



***Ocean*TUFF™**

Marine Drainage Systems

***One Product -  
Many Applications***



# TECHNICAL INFORMATION & INSTALLATION GUIDE

*April 1, 2017*

**SUPERSEDES ALL PREVIOUS EDITIONS**



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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 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 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 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 the appropriate agency. 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](http://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](http://www.cgmix.uscg.mil)

- **ASTM F 2618 Performance Standard** - 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](http://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.

# OceanTUFF™ CPVC Technical Information & Installation Guide



## Typical Physical Properties of Spears® OceanTUFF™ CPVC Material

Property	Test Method	Typical Value
<b>Mechanical Properties @ 73°F</b>		
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
<b>Thermal Properties</b>		
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 <sup>-5</sup>
<b>Flammability</b>		
Limiting Oxygen Index	ASTM D 2863	60
<b>UL 94 Rating</b>		
	UL 94	V-0, 5VB
<b>Solvent Cement</b>		
	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<sup>-5</sup> 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<sup>-5</sup> 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

$\Delta T$  = 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.



# OceanTUFF™ CPVC Technical Information & Installation Guide

**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-OT-5 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-OT-5 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 Polypropylene 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-OT-5 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.

# OceanTUFF™ CPVC Technical Information & Installation Guide



**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 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® 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.



# OceanTUFF™ CPVC Technical Information & Installation Guide

## 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.

# OceanTUFF™ CPVC Technical Information & Installation Guide



## 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 marine drainage 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.

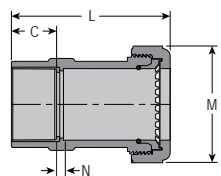
Where it is intended to pass plastic pipes through bulkheads or decks, the original integrity of watertight bulkheads and decks is to be maintained at the location. If the bulkhead or deck is also a fire division and destruction by fire of plastic pipes may cause inflow of liquid from a tank, then a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

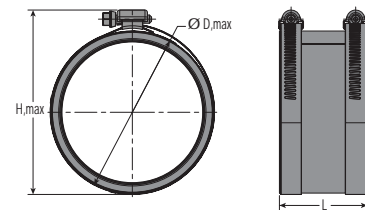


For connection to PP, PVDF or other IPS systems.

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



# OceanTUFF™ CPVC Technical Information & Installation Guide

**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

**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**  
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
CG-P099-080C <sup>1</sup>	8			

<sup>1</sup> Bolted Style

**P102 Increaser 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

**P100 Coupling**  
H x H

Part Number	Size	N
CG-P100-015C	1-1/2	5/16
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

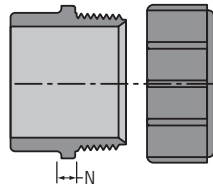


# OceanTUFF™ CPVC Technical Information & Installation Guide



## P103P Trap Adapter - Male

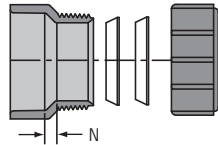
Spig x Slip with Plastic Nut



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

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

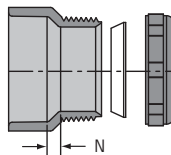
H x Slip w/Plastic Nut



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

## P104X Trap Adapter - Female

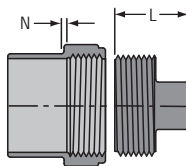
H x Slip w/ Chrome Nut & Washer



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

## P105X Cleanout Adapter with Square Head Plug

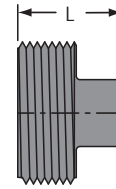
Spig x FPT



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

## P106 Square Head Cleanout Plug

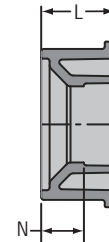
MPT



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

## P107 Flush Bushing

Spig x H

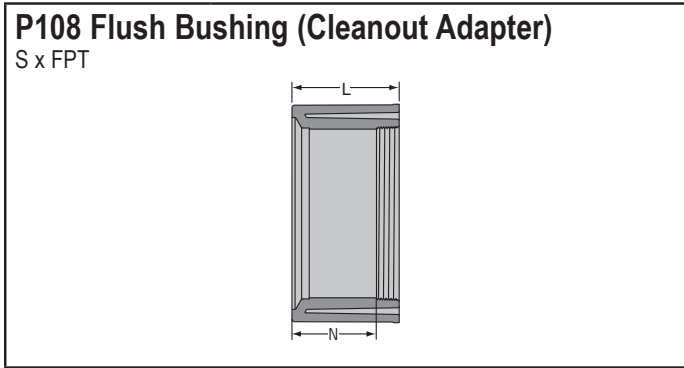


Part Number	Size	L	N
CG-P107-251C	2x1-1/2	1-1/16	7/32
CG-P107-337C	3x1-1/2	1-3/4	1
CG-P107-338C	3x2	1-3/4	31/32
CG-P107-420C	4x2	2	1-3/16
CG-P107-422C	4x3	2	1/2
CG-P107-530C <sup>1</sup>	6x3	3-23/32	2-11/32
CG-P107-532C	6x4	3-7/16	1-11/16
CG-P107-582C	8x4	4-9/16	2-13/16
CG-P107-585C	8x6	4-19/16	1-9/16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

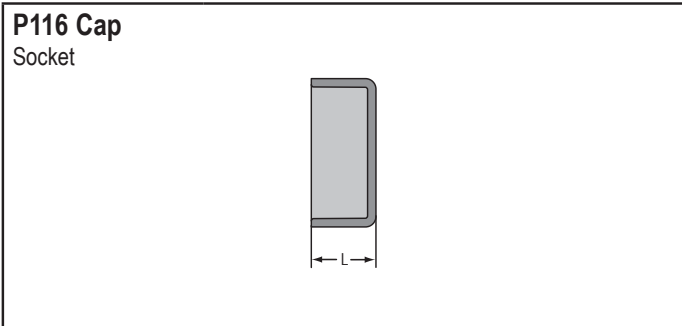
<sup>1</sup> Sized with Bushing



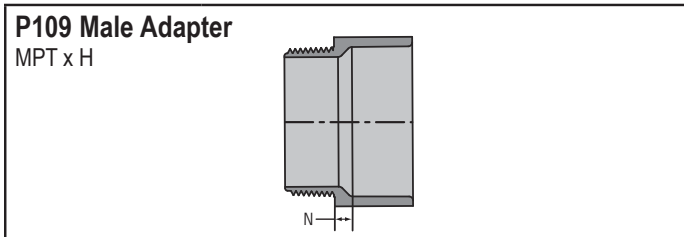
# OceanTUFF™ CPVC Technical Information & Installation Guide



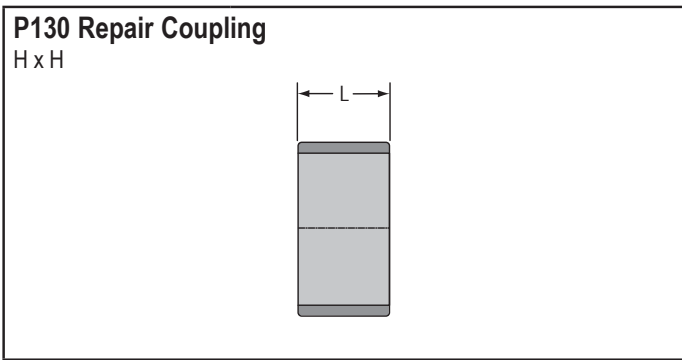
Part Number	Size	L	N
CG-P108-212C	1-1/2x1-1/4	7/8	3/16



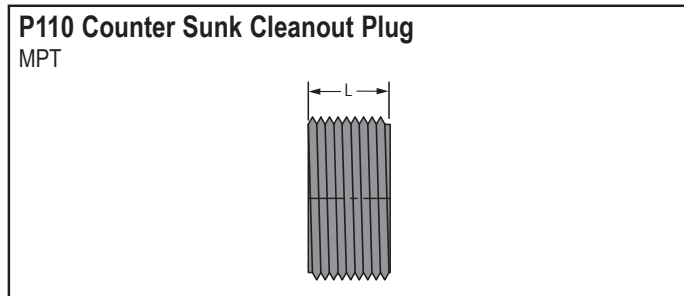
Part Number	Size	L
CG-P116-015C	1-1/2	15/16
CG-P116-020C	2	1
CG-P116-030C	3	1-3/4
CG-P116-040C	4	2
CG-P116-060C	6	3-9/32
CG-P116-080C	8	6-3/8
CG-P116-100CF	10	3-3/4
CG-P116-120CF	12	4-1/8



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-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



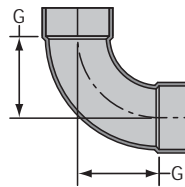
Part Number	Size	L
CG-P110-015C	1-1/2	5/8
CG-P110-020C	2	5/8
CG-P110-030C	3	3/4
CG-P110-040C	4	7/8
CG-P110-060C	6	31/32

# OceanTUFF™ CPVC Technical Information & Installation Guide



## P300 1/4 Bend (90° EII)

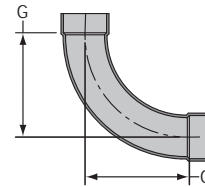
H x H



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 EII)

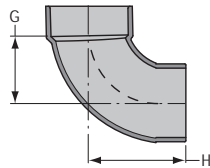
H x H



Part Number	Size	G
CG-P304-015C	1-1/2	2-3/4
CG-P304-020C	2	3-1/4
CG-P304-030C	3	4-1/16
CG-P304-040C	4	5-25/32
CG-P304-060C	6	9

## P302 1/4 Bend, Street (90° Street EII)

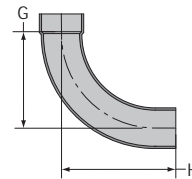
H x Spig



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

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

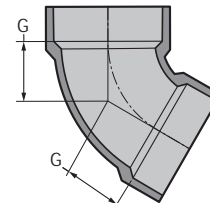
H x Spig



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	5-23/32
CG-P309-040C	4	5-1/32	6-7/16
CG-P309-060C	6	8-31/32	11-29/32

## P319 1/6 Bend (60° EII)

H x H



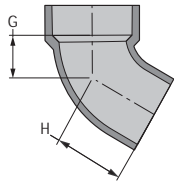
Part Number	Size	G
CG-P319-015C	1-1/2	1-1/16
CG-P319-020C	2	1-3/8
CG-P319-030C	3	1-11/16
CG-P319-040C	4	2-5/32
CG-P319-060CF*	6	4-9/16
CG-P319-120CF*	12	4-15/16

\*Fabricated



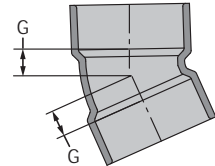
# OceanTUFF™ CPVC Technical Information & Installation Guide

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



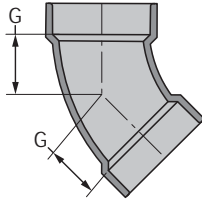
Part Number	Size	G	H
CG-P320-015C	1-1/2	1-1/16	1-3/4
CG-P320-020C	2	1-5/8	2-1/4
CG-P320-030C	3	1-11/16	3-1/16
CG-P320-040C	4	2-5/32	3-19/32

## P324 1/16 Bend (22-1/2° Ell) H x H



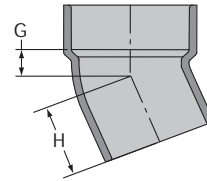
Part Number	Size	G
CG-P324-015C	1-1/2	1/2
CG-P324-020C	2	11/16
CG-P324-030C	3	13/16
CG-P324-040C	4	1
CG-P324-060C	6	1-5/16
CG-P324-080C	8	1-1/2
CG-P324-100CF	10	2-1/16
CG-P324-120CF	12	2-1/4

## P321 1/8 Bend (45° Ell) H x H



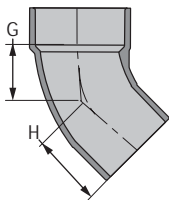
Part Number	Size	G
CG-P321-015C	1-1/2	1-1/8
CG-P321-020C	2	1-1/2
CG-P321-030C	3	1-3/4
CG-P321-040C	4	2-3/16
CG-P321-060C	6	2-1/16
CG-P321-080C	8	2-1/16
CG-P321-100C	10	2-19/32
CG-P321-120C	12	3-1/8

## P326 1/16 Bend, Street (22-1/2° Street Ell) H x Spig



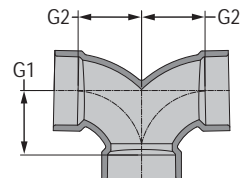
Part Number	Size	G	H
CG-P326-015C	1-1/2	1/2	1-1/4
CG-P326-020C	2	11/16	1-1/2
CG-P326-030C	3	13/16	2-5/16
CG-P326-040C	4	1	2-3/4
CG-P326-060C	6	1-3/8	4-1/2
CG-P326-080C	8	1-3/4	5-5/8

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

## P327 Double 1/4 Bend (3 Way Ell) All Hub



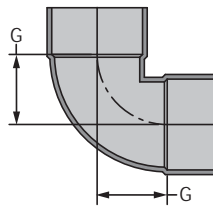
Part Number	Size	G1	G2
CG-P327-015C	1-1/2	1-3/4	1-3/4
CG-P327-020C	2	2-5/16	2-5/16
CG-P327-030C	3	3-1/16	3-1/16
CG-P327-040C	4	3-29/32	3-29/32

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## P331 Vent Ell

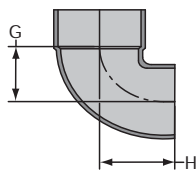
H x H



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

## P333 Vent Ell, Street

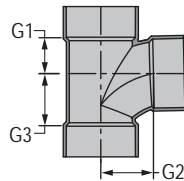
H x Spig



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

## P400 Sanitary Tee

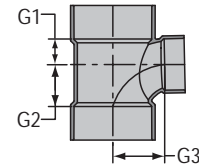
All Hub



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

## P401 Sanitary Tee, Reducing

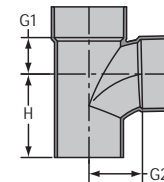
All Hub



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	3x1-1/2	15/16	1-3/4	2-1/2
CG-P401-338C	3x2	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



# OceanTUFF™ CPVC Technical Information & Installation Guide

**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	3x1-1/2	13/16	2-15/32	2-15/16
CG-P404-338C	3x3x2	1-1/16	2-3/4	3-7/32

**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

**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

**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

**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	6x4	3-5/16	8-7/16	10-3/16

**P445X Cleanout Tee with Counter Sunk Plug**  
H x H x FPT

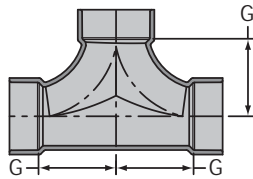
Part Number	Size	G	I	L
CG-P445X-015C	1-1/2	1-1/8	5/8	5/8
CG-P445X-020C	2	1-13/32	5/8	5/8
CG-P445X-030C	3	1-7/8	3/4	3/4
CG-P445X-040C	4	2-7/16	7/8	7/8
CG-P445X-060C	6	3-1/2	1	31/32
CG-P445X-080CF	8	7-5/16	1	1-1/2
CG-P445X-100CF	10	9	1	1-1/2
CG-P445X-120CF	12	9-1/4	1	1-1/2

# OceanTUFF™ CPVC Technical Information & Installation Guide



## P448 2-Way Cleanout

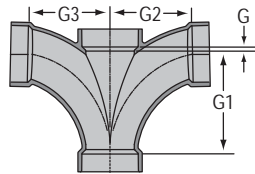
ALL HUB



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

## P500 Double Fixture Fitting

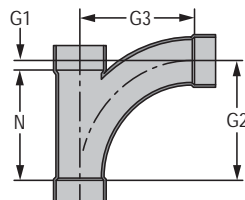
All Hub



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)

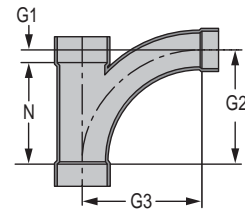
All Hub



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

## P502 Combination Wye and 1/8 Bend, Reducing (Long Turn Tee Wye)

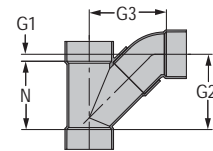
All Hub



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	8x2	7/8	8-7/8	10	8

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

All Hub



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



# OceanTUFF™ CPVC Technical Information & Installation Guide

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

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 <sup>1</sup>	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 <sup>1</sup>	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 <sup>1</sup>	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

<sup>1</sup>Sized with Bushing

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

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

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

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

**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

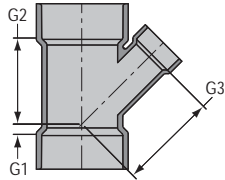


# OceanTUFF™ CPVC Technical Information & Installation Guide



## P601 45° Wye, Reducing

All Hub

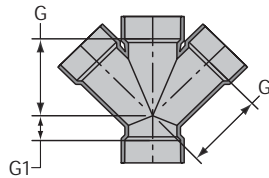


Part Number	Size	G1	G2	G3
CG-P601-241C	2x1-1/2x1-1/2	3/4	2-15/16	2-15/16
CG-P601-251C	2x2x1-1/2	13/16	3-15/32	3-17/32
CG-P601-257C	2x1-1/2x2	1	3-1/2	3-3/8
CG-P601-337C	3x3x1-1/2	1/2	3-25/32	4-3/8
CG-P601-338C	3x3x2	7/8	4-1/8	4-5/8
CG-P601-419C	4x4x1-1/2	3/8	3-9/32	4-3/8
CG-P601-420C	4x4x2	3/8	4-11/16	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 <sup>1</sup>	10x2	3/16	20-15/16	14-1/8
CG-P601-623C <sup>1</sup>	10x3	9/32	10-31/32	14-3/16
CG-P601-624C <sup>1</sup>	10x4	9/32	10-31/32	13-11/16
CG-P601-626C	10x10x6	9/32	10-31/32	11-31/32
CG-P601-663C <sup>1</sup>	12x12x3	3	16-3/16	22-7/8
CG-P601-664C <sup>1</sup>	12x12x4	3	16-3/16	22-3/8
CG-P601-666C <sup>1</sup>	12x6	3	16-3/16	21-1/8
CG-P601-668C <sup>1</sup>	12x8	3-1/4	16-3/16	19
CG-P601-670C <sup>1</sup>	12x12x10	2-15/16	16-3/16	17-3/16

<sup>1</sup> Sized with Bushing

## P611 Double Wye

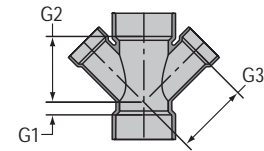
All Hub



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

## P612 Double Wye, Reducing

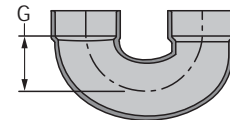
All Hub



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	8x3	1-5/16	9-15/16	10-7/8
CG-P612-582CF	8x4	2-1/16	10-11/16	11-7/8
CG-P612-585CF	8x6	3-1/2	12-1/8	12-13/16
CG-P612-624CF	10x4	1-7/16	12-3/16	13-5/16
CG-P612-628CF	10x8	5-1/8	15-7/8	15-11/16
CG-P612-664CF	12x4	3/8	13-1/8	14-11/16

## 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



# OceanTUFF™ CPVC Technical Information & Installation Guide

**P704P Tail Piece Adapter**  
Spig x Slip w/Plastic Nut

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

**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

**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

**P712P Jar Trap w/Tail Piece Adapter**  
Slip x H

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

**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

**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

**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

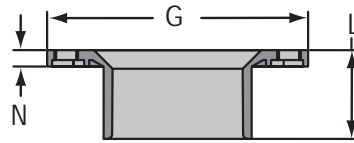
Part Number	Size	G	G1	L
CG-P720-015C	1-1/2	3-5/8	5-11/16	10-5/8
CG-P720-020C	2	3-7/8	5	10-3/8
CG-P720-030C	3	4-1/2	6-3/4	13-7/16
CG-P720-040C	4	4-3/8	8-1/4	15-11/16

# OceanTUFF™ CPVC Technical Information & Installation Guide



## P815 - Closet Flange

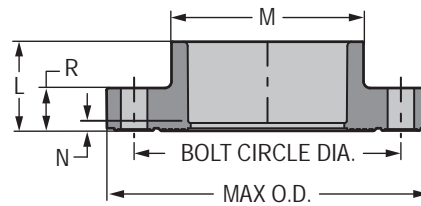
Soc



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

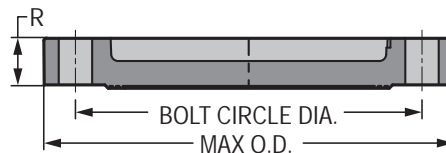
## 851 - One Piece Flange

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
851-120CF	12	10-7/8	14-3/16	4-11/16	1-13/32	12	17	7/8	4	19

## 853 - Blind Flange



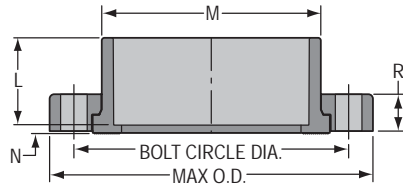
Part Number	Size	R	No. of Bolt Holes	Bolt Circle Dia.	Bolt Size	Min. Bolt Length	Max. O.D.
CG-853-015C	1-1/2	23/32	4	3-27/32	1/2	2-1/2	5-1/16
CG-853-020C	2	27/32	4	4-3/4	5/8	3	5-31/32
CG-853-030C	3	1-1/16	4	6	5/8	3-1/4	7-1/2
CG-853-040C	4	1-5/32	8	7-1/2	5/8	3-1/2	9-1/16
CG-853-060C	6	1-3/8	8	9-1/2	3/4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

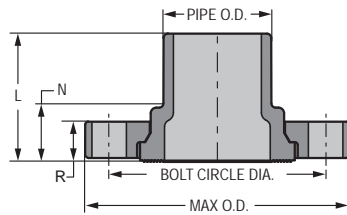
Soc



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

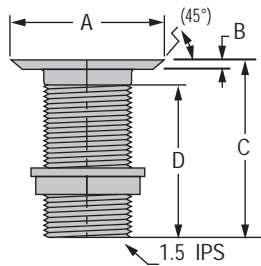


Part Number	Size	L	N	R	No. of Bolt Holes	Bolt Circle Dia.	Bolt Size	Min. Bolt Length	Max O.D.
CG-856-015C	1-1/2	2-5/8	1-9/32	3/4	4	3-7/8	1/2	2-1/2	5
CG-856-020C	2	2-7/8	1-11/32	13/16	4	4-3/4	5/8	3	6
CG-856-030C	3	3-3/8	1-7/16	1-1/16	4	6	5/8	3-1/4	7-1/2
CG-856-040C	4	3-7/8	1-5/8	1-1/4	8	7-1/2	5/8	3-1/2	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

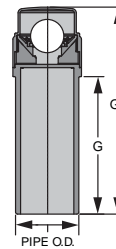


## Waste Assembly Sink Outlet



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

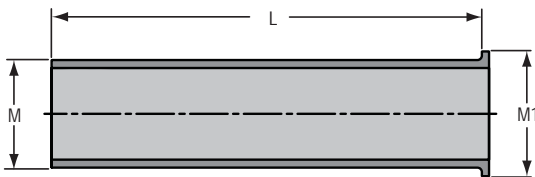
## Air Admittance Valve Spigot



**MAX: 6DFU  
Drainage  
Fixture  
Units**

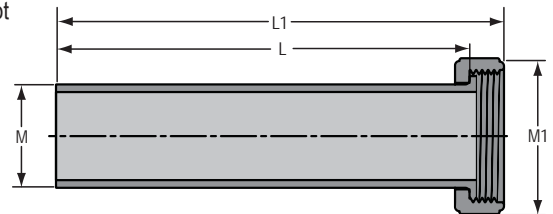
Part Number	Size	G	G1
CG-AAV-015C	1-1/2	4-1/8	6-1/4

## Tail Piece Spigot



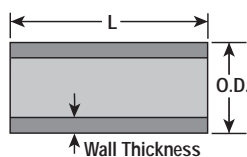
Part Number	Size	L	M	M1
CG-OTTP-015060	1-1/2x6	6	1-1/2	1-3/4
CG-OTTP-015120	1-1/2x12	12	1-1/2	1-3/4
CG-OTTP-015140	1-1/2x14	14	1-1/2	1-3/4

## Tail Piece With Nut Spigot



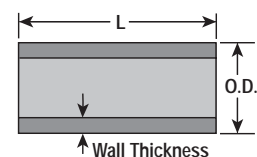
Part Number	Size	L	L1	M	M1
CG-OTTPN-015060	1-1/2x6	6	6-1/2	1-1/2	2-1/4
CG-OTTPN-015120	1-1/2x12	12	12-1/2	1-1/2	2-1/4
CG-OTTPN-015140	1-1/2x14	14	14-1/2	1-1/2	2-1/4

## Pipe 10' Lengths



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

## Pipe 20' Lengths



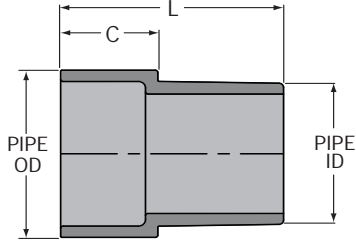
Part Number	Pipe Dia. (inches)	Avg. O.D.	Avg. I.D.	Min. Wall
CG-LW20-015	1-1/2	1.900	1.592	.145
CG-LW20-020	2	2.375	2.049	.154
CG-LW20-030	3	3.500	3.042	.216
CG-LW20-040	4	4.500	3.998	.237
CG-LW20-060	6	6.625	6.031	.280
CG-LW20-080	8	8.625	7.943	.322
CG-LW20-100	10	10.750	9.976	.365
CG-LW20-120	12	12.750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



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### 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.

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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
<b>A</b>		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 Chlorohydrate	C	<b>C</b>	
Acetic Acid Glacial	R	Aniline Hydrochloride	C	Cadium Cyanide	R
Acetic Anhydride	R	Anthraquinone	R	Calcium Acetate	R
Acetone	R	Anthraquinone 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>B</b>		Calcium Nitrate	R
Adipic Acid	R	Barium Acetate	R	Calcium Nitrate	R
Agarose	R	Barium Carbonate	R	Calcium Oxide	R
Alizarin stain Mordant Red 11	R	Barium Chloride	R	Calcium Sulfate	R
Alizarin Red S Mordant Red 3	R	Barium Hydroxide	R	Camphor	---
Alizarin Yellow R Mordant Orange 1	R	Barium Nitrate	R	Cane Sugar Liquors	R
Allyl Alcohol	R	Barium Sulfate	R	Caprylic Acid	---
Allyl Chloride	N	Barium Sulfide	R	Carbitol	---
Aluminum Acetate	R	Beer	R	Carbolic Acid	R
Aluminum Ammonium	R	Beer Sugar Liquors	R	Carbon Dioxide Dry	R
Aluminum Chloride	R	Benzaldehyde	R	Carbon Dioxide Wet	R
Aluminum Fluoride	R	Benzene	C	Carbon Disulfide	C
Aluminum Hydroxide	R	Benzene Sulfonic Acid	C	Carbon Monoxide	R
Aluminum Nitrate	R	Benzoic Acid	R	Carbon Tetrachloride	N
Aluminum Oxychloride	R	Benzyl Alcohol	R	Carbonic Acid	R
Aluminum Potassium	R	Bismuth Carbonate	R	Castor Oil	C
Aluminum Potassium Sulfate, Alum	R	Biuret	R	Caustic Potash	R
Aluminum Sulfate	R	Black Liquor	R	Caustic Soda	R
Ammonia Anhydrous	R	Bleach 5%	R	Cellosolve	C
Ammonia Gas	R	Bleach 12%	R	Cellosolve Acetate	R
Ammonia Liquid	R	Blood	R	Chloral Hydrate	R
Ammonia Acetate	R	Borax	R	Chloramine	R
Ammonium Bicarbonate	R	Boric Acid	R	Chloric Acid	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	R
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	CHEMICAL	RATING	CHEMICAL	RATING
Copper Acetate	R	<b>F</b>		<b>I</b>	
Copper Carbonate	R	Fast Green FCF	R	Indigo Carmine	R
Copper Chloride	R	Fatty Acids	R	Inks	R
Copper Cyanide	R	Fehlings solution A	R	Iodine	R
Copper Fluoride	R	Fehlings solution B	R	Iodine solution, Lugol's	R
Copper Nitrate	R	Ferric Ammonium Sulfate	R	Iron Phosphate	---
Copper Sulfate	R	Ferric Chloride	R	Isobutane	C
Corn Oil	C	Ferric Hydroxide	R	Isobutyl Alcohol	R
Corn Syrup	R	Ferric Nitrate	R	Isocane	R
Cottonseed Oil	C	Ferric Sulfate	R	Isopropyl Acetate	R
m-Cresol Purple	R	Ferrous Chloride	R	Isopropyl Alcohol	R
Cresal Red	R	Ferrous Hydroxide	R	Isopropyl Chloride	N
Creosote	N	Ferrous Nitrate	R	Isopropyl Ether	R
Cresol	N	Ferrous Sulfate	R	Isophorone	R
Cresylic Acid	R	Fish Oil	R	<b>J</b>	
Croton Aldehyde	R	Fluoboric Acid	R	Janus Green	R
Crude Oil	R	Fluorine Gas (Dry)	R	JP-3 Fuel	R
Cumene	C	Fluorine Gas (Wet)	R	JP-4 Fuel	R
Cupric Chloride	R	Fluosilicic Acid 30%	R	JP-5 Fuel	R
Cupric Fluoride	R	Fluosilicic Acid 50%	R	JP-6 Fuel	R
Cupric Nitrate	R	Formaldehyde Dilute	R	<b>K</b>	
Cupric Sulfate	R	Formaldehyde 35%	R	Kerosene	R
Cuprous Chloride	R	Formaldehyde 37%	R	Ketchup	R
Cyclohexane	R	Formaldehyde 50%	C	Kraft Liquors	R
Cyclohexanol	R	Formic Acid	R	<b>L</b>	
Cyclohexanone	R	Freon	R	Lactic Acid 25%	R
<b>D</b>		Freon 12	R	Lactic Acid 80%	R
Decahydronaphthalene	R	Freon 21	---	Lactose	R
Detergents	R	Freon 22	R	Lard Oil	C
Dextrin	R	Freon 113	C	Latex	---
Dextrose	R	Freon 114	---	Lauric Acid	R
Diacetone Alcohol	R	Fructose	R	Lauryl Chloride	R
Diastase of malt	R	Furfural	R	Lead Acetate	R
Dibutoxyethyl Phthalate	N	<b>G</b>		Lead Chloride	R
Dibutyl Ether	R	Gallic Acid	R	Lead Nitrate	R
Dibutyl Phthalate	N	Gasoline	R	Lead Sulfate	R
Dibutyl Sebacate	N	Gasohol	R	Lemon Oil	R
Dichlorobenzene	R	Gelatin	R	Ligroin	R
Dichloroethylene	N	Glauber's Salt	---	Limone	R
2,6 - Dichloroindophenal	R	Glucose	R	Lime Slurry	R
Diesel Fuels	R	Glue, PVA	R	Lime Sulfur	R
Diethylamine	R	Glutathione	R	Linoleic Acid	C
Diethyl Cellosolve	R	Glycerine	R	Linoleic Oil	---
Diethyl Ether	R	Glycine	R	Linseed Oil	C
Diglycolic Acid	R	Glycogen	R	Liqueurs	R
Dimethylamine	R	Glycol	C	Lithium Bromide	R
Dimethyl Formamide	R	Glycol Amine	---	Lithium Carbonate	R
Dimethylhydrazine	R	Glycolic Acid	R	Lithium Chloride	R
Dimethyl Phthalate	N	Glyoxal	R	Lithium Hydroxide 50%	R
Dimethyl Sulfoxide	R	Grape Sugar	R	Lithium Nitrate	R
Diocyl Phthalate	N	Grease	---	Lithium Sulfate	R
Dodecyl Alcohol	R	Green Liquor	R	Lubricating Oil #1	R
Dodecyl Sulfate	R	<b>H</b>		Lubricating Oil #2	R
Dioxane	R	Heptane (Type 1)	R	Lubricating Oil #3	R
Diphenyl Oxide	---	n-Hexane	R	Ludox	---
Disodium Phosphate	R	Hexamethylenediamine	R	Luminol 3-amino	R
Drierite	R	Hexanol, Tertiary	R	Phthalhydrazide	R
<b>E</b>		Hydraulic Oil	---	DL-lysine Hydrochloride	R
Eosin Y	R	Hydrazine	R	Lysozyme	R
Eriochrome Black T	R	Hydrobromic Acid 20%	R	<b>M</b>	
Ether	R	Hydrobromic Acid 50%	R	Magnesium Acetate	R
Ethyl Acetate	R	Hydrochloric Acid 10%	R	Magnesium Bromide	R
Ethyl Acetoacetate	R	Hydrochloric Acid 30%	R	Magnesium Carbonate	R
Ethyl Acrylate	R	Hydrocyanic Acid	R	Magnesium Chloride	R
Ethyl Alcohol	R	Hydrofluoric Acid Dilute	R	Magnesium Citrate	R
Ethyl Benzene	C	Hydrofluoric Acid 30%	R	Magnesium Fluoride	---
Ethyl Chloride	N	Hydrofluoric Acid 50%	R	Magnesium Hydroxide	R
Ethyl Chloroacetate	N	Hydrofluoric Acid 100%	R	Magnesium Nitrate	R
Ethylene Bromide	N	Hydrofluosilicic Acid 50%	R	Magnesium Oxide	---
Ethylene Chloride	N	Hydrogen	R	Magnesium Sulfate	R
Ethylene Chlorohydrin	N	Hydrogen Cyanide	R	Malachite Green	R
Ethylenediamine	R	Hydrogen Fluoride	C	Maleic Acid	R
Ethylene Dichloride	N	Hydrogen Peroxide 50%	R	Malic Acid	R
Ethylene Glycol	C	Hydrogen Peroxide 90%	R	Maltose	R
Ethylene Oxide	R	Hydrogen Phosphide	R	Manganese Chloride	R
Ethyl Ether	R	Hydrogen Sulfide Dry	R	Manganese Nitrate	R
Ethyl Formate	R	Hydrogen Sulfide Wet	R	Manganese Sulfate	R
Ethylene Glycol	C	Hydrogen Sulfide, aqueous	R	Menthol	R
2-Ethylhexanol	R	Hydroquinone, aqueous	R		
Ethyl Mercaptan	R	Hydroxylamine Hydrochloride	R		
Ethyl Oxalate	R	Hydroxylamine Sulfate	R		
		Hypochlorous Acid	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
<b>P</b>	
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	R
Periodic Acid	C
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 Thioulsulphate	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
<b>V</b>	
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.**

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#### **SPEARS® MANUFACTURING COMPANY**

Corporate Office  
15853 Olden Street • Sylmar, CA 91342  
PO Box 9203 • Sylmar, CA 91392  
(818) 364-1611 • <http://www.spearsmfg.com>

