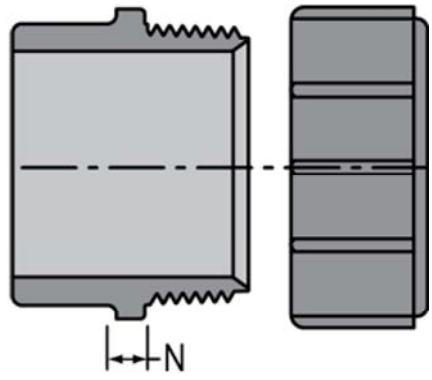
Hub X Hub



Part Number	Size	L	M	M1	N
P102-914CFE*	24X14	63-5/8	25-3/16	14-7/8	37-7/8
P102-916CFE*	24X16	54-1/2	25-3/16	17	34-1/2
P102-918CFE*	24X18	43-3/4	25-3/16	19-1/8	22-3/4
P102-920CFE*	24X20	34-1/4	25-3/16	21-3/16	12-1/4

P103P Trap Adapter - Male

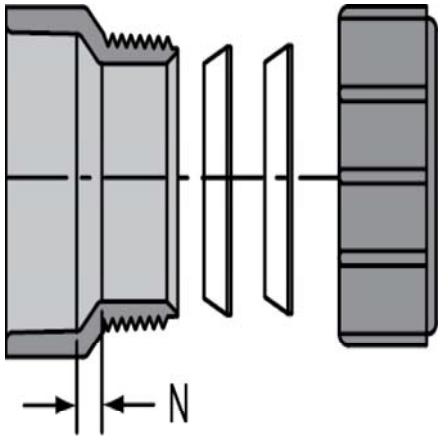
Spig x Slip with Plastic Nut



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

P104R Trap Adapter - Female

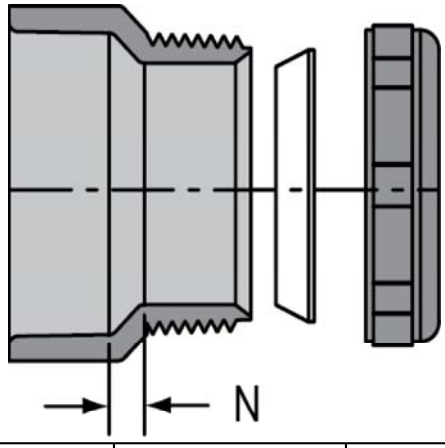
w/1-1/2 Plastic Nut & Washer and 1-1/2x1-1/4 Washer
H x Slip w/Plastic Nut



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

P104X Trap Adapter - Female

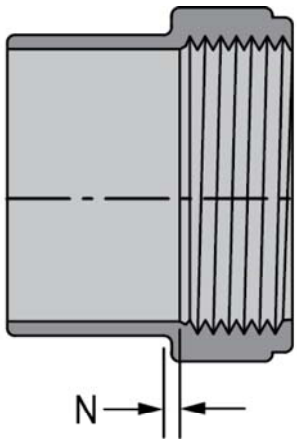
H x Slip w/Chrome Nut & Washer



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

P105 Cleanout Adapter

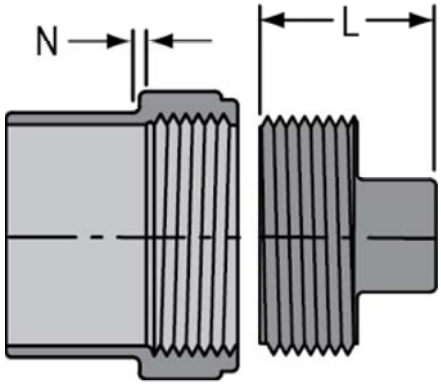
Spig x Fpt



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

P105X Cleanout Adapter with Square Head Plug

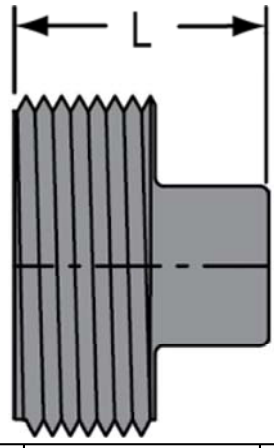
Spig



Part Number	Size	L	N
P105X-015C	1-1/2	1- 3/8	5/32
P105X-020C	2	1-3/8	5/32
P105X-030C	3	1-3/4	1/4
P105X-040C	4	1- 7/8	1/4
P105X-060C	6	1-15/16	3/8
P105X-080C	8	2-1/16	5/16
P105X-100CF[1*]	10	1	0
P105X-120CF[1*]	12	1	0
P105X-140CF[1*]	14	1	0
P105X-160CF[1*]	16	1	0

P106 Square Head Cleanout Plug

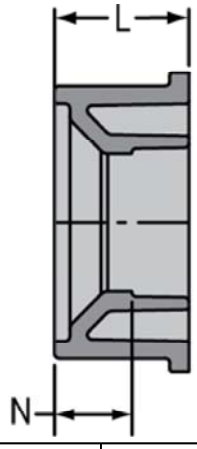
Mpt



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

P107 Flush Bushing

Spig x H

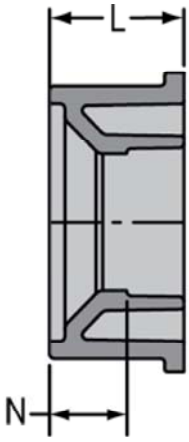


Part Number	Size	L	N
P107-251C	2X1-1/2	1- 1/16	1/4
P107-337C	3X1-1/2	1- 3/4	1
P107-338C	3X2	1-3/4	1
P107-420C	4X2	2	1- 1/8
P107-422C	4X3	2	1/2
P107-530C[1]	6X3	3-3/4	2- 1/4
P107-532C	6X4	3- 7/16	1-3/4
P107-582C	8X4	4- 9/16	2-13/16
P107-585C	8X6	4-9/16	1- 9/16
P107-623C[1]	10X3	6-3/16	4-5/8
P107-624C[1]	10X4	6	4-1/4

Suitable for Oil-Free air handling to 25 psi, not for distribution of compressed air or gas
See Spears® Product Sourcebook for product offerings

P107 Flush Bushing (Continued)

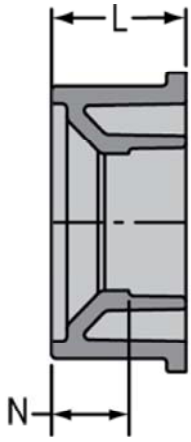
Spig x H



Part Number	Size	L	N
P107-626C	10X6	5- 11/32	2- 5/16
P107-626CF*	10X6	5-13/16	4-1/16
P107-628C	10X8	5-1/4	1-5/16
P107-628CF*	10X8	5-1/4	1-1/4
P107-663CF*	12X3	7-3/16	5-11/16
P107-664C[1]	12X4	6-15/16	5-5/32
P107-666C[1]	12X6	6-7/8	3- 7/8
P107-668C	12X8	6-5/16	2-5/16
P107-670C	12X10	6-5/16	1-5/16
P107-670CF*	12X10	6	1
P107-693CF*	14X3	8-1/8	6-5/8
P107-694CF*	14X4	7-7/8	6-1/8
P107-698CF*	14X8	7-5/16	3-1/4
P107-696CF*	14X6	7-15/16	5
P107-700CF*	14X10	7-5/16	2-1/4
P107-702CF*	14X12	7	1
P107-753CF*	16X3	9-3/16	7-11/16
P107-754CF*	16X4	8-15/16	7-1/8
P107-756CF*	16X6	8-15/16	6
P107-758CF*	16X8	8-5/16	4-5/16
P107-760CF*	16X10	8-5/16	3-5/16
P107-762CF*	16X12	8	1-7/16
P107-764CF*	16X14	8	1
P107-784CF*	18X4	9-15/16	8-1/8
P107-786CF*	18X6	9-15/16	7
P107-788CF*	18X8	9-5/16	5-5/16
P107-790CF*	18X10	9-5/16	4-5/16
P107-792CF*	18X12	9	3
P107-794CF*	18X14	9	1-7/8
P107-796CF*	18X16	9	1
P107-814CF*	20X4	10-15/16	9-1/8
P107-816CF*	20X6	10-15/16	8
P107-818CF*	20X8	10-5/16	6-5/16
P107-820CF*	20X10	10-5/16	5-5/16

P107 Flush Bushing (Continued)

Spig x H

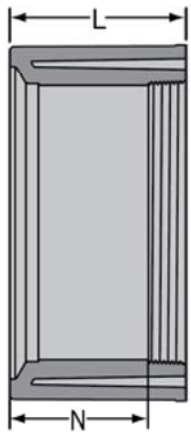


Part Number	Size	L	N
P107-822CF*	20X12	10	4
P107-824CF*	20X14	10	3
P107-826CF*	20X16	10	2
P107-828CF*	20X18	10	1
P107-904CF*	24X4	12-15/16	11-1/8
P107-906CF*	24X6	12-15/16	10
P107-908CF*	24X8	12-5/16	8-5/16
P107-910CF*	24X10	12-5/16	7-5/16
P107-912CF*	24X12	12	6
P107-914CF*	24X14	12	5
P107-916CF*	24X16	12	4
P107-918CF*	24X18	12	3
P107-920CF*	24X20	12	2

[1] Outlet-sized with Bushing

P108 Flush Bushing (Cleanout Adapter)

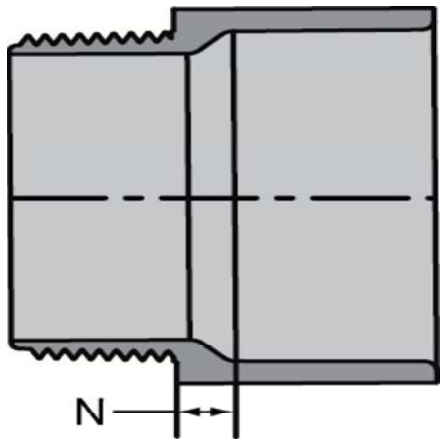
Spig x FPT



Part Number	Size	L	N
P108-212C	1-1/2X1-1/4	7/8	3/16

P109 Male Adapter

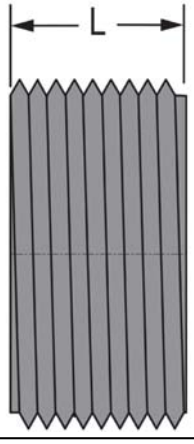
Mpt x H



Part Number	Size	N
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	3/8

P110 Counter Sunk Cleanout Plug

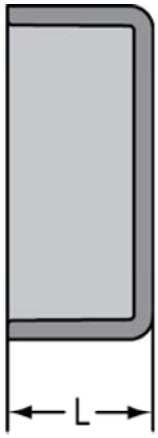
Mpt



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	31/32

P116 Cap

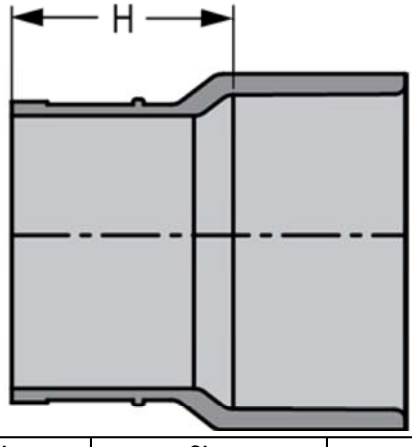
Socket



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	6-3/4
P116-100CF*	10	3-3/4
P116-120CF*	12	4-1/8
P116-140CF*	14	5-3/4
P116-160CF*	16	5-1/4
P116-180CF*	18	5-7/8
P116-200CF*	20	6-3/8
P116-240CF*	24	7

P119 No-Hub Adapter

S x H

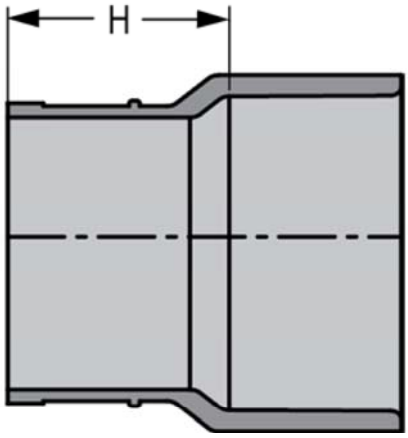


Part Number	Size	H
P119-015C	1-1/2	1- 5/8
P119-020C	2	1- 5/8
P119-030C	3	1-3/4
P119-040C	4	1- 7/8
P119-060C	6	2-9/16

Suitable for Oil-Free air handling to 25 psi, not for distribution of compressed air or gas
See Spears® Product Sourcebook for product offerings

P119 No-Hub Adapter (Continued)

S x H

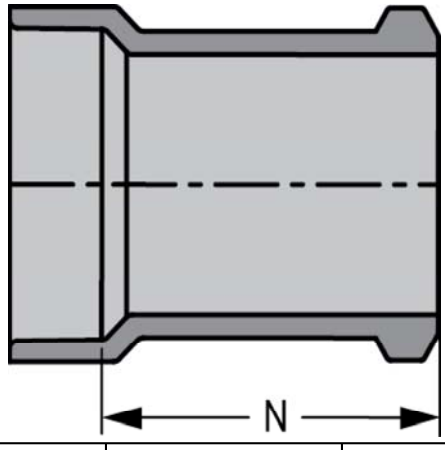


Part Number	Size	H
P119-080CF*	8	4-1/2
P119-100CF*	10	4-3/4
P119-120CF*	12	5-1/8

P123 Hub Adapter

H x S

For connection to Cast Iron system. Requires packing and plastic lead. Warning: Do not use hot lead or oiled Oakum



Part Number	Size	N
P123-020C	2	4- 7/8
P123-030C	3	4- 1/8
P123-040C	4	4-11/32
P123-060CF*	6	5-9/16
P123-080CF*	8	6-1/16

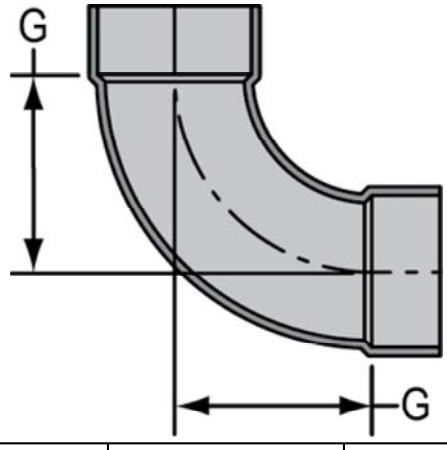
P130 Repair Coupling

H x H

Part Number	Size	L
P130-015C	1-1/2	1-1/2
P130-020C	2	1- 5/8
P130-030C	3	3- 3/16
P130-040C	4	3- 3/4
P130-060C	6	6-3/8
P130-080C	8	8-5/16
P130-100C	10	10-7/16

P300 1/4 Bend (90° Ell)

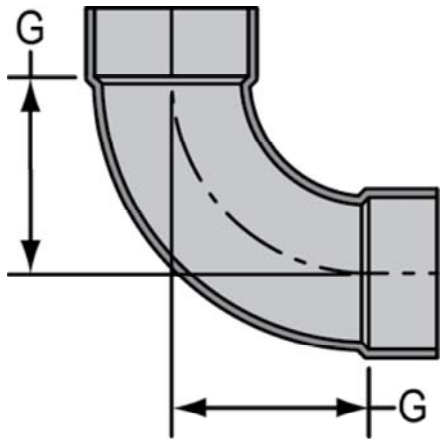
H x H



Part Number	Size	G
P300-015C	1-1/2	1-3/4
P300-020C	2	2- 5/16
P300-030C	3	3-1/16
P300-040C	4	3-7/8
P300-060C	6	5
P300-080C	8	6
P300-080CF*	8	9-1/8
P300-100C	10	9-13/16
P300-100CF*	10	11-9/16
P300-120C	12	10- 3/4
P300-120CF*	12	13-5/16

P300 1/4 Bend (90° Ell) (Continued)

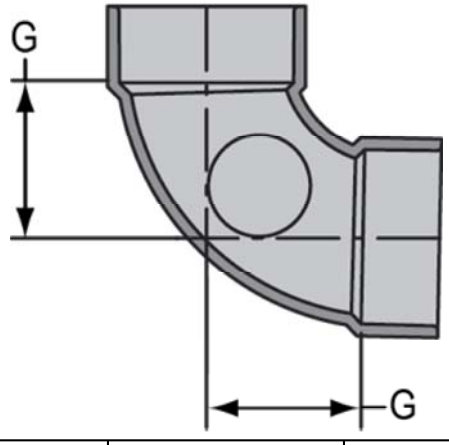
H x H



Part Number	Size	G
P300-140CF*	14	15-5/8
P300-160CF*	16	18-1/16
P300-180CF*	18	20-1/2
P300-200CF*	20	22-7/8
P300-240CF*	24	27-11/16

P300S 1/4 Bend w/Side Inlet (90° Ell)

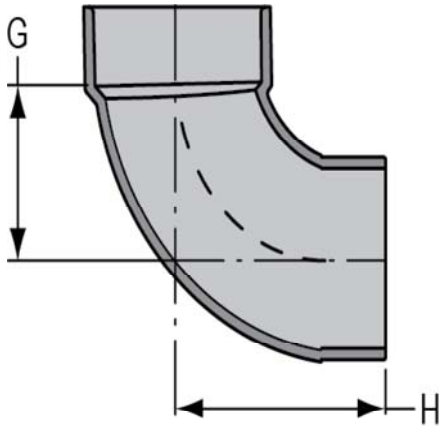
All Hub



Part Number	Size	G
P300S-338C	3X3X2	3- 1/16

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

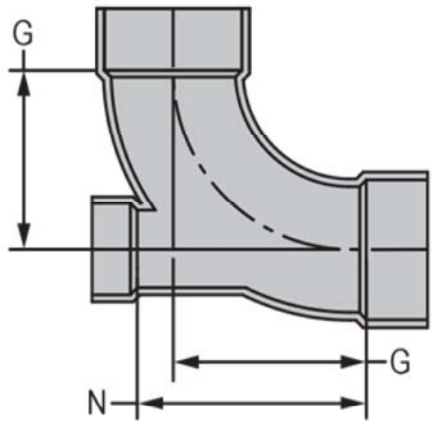
H x Spig



Part Number	Size	G	H
P302-015C	1-1/2	1- 3/4	2-13/32
P302-020C	2	2-5/16	3-1/4
P302-030C	3	3-1/16	4- 9/16
P302-040C	4	3- 7/8	5- 9/16
P302-060C	6	5	8-1/4
P302-080C	8	6	10- 3/8
P302-100C	10	9-13/16	15- 5/16
P302-100CF*	10	11-9/16	20-1/16
P302-120C	12	10-13/16	17- 1/4
P302-120CF*	12	13-5/16	23-5/16
P302-140CF*	14	15-5/8	27-1/8
P302-160CF*	16	18-1/16	31-1/16
P302-180CF*	18	20-1/2	35
P302-200CF*	20	22-7/8	38-7/8
P302-240CF*	24	27-1/16	46-11/16

P303 1/4 Bend w/Low Heel Inlet

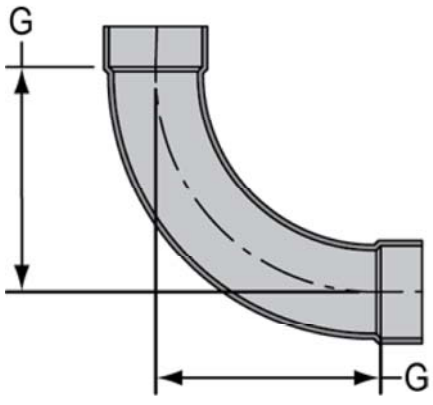
H x H x H



Part Number	Size	G	N
P303-338C	3X3X2	3- 1/16	4- 7/16
P303-420C	4X4X2	3-7/8	5-1/4

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

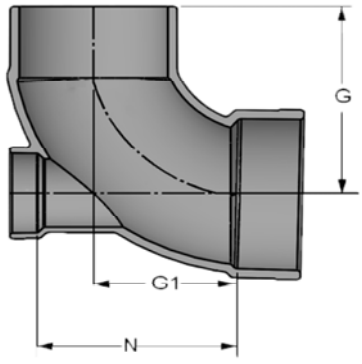
H x H



Part Number	Size	G
P304-015C	1-1/2	2- 3/4
P304-020C	2	3-1/4
P304-030C	3	4-1/16
P304-040C	4	4- 15/16
P304-060C	6	9

P306 1/4 Bend w/Low Heel Inlet

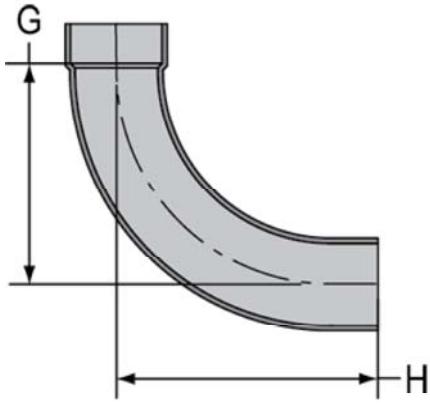
S x H x H



Part Number	Size	G	G1	N
P306-420C	4X4X2	5- 5/8	3- 7/8	5-7/16

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

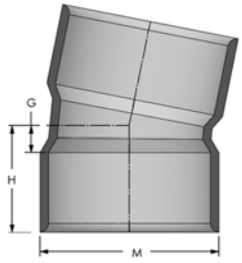
H x Spig



Part Number	Size	G	H
P309-015C	1-1/2	2- 3/4	3-5/16
P309-020C	2	3- 1/4	4
P309-030C	3	4-1/16	5-9/16
P309-040C	4	4-15/16	6-1/2
P309-060C	6	9	11-3/4

P314 1/32 Bend (11-1/4° Ell)

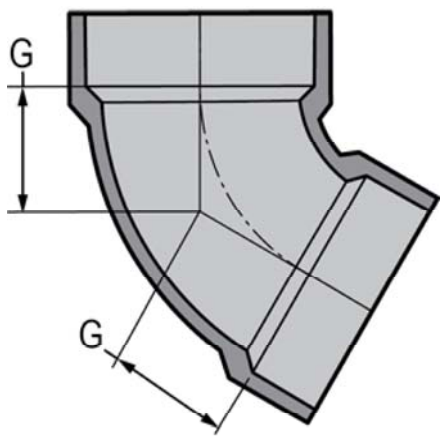
Hub x Hub



Part Number	Size	G	H	M
P314-020CF*	2	1/2	2-1/4	2-11/16
P314-030CF*	3	11-1/6	2-15/16	3-15/16
P314-040CF*	4	3/4	3	5
P314-060CF*	6	1	4-1/4	7-3/16
P314-080CF*	8	1-1/16	5-5/16	9-1/4
P314-100CF*	10	1-7/16	6-11/16	11-1/2
P314-120CF*	12	1-9/16	7-13/16	13-9/16
P314-140CF*	14	2	9	14-7/8
P314-160CF*	16	2-3/8	10-3/8	17
P314-180CF*	18	2-11/16	11-11/16	19-1/8
P314-200CF*	20	3-1/16	13-1/16	21-3/16
P314-240CF*	24	3-3/4	15-3/4	25-3/8

P319 1/6 Bend (60° Ell)

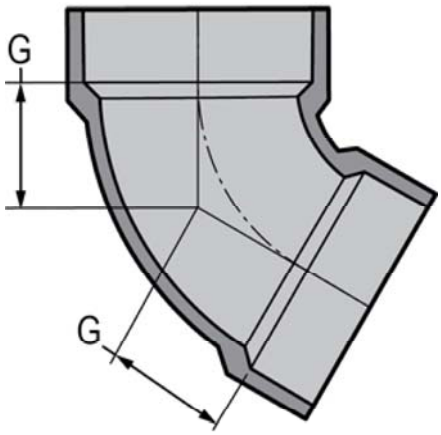
H x H



Part Number	Size	G
P319-015C	1-1/2	1
P319-020C	2	1- 5/16
P319-030C	3	1-11/16
P319-040C	4	2- 1/16
P319-060CF	6	2-13/16
P319-080CF*	8	3-3/8
P319-100CF*	10	4-5/16
P319-120CF	12	4-15/16
P319-140CF*	14	5-3/4

P319 1/6 Bend (60° Ell) (Continued)

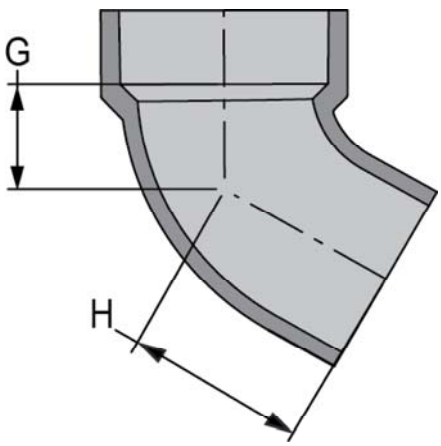
H x H



Part Number	Size	G
P319-160CF*	16	6-5/8
P319-180CF*	18	7-9/16
P319-200CF*	20	16-3/8
P319-240CF*	24	19-13/16

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

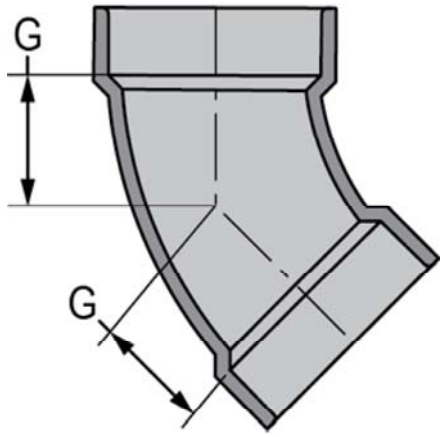
H x Spig



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

P321 1/8 Bend (45° Ell)

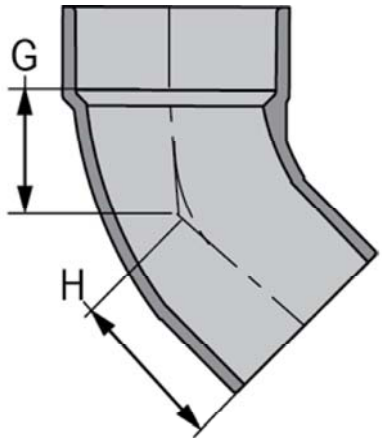
H x H



Part Number	Size	G
P321-015C	1-1/2	1- 1/8
P321-020C	2	1-1/2
P321-030C	3	1-3/4
P321-040C	4	2-3/16
P321-060C	6	2
P321-080C	8	2-1/16
P321-080CF*	8	2-5/8
P321-100C	10	2-5/8
P321-100CF*	10	3-5/16
P321-120C	12	3- 1/8
P321-120CF*	12	3-3/4
P321-140CF*	14	4-7/16
P321-160CF*	16	5-1/8
P321-180CF*	18	5-7/8
P321-200CF*	20	6-9/16
P321-240CF*	24	7-15/16

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

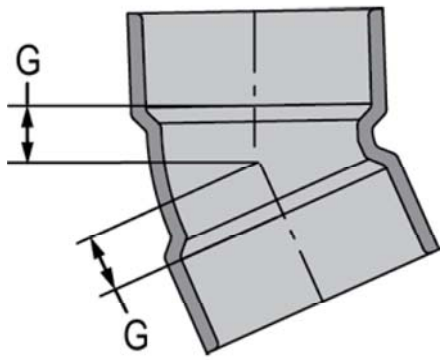
H x Spig



Part Number	Size	G	H
P323-015C	1-1/2	1-1/8	1-3/4
P323-020C	2	1-1/2	2- 3/16
P323-030C	3	1- 3/4	3- 1/4
P323-040C	4	2- 3/16	3-15/16
P323-060C	6	2	5
P323-080C	8	2-1/16	6
P323-100C	10	2-5/8	10-5/8
P323-100CF*	10	3-5/16	11-13/16
P323-120C	12	3-1/8	12-7/8
P323-120CF*	12	3-3/4	13-3/4
P323-140CF*	14	4-7/16	15-15/16
P323-160CF*	16	5-1/8	18-1/8
P323-180CF*	18	5-7/8	20-3/8
P323-200CF*	20	6-9/16	22-9/16
P323-240CF*	24	7-15/16	26-15/16

P324 1/16 Bend (22-1/2° Ell)

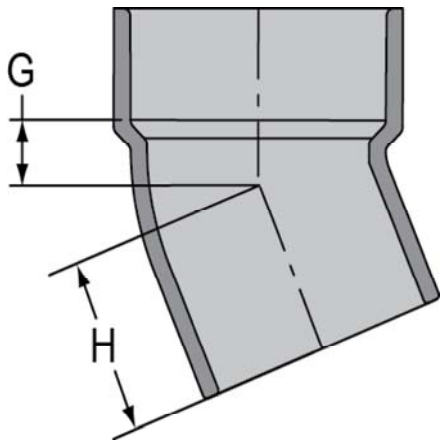
H x H



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- 1/2
P324-080C	8	1-1/2
P324-100CF*	10	2-1/16
P324-120CF*	12	2-1/4
P324-140CF*	14	2-3/4
P324-160CF*	16	3-1/4
P324-180CF*	18	3-11/16
P324-200CF*	20	4-1/8
P324-240CF*	24	5-1/16

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

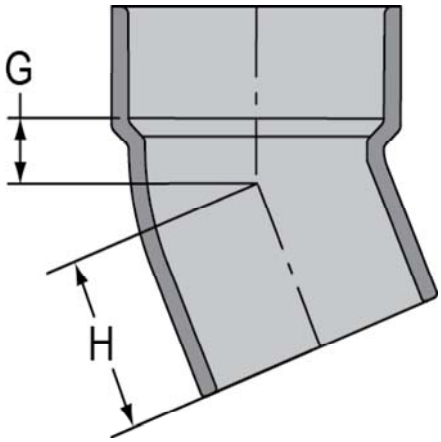
H x Spig



Part Number	Size	G	H
P326-015C	1-1/2	1/2	1- 1/8
P326-020C	2	11/16	1- 3/8

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

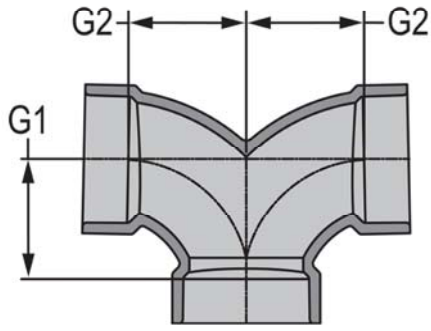
H x Spig



Part Number	Size	G	H
P326-030C	3	13/16	2- 1/4
P326-040C	4	1	2-1/2
P326-060C	6	1- 1/2	4- 1/2
P326-080C	8	1- 1/2	5- 1/2
P326-100CF*	10	2-1/16	10-1/2
P326-120CF*	12	2-1/4	12-1/4
P326-140CF*	14	2-3/4	14-1/4
P326-160CF*	16	3-1/4	16-1/4
P326-180CF*	18	3-11/16	18-3/16
P326-200CF*	20	4-1/8	20-1/8
P326-240CF*	24	5-1/16	24-1/16

P327 Double 1/4 Bend (3 Way Ell)

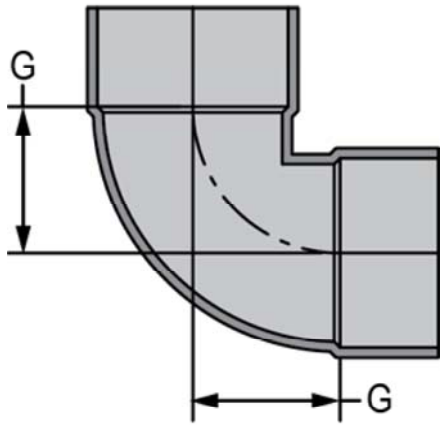
All Hub



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
P327-040C	4	3-7/8	3-7/8
P327-241C	2X1-1/2X1-1/2	1- 15/16	2-3/16

P331 Vent Ell

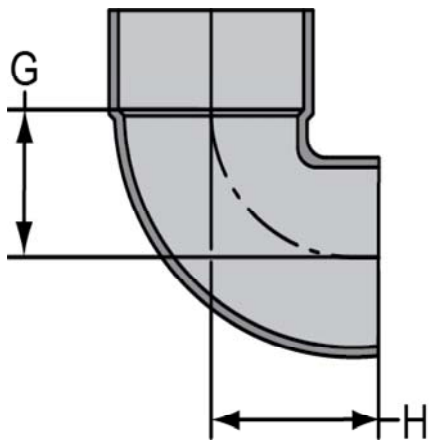
H x H



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- 1/2
P331-060C	6	3-1/2

P333 Vent Ell, Street

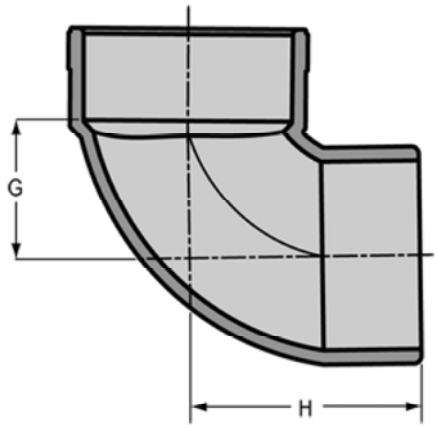
H x Spig



Part Number	Size	G	H
P333-015C	1-1/2	1- 3/16	1-7/8
P333-020C	2	1- 1/2	2- 3/16
P333-030C	3	1- 7/8	3- 5/8
P333-040C	4	2-1/2	4- 7/16

P335 Trap Elbow (for use with Traps only)

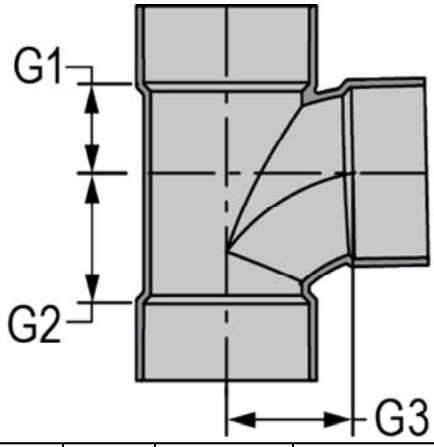
H x S



Part Number	Size	G	H
P335-030C	3	2-1/4	3-7/8
P335-040C	4	2-13/16	4-1/2

P400 Sanitary Tee

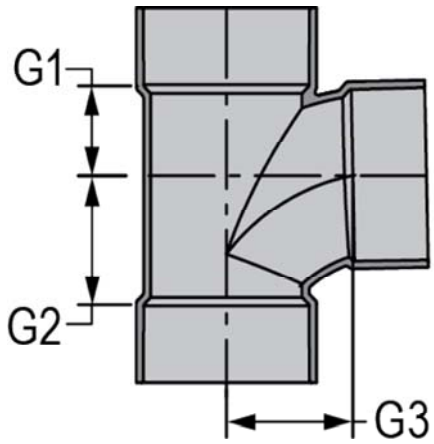
All Hub



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	1-13/16	3-1/16	3-1/16
P400-040C	4	2- 1/4	3-7/8	3-7/8
P400-060C	6	3- 1/2	5	5
P400-080C	8	4-1/2	6	6
P400-080CF*	8	4-5/8	15-5/16	15-3/16
P400-120CF*	12	5-5/8	21-3/4	21-13/16
P400-100C	10	5-1/2	10	10
P400-100CF*	10	5-3/16	18-5/8	19-1/8
P400-120C	12	6- 9/16	11	11
P400-140CF*	14	5-5/16	23-1/16	22-3/4
P400-160CF*	16	6-5/8	26-7/8	25-1/2
P400-180CF*	18	7-1/16	29-13/16	28-1/16

P400 Sanitary Tee (Continued)

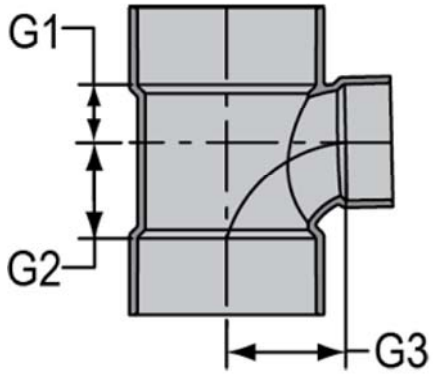
All Hub



Part Number	Size	G1	G2	G3
P400-200CF*	20	7-9/16	34-3/16	32-1/16
P400-240CF*	24	7-11/16	38-5/16	37-13/16

P401 Sanitary Tee, Reducing

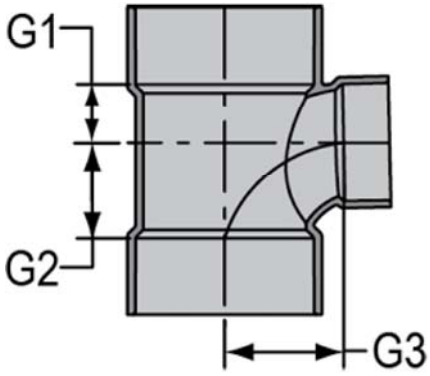
All Hub



Part Number	Size	G1	G2	G3
P401-241C	2X1-1/2X1-1/2	1- 3/16	1-15/16	2- 3/16
P401-251C	2X2X1-1/2	1-3/16	1-15/16	2-3/16
P401-257C	2X1-1/2X2	1- 3/8	2- 5/16	2- 5/16
P401-337C	3X3X1-1/2	15/16	1- 3/4	2- 9/16
P401-338C	3X3X2	1-3/16	2-1/8	2-7/8
P401-419C	4X1-1/2	1-1/8	2-1/16	3-3/8
P401-420C	4X4X2	1-1/8	2-1/16	3- 5/16
P401-422C	4X4X3	1-3/4	3	3-9/16
P401-530CF	6X3	3-1/4	7	9-11/16
P401-532C	6X4	2-3/16	3-5/8	4-11/16
P401-582C	8X4	4-1/2	6	8- 7/8
P401-578CF	8X2	3-1/2	6-1/4	8-3/8
P401-585CF	8X6	3-7/8	11-3/4	12-7/8
P401-621CF*	10X2	3-1/2	6-1/4	9-3/8
P401-623CF*	10X3	4-1/16	7-11/16	11-5/8
P401-624CF	10X4	4-5/16	9-5/16	12-1/8

P401 Sanitary Tee, Reducing (Continued)

All Hub

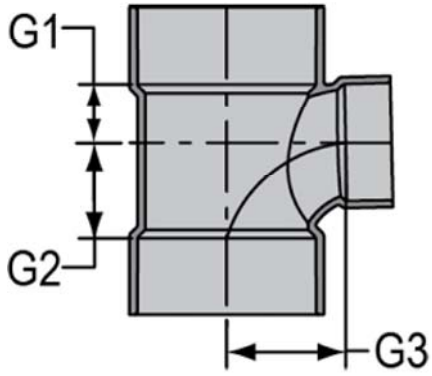


Part Number	Size	G1	G2	G3
P401-626CF	10X6	4-15/16	12-13/16	13-7/8
P401-628CF	10X8	5-1/4	15-3/4	16-3/16
P401-661CF*	12X2	3-15/16	6-9/16	10-5/16
P401-663CF*	12X3	4-1/4	7-3/4	12-5/8
P401-664CF*	12X4	4-5/16	9-3/16	13-1/8
P401-666CF	12X6	4-7/8	12-5/8	14-7/8
P401-668CF	12X8	5	15-1/2	17-1/8
P401-670CF*	12X10	5-1/16	18-7/16	20-1/16
P401-691CF*	14X2	3-11/16	6-5/16	10-15/16
P401-693CF*	14X3	4-1/2	8	13-3/16
P401-694CF*	14X4	4-9/16	9-7/16	13-11/16
P401-696CF*	14X6	4-5/8	12-3/8	15-7/16
P401-698CF*	14X8	4-13/16	15-3/16	17-3/4
P401-700CF*	14X10	4-7/8	18-1/8	20-11/16
P401-702CF*	14X12	6	22	22-3/8
P401-753CF*	16X3	5-3/16	8-9/16	14-1/8
P401-754CF*	16X4	5-1/8	9-7/8	14-5/8
P401-756CF*	16X6	6-1/16	13-11/16	16-3/8
P401-758CF*	16X8	5-3/8	15-5/8	18-11/16
P401-760CF*	16X10	5-7/16	18-9/16	21-5/8
P401-762CF*	16X12	5-9/16	21-7/16	23-5/16
P401-764CF*	16X14	5-9/16	23-3/16	23-11/16
P401-784CF*	18X4	5-9/16	10-3/16	15-9/16
P401-786CF*	18X6	6-1/8	13-5/8	17-5/16
P401-788CF*	18X8	6-5/16	16-7/16	19-5/8
P401-790CF*	18X10	5-7/8	18-7/8	22-9/16
P401-792CF*	18X12	6	21-3/4	24-1/4
P401-794CF*	18X14	5-5/8	23-1/8	24-5/8
P401-796CF*	18X16	6-13/16	26-15/16	26-7/16
P401-814CF*	20X4	6-1/8	10-5/8	16-9/16
P401-816CF*	20X6	6-3/16	13-9/16	18-5/16
P401-818CF*	20X8	6-5/16	16-7/16	20-9/16
P401-820CF*	20X10	5-7/8	18-7/8	23-1/2
P401-822CF*	20X12	6-1/2	22-1/4	25-1/4
P401-824CF*	20X14	6-3/16	23-9/16	25-9/16

Suitable for Oil-Free air handling to 25 psi, not for distribution of compressed air or gas
See Spears® Product Sourcebook for product offerings

P401 Sanitary Tee, Reducing (Continued)

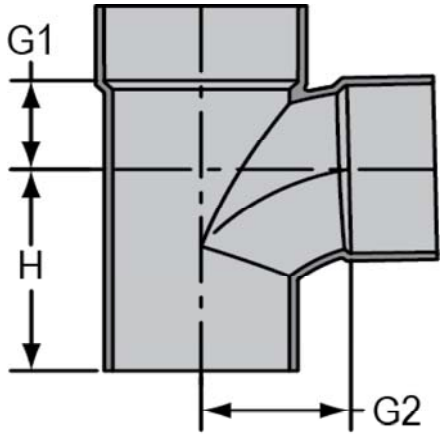
All Hub



Part Number	Size	G1	G2	G3
P401-826CF*	20X16	6-3/8	26-3/8	27-3/8
P401-828CF*	20X18	6-9/16	29-3/16	29-1/16
P401-904CF*	24X4	6-15/16	11-5/16	18-7/16
P401-906CF*	24X6	7-1/8	14-3/8	20-3/16
P401-908CF*	24X8	7-5/16	17-3/16	22-1/2
P401-910CF*	24X10	7	19-3/4	25-7/16
P401-912CF*	24X12	7-1/2	23	27-1/8
P401-914CF*	24X14	7-3/8	24-5/8	27-1/2
P401-916CF*	24X16	8-7/16	28-5/16	29-5/16
P401-918CF*	24X18	8-5/8	31-1/8	30-15/16
P401-920CF*	24X20	8-1/2	33-3/4	33-15/16

P403 Sanitary Tee, Street

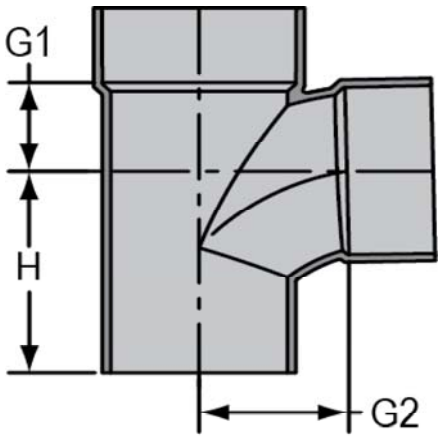
S x H x H



Part Number	Size	G1	G2	H
P403-015C	1-1/2	1	1-3/4	2- 7/16
P403-020C	2	1-3/8	2-5/16	3-3/16
P403-030C	3	1-13/16	3-1/16	4-1/2
P403-040C	4	2- 1/4	3- 7/8	5- 5/8
P403-060C	6	3-1/2	5	7-1/2
P403-080C	8	4- 1/2	6	9-3/8

P403 Sanitary Tee, Street (Continued)

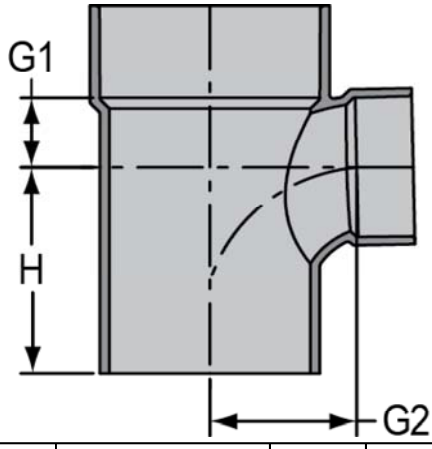
S x H x H



Part Number	Size	G1	G2	H
P403-100C	10	5-5/8	10	14-5/8
P403-120C	12	6-1/2	11	16- 1/4

P404 Sanitary Tee, Street, Reducing

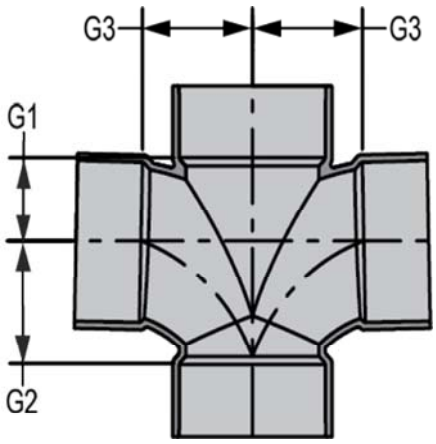
S x H x H



Part Number	Size	G1	G2	H
P404-241C	2X1-1/2X1-1/2	1-3/16	2-3/16	2-11/16
P404-251C	2X1-1/2	1-3/16	2-3/16	2-11/16
P404-337C	3X3X1-1/2	15/16	2-9/16	3-9/32
P404-338C	3X3X2	1-3/16	2-7/8	3-5/8

P428 Double Sanitary Tee

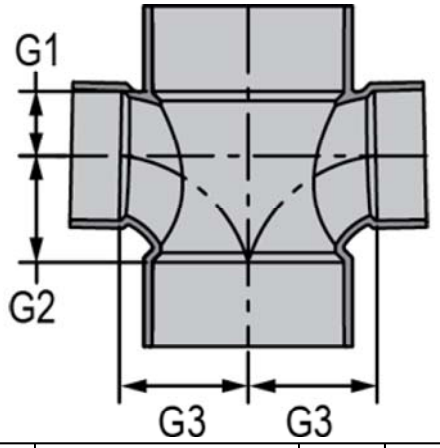
All Hub



Part Number	Size	G1	G2	G3
P428-015C	1-1/2	1	1-3/4	1-3/4
P428-020C	2	1-3/8	2-5/16	2-5/16
P428-030C	3	1-13/16	3-1/16	3-1/16
P428-040C	4	2-1/4	3-7/8	3-7/8
P428-060CF*	6	4-3/16	12-3/16	11-5/16
P428-080CF*	8	4-5/8	15-5/16	15-3/16
P428-100CF*	10	5-3/16	18-5/8	19-1/8
P428-120CF*	12	5-5/8	21-3/4	21-13/16
P428-140CF*	14	5-5/16	23-1/16	22-3/4
P428-160CF*	16	6-5/8	26-7/8	25-1/2
P428-180CF*	18	7-1/16	29-13/16	28-1/16
P428-200CF*	20	7-9/16	34-3/16	32-1/16
P428-240CF*	24	7-11/16	38-5/16	37-13/16

P429 Double Sanitary Tee, Reducing

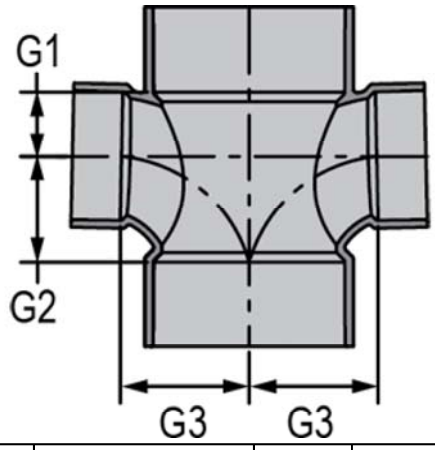
All Hub



Part Number	Size	G1	G2	G3
P429-241C	2X1-1/2X1-1/2X1-1/2	1- 3/16	1- 15/16	2- 3/16
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	2-9/16

P429 Double Sanitary Tee, Reducing (Continued)

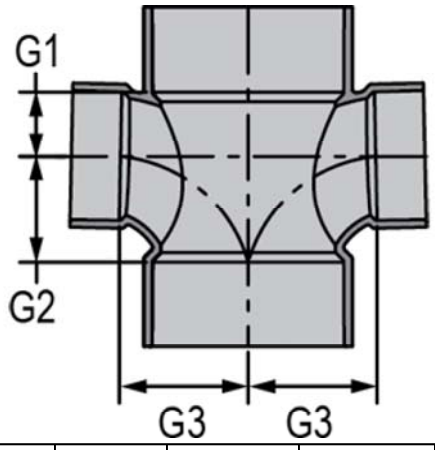
All Hub



Part Number	Size	G1	G2	G3
P429-338C	3X3X2X2	1- 1/8	2- 1/8	2- 7/8
P429-419C	4X4X1-1/2X1-1/2	1- 1/16	2	3-1/4
P429-420C	4X4X2X2	1- 1/8	2- 1/16	3- 5/16
P429-422C	4X4X3X3	1- 3/4	3	3- 9/16
P429-532CF	6X6X4X4	3-5/16	8-7/16	10-3/16
P429-578CF*	8X8X2X2	3-1/2	6-1/4	8-3/8
P429-580CF*	8X8X3X3	3-3/4	7-1/2	10-5/8
P429-582CF*	8X8X4X4	3-7/8	8-7/8	11-1/8
P429-585CF*	8X8X6X6	3-7/8	11-3/4	12-7/8
P429-621CF*	10X2	3-1/2	6-1/4	9-3/8
P429-623CF*	10X3	4-1/16	7-11/16	11-5/8
P429-624CF*	10X4	4-5/16	9-5/16	12-7/8
P429-626CF*	10X6	4-15/16	12-13/16	13-7/8
P429-628CF*	10X8	5-1/4	15-3/4	16-3/16
P429-661CF*	12X2	3-15/16	6-9/16	10-5/16
P429-663CF*	12X3	4-5/16	9-3/16	13-1/8
P429-664CF*	12X4	4-7/8	12-5/8	14-7/8
P429-666CF*	12X6	4-7/8	12-5/8	14-7/8
P429-668CF*	12X8	5	15-1/2	17-1/8
P429-670CF*	12X10	5-1/16	18-7/16	20-1/16
P429-691CF*	14X2	3-11/16	6-5/16	10-15/16
P429-693CF*	14X3	4-1/2	8	13-3/16
P429-694CF*	14X4	4-9/16	9-7/16	13-11/16
P429-696CF*	14X6	4-5/8	12-3/8	15-7/16
P429-698CF*	14X8	4-13/16	15-3/16	17-3/4
P429-700CF*	14X10	4-7/8	18-1/8	20-1/16
P429-702CF*	14X12	6	22	22-3/8
P429-753CF*	16X3	5-3/16	8-9/16	14-1/8
P429-754CF*	16X4	5-1/8	9-7/8	14-5/8
P429-756CF*	16X6	6-1/16	13-11/16	16-3/8
P429-758CF*	16X8	5-3/8	15-5/8	18-11/16
P429-760CF*	16X10	5-7/16	18-9/16	21-5/8
P429-762CF*	16X12	5-9/16	21-7/16	23-5/16
P429-764CF*	16X14	5-9/16	23-3/16	23-11/16

P429 Double Sanitary Tee, Reducing (Continued)

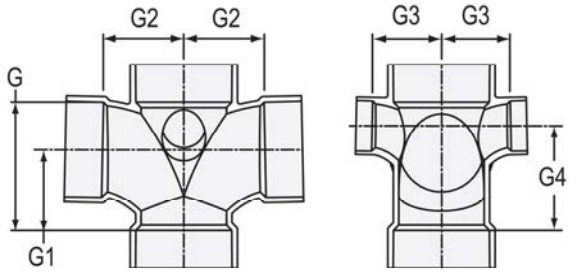
All Hub



Part Number	Size	G1	G2	G3
P429-784CF*	18X4	5-9/16	10-3/16	15-9/16
P429-786CF*	18X6	6-1/8	13-5/8	17-5/16
P429-788CF*	18X8	6-5/16	16-7/16	19-5/8
P429-790CF*	18X10	5-7/8	18-7/8	22-9/16
P429-792CF*	18X12	6	21-3/4	24-1/4
P429-794CF*	18X14	5-5/8	23-1/8	24-5/8
P429-796CF*	18X16	6-13/16	26-15/16	26-7/16
P429-814CF*	20X4	6-1/8	10-5/8	16-9/16
P429-816CF*	20X6	6-3/16	13-9/16	18-5/16
P429-818CF*	20X8	6-5/16	16-7/16	20-9/16
P429-820CF*	20X10	5-7/8	18-7/8	23-1/2
P429-822CF*	20X12	6-1/2	22-1/4	25-1/4
P429-824CF*	20X14	6-3/16	23-9/16	25-9/16
P429-826CF*	20X16	6-3/8	26-3/8	27-3/8
P429-828CF*	20X18	6-9/16	29-3/16	29-1/16
P429-904CF*	24X4	6-15/16	11-5/16	18-7/16
P429-906CF*	24X6	7-1/8	14-3/8	20-3/16
P429-908CF*	24X8	7-5/16	17-3/16	22-1/2
P429-910CF*	24X10	7	19-3/4	25-7/16
P429-912CF*	24X12	7-1/2	23	27-1/8
P429-914CF*	24X14	7-3/8	24-5/8	27-1/2
P429-916CF*	24X16	8-7/16	28-5/16	29-5/16
P429-918CF*	24X18	8-5/8	31-1/8	30-15/16
P429-920CF*	24X20	8-1/2	33-3/4	33-15/16

P439 Double Sanitary Tee with R&L Side Inlets

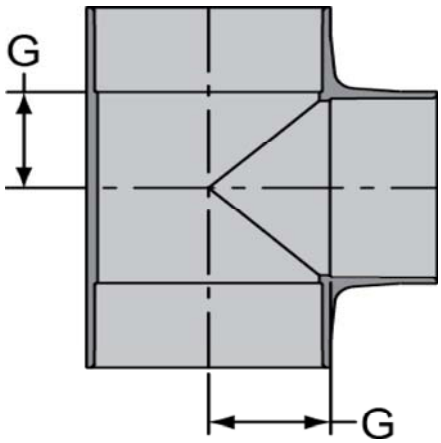
All Hub



Part Number	Size	G	G1	G2	G3	G4
P439-338C	3X3X3X3X2X2	4-7/8	3-1/16	3- 1/16	2-7/8	3-11/16
P439-420C	4X4X4X4X2X2	6-1/8	3-7/8	3-7/8	3-3/16	4-15/16

P441 Vent Tee

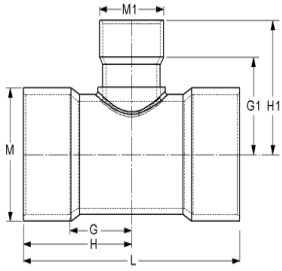
All Hub



Part Number	Size	G
P441-015C	1-1/2	1-3/16
P441-020C	2	1-1/2
P441-030C	3	1-15/16
P441-040C	4	2-1/2
P441-060C	6	3- 5/8
P441-080C	8	4-1/2
P441-080CF*	8	7-5/16
P441-100CF*	10	9
P441-120CF*	12	11-1/4
P441-140CF*	14	11
P441-160CF*	16	12-7/8
P441-180CF*	18	13-3/8
P441-200CF*	20	15-1/2
P441-240CF*	24	17-1/2

P442 Vent Tee, Reducing

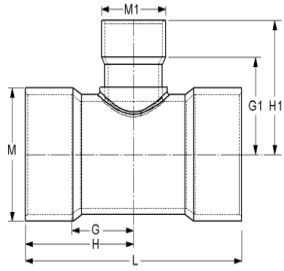
All Hub



Part Number	Size	G	G1	H	H1	L	M	M1
P442-422CF*	4X3	4-13/16	5	7-1/16	7-1/4	14-1/8	5	3-15/16
P442-528CF*	6X2	3-3/8	5-5/16	6-5/8	7-1/16	13-1/4	7-3/16	2-11/16
P442-530CF*	6X3	4-5/8	6-1/16	7-7/8	8-5/16	15-3/4	7-3/16	3-15/16
P442-578CF*	8X2	4-1/16	6-1/4	8-5/16	8	16-5/8	9-1/4	2-11/16
P442-580CF*	8X3	4-9/16	7	8-13/16	9-1/4	17-5/8	9-1/4	3-15/16
P442-582CF*	8X4	5-1/16	7-5/16	9-5/16	9-9/16	18-5/8	9-1/4	5
P442-623CF*	10X3	4-7/8	8	10-1/8	10-1/4	20-1/4	11-1/2	3-15/16
P442-624CF*	10X4	5-3/8	8-5/16	10-5/8	10-9/16	21-1/4	11-1/2	5
P442-626CF*	10X6	5-7/8	8-3/8	11-1/8	11-5/8	22-1/4	11-1/2	7-3/16
P442-628CF*	10X8	6-3/4	8-5/16	12	12-9/16	24	11-1/2	9-1/4
P442-663CF*	12X3	5-1/4	9	11-1/2	11-1/4	23	13-9/16	3-15/16
P442-664CF*	12X4	5-3/4	9-5/16	12	11-9/16	24	13-9/16	5
P442-666CF*	12X6	7	9-3/8	13-1/4	12-5/8	26-1/2	13-9/16	7-3/16
P442-668CF*	12X8	8	9-5/16	14-1/4	13-9/16	28-1/2	13-9/16	9-1/4
P442-670CF*	12X10	10-1/4	10-3/8	16-1/2	15-5/8	33	13-9/16	11-1/2
P442-693CF*	14X3	4-7/8	9-9/16	11-7/8	11-13/16	23-3/4	14-7/8	3-15/16
P442-694CF*	14X4	5-3/8	9-7/8	12-3/8	12-1/8	24-3/4	14-7/8	5
P442-698CF*	14X8	7-3/8	9-7/8	14-3/8	14-1/8	28-3/4	14-7/8	9-1/4
P442-700CF*	14X10	8-1/2	10-15/16	15-1/2	16-3/16	31	14-7/8	11-1/2
P442-702CF*	14X12	9-1/2	10-3/4	16-1/2	17	33	14-7/8	13-9/16
P442-753CF*	16X3	5-1/8	10-1/2	13-1/8	12-3/4	26-1/4	17	3-15/16
P442-754CF*	16X4	5-5/8	10-13/16	13-5/8	13-1/16	27-1/4	17	5
P442-756CF*	16X6	6-3/4	10-7/8	14-3/4	14-1/8	29-1/2	17	7-3/16
P442-758CF*	16X8	7-3/4	10-13/16	15-3/4	15-1/16	31-1/2	17	9-1/4
P442-760CF*	16X10	8-3/4	11-7/8	16-3/4	17-1/8	33-1/2	17	11-1/2
P442-762CF*	16X12	9-3/4	11-11/16	17-3/4	17-15/16	35-1/2	17	13-9/16
P442-764CF*	16X14	10-3/8	11-15/16	18-3/8	18-15/16	36-3/4	17	14-7/8
P442-784CF*	18X4	6-3/8	11-3/4	15-3/8	14	30-3/4	19-1/8	5
P442-786CF*	18X6	7-3/8	11-13/16	16-3/8	15-1/16	32-3/4	19-1/8	7-3/16
P442-788CF*	18X8	8-3/8	11-3/4	17-3/8	16	34-3/4	19-1/8	9-1/4
P442-790CF*	18X10	9-1/2	12-13/16	18-1/2	18-1/16	37	19-1/8	11-1/2
P442-792CF*	18X12	10-1/2	12-5/8	19-1/2	18-7/8	39	19-1/8	13-9/16
P442-794CF*	18X14	11-1/8	12-7/8	20-1/8	19-7/8	40-1/4	19-1/8	14-7/8
P442-796CF*	18X16	12-1/8	13-13/16	21-1/8	21-13/16	42-1/4	19-1/8	17
P442-814CF*	20X4	6-1/8	12-3/4	16-1/8	15	32-1/4	21-3/16	5
P442-816CF*	20X6	7-1/4	12-13/16	17-1/4	16-1/16	34-1/2	21-3/16	7-3/16
P442-818CF*	20X8	5-1/4	12-3/4	18-1/4	17	36-1/2	21-3/16	9-1/4
P442-820CF*	20X10	9-1/4	13-13/16	19-1/4	19-1/16	38-1/2	21-3/16	11-1/2

P442 Vent Tee, Reducing (Continued)

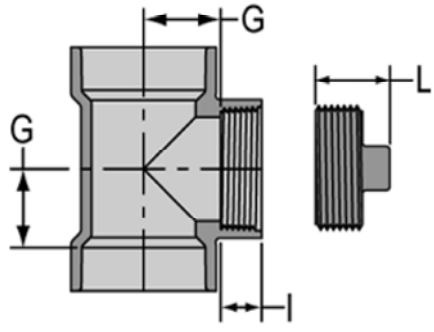
All Hub



Part Number	Size	G	G1	H	H1	L	M	M1
P442-822CF*	20X12	10-1/4	13-5/8	20-1/4	19-7/8	40-1/2	21-3/16	13-9/16
P442-824CF*	20X14	10-7/8	13-7/8	20-7/8	20-7/8	41-3/4	21-3/16	14-7/8
P442-826CF*	20X16	11-7/8	14-13/16	21-7/8	22-13/16	43-3/4	21-3/16	
P442-828CF*	20X18	12-7/8	14-3/8	22-7/8	23-3/8	45-3/4	21-3/16	19-1/8
P442-904CF*	24X4	7-3/8	14-5/8	19-3/8	16-7/8	38-3/4	25-3/8	
P442-906CF*	24X6	8-3/8	14-11/16	20-3/8	17-15/16	40-3/4	25-3/8	7-3/16
P442-908CF*	24X8	9-3/8	14-5/8	21-3/8	18-7/8	42-3/4	25-3/8	9-1/4
P442-910CF*	24X10	10-1/2	15-11/16	22-1/2	20-15/16	45	25-3/8	11-1/2
P442-912CF*	24X12	11-1/2	15-1/2	23-1/2	21-3/4	47	25-3/8	13-9/16
P442-914CF*	24X14	12-1/8	15-3/4	24-1/8	22-3/4	48-1/4	25-3/8	14-7/8
P442-916CF*	24X16	13-1/8	16-11/16	25-1/8	24-11/16	50-1/4	25-3/8	17
P442-918CF*	24X18	14-1/8	16-1/4	26-1/8	25-1/4	52-1/4	25-3/8	19-1/8
P442-920CF*	24X20	15-1/8	17-5/16	27-1/8	27-5/16	54-1/4	25-3/8	21-3/16

P444X Cleanout Tee w/Plug

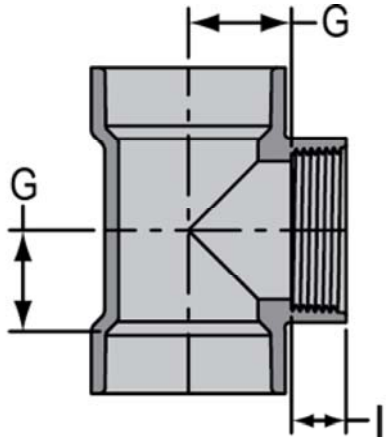
H x H x Fpt



Part Number	Size	G	I	L
P444X-015C	1-1/2	1- 3/16	5/8	1- 3/8
P444X-020C	2	1- 1/2	5/8	1-3/8
P444X-030C	3	1- 7/8	3/4	1-3/4
P444X-040C	4	2- 1/2	7/8	1- 7/8
P444X-060C	6	3-1/2	1	2
P444X-080C	8	4-9/16	1-1/8	2-1/16

P445 Cleanout Tee

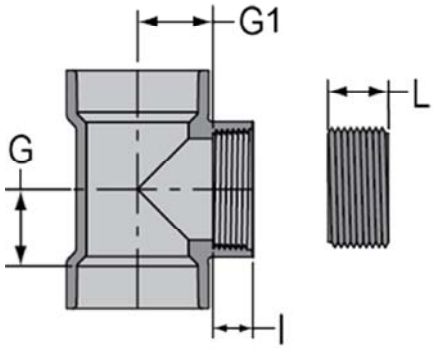
H x H x Fpt



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

P445X Cleanout Tee with Counter Sunk Plug

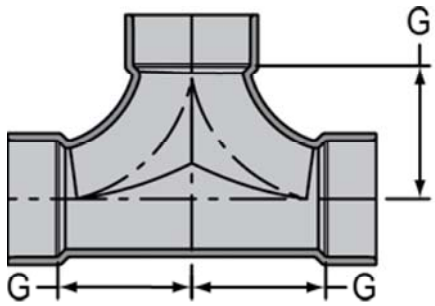
H x H



Part Number	Size	G	G1	I	L
P445X-015C	1-1/2	1-3/16	1-3/16	5/8	5/8
P445X-020C	2	1-1/2	1-1/2	5/8	5/8
P445X-030C	3	1- 7/8	1-7/8	3/4	3/4
P445X-040C	4	2- 1/2	2-1/2	7/8	7/8
P445X-060C	6	3- 1/2	3-1/2	1	1
P445X-080CF	8	7-5/16	4-1/4	1	1-1/2
P445X-100CF	10	9	5-3/4	1	1-1/2
P445X-120CF	12	9-1/4	7-9/16	1	1-1/2

P448 2-WAY Cleanout

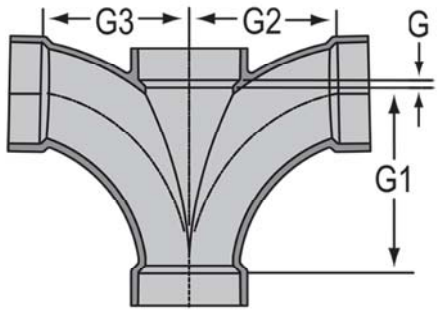
All Hub



Part Number	Size	G
P448-030C	3	4-1/16
P448-040C	4	4-7/8

P500 Double Fixture Fitting

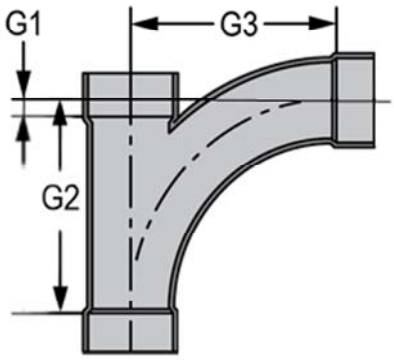
All Hub



Part Number	Size	G	G1	G2	G3
P500-020C	2X2X2X2	3/8	4-1/4	3- 1/2	3- 1/2
P500-030C	3X3X3X3	1/2	6- 1/4	4-15/16	4-15/16
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- 1/4	2-7/8	2-7/8
P500-338C	3X2X3X3	1/2	6- 9/32	4- 7/8	4- 7/8

P501 Combo Wye + 1/8 Bend (Long Turn Tee Wye)

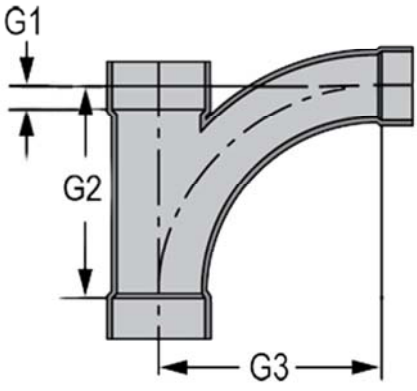
All Hub



Part Number	Size	G1	G2	G3
P501-015C	1-1/2	7/16	3-15/16	3-15/16
P501-020C	2	11/16	5-1/8	5-1/8
P501-030C	3	1-1/8	7-9/16	7-9/16
P501-040C	4	1- 1/2	10	10
P501-060CF*	6	13/16	15-9/16	12-11/16
P501-080CF*	8	3/16	19-3/4	16-1/8
P501-100CF*	10	1/16	23-3/4	19-13/16
P501-120CF*	12	1/2	27-7/8	23-5/8
P501-140CF*	14	1-1/4	29-5/8	29-5/16
P501-160CF*	16	7/8	34-3/8	33
P501-180CF*	18	1-3/8	38-1/4	36-9/16
P501-200CF*	20	1-13/16	43-9/16	41-7/16
P501-240CF*	24	4-5/16	50-5/16	50-5/16

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

All Hub

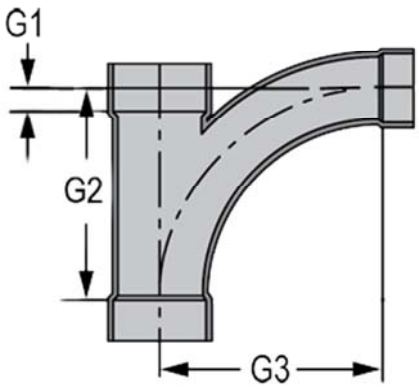


Part Number	Size	G1	G2	G3
P502-251C	2X2X1-1/2	7/16	3-15/16	4- 3/16
P502-337C	3X3X1-1/2	7/16	3-15/16	4-13/16
P502-338C	3X3X2	11/16	5-1/8	5-11/16
P502-420C	4X4X2	5/8	5-1/8	6-1/8
P502-422C	4X4X3	1- 1/16	7-9/16	8-1/16
P502-532CF*	6X4	1/16	11-11/16	11-5/16
P502-578C	8X8X2	7/8	8-7/8	10
P502-578CF*	8X2	1-3/8	8-3/8	9-1/4
P502-580CF*	8X3	15/16	10-5/16	10-1/16
P502-582CF*	8X4	9/16	12-3/16	12-1/4
P502-585CF*	8X6	7/16	15-3/16	13-11/16
P502-621CF*	10X2	1-3/8	8-3/8	10-5/16
P502-623CF*	10X3	1-1/4	10-7/16	11-3/4
P502-624CF*	10X4	1-1/16	12-9/16	13-1/4
P502-626CF*	10X6	1-9/16	16-3/16	14-11/16
P502-628CF*	10X8	3/4	20-1/4	17-1/8
P502-661CF*	12X2	1-13/16	8-11/16	11-1/4
P502-663CF*	12X3	1-3/8	10-5/8	12-11/16
P502-664CF*	12X4	1-1/16	12-7/16	14-1/4
P502-666CF*	12X6	1-1/2	16	15-5/8
P502-668CF*	12X8	9/16	19-15/16	18-1/8
P502-670CF*	12X10	1/16	23-9/16	20-3/4
P502-691CF*	14X2	1-5/8	8-3/8	11-13/16
P502-693CF*	14X3	1-11/16	10-13/16	13-5/16
P502-694CF*	14X4	1-5/16	12-11/16	14-13/16
P502-696CF*	14X6	1-1/4	15-3/4	16-1/4
P502-698CF*	14X8	5/16	19-11/16	18-1/16
P502-700CF*	14X10	1/4	23-1/4	21-3/8
P502-702CF*	14X12	1/8	28-1/8	24-1/4
P502-753CF*	16X3	2-3/8	11-3/8	14-1/4
P502-754CF*	16X4	1-7/8	13-1/8	15-3/4
P502-756CF*	16X6	2-11/16	17-1/16	17-3/16

Suitable for Oil-Free air handling to 25 psi, not for distribution of compressed air or gas
See Spears® Product Sourcebook for product offerings

P502 Combination Wye + 1/8 Bend Reducing (Long Turn Tee Wye) (Continued)

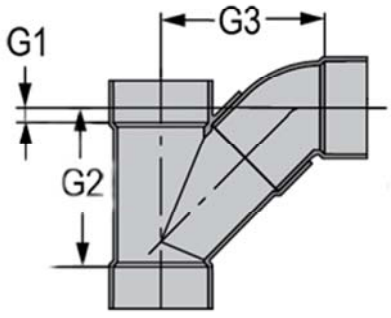
All Hub



Part Number	Size	G1	G2	G3
P502-758CF*	16X8	7/8	20-1/8	19-5/8
P502-760CF*	16X10	5/16	23-11/16	22-5/16
P502-762CF*	16X12	9/16	27-9/16	25-3/16
P502-764CF*	16X14	1	29-3/4	30-1/4
P502-784CF*	18X4	2-5/16	13-7/16	16-11/16
P502-786CF*	18X6	2-3/4	17	18-1/8
P502-788CF*	18X8	1-13/16	20-15/16	20-9/16
P502-790CF*	18X10	3/4	24	23-1/4
P502-792CF*	18X12	1/8	27-7/8	26-1/8
P502-794CF*	18X14	15/16	29-11/16	31-3/16
P502-796CF*	18X16	11/16	34-7/16	33-15/16
P502-814CF*	20X4	2-7/8	13-7/8	17-11/16
P502-816CF*	20X6	2-13/16	16-15/16	19-1/16
P502-818CF*	20X8	1-7/8	20-7/8	21-9/16
P502-820CF*	20X10	3/4	24	24-3/16
P502-822CF*	20X12	3/8	28-3/8	27-1/16
P502-824CF*	20X14	3/8	30-1/8	32-1/8
P502-826CF*	20X16	1-1/8	33-7/8	34-7/8
P502-828CF*	20X18	1-7/8	37-5/8	37-1/2
P502-904CF*	24X4	3-11/16	14-9/16	19-9/16
P502-906CF*	24X6	3-3/4	17-3/4	21
P502-908CF*	24X8	2-13/16	21-11/16	23-7/16
P502-910CF*	24X10	1-7/8	24-7/8	26-1/8
P502-912CF*	24X12	1-3/8	29-1/8	29
P502-914CF*	24X14	13/16	31-3/16	34-1/16
P502-916CF*	24X16	15/16	35-13/16	36-13/16
P502-918CF*	24X18	3/16	39-9/16	39-7/16
P502-920CF*	24X20	7/8	43-3/16	43-3/8

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

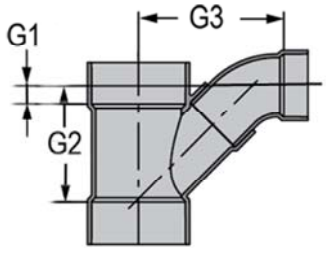
All Hub



Part Number	Size	G1	G2	G3
P503-040C	4	7/8	9-3/16	9-1/2
P503-060C	6	1-1/16	11-3/16	11-1/2
P503-080C	8	1-3/16	14-7/8	14-5/8
P503-100C	10	1-1/4	18-5/16	17-7/8
P503-120C	12	1-11/16	21-9/16	20-15/16

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

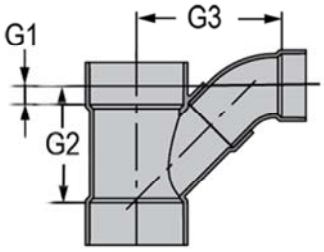
All Hub



Part Number	Size	G1	G2	G3
P504-241C	2X1-1/2X1-1/2	1/2	4-1/8	4-7/16
P504-422C	4X4X3	1	7-5/8	8-5/16
P504-528C[1]	6X2	5/8	7-13/16	9-3/32
P504-530C	6X3	5/8	7-3/4	9-5/16
P504-532C	6X4	1-3/8	8-1/4	10-1/4
P504-580C	8X3	1-1/8	8-13/16	10-9/16
P504-582C	8X4	1- 1/4	9-1/4	11- 1/8
P504-585C	8X6	1	10-1/2	12-1/2
P504-623C[1]	10X3	1-1/4	12-1/16	14-3/32

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

All Hub

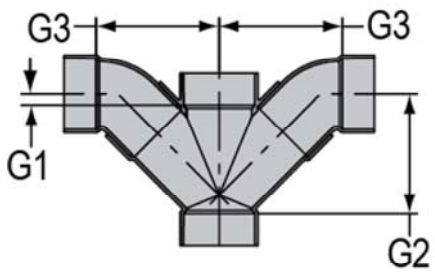


Part Number	Size	G1	G2	G3
P504-624C	10X4	1-7/16	12-1/2	14-11/16
P504-626C	10X6	15/16	11-3/4	14- 1/16
P504-628C	10X8	15/16	14-1/2	15- 1/2
P504-663C[1]	12X3	1-9/32	20-11/16	19-3/16
P504-664C	12X4	1-11/16	21-1/16	20-1/16
P504-666C	12X6	1-9/16	20-15/16	19-3/4
P504-668C[1]	12X8	1-3/16	20-9/16	19-5/16
P504-670C	12X10	5/8	19-11/16	19-1/2

[1] Sized with Bushing

P507 Double Combination Wye and 1/8 Bend

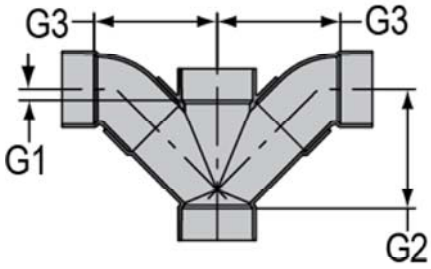
All Hub



Part Number	Size	G1	G2	G3
P507-020C	2	9/16	5-7/16	5-5/8
P507-030C	3	7/8	7-3/8	7-9/16
P507-040C	4	15/16	9-1/8	9-1/2
P507-060C	6	1-1/16	11-3/16	11-1/2
P507-080CF	8	3/16	19-3/4	16-1/8

P507 Double Combination Wye and 1/8 Bend (Continued)

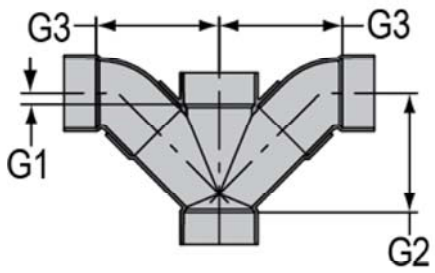
All Hub



Part Number	Size	G1	G2	G3
P507-100CF*	10	1-1/6	23-3/4	19-13/16
P507-120CF*	12	1/2	27-7/8	23-5/8
P507-140CF*	14	1-1/4	29-5/8	29-5/16
P507-160CF*	16	7/8	34-3/8	33
P507-180CF*	18	1-3/8	38-1/4	36-9/16
P507-200CF*	20	1-13/16	43-9/16	41-7/16
P507-240CF*	24	4-5/16	50-5/16	50-5/16
P507-251C	2X2X1-1/2X1-1/2	3/8	4-21/32	4-23/32
P507-338C	3X3X2X2	3/4	5-11/16	6-3/8
P507-420C	4X4X2X2	7/8	5-7/8	7-1/32
P507-422C	4X4X3X3	1	7-9/16	8-5/16
P507-530C	6X6X3X3	1- 1/4	8-1/8	9-11/16
P507-532C	6X6X4X4	1-3/8	8-1/4	10-1/4
P507-578CF	8X2	1-3/8	8-3/8	9-1/4
P507-580CF*	8X3	15/16	10-5/16	10-11/16
P507-582CF	8X4	9/16	12-3/16	12-1/4
P507-585CF	8X6	7/16	15-3/16	13-11/16
P507-621CF*	10X2	1-3/8	8-3/8	10-5/16
P507-623CF*	10X3	1-1/4	10-1/2	11-3/4
P507-624CF	10X10X4X4	1-1/16	12-9/16	13-1/4
P507-626CF	10X10X6X6	1-9/16	16-3/16	14-11/16
P507-628CF	10X10X8X8	3/4	20-1/4	17-1/8
P507-661CF*	12X2	1-13/16	8-11/16	11-1/4
P507-663CF*	12X3	1-3/8	10-5/8	12-11/16
P507-664CF*	12X12X4X4	1-1/16	12-7/16	14-1/4
P507-666CF*	12X12X6X6	1-1/2	16	15-5/8
P507-668CF	12X12X8X8	9/16	19-15/16	18-1/8
P507-670CF	12X12X10X10	1/16	23-9/16	20-3/4
P507-691CF*	14X2	1-5/8	8-3/8	11-13/16
P507-693CF*	14X3	1-11/16	10-13/16	13-5/16
P507-694CF*	14X14X4X4	1-5/16	12-11/16	14-13/16
P507-696CF*	14X6	1-1/4	15-3/4	16-1/4
P507-698CF*	14X8	5/16	19-11/16	18-11/16
P507-700CF*	14X14X10X10	1/4	23-1/4	21-3/8
P507-702CF*	14X12	1/8	28-1/8	24-1/4

P507 Double Combination Wye and 1/8 Bend (Continued)

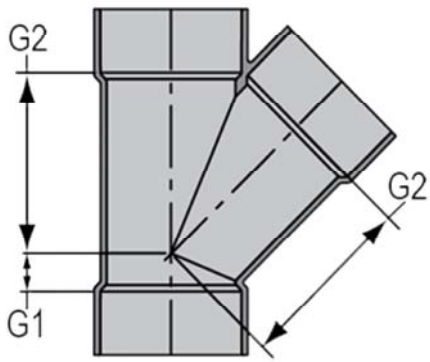
All Hub



Part Number	Size	G1	G2	G3
P507-753CF*	16X3	2-3/8	11-3/8	14-1/4
P507-754CF*	16X4	1-7/8	13-1/8	15-3/4
P507-756CF*	16X6	2-11/16	17-1/16	17-3/16
P507-758CF*	16X8	7/8	20-1/8	19-5/8
P507-760CF*	16X10	5/16	24	22-5/16
P507-762CF*	16X12	9/16	27	25-3/16
P507-764CF*	16X14	1	28-3/4	30-1/4
P507-784CF*	18X4	2-5/16	13-7/16	16-11/16
P507-786CF*	18X6	2-3/4	17	18-1/8
P507-788CF*	18X8	1-13/16	20-15/16	20-9/16
P507-790CF*	18X10	3/4	24	23-1/4
P507-792CF*	18X12	1/8	27-3/4	26-1/8
P507-794CF*	18X14	15/16	29-5/8	31-3/16
P507-796CF*	18X16	11/16	33-7/16	33-15/16
P507-814CF*	20X4	2-7/8	13-7/8	17-1/16
P507-818CF*	20X8	1-7/8	20-7/8	21-9/16
P507-816CF*	20X6	2-13/16	16-15/16	19-1/16
P507-820CF*	20X10	3/4	24	24-3/16
P507-822CF*	20X12	3/8	28-3/8	27-1/16
P507-824CF*	20X14	3/8	29-3/4	32-1/8
P507-826CF*	20X16	1-1/8	32-3/4	34-7/8
P507-828CF*	20X18	1-7/8	35-3/4	37-1/2
P507-904CF*	24X4	3-11/16	14-9/16	19-9/16
P507-906CF*	24X6	3-3/4	17-3/4	21
P507-908CF*	24X8	2-13/16	21-11/16	23-7/16
P507-910CF*	24X10	1-7/8	24-7/8	26-1/8
P507-912CF*	24X12	1-3/8	29-1/8	29
P507-914CF*	24X14	13/16	31-3/16	34-1/16
P507-916CF*	24X16	15/16	35-13/16	36-13/16
P507-918CF*	24X18	3/16	39-9/16	39-7/16
P507-920CF*	24X20	7/8	42-1/4	43-3/8

P600 45° Wye

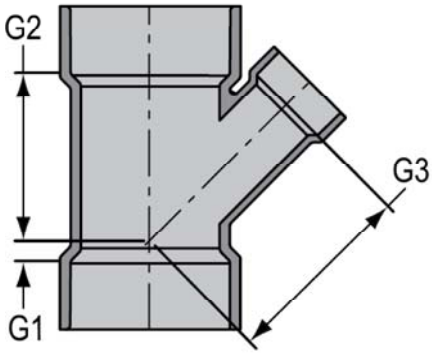
All Hub



Part Number	Size	G1	G2
P600-015C	1-1/2	1- 1/8	2-7/8
P600-020C	2	1-3/8	3-5/8
P600-030C	3	1- 5/8	5
P600-040C	4	1- 7/8	6-3/8
P600-060C	6	1- 3/4	8-7/16
P600-080C	8	2- 3/8	11-3/4
P600-080CF*	8	5-5/8	14-5/16
P600-100C	10	2- 1/2	13-15/16
P600-100CF*	10	6-9/16	17-1/4
P600-120C	12	3- 3/32	16-1/4
P600-120CF*	12	7-5/16	20-1/16
P600-140CF*	14	7-3/16	21-3/16
P600-160CF*	16	8-3/4	24-3/4
P600-180CF*	18	9-7/16	27-7/16
P600-200CF*	20	11-7/16	30-5/16
P600-240CF*	24	11	35

P601 45° Wye, Reducing

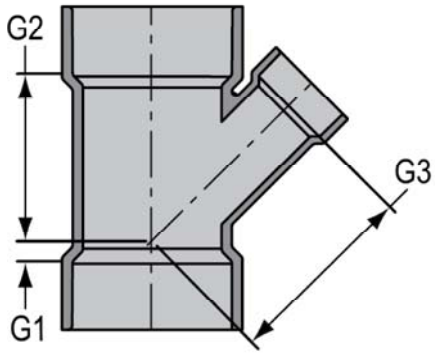
All Hub



Part Number	Size	G1	G2	G3
P601-241C	2X1-1/2X1-1/2	3/4	2-13/16	2-15/16
P601-251C	2X2X1-1/2	1-1/16	3-5/16	3-17/32

P601 45° Wye, Reducing (Continued)

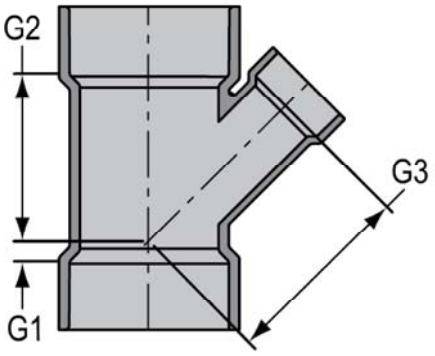
All Hub



Part Number	Size	G1	G2	G3
P601-257C	2X1-1/2X2	1	3-1/2	3-3/8
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	0	3- 3/4	4-1/2
P601-420C	4X4X2	3/8	4-11/16	5- 9/16
P601-422C	4X4X3	1-1/16	5-9/16	6
P601-528C[1]	6X6X2	3/8	6- 3/4	8- 3/8
P601-530C	6X6X3	1/4	6-15/16	7-3/8
P601-532C	6X6X4	1/4	6- 11/16	7- 7/16
P601-578C[1]	8X8X2	3/8	7-5/8	9-15/16
P601-578CF*	8X8X2	9/16	9-3/16	9-3/4
P601-580C	8X8X3	7/16	9- 1/8	7-5/8
P601-580CF*	8X8X3	1-5/16	9-15/16	10-7/8
P601-582C	8X8X4	3/8	7-5/8	8-5/8
P601-582CF*	8X8X4	2-1/16	10-11/16	11-7/8
P601-585C	8X8X6	1	9- 1/2	9-13/16
P601-585CF*	8X8X6	3-1/2	12-1/8	12-13/16
P601-621C[1]	10X10X2	3/16	11	14-1/8
P601-621CF*	10X10X2	1/2	10-1/4	11-3/16
P601-623C[1]	10X10X3	3/16	10-31/32	14-3/16
P601-623CF*	10X10X3	1/2	11-1/4	12-5/16
P601-624C[1]	10X10X4	3/16	11	13-11/16
P601-624CF*	10X10X4	1-7/16	12-3/16	13-5/16
P601-626C	10X10X6	3/16	11	12
P601-626CF*	10X10X6	3-1/2	14-1/4	14-1/4
P601-628C	10X10X8	1- 7/16	12- 1/2	13
P601-628CF*	10X10X8	5-1/8	15-7/8	15-11/16
P601-661C[1]	12X12X2	3-3/16	16- 3/16	22-1/2
P601-661CF*	12X12X2	1-1/8	11-5/8	12-9/16
P601-663C[1]	12X12X3	3-3/16	16- 3/16	21-13/16
P601-663CF*	12X12X3	3/8	12-3/8	13-11/16
P601-664C[1]	12X12X4	3-3/16	16- 3/16	21-5/16
P601-664CF*	12X12X4	3/8	13-1/8	14-11/16
P601-666C[1]	12X12X6	3-3/16	16- 3/16	20-1/16
P601-666CF*	12X12X6	2-3/8	15-1/8	15-5/8

P601 45° Wye, Reducing (Continued)

All Hub



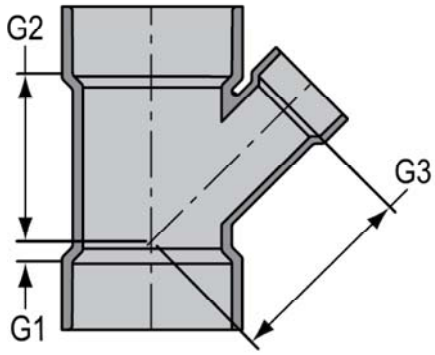
Part Number	Size	G1	G2	G3
P601-668C[1]	12X12X8	3-3/16	16-3/16	19
P601-668CF*	12X12X8	3-7/8	16-5/8	17-1/16
P601-670C[1]	12X10	3-3/16	16- 3/16	17-1/2
P601-670CF*	12X12X10	5-3/8	18-1/8	18-1/8
P601-691CF*	14X14X2	2	12	13-7/16
P601-693CF*	14X14X3	3/4	13-1/4	14-9/16
P601-694CF*	14X14X4	0	14	15-9/16
P601-696CF*	14X14X6	1-1/2	15-1/2	16-1/2
P601-698CF*	14X14X8	3	17	7-15/16
P601-700CF*	14X14X10	4-1/2	18-1/2	19
P601-702CF*	14X14X12	7	21	20-15/16
P601-751CF*	16X16X2	2	14	14-3/4
P601-753CF*	16X16X3	1-1/8	14-7/8	15-7/8
P601-754CF*	16X16X4	1/2	15-1/2	16-7/8
P601-756CF*	16X16X6	1-7/8	17-7/8	17-13/16
P601-758CF*	16X16X8	2-1/2	18-1/2	19-1/4
P601-760CF*	16X16X10	4	20	20-5/16
P601-762CF*	16X16X12	5-1/2	21-1/2	22-1/4
P601-764CF*	16X16X14	6-3/8	22-3/8	22-1/2
P601-784CF*	18X18X4	1-1/8	16-7/8	18-3/16
P601-786CF*	18X18X6	7/8	18-7/8	19-1/8
P601-788CF*	18X18X8	2-3/8	20-3/8	20-9/16
P601-790CF*	18X18X10	3-3/8	21-3/8	21-5/8
P601-792CF*	18X18X12	4-7/8	22-7/8	23-9/16
P601-794CF*	18X14	5-3/8	23-3/8	23-13/16
P601-796CF*	18X18X16	7-7/8	25-7/8	26-1/16
P601-814CF*	20X20X4	1-5/8	18-3/8	19-9/16
P601-816CF*	20X20X6	1/8	19-7/8	20-1/2
P601-818CF*	20X20X8	1-3/8	21-3/8	21-15/16
P601-820CF*	20X20X10	2-3/8	22-3/8	23
P601-822CF*	20X20X12	4-3/8	24-3/8	24-15/16
P601-824CF*	20X20X14	4-7/8	24-7/8	25-3/16
P601-826CF*	20X16	6-3/8	26-3/8	27-7/16
P601-828CF*	20X18	7-7/8	27-7/8	26-13/16
P601-904CF*	24X4	2-7/8	21-1/8	22-1/4

Suitable for Oil-Free air handling to 25 psi, not for distribution of compressed air or gas

See Spears® Product Sourcebook for product offerings

P601 45° Wye, Reducing (Continued)

All Hub

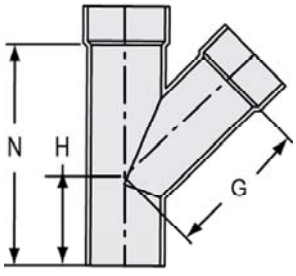


Part Number	Size	G1	G2	G3
P601-906CF*	24X24X6	1-1/4	22-3/4	23-3/16
P601-908CF*	24X24X8	1/4	24-1/4	24-5/8
P601-910CF*	24X24X10	1-3/8	25-3/8	25-11/16
P601-912CF*	24X24X12	3-1/4	27-1/4	27-5/8
P601-914CF*	24X24X14	4	28	27-7/8
P601-916CF*	24X24X16	6-3/8	30-3/8	30-1/8
P601-918CF*	24X24X18	7-7/8	31-7/8	31-1/2
P601-920CF*	24X24X20	9-1/8	33-1/8	33

[1] Sized with Bushing

P602 45° Wye, Street

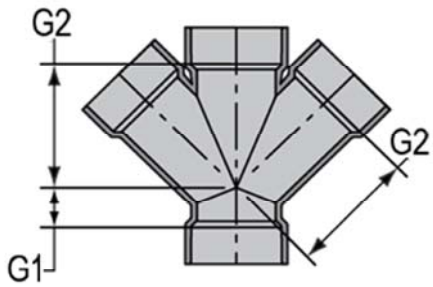
S x H x H



Part Number	Size	G	H	N
P602-030C	3	5	3	8
P602-040C	4	6-7/16	3-1/2	9 15/16

P611 Double Wye

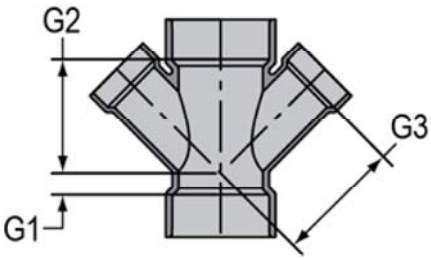
All Hub



Part Number	Size	G1	G2
P611-015C	1-1/2	1- 1/8	2-7/8
P611-020C	2	1- 3/8	3-3/8
P611-030C	3	1- 5/8	5
P611-040C	4	1-7/8	6-3/8
P611-060C	6	1-3/4	8-7/16
P611-080CF	8	5-5/8	14-5/16
P611-100CF	10	6-9/16	17-1/4
P611-120CF	12	7-5/16	20-1/16
P611-140CF*	14	7-3/16	21-3/16
P611-160CF*	16	8-3/4	24-3/4
P611-180CF*	18	9-7/16	27-7/16
P611-200CF*	20	11-7/16	30-5/16
P611-240CF*	24	11	35

P612 Double Wye, Reducing

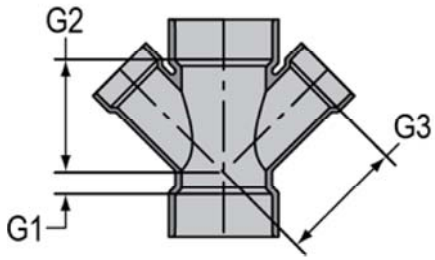
All Hub



Part Number	Size	G1	G2	G3
P612-241C	2X1-1/2X1-1/2X1-1/2	1-1/16	3-5/16	3-7/16
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- 11/16	5-9/16

P612 Double Wye, Reducing (Continued)

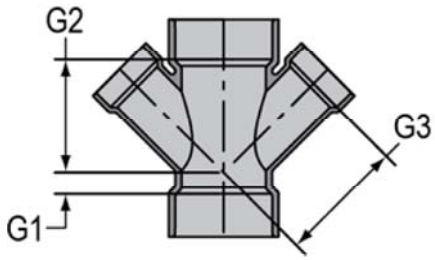
All Hub



Part Number	Size	G1	G2	G3
P612-422C	4X4X3X3	1- 1/16	5- 9/16	6
P612-530C[1]	6X6X3X3	3/16	6-11/16	7-15/16
P612-532C	6X6X4X4	3/16	6-11/16	7- 7/16
P612-578CF*	8X8X2X2	9/16	9-3/16	9-3/4
P612-580CF	8X8X3X3	1-5/16	9-15/16	10-7/8
P612-582CF	8X8X4X4	2-1/16	10-11/16	11-7/8
P612-585CF	8X8X6X6	3-1/2	12-1/8	12-13/16
P612-621CF*	10X10X2X2	1/2	10-1/4	11-3/16
P612-623CF*	10X10X3X3	1/2	11-1/4	12-5/16
P612-624CF	10X10X4X4	1-7/16	12-3/16	13-5/16
P612-626CF*	10X10X6X6	3-1/2	14-1/4	14-1/4
P612-628CF	10X10X8X8	5-1/8	15-7/8	15-11/16
P612-661CF*	12X12X2X2	1-1/8	11-5/8	12-9/16
P612-663CF*	12X12X3X3	3/8	12-3/8	13-11/16
P612-664CF	12X12X4X4	3/8	13-1/8	14-11/16
P612-666CF*	12X12X6X6	2-3/8	15-1/8	15-5/8
P612-668CF*	12X12X8X8	3-7/8	16-5/8	17-1/16
P612-670CF*	12X12X10X10	5-3/8	18-1/8	18-1/8
P612-691CF*	14X14X2X2	2	12	13-7/16
P612-693CF*	14X14X3X3	3/4	13-1/4	16-13/16
P612-694CF*	14X14X4X4	0	14	15-9/16
P612-698CF*	14X14X8X8	3	17	17-15/16
P612-696CF*	14X14X6X6	1-1/2	15-1/2	16-1/2
P612-700CF*	14X14X10X10	4-1/2	18-1/2	19
P612-702CF*	14X14X12X12	7	21	20-15/16
P612-751CF*	16X16X2X2	2	14	14-3/4
P612-753CF*	16X16X3X3	1-1/8	14-7/8	15-7/8
P612-754CF*	16X16X4X4	1/2	15-1/2	16-7/8
P612-756CF*	16X16X6X6	1-7/8	17-7/8	17-13/16
P612-758CF*	16X16X8X8	2-1/2	18-1/2	19-1/4
P612-760CF*	16X16X10X10	4	20	20-5/16
P612-762CF*	16X16X12X12	5-1/2	21-1/2	22-1/4
P612-764CF*	16X16X14X14	6-3/8	22-3/8	22-1/2
P612-784CF*	18X18X4X4	1-1/8	16-7/8	18-3/16
P612-786CF*	18X18X6X6	7/8	18-7/8	19-1/8

P612 Double Wye, Reducing (Continued)

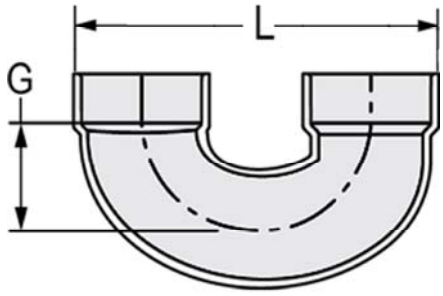
All Hub



Part Number	Size	G1	G2	G3
P612-788CF*	18X18X8X8	2-3/8	20-3/8	20-9/16
P612-790CF*	18X18X10X10	3-3/8	21-3/8	21-5/8
P612-792CF*	18X18X12X12	4-7/8	22-7/8	23-9/16
P612-794CF*	18X18X14X14	5-3/8	23-3/8	23-13/16
P612-796CF*	18X18X16X16	7-7/8	25-7/8	26-1/16
P612-814CF*	20X20X4X4	1-5/8	18-3/8	19-9/16
P612-816CF*	20X20X6X6	1/8	19-7/8	20-1/2
P612-818CF*	20X20X8X8	1-3/8	21-3/8	21-15/16
P612-820CF*	20X20X10X10	2-3/8	22-3/8	23
P612-822CF*	20X20X12X12	4-3/8	24-3/8	24-15/16
P612-824CF*	20X20X14X14	4-7/8	24-7/8	25-3/16
P612-826CF*	20X20X16X16	6-3/8	26-3/8	27-7/16
P612-828CF*	20X20X18X18	7-7/8	27-7/8	28-13/16
P612-904CF*	24X24X4X4	2-7/8	21-1/8	22-1/4
P612-906CF*	24X24X6X6	1-1/4	22-3/4	23-3/16
P612-908CF*	24X24X8X8	1/4	24-1/4	24-5/8
P612-910CF*	24X24X10X10	1-3/8	25-3/8	25-11/16
P612-912CF*	24X24X12X12	3-1/4	27-1/4	27-5/8
P612-914CF*	24X24X14X14	4	28	27-7/8
P612-916CF*	24X24X16X16	6-3/8	30-3/8	30-1/8
P612-918CF*	24X24X18X18	7-7/8	31-7/8	31-1/2
P612-920CF*	24X24X20X20	9-1/8	33-1/8	33

P700 Return Bend

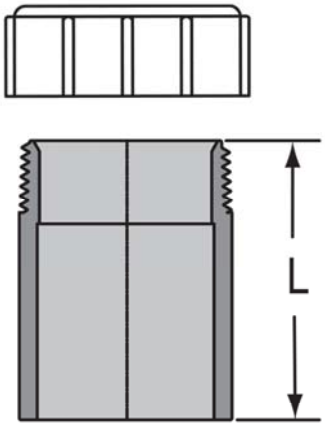
H x H



Part Number	Size	G
P700-015C	1-1/2	1-7/16
P700-020C	2	2- 3/8
P700-030C	3	3
P700-040C	4	3- 3/4
P700-060C	6	5
P700-080C	8	6
P700-100C	10	9-13/16
P700-120C	12	10-3/4

P704P Tail Piece Adapter

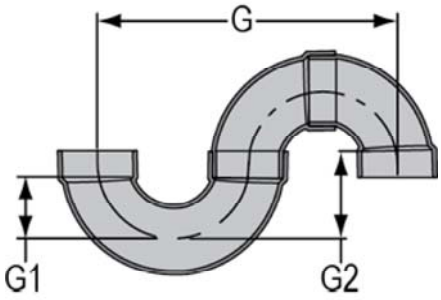
Spig x Slip w/Plastic Nut



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

P705 S-Trap

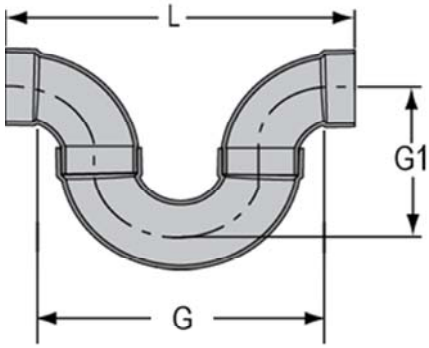
H x H



Part Number	Size	G	G1	G2
P705-015C	1-1/2	7- 1/4	1- 7/16	2- 1/4
P705-020C	2	10- 1/2	2- 3/8	3-1/4
P705-030C	3	14- 3/8	3	4- 1/2
P705-040C	4	17-3/4	3- 3/4	5- 9/16

P705R Running Trap

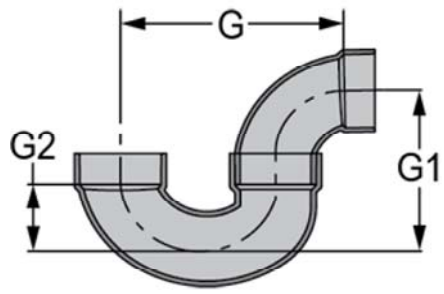
H x H



Part Number	Size	G	G1	L
P705R-015C	1-1/2	6-7/16	3- 13/16	7-7/8
P705R-020C	2	9-5/16	5- 9/16	11
P705R-030C	3	12-7/8	7-9/16	15-7/8
P705R-040C	4	16	9- 5/16	19-1/2

P706X P-Trap

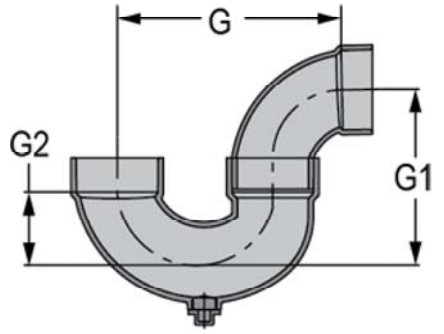
H x H



Part Number	Size	G	G1	G2
P706X-015C	1-1/2	4-3/8	3-5/8	1-7/16
P706X-020C	2	6- 1/2	4-5/8	2-3/8
P706X-030C	3	8-7/8	6-7/8	3
P706X-040C	4	11	8- 3/16	3-3/4
P706X-060C	6	18-3/8	13- 1/4	5
P706X-080C	8	22-9/16	16- 1/2	6
P706X-100C	10	35-5/16	25- 1/4	9-13/16
P706X-120C	12	39-1/4	28- 1/8	10- 7/8

P707X P-Trap w/Cleanout

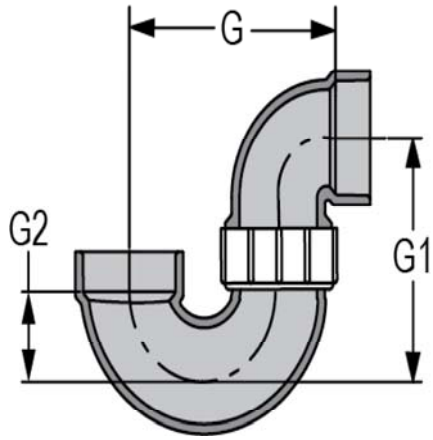
H x H



Part Number	Size	G	G1	G2
P707X-015C	1-1/2	4- 3/16	3-13/16	1- 3/8

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

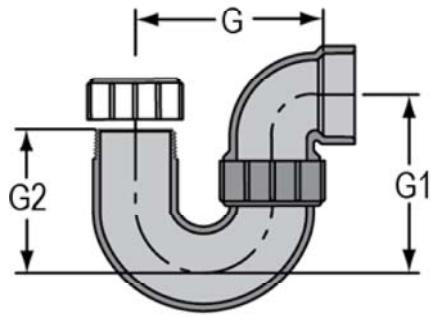
H x H



Part Number	Size	G	G1	G2
P708P-015C	1-1/2	4-1/2	3- 3/4	1-7/16
P708P-020C	2	6- 7/16	4- 3/8	2-5/16

P711P L.A Pattern P-Trap w/Plastic Nut

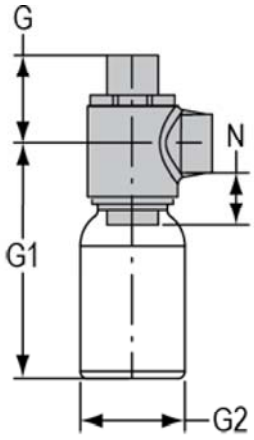
(Union Connection w/Slip Joint) Slip x H w/Plastic Nut



Part Number	Size	G	G1	G2
P711P-015C	1-1/2	4-1/4	3- 7/8	3- 3/44

P712 Jar Trap

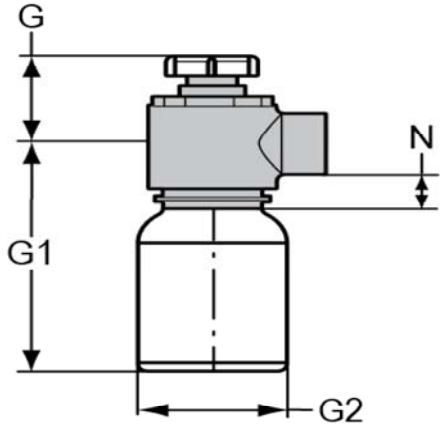
Spig x H
32 oz. PP Jar



Part Number	Size	G	G1	G2	N
P712-015C	1-1/2	3- 3/16	8- 1/4	3-29/32	1- 7/8

P712P Jar Trap w/Tail Piece Adapter

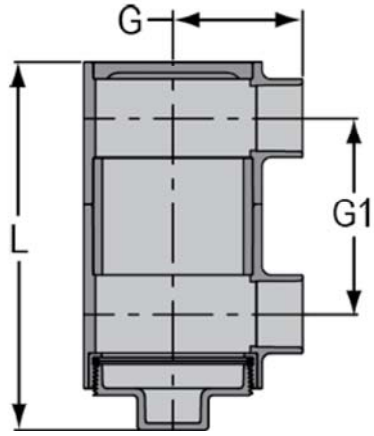
Slip x H
32 oz. PP Jar



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

P720 Drum Trap

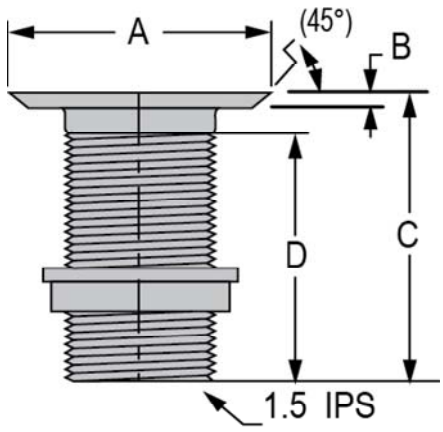
H x H



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

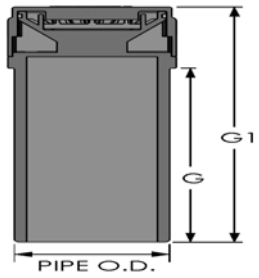


Part Number	Size	A	B	C	D
LWWA-1	1-1/2	2- 7/16	9/32	4- 9/32	3-27/32

LabWaste® Air Admittance Valve With Diaphragm Seal

Spigot

Maximum 6 DFU (Drainage Fixture Units)

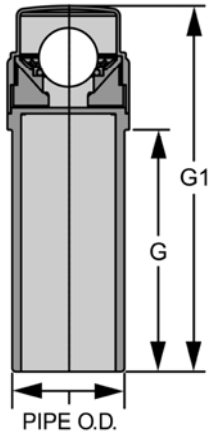


Part Number	Size	G	G1
AADV-015C	1-1/2	4-1/8	5-9/16

LabWaste® Air Admittance Valve With Ball Seal

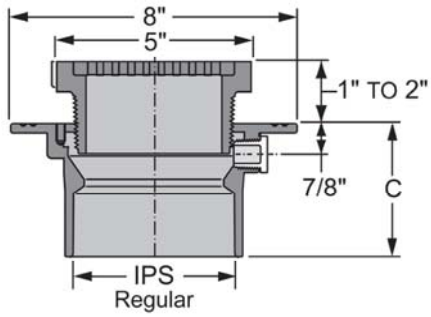
Spigot

Maximum 6 DFU (Drainage Fixture Units)



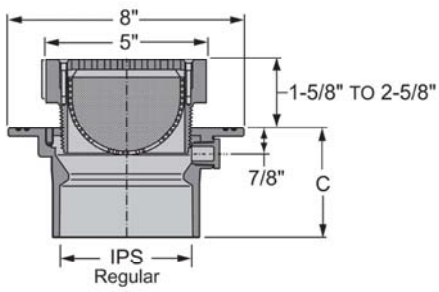
Part Number	Size	G	G1
AAV-015C	1-1/2	4- 1/8	6- 1/4

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



Part Number	Size	C	IPS
LW1500-015C	1-1/2X5	4- 3/16	1- 1/2
LW1500-020C	2X5	4	2
LW1500-030C	3X5	4	3
LW1500-040C	4X5	3- 3/4	4

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

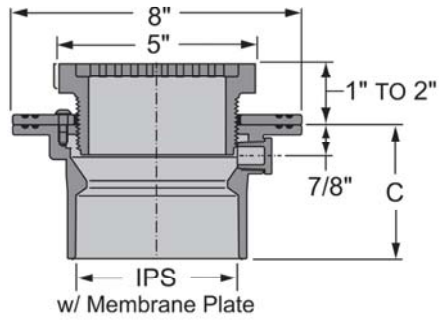


Part Number	Size	C	IPS
LW1520-015C	1-1/2X5	4- 3/16	1- 1/2
LW1520-020C	2X5	4	2
LW1520-030C	3X5	4	3
LW1520-040C	4X5	3- 3/4	4

Suitable for Oil-Free air handling to 25 psi, not for distribution of compressed air or gas

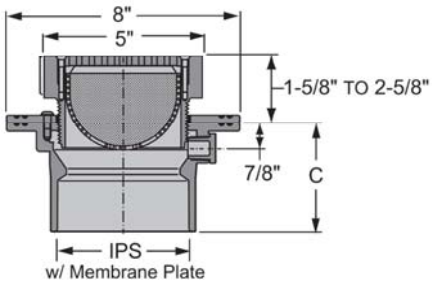
See Spears® Product Sourcebook for product offerings

LW150M Floor Drain with CPVC Adjustable Top w/5" Round Grate and Membrane Collar



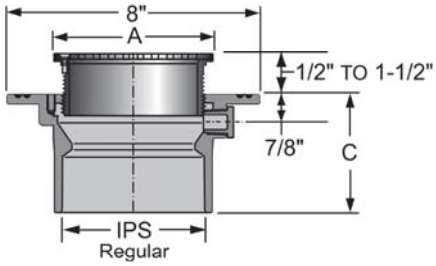
Part Number	Size	C	IPS
LW150M-015C	1-1/2X5	4- 3/16	1- 1/2
LW150M-020C	2X5	4	2
LW150M-030C	3X5	4	3
LW150M-040C	4X5	3- 3/4	4

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



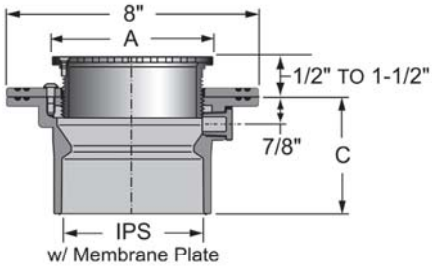
Part Number	Size	C	IPS
LW152M-015C	1-1/2X5	4- 3/16	1- 1/2
LW152M-020C	2X5	4	2
LW152M-030C	3X5	4	3
LW152M-040C	4X5	3- 3/4	4

Floor Drain with Stainless Steel Adjustable Top w/Round Grate



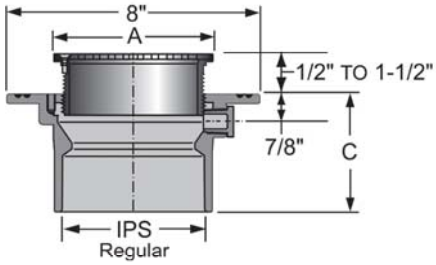
Part Number	Size	A, Nom	C	IPS
LW1500-015S	1-1/2X5	5	4- 3/16	1- 1/2
LW1600-015S	1-1/2X6	6	4- 3/16	1- 1/2
LW1700-015S	1-1/2X7	7	4- 3/16	1- 1/2
LW1800-015S	1-1/2X8	8	4- 3/16	1- 1/2
LW1500-020S	2X5	5	4	2
LW1600-020S	2X6	6	4	2
LW1700-020S	2X7	7	4	2
LW1800-020S	2X8	8	4	2
LW1500-030S	3X5	5	4	3
LW1600-030S	3X6	6	4	3
LW1700-030S	3X7	7	4	3
LW1800-030S	3X8	8	4	3
LW1500-040S	4X5	5	3- 3/4	4
LW1600-040S	4X6	6	3- 3/4	4
LW1700-040S	4X7	7	3- 3/4	4
LW1800-040S	4X8	8	3- 3/4	4

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



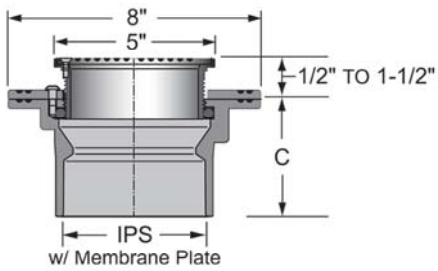
Part Number	Size	A, Nom	C	IPS
LW150M-015S	1-1/2X5	5	4- 3/16	1- 1/2
LW160M-015S	1-1/2X6	6	4-3/16	1-1/2
LW170M-015S	1-1/2X7	7	4-3/16	1- 1/2
LW180M-015S	1-1/2X8	8	4-3/16	1- 1/2
LW150M-020S	2X5	5	4	2
LW160M-020S	2X6	6	4	2
LW170M-020S	2X7	7	4	2
LW180M-020S	2X8	8	4	2
LW150M-030S	3X5	5	4	3
LW160M-030S	3X6	6	4	3
LW170M-030S	3X7	7	4	3
LW180M-030S	3X8	8	4	3
LW150M-040S	4X5	5	3- 3/4	4
LW160M-040S	4X6	6	3-3/4	4
LW170M-040S	4X7	7	3-3/4	4
LW180M-040S	4X8	8	3-3/4	4

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



Part Number	Size	C	IPS
LW1510-015S	1-1/2X5	4- 3/16	1- 1/2
LW1510-020S	2X5	4	2
LW1510-030S	3X5	4	3
LW1510-040S	4X5	3- 3/4	4

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



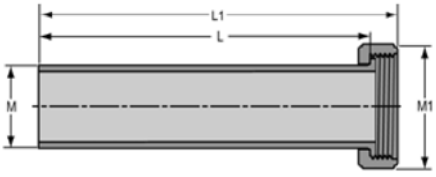
Part Number	Size	C	IPS
LW151M-015S	1-1/2X5	4- 3/16	1- 1/2
LW151M-020S	2X5	4	2
LW151M-030S	3X5	4	3
LW151M-040S	4X5	3- 3/4	4

Suitable for Oil-Free air handling to 25 psi, not for distribution of compressed air or gas
See Spears® Product Sourcebook for product offerings

LWTP CPVC Tail Piece

Part Number	Size	L	M	M1
LWTP-015060	1-1/2X6	6	1-1/2	1-3/4
LWTP-015120	1-1/2X12	12	1-1/2	1-3/4
LWTP-015140	1-1/2X14	14	1-1/2	1-3/4

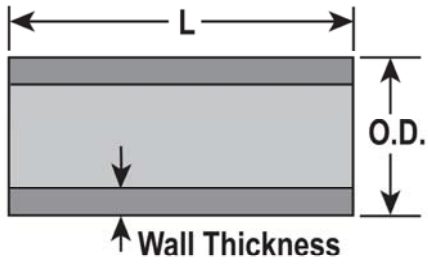
LWTPN CPVC Tail Piece with Nut & Gasket



Part Number	Size	L	L1	M	M1
LWTPN-015060	1-1/2X6	6	6-1/2	1-1/2	2-1/4
LWTPN-015120	1-1/2X12	12	12-1/2	1-1/2	2-1/4
LWTPN-015140	1-1/2X14	14	14-1/2	1-1/2	2-1/4

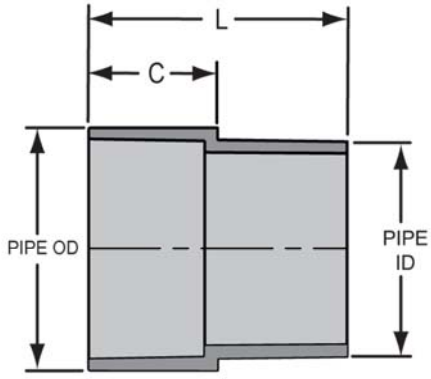
Pipe - LabWaste® CPVC

10' Lengths



Part Number	Size	L	AVG.O.D.	Minimum Wall
LW-015	1-1/2	10	1.900	.145
LW-020	2	10	2.375	.154
LW-030	3	10	3.500	.216
LW-040	4	10	4.500	.237
LW-060	6	10	6.625	.280
LW-080	8	10	8.625	.322
LW-100	10	10	10.750	.365
LW-120	12	10	12.750	.406
LW-140	14	10	14	.437
LW-160	16	10	16	.500
LW-180	18	10	18	.562
LW-200	20	10	20	.593
LW-240	24	10	24	.687

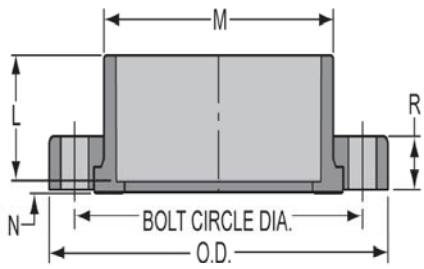
Pipe Extenders, LabWaste®



Part Number	Size	C	L
S0301-15C	1-1/2	1-1/4	2-1/2
S0301-20C	2	1-1/4	2-7/8
S0301-30C	3	2	4
S0301-40C	4	2-1/8	4-1/4

Flange, Van Stone Style CPVC

Socket



Part Number	Size	L	M	N	O.D.	R	Bolt Circle Dia.	Bolt Size	Min. Bolt Length	No of Bolts
854-015C	1-1/2	1-1/2	2-7/16	1/8	5	13/16	3-7/8	1/2	2-1/2	4
854-020C	2	1-21/32	2-31/32	1/8	6	7/8	4-3/4	5/8	3	4
854-030C	3	2-1/8	4-1/4	1/4	7-1/2	1-1/8	6	5/8	3-1/4	4
854-040C	4	2-1/2	5-1/4	9/32	9-3/32	1-3/16	7-1/2	5/8	3-1/2	8
854-060C	6	3-3/8	7-9/16	5/16	11	1-3/8	9-1/2	3/4	4	8
854-080C	8	4-13/32	9-5/16	5/16	13-9/16	1-1/2	11-3/4	3/4	4-1/2	8
854-100C	10	5-23/32	11-3/4	21/32	16-1/16	1-25/32	14-1/4	7/8	5	12
854-120C	12	6-19/32	13-3/4	5/8	19	1-13/16	17	7/8	5	12
854-140C	14	7-19/32	15-9/16	9/16	21	2-1/16	18-3/4	1	5-1/2	12
854-160C	16	8-5/8	17-13/16	17/32	23-1/2	2-15/32	21-1/4	1	6-1/2	16

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 effect 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.

WARNING: Hazardous material (including certain solvents and high concentrations of certain acids), are typically not discharged into lab waste piping. Laboratories routinely have specialized collection equipment and contracted disposal services for waste considered "hazardous". Proper laboratory protocols on handling materials identified by OSHA and EPA as "hazardous" must be established and followed. Such requirements typically specify special storage and disposal apart from drainage disposal via dilution or neutralization. Even improper handling and disposal of HAZARDOUS materials by accident are subject to heavy fines by Federal, State and Local Authorities.

CPVC Drainage System Chemical Resistance

Chemical Resistance Tables

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

IMPORTANT NOTE: Chemical Resistance data is provided 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 be involved. Data is applicable to laboratory drainage systems only and may not besuitable for continuous service or pressure applications.

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

CPVC Drainage System Chemical Resistance

CHEMICAL	RATING
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
Dioctyl Phthalate	N
Dodecyl Alcohol	R
Dodecyl Sulfate	R
Dioxane	R
Diphenyl Oxide	---
Disodium Phosphate	R
Drierite	R
E	
Eosin Y	R
Eriochrome 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 Oxide	R
Ethyl Ether	R
Ethyl Formate	R
Ethylene Glycol	C
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
Flormaldehyde Dilute	R
Flormaldehyde 35%	R
Flormaldehyde 37%	R
Flormaldehyde 50%	C
Formic Acid	R
Freon	R
Freon 12	R
Freon 21	---
Freon 22	R
Freon113	C
Freon114	---
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

CHEMICAL	RATING
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
Hydrofluosilic Acid 50%	R
Hydrogen	R
Hydrogen Cyanide	R
Hydrogen Fluoride	C
Hydrogen Peroxide 50%	R
Hydrogen Peroxide 90%	R
Hydrogen Phosphide	R
Hydrogen Sulfide Dry	R
Hydrogen Sulfide Wet	R
Hydrogen Sulfide, agueous	R
Hydroquinone, aqueous	R
Hydroxylamine Hyrochloride	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 Hyrdroxide 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

CHEMICAL	RATING
M	
Magnesium Acetate	R
Magnesium Bromide	R
Magensium Carbonate	R
Magnesium Chloride	R
Magnesium Citrate	R
Magnesium Fluoride	---
Magnesium Hydroxide	R
Magnesium Nitrate	R
Magnesium Oxide	---
Magnesium Sulfate	R
Malachite Green	R
Maleic Acid	R
Malic Acid	R
Maltose	R
Manganese Chloride	R
Manganese Nitrate	R
Manganese Sulfate	R
Menthol	R
Mercuric Chloride	R
Mercuric Cyanide	R
Mercuric Sulfate	R
Mercurous Nitrate	R
Mercury	R
Methane	R
Methanol	R
DL-methionine	R
Methoxyethyl Oleate	---
Methyl Acetate	R
Methyl Acetone	R
Methyl Acrylate	---
Methyl Amine	R
Methyl Bromide	N
Methyl Cellosolve	R
Methyl Cellulose	R
Methyl Chloride	N
Methyl Chloroform	N
Methyl Ethyl Ketone	R
Methyl Formate	R\
Methyl Green	R
Methyl Isobutyl Carbinol	R
Methyl Isobutyl Ketone	R
Methyl Isopropyl Ketone	R
Methyl Methacrylate	R
Methyl Red	R
Methyl Sulfate	R
Methyl Violet-2B	R
Methyl Violet-6B	R
Methylene Blue	R
Methylene Bromide	N
Methylene Chloride	N
Methylene Chlorobromide	N
Methylene Iodine	N
Methysulfuric Acid	R
Milk	R
Mineral Oil	R
Molasses	R
Monochloroacetic Acid	R
Monochlorobenzene	N
Monoethanolamine	R
Monosodium Glutamate	R
Motor Oil	R
Morpholine	R
N	
Naphtha	R
Naphthalene	C
Natural Gas	R
Neutral Red	R
Nickel Acetate	R
Nickel Ammonium Sulfate ---	
Nickel Chloride	R
Nickel Nitrate	R
Nickel Sulfate	R
Nicotine	R
Nicotinic Acid	R
Nitric Acid 10%	R
Nitric Acid 30%	R
Nitric Acid 40%	R
Nitric Acid 50%	R
Nitric Acid 70%	R
Nitric Acid 100%	R
Nitrobenzene	N
Nitroethane	C
Nitrogen Gas	---
Nitroglycerine	C
Nitroglycol	---
Nitromethane	C
Nitrous Acid	R
Nitrous Oxide	R
O	
n-Octane	C
Octanol	R
OleicAcid	R

CPVC Drainage System Chemical Resistance

CHEMICAL	RATING
Oleum	R
Olive Oil	C
Orange G - acid orange 10	R
Orange IV - acid orange 5	R
Orcinol	R
Osmium Tetroxide	R
Oxalic Acid	R
Oxygen Gas	R
Ozone	R
Ozonized Water	R
P	
Palm Oil	R
Palmitic Acid 10%	R
Palmitic Acid 70%	R
Pancreatin	R
Papain	R
Paraffin	R
Peanut Oil	C
Pectin	R
n-Pentane	C
Pepsin	R
Peracetic Acid	R
Perchloric Acid 15%	R
Perchloric Acid 70%	R
Perchloroethylene	C
Periodic Acid	R
Perphosphate	R
Phenol	R
Phenolphthalein	R
Phenyl Salicylate	R
Phenylhydrazine	C
Phosphate Esters	---
Phosphoric Acid 10%	R
Phosphoric Acid 50%	R
Phosphoric Acid 85%	R
Phosphoric Anhydride	R
Phosphorous (Red)	C
Phosphorous (Yellow)	C
Phosphorous Pentoxide	R
Phosphorous Trichloride	R
Photographic Solutions	R
Phthalic Acid	R
Picric Acid	R
Pine Oil	C
Plating Solutions Brass	R
Plating Solutions Cadium	R
Plating Solutions Chrome	R
Plating Solutions Copper	R
Plating Solutions Gold	R
Plating Solutions Lead	R
Plating Solutions Nickel	R
Plating Solutions Rhodium	R
Plating Solutions Silver	R
Plating Solutions Tin	R
Plating Solutions Zinc	R
Polyvinyl Acetate	---
Polyvinyl Alcohol	R
Potash	R
Potassium Acetate	R
Potassium Alum	R
Potassium Aluminum	R
Potassium Bicacbonate	R
Potassium Bichromate	R
Potassium Bisulfate	R
Potassium Bitartrate	R
Potassium Borate	R
Potassium Bromate	R
Potassium Bromide	R
Potassium Carbonate	R
Potassium Chlorate	R
Potassium Chloride	R
Potassium Chromate	R
Potassium Citrate	R
Potassium Cyanide	R
Potassium Dichromate	R
Potassium Ethyl Xanthate	---
Potassium Ferricyanide	R
Potassium Ferroycanide	R
Potassium Fluoride	R
Potassium Hydrogen Phosphate	R
Potassium Hydrogen Phthalate	R
Potassium Hydroxide	R
Potassium Hyprochlorite	R
Potassium Iodate	R
Potassium Iodide	R
Potassium Nitrate	R
Potassium Nitrite	R
Potassium Perborate	R
Potassium Perchlorate	R
Potassium Permanganate 10%	R
Potassium Permanganate 25%	R
Potassium Persulfate	R
Potassium Phosphate	R
Potassium Sodium Tartrate	R
Potassium Sulfate	R
Potassium Sulfide	R
Potassium Sulfite	R
Potassium Thiocyanate	R
Propane	R
Propargyl Alcohol	R
Propionic Acid	R
Propyl Acetate	---
Propyl Alcohol	R
N-Propyl Bromide	---
Propylene Dichloride	N
Propylene Glycol	C
Propylene Oxide	R
Pyridine	R
Pyrogallic Acid	R
Pyrrole	R
Q	
Quinine Sulfate	R
Quinine Chloride Dihydrate	R
Quinone	---
R	
Rayon Coagulating Bath	R
Rennin	R
Resazurin	R
Ringers Solution	R
Rose Bengal Acid Red 94	R
S	
Safranin O	R
Salicylaldehyde	N
Salicylic Acid	R
Selenic Acid, Aq.	R
Silicic Acid	R
Silicone Oil	R
Silver Acetate	R
Silver Chloride	R
Silver Cyanide	R
Silver Nitrate	R
Silver Sulfate	R
Soaps	R
Sodium Acetate	R
Sodium Alum	R
Sodium Aluminate	R
Sodium Arsenate	R
Sodium Benzoate	R
Sodium Bicarbonate	R
Sodium Bichromate	R
Sodium Bisulfate	R
Sodium Bisulfite	R
Sodium Borate	R
Sodium Bromide	R
Sodium Carbonate	R
Sodium Chlorate	R
Sodium Chloride	R
Sodium Chlorite	R
Sodium Chromate	R
Sodium Citrate	R
Sodium Cyanide	R
Sodium Dichromate	R
Sodium Diphenylamine Sulfonate	R
Sodium Dithionite	R
Sodium Ferricyanide	R
Sodium Ferrocyanide	R
Sodium Fluoride	R
Sodium Hexametaphosphate	R
Sodium Hydroxide 15%	R
Sodium Hydroxide 30%	R
Sodium Hydroxide 50%	R
Sodium Hydroxide 70%	R
Sodium Hypochlorite	R
Sodium Iodate	R
Sodium Iodide	R
Sodium Metabisulfite	R
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 Sulfite	R
Sodium	R
Sodium Thiousulphate	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	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
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

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