

***Ocean*TUFF™**

Marine Drainage Systems

***One Product -
Many Applications***

TECHNICAL INFORMATION & INSTALLATION GUIDE

August 1, 2017

SUPERSEDES ALL PREVIOUS EDITIONS



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www.spearsmfg.com

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OceanTUFF™ CPVC Technical Information & Installation Guide

This manual provides basic technical information, dimensions and installation guidelines for Spears® **OceanTUFF™** CPVC Marine Drainage System that is designed for black and gray water marine drainage and chemical waste drainage system applications. This unique product developed by Spears® has been awarded a U.S. Patent, No. 7,178,557 and is manufactured to ASTM F 2618 *Standard Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Fittings for Chemical Waste Drainage Systems* developed for this system. Spears® **OceanTUFF™** CPVC Marine Drainage Systems carries a limited Lifetime Warranty. Please contact Spears® Technical Services for additional information not covered.

Marine & Off-Shore Applications

CPVC plastic piping products are gaining acceptance for use in non-essential marine applications due to their lighter weight, corrosion resistance and low flame, smoke and toxicity properties. The **OceanTUFF™** system is assembled using a one-step cement to aid in a faster cleaner installation process.- using simple readily available joining tools instead of bulky expensive machinery.

Drainage Applications

Spears® **OceanTUFF™** CPVC products can be used in a broad variety of dedicated waste applications with proper evaluation of waste medium and service conditions. Among its many uses include Black & Gray water systems, Saltwater and Fresh water washdown piping – all locations, sanitary & galley drains in most spaces (except cargo pump room and cargo tanks) overboard scupper and discharge lines (must have remote closure on overboard skin valves) and system venting. Please contact Spears Technical Services to check your application suitability.

Independent Product Certifications and Approvals

Spears® **OceanTUFF™** CPVC Marine Drainage System is sold as a complete system of pipe, fittings and solvent cement and manufactured to ASTM F2618, Standard Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Fittings for Chemical Waste Drainage Systems. Conformance of Spears® **OceanTUFF™** CPVC pipe, fittings, and solvent cement to this standard and other approvals are independently (3rd party) tested, evaluated and certified by tNSF International. All approvals are routinely monitored through an ongoing program of periodic inspection and testing by the certifying/approving agency.

- **American Bureau of Shipping (ABS)** Type Approved for use in marine and off-shore applications in nominal pipe sizes 1-1/2" through 12". Meets IMO International Code for Application of Fire Test Procedures, Annex 1, Part 5 for Surface Flammability (A.653), Suitable for Marine & Offshore Applications for non-essential Systems including Fresh Water, Sea Water, Potable Water, Drains, Sanitary, Vents, and Brine in Services requiring no Fire Endurance Testing, no Smoke and Toxicity Testing or Electrical Conductivity Testing. Piping to be used in non-hazardous areas only.

Type Approval details and restrictions are specified in ABS Certificate # 15-HS1440412-PDA available on the ABS website at www.eagle.org.

- **US Coast Guard (USCG)** approved for use in non-essential areas of USCG inspected marine vessels in nominal pipe sizes 1-1/2" through 12". Meets the low flame, smoke and toxicity requirements of the 2010 FTP Code Annex 1, Parts 2 and 5, and may be installed in concealed spaces in accommodation, service and control spaces without meeting the additional requirements of 46 CFR 56.60-25 (a) (2).

Approval details and restrictions are specified in USCG file # 164.141/45/0 available on the USCG website at www.cgmix.uscg.mil

- **NSF International** - Certified for marine drainage end use by NSF International in accordance with ASTM F 2618, *Standard Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Fittings for Chemical Waste Drainage Systems* (NSF®-cw). See Spears® NSF® Official Listings at www.nsf.org.

- **NSF ORD 10222 For Use in Canada** - Certified for use in Canada by NSF International under the Standards Council of Canada as an Other Recognized Document (ORD) that defines the product specific requirements for Chlorinated Poly Vinyl Chloride (CPVC) Chemical Waste Systems, in accordance with ASTM F 2618 requirements.

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Typical Physical Properties of Spears® OceanTUFF™ 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)	ASTM D 256	
Fittings		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
Solvent Cement		
	ASTM F 2618/ASTM F 493	Heavy Body; Mustard Yellow Color

Pipe & Fittings

Spears® OceanTUFF™ 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*.

Schedule 40 CPVC Pipe Dimensions (inch)

Pipe Diameter	1-1/2	2	3	4	6	8	10	12
Avg. O.D.	1.900	2.375	3.500	4.500	6.625	8.625	10.750	12.750
Avg. I.D.	1.592	2.049	3.042	3.998	6.031	7.943	9.976	11.889
Min. Wall	.145	.154	.216	.237	.280	.322	.365	.406

OceanTUFF™ CPVC fitting configurations are produced to applicable DWV patterns of ASTM D3311, *Standard Specification for Drain, Waste, and Vent (DWV) Plastic Fittings Patterns*, plus various specialty patterns and manufactured specified configurations not included in ASTM D3311. All drainage fittings with 90° angles (sanitary tees, elbows, etc.) have socket pitch to maintain approximately 1/4" per foot drainage. OceanTUFF™ CPVC pipe is produced to dimensions specified in ASTM F 2618.

Expansion & Contraction

Spears® OceanTUFF™ CPVC products, like all piping materials, expand and contract with changes in temperature.

Example: 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. 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:

$$e = 3.2 \times 10^{-5} \text{ in./in. } ^\circ\text{F}$$

L = Length of Run in feet

ΔT = Temperature Change in °F

Example:

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

$$\Delta L = 12eL (\Delta T)$$

$$\Delta L = 12 \times .000032 \times 50 \times 40$$

$$\Delta L = .768 \text{ inches}$$

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



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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® OceanTUFF™ CPVC pipe and fittings are easily joined using Spears® CG-OT5 One-Step Solvent Cement that has been specially formulated for marine drainage 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® CG-OT5 is a “one-step” cement and does not require the use of primer. Spears® OceanTUFF™ 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 other piping systems.

Solvent Cement Joints – Store solvent cement cans 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.

1. Cut pipe square, deburr and chamfer (bevel 10° to 15°). Clean and dry joining surfaces.
2. Check dry fit. For interference fit, pipe should push 1/4 to 3/4 way into fitting snugly.
3. Use a suitable applicator at least 1/2 size of pipe diameter; for larger sizes use brush or roller.
4. Apply a full even layer of cement on the pipe equal to the socket depth. Coat the fitting socket with a medium layer. Avoid excess and puddling. If necessary, apply a second full layer on pipe.
5. Assemble while cement is wet. If not wet, recoat all parts before assembly. Assure pipe bottoms into fitting socket using a 1/8 to 1/4 turn 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. In moist or humid conditions (relative humidity above 60%) allow 50% more cure time.

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.

Average Number of Joints per Quart of CG-OT5 One-Step Cement

Pipe Diameter	1-1/2	2	3	4	6	8	10	12
No. of Joints	90	60	40	30	10	5	2-3	1-2

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

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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 over tightening. **DO NOT** use conventional pipe wrenches that can damage plastic fittings.

If a tape sealant is used:

1. Use TFE tape no less than 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	

OceanTUFF™ Transitions To Other Systems – Spears® **OceanTUFF™** Marine Drainage System provides a complete line of transition fittings for use with other marine drainage piping materials for system additions and retrofits. Please contact Spears® for special construction of any system transition connection needs not specified.

CG-P092 GripLoc™ Transition Coupling: Hub X GripLoc™ Compression. Allows connection of **OceanTUFF™** to Polypropylene, PVDF pipe or other IPS Systems and solvent cement socket connection to CPVC system.

CG-P093 Elastomer Transitions Coupling: IPS Clamp Joint X Clamp Joint. Allows mechanical connection of Spears® **OceanTUFF™** 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.

CG-P096 Grooved Coupling Adapter: Groove X Socket. Allows connection of the Spears® **OceanTUFF™** 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.

CG-P099 Transition Coupling: Hub X Compression. Allows connection of Spears® **OceanTUFF™** to other piping systems 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® Manufacturing Company.

Flanges: Spears® provides a full range of flange connections including One-piece hub, Van Stone hub and Van Stone Spigot and Blind connections.



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Support Spacing

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

Split ring pipe hangers and/or wrap around type brackets with adequate corrosion resistance can be used. However, hangers must **NOT** be used to pull the piping system into position or over tightened to either restrict necessary movement or cut into pipe. Hangers should be smooth, free of burrs and provide at least 1/2" load-bearing surface.

Systems should be supported in accordance with manufacturers recommendations and standard marine design protocol. 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. 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
Hanger Spacing	6	6	7	7-1/2	8-1/2	9	10	11-1/2

System Pressure Testing

Spears® OceanTUFF™ CPVC systems should be tested with water as follows, or according to class society rules and regulations. Test only after sufficient joint cure (see "Recommended Set & Cure Time"). The system may be tested in its entirety or isolated in sections for testing.

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

Drain each section after inspection. Any leaking solvent cement joints should be cut from the system, replaced and retested after proper joint cure.

Check any leaking mechanical joints for proper installation, applicable tightening, and presence of any debris in the joint. Reassemble and retest

Supplemental Equipment Not Specified in this Manual

A variety of supplemental equipment including custom manifolds can be built to customer specifications. Spears® can custom fabricate virtually any Spears® OceanTUFF™ system component. Contact Spears® for additional needs or a custom quotation

System Integrity

Spears® OceanTUFF™ 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® OceanTUFF™ components should be used in order to ensure a sound piping system. Substitution of other products for Spears® OceanTUFF™ 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® OceanTUFF™ system products.

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Exposure to Weather and Ultra Violet Rays

In open deck and exposed applications where CPVC products may come in contact with ultra-violet radiation from the sun or other weather related exposure, Spears® recommends painting the CPVC system using a light colored or reflective water-based latex or acrylic paint. A water-based paint will protect the material from the effects of ultra-violet rays and aid in controlling expansion and contraction. It is advisable to consult the paint manufacturer for specific product availability and application recommendations.

Sample Engineering Specification

Spears® **OceanTUFF™** Marine Drainage System for sanitary and chemical waste shall be manufactured from CPVC Type IV, minimum ASTM Cell Classification 23447 per ASTM D1784 and available in sizes 1-1/2" – 12". System pipe and fittings shall be manufactured in accordance with ASTM F2618 and certified by NSF International for use in corrosive waste systems. System shall be approved by the United States Coast Guard and meet flame spread and smoke and toxicity requirements of the 2010 FTP code annex 1, Parts 2 and 5 and IMO FTP Code Annex 1, Part 5 for Surface Flammability. All fittings shall be CPVC drainage patterns meeting the applicable requirements of ASTM D3311 or the manufacturer's 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 chemicals and manufactured in accordance with ASTM F2618 and F493. Spears® **OceanTUFF™** Marine Drainage System shall be approved by the American Bureau of Shipping (ABS) and meet IMO FTP Code Annex 1, Part 5 for Surface Flammability (IMO Resolution A.653 (16) for Low Flame Spread) All pipe, fittings, and cement shall be supplied together as a complete system with a Limited Lifetime Warranty, as Spears® **OceanTUFF™** CPVC Marine Drainage System manufactured by Spears® Manufacturing Company.

Deck & Bulkhead Penetrations

Spears® marine products can be installed in deck and bulkhead penetrations according to their respective approval requirements. There are many marine firestop companies that can provide suitable bulkhead penetration systems that are compatible with CPVC piping. Be sure to check fire stop system and CPVC material compatibility with the fire stop manufacturer. For more information please contact our Technical Support Department at (818) 364-1611.

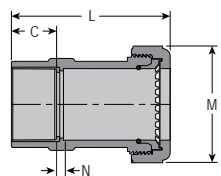
Where it is intended to pass plastic pipes through bulkheads or decks, the original integrity of watertight bulkheads and decks is to be maintained at the location. If the bulkhead or deck is also a fire division and destruction by fire of plastic pipes may cause inflow of liquid from a tank, then a metallic shutoff valve operable from above the bulkhead deck is to be fitted at the bulkhead or deck.

Note: Spears® marine approved products have not been tested for "A" or "B" class divisions in accordance with IMO Resolution A.754(18), Recommendation on Fire Resistance Tests for "A", "B" and "F" Class Divisions.

OceanTUFF™ Dimensional Information

P092 GripLoc™ Transition Coupling

H x GripLoc™ Compression

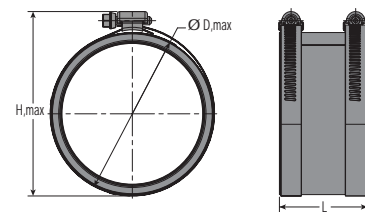


For connection to PP, PVDF or other IPS systems.

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

P093 FKM Transition Coupling

IPS Clamp Joint x IPS Clamp Joint



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



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P096 Grooved Coupling
Grv x Soc

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

P100 Coupling
H x H

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

P099 Transition Coupling
H x Compression

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

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

P101 Female Adapter
FPT x H

Part Number	Size	N
CG-P101-015C	1-1/2	1/4
CG-P101-020C	2	1/4
CG-P101-030C	3	5/16
CG-P101-040C	4	3/8
CG-P101-060C	6	15/32
CG-P101-080C	8	1/4

P099 Transition Coupling - Bolted Style
H x Compression

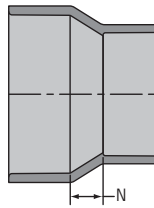
Part Number	Size	L	M
CG-P099-080C	8	11	8-19/32

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P102 Inserter Reducer

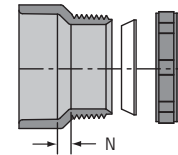
H x H



Part Number	Size	N
CG-P102-251C	2x1-1/2	11/16
CG-P102-337C	3x1-1/2	1-3/32
CG-P102-338C	3x2	15/16
CG-P102-420C	4x2	1-3/4
CG-P102-422C	4x3	15/16
CG-P102-530C	6x3	1-15/16
CG-P102-532C	6x4	1-7/16
CG-P102-582C	8x4	2-11/32
CG-P102-585C	8x6	1-11/32
CG-P102-624C	10x4	3-3/8
CG-P102-626C	10x6	2-3/16
CG-P102-628C	10x8	1-9/32
CG-P102-666C	12x6	3-9/32
CG-P102-668C	12x8	2-1/4
CG-P102-670C	12x10	1-11/32

P104X Trap Adapter - Female

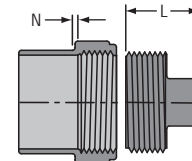
H x Slip w/ Chrome Nut & Washer



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

P105X Cleanout Adapter with Square Head Plug

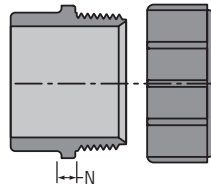
Spig



Part Number	Size	L	N
CG-P105X-015C	1-1/2	1-3/8	5/32
CG-P105X-020C	2	1-5/16	1/4
CG-P105X-030C	3	1-25/32	11/32
CG-P105X-040C	4	1-7/8	1/4
CG-P105X-060C	6	1-15/16	11/32
CG-P105X-080C	8	2-1/16	13/32

P103P Trap Adapter - Male

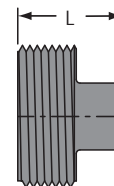
Spig x Slip with Plastic Nut



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

P106 Square Head Cleanout Plug

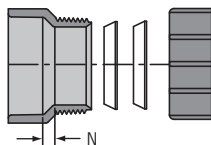
MPT



Part Number	Size	L
CG-P106-015C	1-1/2	1-3/8
CG-P106-020C	2	1-5/16
CG-P106-030C	3	1-25/32
CG-P106-040C	4	1-7/8
CG-P106-060C	6	1-15/16
CG-P106-080C	8	2-1/16

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

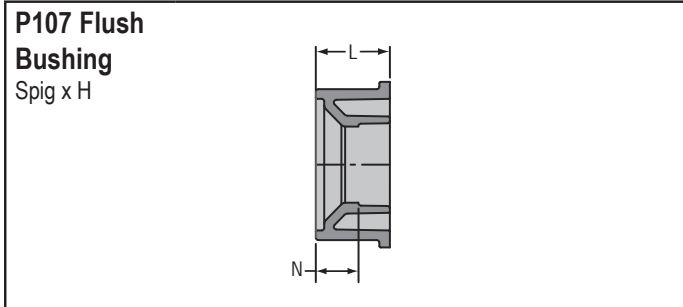
H x Slip w/Plastic Nut



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

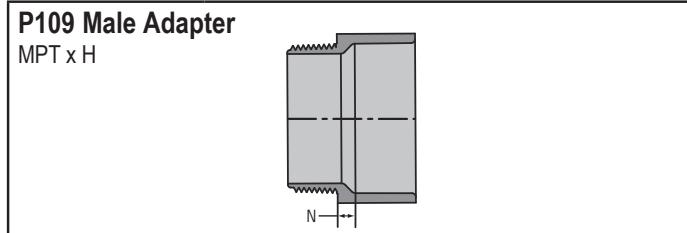


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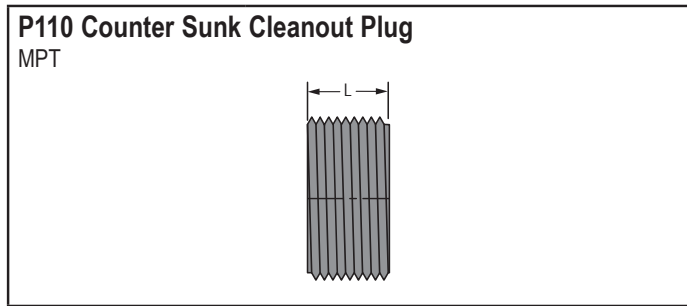


Part Number	Size	L	N
CG-P107-251C	2x1-1/2	1-1/16	7/32
CG-P107-337C	3x1-1/2	1-3/4	1
CG-P107-338C	3x2	1-3/4	31/32
CG-P107-420C	4x2	2	1-3/16
CG-P107-422C	4x3	2	1/2
CG-P107-530C ¹	6x3	3-23/32	2-11/32
CG-P107-532C	6x4	3-7/16	1-11/16
CG-P107-582C	8x4	4-9/16	2-13/16
CG-P107-585C	8x6	4-19/16	1-9/16
CG-P107-623C ¹	10x3	6-5/16	4-13/16
CG-P107-624C ¹	10x4	6	4-1/4
CG-P107-628C	10x8	5-11/32	1-5/16
CG-P107-664C ¹	12x4	6-15/16	5-5/32
CG-P107-666C ¹	12x6	6-3/4	3-11/16
CG-P107-668C	12x8	6-5/16	2-5/16
CG-P107-670C	12x10	6-5/16	1-5/16

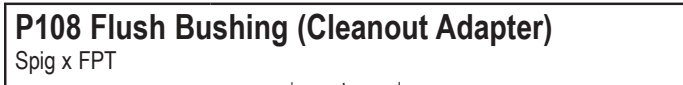
¹ Sized with Bushing



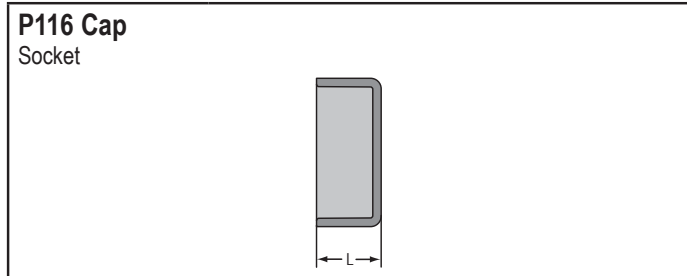
Part Number	Size	N
CG-P109-015C	1-1/2	3/16
CG-P109-020C	2	3/16
CG-P109-030C	3	3/8
CG-P109-040C	4	3/8
CG-P109-060C	6	11/16



Part Number	Size	L
CG-P110-015C	1-1/2	5/8
CG-P110-020C	2	5/8
CG-P110-030C	3	3/4
CG-P110-040C	4	7/8
CG-P110-060C	6	31/32



Part Number	Size	L	N
CG-P108-212C	1-1/2x1-1/4	7/8	3/16



Part Number	Size	L
CG-P116-015C	1-1/2	15/16
CG-P116-020C	2	1
CG-P116-030C	3	1-3/4
CG-P116-040C	4	2
CG-P116-060C	6	3-9/32
CG-P116-080C	8	6-3/8
CG-P116-100CF	10	3-3/4
CG-P116-120CF	12	4-1/8

OceanTUFF™ CPVC Technical Information & Installation Guide



P130 Repair Coupling

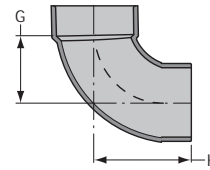
H x H



Part Number	Size	L
CG-P130-015C	1-1/2	1-17/32
CG-P130-020C	2	1-21/32
CG-P130-030C	3	3-7/32
CG-P130-040C	4	3-13/16
CG-P130-060C	6	6-3/8
CG-P130-080C	8	8-5/16
CG-P130-100C	10	10-7/16

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

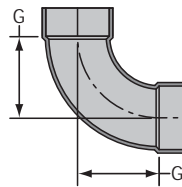
H x Spig



Part Number	Size	G	H
CG-P302-015C	1-1/2	1-9/16	2-13/32
CG-P302-020C	2	2-5/16	3-1/4
CG-P302-030C	3	3-1/8	4-19/32
CG-P302-040C	4	3-15/16	5-5/8
CG-P302-060C	6	5	8-11/32
CG-P302-080C	8	6	10-1/2
CG-P302-100C	10	9-29/32	15-3/8
CG-P302-120C	12	10-15/16	17-3/8

P300 1/4 Bend (90° Ell)

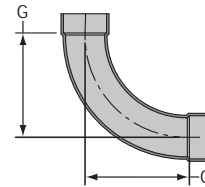
H x H



Part Number	Size	G
CG-P300-015C	1-1/2	1-11/16
CG-P300-020C	2	2-5/16
CG-P300-030C	3	3-1/16
CG-P300-040C	4	3-7/8
CG-P300-060C	6	5
CG-P300-080C	8	6
CG-P300-100C	10	9-29/32
CG-P300-120C	12	10-29/32

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

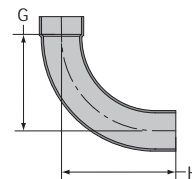
H x H



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

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

H x Spig



Part Number	Size	G	H
CG-P309-015C	1-1/2	2-3/4	3-11/32
CG-P309-020C	2	3-9/32	4-3/32
CG-P309-030C	3	3-15/16	5-3/4
CG-P309-040C	4	5-1/32	6-15/32
CG-P309-060C	6	8-31/32	11-29/32



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P319 1/6 Bend (60° EII)
H x H

Part Number	Size	G
CG-P319-015C	1-1/2	1-1/16
CG-P319-020C	2	1-3/8
CG-P319-030C	3	1-11/16
CG-P319-040C	4	2-5/32
CG-P319-060C	6	4-9/16
CG-P319-120C	12	4-15/16

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

Part Number	Size	G	H
CG-P323-015C	1-1/2	1-1/8	1-3/4
CG-P323-020C	2	1-1/2	2-3/16
CG-P323-030C	3	1-3/4	3-1/4
CG-P323-040C	4	2-3/16	3-15/16
CG-P323-060C	6	1-29/32	5-1/16
CG-P323-080C	8	3-1/8	6-1/2
CG-P323-100C	10	2-5/8	10-5/8
CG-P323-120C	12	3-3/32	12-7/8

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

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

P324 1/16 Bend (22-1/2° EII)
H x H

Part Number	Size	G
CG-P324-015C	1-1/2	1/2
CG-P324-020C	2	11/16
CG-P324-030C	3	13/16
CG-P324-040C	4	1
CG-P324-060C	6	1-5/16
CG-P324-080C	8	1-1/2
CG-P324-100CF	10	2-1/16
CG-P324-120CF	12	2-1/4

P321 1/8 Bend (45° EII)
H x H

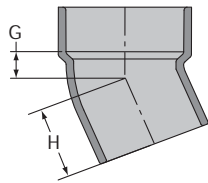
Part Number	Size	G
CG-P321-015C	1-1/2	1-1/8
CG-P321-020C	2	1-1/2
CG-P321-030C	3	1-3/4
CG-P321-040C	4	2-3/16
CG-P321-060C	6	2-1/16
CG-P321-080C	8	2-1/16
CG-P321-100C	10	2-19/32
CG-P321-120C	12	3-1/8

OceanTUFF™ CPVC Technical Information & Installation Guide



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

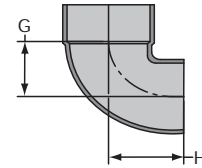
H x Spig



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

P333 Vent Ell, Street

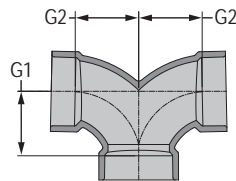
H x Spig



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

P327 Double 1/4 Bend (3 Way Ell)

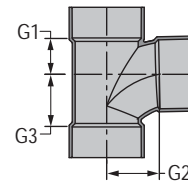
All Hub



Part Number	Size	G1	G2
CG-P327-015C	1-1/2	1-3/4	1-3/4
CG-P327-020C	2	2-5/16	2-5/16
CG-P327-030C	3	3-1/16	3-1/16
CG-P327-040C	4	3-29/32	3-29/32

P400 Sanitary Tee

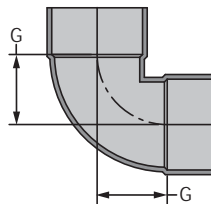
All Hub



Part Number	Size	G1	G2	G3
CG-P400-015C	1-1/2	25/32	1-9/16	1-9/16
CG-P400-020C	2	1-11/32	2-5/16	2-5/16
CG-P400-030C	3	1-13/16	2-7/8	2-7/8
CG-P400-040C	4	2-1/32	3-11/16	3-11/16
CG-P400-060C	6	3-7/16	5-1/32	5-1/32
CG-P400-080C	8	4-13/32	6-1/16	6-1/16
CG-P400-100C	10	5-17/32	9-31/32	9-29/32
CG-P400-120C	12	6-1/2	10-31/32	11-1/32

P331 Vent Ell

H x H



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



OceanTUFF™ CPVC Technical Information & Installation Guide

P401 Sanitary Tee, Reducing
All Hub

Part Number	Size	G1	G2	G3
CG-P401-241C	2x1-1/2x1-1/2	1-3/16	1-15/16	2-3/16
CG-P401-251C	2x1-1/2	1-3/16	1-15/16	2-1/4
CG-P401-257C	2x1-1/2x2	1-3/8	2-5/16	2-5/16
CG-P401-337C	3x3x1-1/2	15/16	1-3/4	2-1/2
CG-P401-338C	3x3x2	1-5/32	2-5/32	2-7/8
CG-P401-419C	4x1-1/2	1-1/16	2	3-1/4
CG-P401-420C	4x4x2	7/8	1-27/32	3-5/32
CG-P401-422C	4x4x3	1-13/16	2-15/16	3-9/16
CG-P401-530CF	6x3	3-1/4	7	9-11/16
CG-P401-532C	6x4	2-1/8	3-19/32	4-11/16
CG-P401-578CF	8x2	3-1/2	6-1/4	8-7/16
CG-P401-582C	8x4	4-17/32	5-7/8	8-7/8
CG-P401-585CF	8x6	3-7/8	11-3/4	12-7/8
CG-P401-624CF	10x4	4-5/16	9-5/16	12-1/8
CG-P401-626CF	10x6	4-15/16	12-13/16	13-7/8
CG-P401-628CF	10x8	5-1/4	15-3/4	16-3/16
CG-P401-666CF	12x6	4-7/8	12-5/8	14-7/8
CG-P401-668CF	12x8	5	15-1/8	17-1/8

P403 Sanitary Tee, Street
S x H x H

Part Number	Size	G1	G2	H
CG-P403-015C	1-1/2	13/16	1-17/32	2-7/16
CG-P403-020C	2	1-3/8	2-5/16	3-3/16
CG-P403-030C	3	1-13/16	3-1/16	4-1/2
CG-P403-040C	4	2-1/4	3-7/8	5-5/8
CG-P403-060C	6	3-3/4	4-1/4	7-1/2
CG-P403-080C	8	4-3/8	5-31/32	9-13/32
CG-P403-100C	10	5-19/32	9-1/2	14-19/32
CG-P403-120C	12	6-15/32	11-1/32	16-9/32

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

Part Number	Size	G1	G2	H
CG-P404-241C	2x1-1/2x1-1/2	1-7/32	2-7/32	2-9/16
CG-P404-251C	2x1-1/2	1-9/32	2-3/16	2-1/2
CG-P404-337C	3x3x1-1/2	13/16	2-15/32	2-15/16
CG-P404-338C	3x3x2	1-1/16	2-3/4	3-7/32

P428 Double Sanitary Tee
All Hub

Part Number	Size	G	G1	G2
CG-P428-015C	1-1/2	1-11/16	31/32	1-21/32
CG-P428-020C	2	2-1/4	1-9/32	2-1/4
CG-P428-030C	3	3	1-3/4	3-1/32
CG-P428-040C	4	3-3/4	2-3/8	2-11/16

P429 Double Sanitary Tee, Reducing
All Hub

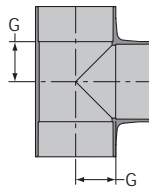
Part Number	Size	G1	G2	G3
CG-P429-241C	2x1-1/2x1-1/2x1-1/2	1-3/16	1-7/8	2-1/16
CG-P429-251C	2x2x1-1/2x1-1/2	1-1/8	1-7/8	2-1/8
CG-P429-337C	3x3x1-1/2x1-1/2	15/16	1-3/4	4
CG-P429-338C	3x3x2x2	1-3/16	2-1/8	2-7/8
CG-P429-419C	4x4x1-1/2x1-1/2	1-1/16	2	5-1/16
CG-P429-420C	4x4x2x2	1-1/8	2-1/16	5-1/16
CG-P429-422C	4x4x3x3	1-3/4	3	5-1/16
CG-P429-532CF	6x6x4x4	3-5/16	8-7/16	10-3/16

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P441 Vent Tee

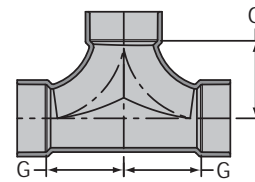
All Hub



Part Number	Size	G
CG-P441-015C	1-1/2	1-5/32
CG-P441-020C	2	1-1/2
CG-P441-030C	3	1-29/32
CG-P441-040C	4	2-3/8
CG-P441-060C	6	3-5/8
CG-P441-080C	8	4-1/2

P448 2-Way Cleanout

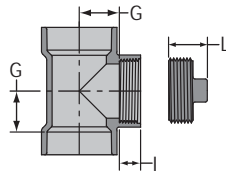
All Hub



Part Number	Size	G
CG-P448-030C	3	4
CG-P448-040C	4	4-13/16

P444X Cleanout Tee w/Plug

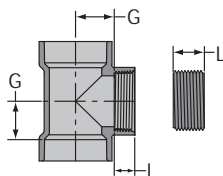
H x H x FPT



Part Number	Size	G	I	L
CG-P444X-015C	1-1/2	1-3/16	5/8	1-3/8
CG-P444X-020C	2	1-1/2	13/16	1-17/32
CG-P444X-030C	3	1-7/8	3/4	1-25/32
CG-P444X-040C	4	2-7/16	7/8	1-7/8
CG-P444X-060C	6	3-1/2	1-1/4	1-15/16
CG-P444X-080C	8	4-13/16	1-1/8	2-1/16

P445X Cleanout Tee with Counter Sunk Plug

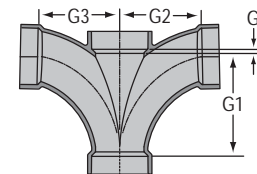
H x H x FPT



Part Number	Size	G	I	L
CG-P445X-015C	1-1/2	1-1/8	5/8	5/8
CG-P445X-020C	2	1-13/32	5/8	5/8
CG-P445X-030C	3	1-7/8	3/4	3/4
CG-P445X-040C	4	2-7/16	7/8	7/8
CG-P445X-060C	6	3-1/2	1	31/32
CG-P445X-080CF	8	7-5/16	1	1-1/2
CG-P445X-100CF	10	9	1	1-1/2
CG-P445X-120CF	12	9-1/4	1	1-1/2

P500 Double Fixture Fitting

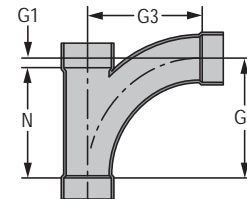
All Hub



Part Number	Size	G	G1	G2	G3
CG-P500-020C	2x2x2x2	9/16	3-9/16	3-5/16	3-5/16
CG-P500-030C	3x3x3x3	1/2	6-9/32	4-29/32	4-29/32
CG-P500-241C	2x1-1/2x1-1/2x1-1/2	3/8	3-1/8	2-7/8	2-7/8
CG-P500-251C	2x2x1-1/2x1-1/2	1/8	3-1/4	2-25/32	2-25/32
CG-P500-338C	3x2x3x3	1/2	6-9/32	4-7/8	4-7/8

P501 Combination Wye and 1/8 Bend (Long Turn Tee Wye)

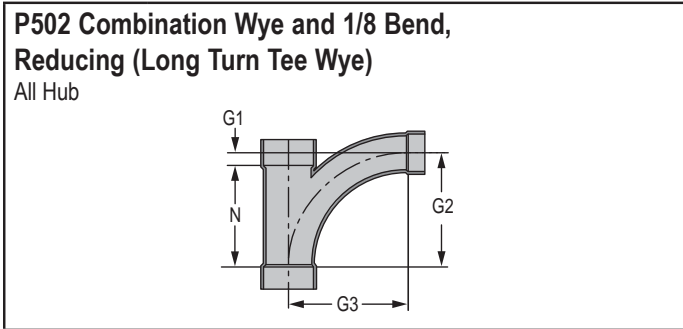
All Hub



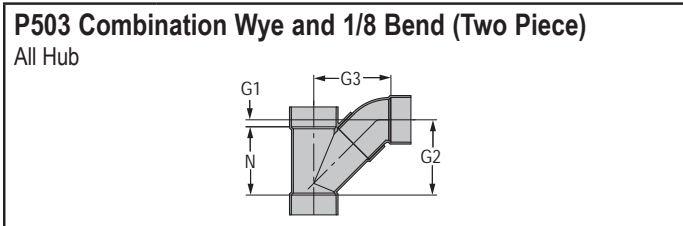
Part Number	Size	G1	G2	G3	N
CG-P501-015C	1-1/2	13/32	3-7/8	3-7/8	3-15/32
CG-P501-020C	2	11/16	5-1/8	5-1/8	4-7/16
CG-P501-030C	3	1-1/16	7-9/16	7-9/16	6-1/2
CG-P501-040C	4	1-1/2	10	10	8-1/2



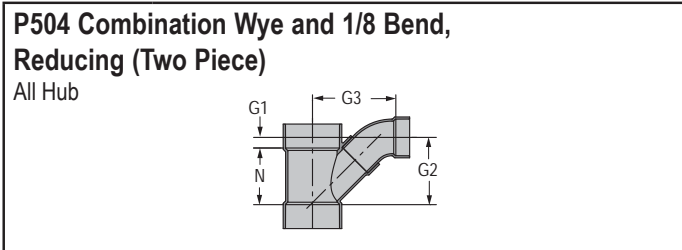
OceanTUFF™ CPVC Technical Information & Installation Guide



Part Number	Size	G1	G2	G3	N
CG-P502-251C	2x2x1-1/2	7/16	3-15/16	4-3/16	3-1/2
CG-P502-337C	3x3x1-1/2	7/16	3-15/16	4-13/16	3-1/2
CG-P502-338C	3x3x2	11/16	5-1/8	5-11/16	4-1/2
CG-P502-420C	4x4x2	11/16	5-1/4	6-3/16	4-9/16
CG-P502-422C	4x4x3	15/16	7-3/8	8-1/8	6-7/16
CG-P502-578CF	8x8x2	7/8	8-7/8	10	8

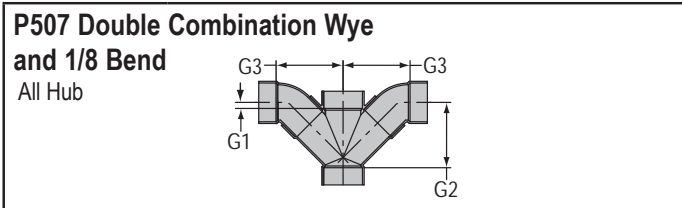


Part Number	Size	G1	G2	G3	N
CG-P503-040C	4	7/8	9-3/16	9-1/2	8-1/4
CG-P503-060C	6	31/32	10-31/32	11-11/32	10
CG-P503-080C	8	1-1/2	16	16	14-1/2
CG-P503-100C	10	2-1/2	21-7/8	17-15/16	16-9/16
CG-P503-120C	12	2-1/16	21-1/16	22-1/16	19



Part Number	Size	G1	G2	G3	N
CG-P504-241C	2x1-1/2	3/32	4-7/16	4-15/32	4-5/16
CG-P504-422C	4x3	1	7-5/8	8-5/16	5-9/16
CG-P504-528C ¹	6x2	15/32	7-9/16	8-27/32	7-3/32
CG-P504-530C	6x3	5/8	7-1/4	8-29/32	7-3/32
CG-P504-532C	6x4	1-5/16	8-3/32	10-3/32	6-27/32
CG-P504-580C	8x3	1-1/16	9-1/8	10-3/8	7-11/16
CG-P504-582C	8x4	1-1/4	9-1/4	11-1/8	8
CG-P504-585C	8x6	1	11-5/16	12-7/16	10-7/16
CG-P504-623C ¹	10x3	2-3/8	11-1/16	13-15/16	11-1/16
CG-P504-624C	10x4	1-3/8	12-3/16	14-5/8	10-13/16
CG-P504-626C	10x6	2-1/2	11-3/4	14-1/16	10-13/16
CG-P504-628C	10x8	2-1/2	14-1/2	15-1/2	13-9/16
CG-P504-663C	12x3	1-9/32	20-11/16	19-3/16	19-7/16
CG-P504-664C	12x4	2	21	20-1/2	19
CG-P504-666C	12x6	1-13/16	20-13/16	20-1/8	19
CG-P504-668C ¹	12x8	3	20-1/8	19-1/8	19-1/8
CG-P504-670C	12x10	3	19-13/16	19-1/2	19-1/8

¹ Sized with Bushing

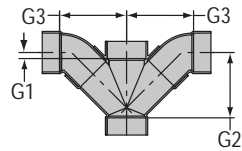


Part Number	Size	G1	G2	G3
CG-P507-020C	2	9/16	5-7/16	5-9/16
CG-P507-030C	3	27/32	7-11/32	7-1/2
CG-P507-040C	4	7/8	9-5/32	9-7/16
CG-P507-060C	6	1	11-1/32	11-13/32
CG-P507-080CF	8	1/8	19-15/16	16-1/8

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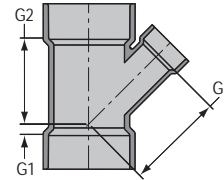
P507 Double Reducing Combination Wye and 1/8 Bend All Hub



(Continued)

Part Number	Size	G1	G2	G3
CG-P507-251C	2x1-1/2	3/8	4-21/32	4-23/32
CG-P507-338C	3x2	29/32	5-3/4	6-1/2
CG-P507-420C	4x2	7/8	5-7/8	7-1/32
CG-P507-422C	4x3	1-1/16	7-1/2	8-1/8
CG-P507-530C	6x3	1-1/32	10-7/8	10-7/8
CG-P507-532C	6x4	1-23/32	11-5/8	12-5/32
CG-P507-578CF	8x2	1-5/8	9-3/4	9-1/16
CG-P507-582CF	8x4	3/4	12-3/4	12-1/8
CG-P507-585CF	8x6	5/8	15-5/8	13-9/16
CG-P507-624CF	10x4	1-1/4	13-5/8	13-1/8
CG-P507-626CF	10x6	1-11/16	17-3/4	14-9/16
CG-P507-628CF	10x8	3/4	21	17-3/16
CG-P507-668CF	12x8	1/2	20-1/2	18-1/8
CG-P507-670CF	12x10	9/16	23-1/2	20-3/16

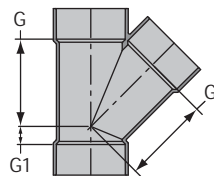
P601 45° Wye, Reducing All Hub



Part Number	Size	G1	G2	G3
CG-P601-241C	2x1-1/2x1-1/2	3/4	2-15/16	2-15/16
CG-P601-251C	2x2x1-1/2	13/16	3-15/32	3-17/32
CG-P601-257C	2x1-1/2x2	1	3-1/2	3-3/8
CG-P601-337C	3x3x1-1/2	1/2	3-25/32	4-3/8
CG-P601-338C	3x3x2	7/8	4-1/8	4-5/8
CG-P601-419C	4x4x1-1/2	3/8	3-9/32	4-3/8
CG-P601-420C	4x4x2	3/8	4-11/16	5-5/16
CG-P601-422C	4x4x3	1-1/16	5-9/16	6
CG-P601-530C	6x3	1-1/8	6	6-7/8
CG-P601-532C	6x4	23/32	6-3/16	7-1/8
CG-P601-580C	8x8x3	7/32	9-1/8	7-11/32
CG-P601-582C	8x8x4	3/8	7-5/8	8-5/8
CG-P601-585C	8x8x6	1	9-1/2	9-13/16
CG-P601-621C ¹	10x2	3/16	20-15/16	14-1/8
CG-P601-623C ¹	10x3	9/32	10-31/32	14-3/16
CG-P601-624C ¹	10x4	9/32	10-31/32	13-11/16
CG-P601-626C	10x10x6	9/32	10-31/32	11-31/32
CG-P601-663C ¹	12x12x3	3	16-3/16	22-7/8
CG-P601-664C ¹	12x12x 4	3	16-3/16	22-3/8
CG-P601-666C ¹	12x6	3	16-3/16	21-1/8
CG-P601-668C ¹	12x8	3-1/4	16-3/16	19
CG-P601-670C ¹	12x12x10	2-15/16	16-3/16	17-3/16

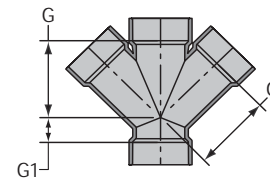
¹ Sized with Bushing

P600 45° Wye All Hub



Part Number	Size	G	G1
CG-P600-015C	1-1/2	2-7/8	1-3/32
CG-P600-020C	2	3-5/8	7/8
CG-P600-030C	3	5	1-5/8
CG-P600-040C	4	6-1/4	1-7/8
CG-P600-060C	6	8	1-3/8
CG-P600-080C	8	11-5/16	2
CG-P600-100C	10	14-1/32	2-7/16
CG-P600-120C	12	16-1/4	3-3/32

P611 Double Wye All Hub



Part Number	Size	G	G1
CG-P611-015C	1-1/2	2-7/8	1-1/8
CG-P611-020C	2	3-9/16	1-3/8
CG-P611-030C	3	4-15/16	1-5/8
CG-P611-040C	4	6-11/32	1-27/32
CG-P611-060C	6	8-5/16	1-25/32
CG-P611-080CF	8	14-5/16	5-5/8
CG-P611-100CF	10	17-1/4	6-9/16
CG-P611-120CF	12	20-1/16	7-5/16



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P612 Double Wye, Reducing
All Hub

Part Number	Size	G1	G2	G3
CG-P612-241C	2x1-1/2x1-1/2x1-1/2	25/32	3-3/8	4-3/16
CG-P612-251C	2x2x1-1/2x1-1/2	1-1/16	3-15/32	3-7/16
CG-P612-337C	3x3x1-1/2x1-1/2	1/2	3-3/4	4-5/16
CG-P612-338C	3x3x2x2	7/8	4-1/16	4-5/8
CG-P612-420C	4x4x2x2	3/8	4-5/8	5-17/32
CG-P612-422C	4x4x3x3	1-1/2	5-1/32	5-9/32
CG-P612-530C	6x3	3/16	6-11/16	7-15/16
CG-P612-532C	6x6x4x4	3/16	6-11/16	7-7/16
CG-P612-580CF	8x8x3x3	1-5/16	9-15/16	10-7/8
CG-P612-582CF	8x8x4x4	2-1/16	10-11/16	11-7/8
CG-P612-585CF	8x8x6x6	3-1/2	12-1/8	12-13/16
CG-P612-624CF	10x10x4x4	1-7/16	12-3/16	13-5/16
CG-P612-628CF	10x10x8x8	5-1/8	15-7/8	15-11/16
CG-P612-664CF	12x12x4x4	3/8	13-1/8	14-11/16

P704P Tail Piece Adapter
Spig x Slip w/Plastic Nut

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

P705R Running Trap
H x H

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

P700 Return Bend
H x H

Part Number	Size	G
CG-P700-015C	1-1/2	1-7/16
CG-P700-020C	2	2-3/8
CG-P700-030C	3	3
CG-P700-040C	4	3-7/16
CG-P700-060C	6	5
CG-P700-080C	8	6-1/8
CG-P700-100C	10	10
CG-P700-120C	12	11

P706X P-Trap
H x H

Part Number	Size	G	G1	G2
CG-P706X-015C	1-1/2	4-5/16	3-11/16	1-7/16
CG-P706X-020C	2	6-7/16	4-21/32	2-11/32
CG-P706X-030C	3	8-11/16	6-15/16	3-1/32
CG-P706X-040C	4	11-1/32	8-1/8	3-23/32
CG-P706X-060C	6	18-25/32	14-3/4	5-13/16
CG-P706X-080C	8	22	17	6-3/4
CG-P706X-100C	10	36-1/4	24-7/8	10
CG-P706X-120C	12	40-3/8	27-13/16	11

P707X P-Trap w/Cleanout
H x H

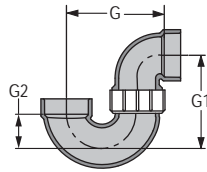
Part Number	Size	G	G1	G2
CG-P707X-015C	1-1/2	4-3/16	3-21/32	1-7/32

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

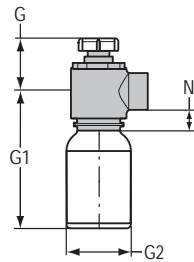
H x H



Part Number	Size	G	G1	G2
CG-P708P-015C	1-1/2	4-15/32	3-5/8	1-13/32
CG-P708P-020C	2	7-1/4	4-3/8	2-13/32

P712P Jar Trap w/Tail Piece Adapter

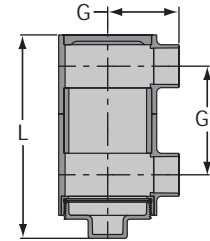
Slip x H
32oz. PP Jar



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

P720 Drum Trap

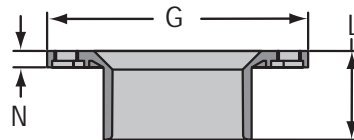
H x H



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

P815 - Closet Flange

Soc/Spig

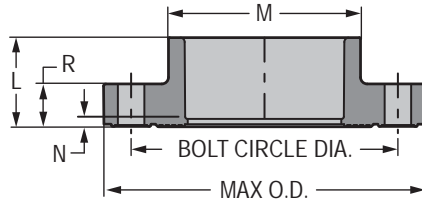


Part Number	Size	G	L	N
CG-P815-040C	4x4/4x3	7-1/32	2-3/8	15/32



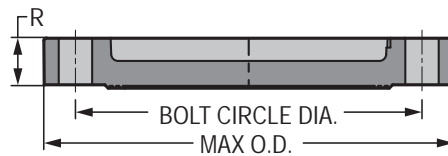
OceanTUFF™ CPVC Technical Information & Installation Guide

851 - One Piece Flange Soc



Part Number	Size	L	M	N	R	No. of Bolt Holes	Bolt Circle Dia.	Bolt Size	Min. Bolt Length	Max O.D.
CG-851-015C	1-1/2	1-19/32	2-1/2	3/16	23/32	4	3-7/8	1/2	2-1/2	5-1/16
CG-851-020C	2	1-27/32	3	5/16	27/32	4	4-3/4	5/8	3	6
CG-851-030C	3	2-5/16	4-9/32	3/8	1-1/16	4	6	5/8	3-1/4	7-1/2
CG-851-040C	4	2-7/16	5-7/32	3/16	1-5/32	8	7-1/2	5/8	3-1/2	9-1/16
CG-851-060C	6	3-1/4	7-9/16	1/4	1-3/8	8	9-1/2	3/4	4	11
CG-851-080C	8	4-17/32	9-3/4	1/2	1-7/16	8	11-11/16	3/4	4-1/2	13-5/8
CG-851-100CF	10	9-27/32	11-15/16	4-5/8	1-1/4	12	14-1/4	7/8	4	16
CG-851-120CF	12	10-7/8	14-3/16	4-11/16	1-13/32	12	17	7/8	4	19

853 - Blind Flange



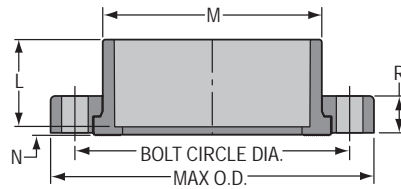
Part Number	Size	R	No. of Bolt Holes	Bolt Circle Dia.	Bolt Size	Min. Bolt Length	Max. O.D.
CG-853-015C	1-1/2	23/32	4	3-27/32	1/2	2-1/2	5-1/16
CG-853-020C	2	27/32	4	4-3/4	5/8	3	5-31/32
CG-853-030C	3	1-1/16	4	6	5/8	3-1/4	7-1/2
CG-853-040C	4	1-5/32	8	7-1/2	5/8	3-1/2	9-1/16
CG-853-060C	6	1-3/8	8	9-1/2	3/4	4	11
CG-853-080C	8	1-7/16	8	11-3/4	3/4	4-1/2	13-1/2
CG-853-100C	10	1-11/16	12	14-1/4	7/8	5	16
CG-853-120C	12	1-11/16	12	17	7/8	5	19

OceanTUFF™ CPVC Technical Information & Installation Guide



854 - Van Stone Style Flange

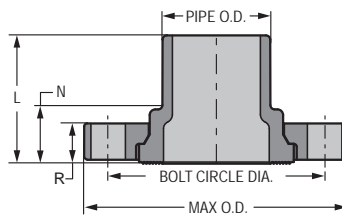
Soc



Part Number	Size	L	M	N	R	No. of Bolt Holes	Bolt Circle Dia.	Bolt Size	Min. Bolt Length	Max O.D.
CG-854-015C	1-1/2	1-17/32	2-7/16	3/16	3/4	4	3-7/8	1/2	2-1/2	5
CG-854-020C	2	1-11/16	2-15/16	3/16	13/16	4	4-3/4	5/8	3	6
CG-854-025C	2-1/2	2	3-1/2	3/16	31/32	4	5-1/2	5/8	3-1/4	7
CG-854-030C	3	2-1/8	4-1/4	1/4	1-1/16	4	6	5/8	3-1/4	7-1/2
CG-854-040C	4	2-1/2	5-1/4	1/4	1-1/8	8	7-1/2	5/8	3-1/2	9
CG-854-060C	6	3-3/8	7-9/16	7/16	1-9/32	8	9-1/2	3/4	4	11
CG-854-080C	8	4-3/8	9-5/16	9/32	1-3/8	8	11-3/4	3/4	4-1/2	13-1/2
CG-854-100C	10	5-11/16	11-3/4	21/32	1-5/8	12	14-1/4	7/8	5	16
CG-854-120C	12	7-1/4	13-3/4	5/8	1-1/2	12	17	7/8	5	19

856 - Van Stone Style Flange

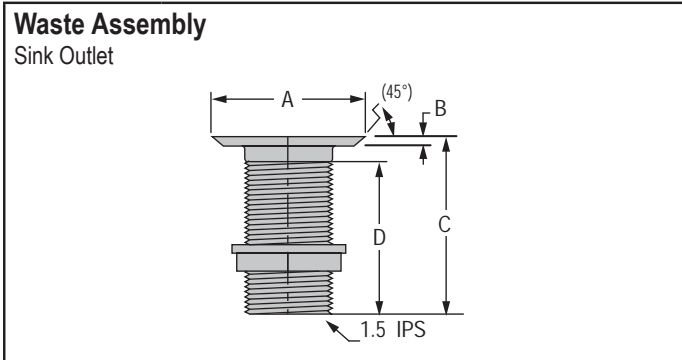
Spig



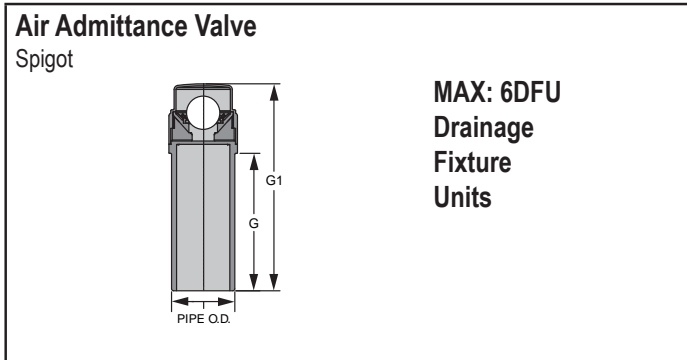
Part Number	Size	L	N	R	No. of Bolt Holes	Bolt Circle Dia.	Bolt Size	Min. Bolt Length	Max O.D.
CG-856-015C	1-1/2	2-5/8	1-9/32	3/4	4	3-7/8	1/2	2-1/2	5
CG-856-020C	2	2-7/8	1-11/32	13/16	4	4-3/4	5/8	3	6
CG-856-030C	3	3-3/8	1-7/16	1-1/16	4	6	5/8	3-1/4	7-1/2
CG-856-040C	4	3-7/8	1-5/8	1-1/4	8	7-1/2	5/8	3-1/2	9
CG-856-060C	6	4-3/4	1-25/32	1-9/32	8	9-1/2	3/4	4	11
CG-856-080C	8	5-7/8	1-15/16	1-3/8	8	11-3/4	3/4	4-1/2	13-1/2
CG-856-100C	10	8	2-1/4	1-5/8	12	14-1/4	7/8	5	16
CG-856-120C	12	8-1/2	2-3/16	1-5/8	12	17	7/8	5	19



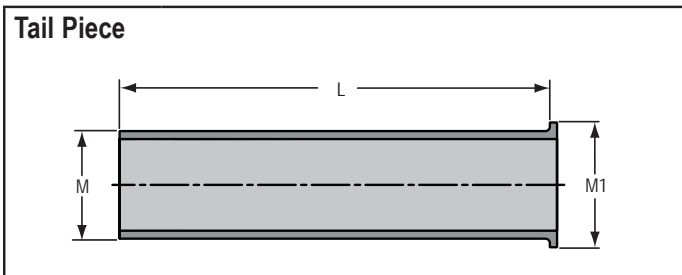
OceanTUFF™ CPVC Technical Information & Installation Guide



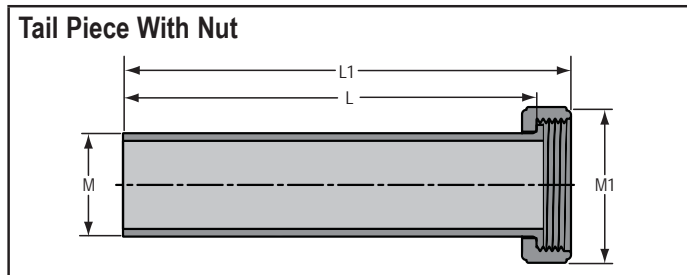
Part Number	Size	A	B	C	D
CG-OTWA-1	1-1/2	2-7/16	9/32	4-9/32	3-27/32



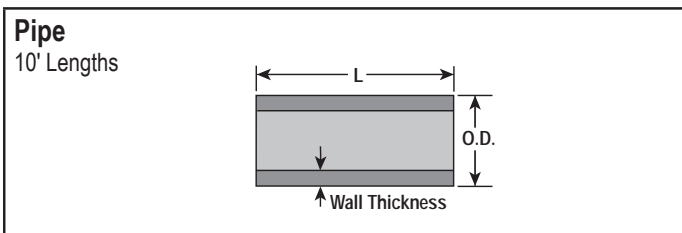
Part Number	Size	G	G1
CG-AAV-015C	1-1/2	4-1/8	6-1/4



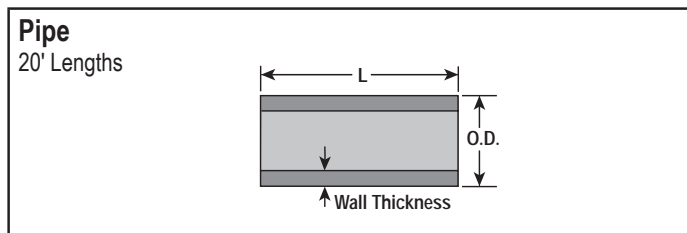
Part Number	Size	L	M	M1
CG-OTTP-015060	1-1/2x6	6	1-1/2	1-3/4
CG-OTTP-015120	1-1/2x12	12	1-1/2	1-3/4
CG-OTTP-015140	1-1/2x14	14	1-1/2	1-3/4



Part Number	Size	L	L1	M	M1
CG-OTTPN-015060	1-1/2x6	6	6-1/2	1-1/2	2-1/4
CG-OTTPN-015120	1-1/2x12	12	12-1/2	1-1/2	2-1/4
CG-OTTPN-015140	1-1/2x14	14	14-1/2	1-1/2	2-1/4



Part Number	Pipe Dia. (inches)	Avg. O.D.	Avg. I.D.	Min. Wall
CG-LW-015	1-1/2	1.900	1.592	.145
CG-LW-020	2	2.375	2.049	.154
CG-LW-030	3	3.500	3.042	.216
CG-LW-040	4	4.500	3.998	.237
CG-LW-060	6	6.625	6.031	.280
CG-LW-080	8	8.625	7.943	.322
CG-LW-100	10	10.750	9.976	.365
CG-LW-120	12	12.750	11.890	.406



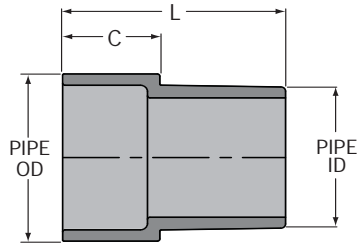
Part Number	Pipe Dia. (inches)	Avg. O.D.	Avg. I.D.	Min. Wall
CG-LW20-015	1-1/2	1.900	1.592	.145
CG-LW20-020	2	2.375	2.049	.154
CG-LW20-030	3	3.500	3.042	.216
CG-LW20-040	4	4.500	3.998	.237
CG-LW20-060	6	6.625	6.031	.280
CG-LW20-080	8	8.625	7.943	.322
CG-LW20-100	10	10.750	9.976	.365
CG-LW20-120	12	12.750	11.890	.406

OceanTUFF™ CPVC Technical Information & Installation Guide



Pipe Extender

Pipe O.D. Spigot x Pipe I.D. Spigot



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

One-Step CPVC Cement Mustard-Heavy Bodied



Part Number	Size
CG-OT5-030	Quart
CG-OT5-040	Gallon

Average Number of Joints per Quart of Solvent Cement

Pipe Diameter	Number of Joints
1-1/2"	90
2"	60
3"	40
4"	30
6"	10
8"	5
10"	2 - 3
12"	1 - 2

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



OceanTUFF™ CPVC Technical Information & Installation Guide

Chemical Resistance Information

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

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

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

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

Noted Caution Areas for CPVC

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

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Chemical Resistance Tables

Resistance Rating Codes

R = Recommended

C = Use with Caution.

N = Not Recommended.

--- = No data available

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

CHEMICAL	RATING	CHEMICAL	RATING	CHEMICAL	RATING
A		Ammonium Thiocyanate	R	Butylene (C)	---
Acacia, Gum Arabic	R	Amyl Acetate	C	Butyl Phenol	C
Acetaldehyde	R	Amyl Alcohol 1%	R	Butyl Phthalate	---
Acetamide	R	Amyl Alcohol >1%	C	Butyl Stearate	---
Acetic Acid Vapor 25%	R	n-Amyl Chloride	C	Butynediol	---
Acetic Acid 60%	R	Aniline	C	Butyric Acid	R
Acetic Acid 85%	R	Aniline Chlorhydrate	C	C	
Acetic Acid Glacial	R	Aniline Hydrochloride	C	Cadium Cyanide	R
Acetic Anhydride	R	Antraquinone	R	Calcium Acetate	R
Acetone	R	Antraquinone Sulfonic Acid	R	Calcium Bisulfide	R
Acetophenone	C	Antimony Trichloride	R	Calcium Bisulfate	R
Acetyl Chloride	R	Aqua Regia	R	Calcium Carbonate	R
Acetylene	N	Argon	---	Calcium Chlorate	R
Acetylnitrile	R	Arsenic Acid	R	Calcium Chloride	R
Acetylsalicylic acid, aspirin	R	Aryl Sulfonic Acid	R	Calcium Chloride	R
Acrylic Acid	R	Asorbic Acid	R	Calcium Fluoride	R
Acrylonitrile	R	L-Asparagine	R	Calcium Hydroxide	R
Adenine, 6-aminopurine	R	Asphalt	N	Calcium Hypochlorite	R
Adenosine Triphosphate	R	B		Calcium Nitrate	R
Adipic Acid	R	Barium Acetate	R	Calcium Oxide	R
Agarose	R	Barium Carbonate	R	Calcium Sulfate	R
Alizarin stain Mordant Red 11	R	Barium Chloride	R	Camphor	---
Alizarin Red S Mordant Red 3	R	Barium Hydroxide	R	Cane Sugar Liquors	R
Alizarin Yellow R Mordant Orange 1	R	Barium Nitrate	R	Caprylic Acid	---
Allyl Alcohol	R	Barium Sulfate	R	Carbitol	---
Allyl Chloride	N	Barium Sulfide	R	Carbolic Acid	R
Aluminum Acetate	R	Beer	R	Carbon Dioxide Dry	R
Aluminum Ammonium	R	Beer Sugar Liquors	R	Carbon Dioxide Wet	R
Aluminum Chloride	R	Benzaldehyde	R	Carbon Disulfide	C
Aluminum Fluoride	R	Benzene	C	Carbon Monoxide	R
Aluminum Hydroxide	R	Benzene Sulfonic Acid	R	Carbon Tetrachloride	N
Aluminum Nitrate	R	Benzoic Acid	R	Carbonic Acid	R
Aluminum Oxychloride	R	Benzyl Alcohol	R	Castor Oil	C
Aluminum Potassium	R	Bismuth Carbonate	R	Caustic Potash	R
Aluminum Potassium Sulfate, Alum	R	Bluret	R	Caustic Soda	R
Aluminum Sulfate	R	Black Liquor	R	Cellosolve	C
Ammonia Anhydrous	R	Bleach 5%	R	Cellosolve Acetate	R
Ammonia Gas	R	Bleach 12%	R	Chloral Hydrate	R
Ammonia Liquid	R	Blood	R	Chloramine	R
Ammonia Acetate	R	Borax	R	Chloric Acid	R
Ammonium Bicarbonate	R	Boric Acid	R	Chloric Acid 20%	R
Ammonium Bifluoride	R	Brake Fluid	---	Chlorine, Aqueous	R
Ammonium Bisulfide	R	Brine	R	Chlorinated Water 10 PPM	R
Ammonium Bromide	R	Brilliant Blue G-250	R	Chlorinated Water Sat'd	R
Ammonium Carbonate	R	Brilliant Blue R-250	R	Chloroacetic Acid	R
Ammonium Chloride	R	Brilliant Cresyl Blue	R	Chloroacetyl Chloride	---
Ammonium Citrate	R	Brilliant Green	R	Chlorobenzene	N
Ammonium Dichromate	R	Bromocresal Green	R	Chlorobenzyl Chloride	N
Ammonium Dihydrogen Phosphate	R	Bromocresal purple	R	Chloroform	N
Ammonium Ferric Sulfate	R	Bromic Acid	R	Chlorophenol Red	R
Ammonium Ferrous Sulfate	R	Bromine Liquid	R	Chloropicrin	---
Ammonium Fluoride 10%	R	Bromine Vapor	R	Chlorosulfonic Acid	R
Ammonium Fluoride 25%	R	Bromine Water	R	Chromic Acid 10%	R
Ammonium Hydroxide 10% - 28%	R	Bromotoluene	---	Chromic Acid 30%	R
Ammonium Hydroxide 100%	R	Bromophenol Blue	R	Chromic Acid 40%	R
Ammonium Iodide	R	Bromthymol Blue	R	Chromic Acid 50%	C
Ammonium Nitrate	R	Butadiene	R	Chromium	R
Ammonium Persulfate	R	Butane	R	Chromium Tetroxide	R
Ammonium Phosphate Monbasic/Dibasic	R	Butyl Acetate	C	Citric Acid	R
Ammonium Sulfate	R	Butyl Alcohol	C	Clayton Yellow	R
Ammonium Sulfide	R	Butyl Cellosolve	R	Coconut Oil	C
Ammonium Sulfite	R	n-Butyl Chloride	---	Coffee	R
				Congo Red solution	R



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CHEMICAL	RATING
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-Cresol Purple	R
Cresol 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

Decahydranaphthalene	R
Detergents	R
Dextrin	R
Dextrose	R
Diacetone Alcohol	R
Diastase of malt	R
Dibutoxyethyl Phthalate	N
Dibutyl Ether	R
Dibutyl Phthalate	N
Dibutyl Sebacate	N
Dichlorobenzene	R
Dichloroethylene	N
2,6 - Dichloroindophenal	R
Diesel Fuels	R
Diethylamine	R
Diethyl Cellosolve	R
Diethyl Ether	R
Diglycolic Acid	R
Dimethylamine	R
Dimethyl Formamide	R
Dimethylhydrazine	R
Dimethyl Phthalate	N
Dimethyl Sulfoxide	R
Diocyl 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 Glycol	C
Ethylene Oxide	R
Ethyl Ether	R
Ethyl Formate	R
Ethylene Glycol	C
2-Ethylhexanol	R
Ethyl Mercaptan	R
Ethyl Oxalate	R

CHEMICAL	RATING
F	
Fast Green FCF	R
Fatty Acids	R
Fehlings solution A	R
Fehlings solution B	R
Ferric Ammonium Sulfate	R
Ferric Chloride	R
Ferric Hydroxide	R
Ferric Nitrate	R
Ferric Sulfate	R
Ferrous Chloride	R
Ferrous Hydroxide	R
Ferrous Nitrate	R
Ferrous Sulfate	R
Fish Oil	R
Fluoboric Acid	R
Fluorine Gas (Dry)	R
Fluorine Gas (Wet)	R
Fluosilicic Acid 30%	R
Fluosilicic Acid 50%	R
Formaldehyde Dilute	R
Formaldehyde 35%	R
Formaldehyde 37%	R
Formaldehyde 50%	C
Formic Acid	R
Freon	R
Freon 12	R
Freon 21	---
Freon 22	R
Freon 113	C
Freon 114	---
Fructose	R
Furfural	R

G

Gallic Acid	R
Gasoline	R
Gasohol	R
Gelatin	R
Glauber's Salt	---
Glucose	R
Glue, PVA	R
Glutathione	R
Glycerine	R
Glycine	R
Glycogen	R
Glycol	C
Glycol Amine	---
Glycolic Acid	R
Glyoxal	R
Grape Sugar	R
Grease	---
Green Liquor	R

H

Heptane (Type 1)	R
n-Hexane	R
Hexamethylenediamine	R
Hexanol, Tertiary	R
Hydraulic Oil	---
Hydrazine	R
Hydrobromic Acid 20%	R
Hydrobromic Acid 50%	R
Hydrochloric Acid 10%	R
Hydrochloric Acid 30%	R
Hydrocyanic Acid	R
Hydrofluoric Acid Dilute	R
Hydrofluoric Acid 30%	R
Hydrofluoric Acid 50%	R
Hydrofluoric Acid 100%	R
Hydrofluosilicic Acid 50%	R
Hydrogen	R
Hydrogen Cyanide	R
Hydrogen Fluoride	C
Hydrogen Peroxide 50%	R
Hydrogen Peroxide 90%	R
Hydrogen Phosphide	R
Hydrogen Sulfide Dry	R
Hydrogen Sulfide Wet	R
Hydrogen Sulfide, aqueous	R
Hydroquinone, aqueous	R
Hydroxylamine Hydrochloride	R
Hydroxylamine Sulfate	R
Hypochlorous Acid	R

CHEMICAL	RATING
I	
Indigo Carmine	R
Inks	R
Iodine	R
Iodine solution, Lugol's	R
Iron Phosphate	---
Isobutane	C
Isobutyl Alcohol	R
Isocetane	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
Limone	R
Lime Slurry	R
Lime Sulfur	R
Linoleic Acid	C
Linoleic Oil	---
Linseed Oil	C
Liqueurs	R
Lithium Bromide	R
Lithium Carbonate	R
Lithium Chloride	R
Lithium Hydroxide 50%	R
Lithium Nitrate	R
Lithium Sulfate	R
Lubricating Oil #1	R
Lubricating Oil #2	R
Lubricating Oil #3	R
Ludox	---
Luminol 3-amino	R
Phthalhydrazide	R
DL-lysine Hydrochloride	R
Lysozyme	R

M

Magnesium Acetate	R
Magnesium Bromide	R
Magnesium Carbonate	R
Magnesium Chloride	R
Magnesium Citrate	R
Magnesium Fluoride	---
Magnesium Hydroxide	R
Magnesium Nitrate	R
Magnesium Oxide	---
Magnesium Sulfate	R
Malachite Green	R
Maleic Acid	R
Malic Acid	R
Maltose	R
Manganese Chloride	R
Manganese Nitrate	R
Manganese Sulfate	R
Menthol	R

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CHEMICAL	RATING
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
Methylsulfuric 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
Oleic Acid	R
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

CHEMICAL	RATING
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 Cadmium	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 Bicarbonate	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 Ferrocyanide	R
Potassium Fluoride	R
Potassium Hydrogen Phosphate	R
Potassium Hydrogen Phthalate	R
Potassium Hydroxide	R
Potassium Hypochlorite	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

CHEMICAL	RATING
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
Pyrrrole	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 Palmirate	R
Sodium Perborate	R
Sodium Perchlorate	R
Sodium Periodate	R
Sodium Peroxide	R
Sodium Phosphate Acid	R



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

T

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

U

Urea	R
Urease	R
Urine	R

CHEMICAL	RATING
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

SPEARS® MANUFACTURING COMPANY

PRODUCT LIMITED LIFETIME WARRANTY

Except as otherwise specified for certain products, mandated by law or herein provided, Spears® Manufacturing Company (“Company”) warrants Standard Catalog Products (“Products”) which have been directly manufactured by them to be free from defects in material and workmanship for as long as the original intended end user of the Products (“End User”) retains ownership and possession of the Products and complies with this Warranty (“Warranty Period”). Each other person or entity acquiring or employing the Products, including buyers, contractors and installers (“Buyer”) and End Users (“Buyer/End User”) agrees that this Warranty shall be effective only during the Warranty Period so long as the Products are used solely for the normal purposes for which they are intended and in conformance with industry established standards, engineering, installation, operating, and maintenance specifications, recommendations and instructions including explicit instructions by the Company; the Products are properly installed, operated and used, and have not been modified; and all the other terms of this Warranty are complied with. Any violation thereof shall void this Warranty and relieve Company from all obligations arising from this Warranty and the Products.

Upon receipt or discovery of any Products that appear questionable or defective each Buyer/End User shall promptly inspect and return any such Product to the Company at 15853 Olden Street, Sylmar, California 91342, accompanied by a letter stating the nature of any problems. If the Products are determined by Company to be defective in materials or workmanship directly provided by Company, Company, at its sole option, may either repair or replace the defective Products, or reimburse applicable Buyer/End User for the cost of such Products. The applicable Buyer/End User shall bear all applicable shipping costs. **THIS SHALL BE BUYERS/END USERS’ SOLE REMEDY. EACH BUYER/END USER AGREES THAT COMPANY WILL NOT BE RESPONSIBLE FOR ANY OTHER OBLIGATIONS RELATING TO THE PRODUCTS, INCLUDING ANY OTHER MATERIALS OR LABOR COSTS, LOSS OF USE OR ANY OTHER ITEM OR FOR ANY DELAYS IN COMPLYING WITH THIS WARRANTY BEYOND COMPANY’S REASONABLE CONTROL.**

COMPANY SHALL NOT BE LIABLE FOR, DOES NOT ASSUME, AND EXPRESSLY DISCLAIMS, ANY LIABILITY, RESPONSIBILITY AND DAMAGES: DUE TO ANY BUYER/END USER’S FAILURE TO COMPLY WITH THIS WARRANTY, INCLUDING IMPROPER INSTALLATION, USE OR OPERATION; USE WITH PRODUCTS FROM OTHER MANUFACTURERS THAT DO NOT MEET ASTM OR OTHER APPLICABLE PRODUCT STANDARDS; IMPROPER CONTROL OF SYSTEM HYDRAULICS, IMPROPER WINTERIZATION PROCEDURES, IMPROPER VOLTAGE SUPPLY, CONTACT WITH INCOMPATIBLE MATERIALS OR CHEMICALS, EXCAVATION/DIGGING, EXCESSIVE WEIGHT, AND VANDALISM; DUE TO REASONABLE WEAR AND TEAR AND DUE TO ANY ACTS OF NATURE, INCLUDING LIGHTNING, EARTHQUAKES, GROUND MOVEMENT, FROST HEAVE, OR FLOODS.

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BY ITS ACCEPTANCE OF THE PRODUCTS, EACH BUYER/END USER EXPRESSLY WAIVES ALL OTHER LIABILITY OR OBLIGATION OF ANY KIND OR CHARACTER OF COMPANY, INCLUDING LIABILITY PREDICATED UPON CONTRACT, TORT, STRICT LIABILITY OR OTHER LEGAL OR EQUITABLE GROUNDS, AND ALL, IF ANY, DAMAGES AND LOSSES AS A RESULT THEREOF, INCLUDING ALL, IF ANY, COMPENSATORY, GENERAL, SPECIAL, CONSEQUENTIAL, INCIDENTAL, OR PUNITIVE DAMAGES. WITH RESPECT TO SUCH WAIVERS, EACH BUYER/END USER EXPLICITLY WAIVES CALIFORNIA CIVIL CODE §1542 WHICH STATES “A GENERAL RELEASE DOES NOT EXTEND TO CLAIMS WHICH THE CREDITOR DOES NOT KNOW OR SUSPECT TO EXIST IN HIS FAVOR AT THE TIME OF EXECUTING THIS RELEASE, WHICH IF KNOWN BY HIM MUST HAVE MATERIALLY ADVERSELY AFFECTED HIS SETTLEMENT WITH DEBTOR” AND ALL OTHER SIMILAR STATUTORY, COMMON AND CASE LAW RIGHTS, DEFENSES AND LIMITATIONS.

Having previously independently inspected the Products, or a sample, as fully as desired, or having the opportunity to and having not done so, upon acceptance of delivery of the Products, and except as otherwise herein explicitly provided, each Buyer/End User by acceptance or use of the Products accepts them in their “AS IS” and “WITH ALL FAULTS” condition without any other warranty, expressed, implied or otherwise, and accepts and assumes the entire risk and cost of all servicing, remediation and consequences thereof. This Warranty shall be governed by California law and any unenforceable provisions severed without affecting the remaining provisions. As used herein, “including” includes “without limitation.”



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