Victaulic®

I-100

FIELD INSTALLATION HANDBOOK

For IPS and Metric Carbon Steel, Stainless Steel, and Aluminum Products

- **GASKET INFORMATION**
- **PIPE PREPARATION**
- **PRODUCT INSTALLATION**
- **PRODUCT DATA**

⚠ WARNING

- Read and understand all instructions before attempting to install, remove, adjust or maintain any Victaulic products.
- Depressurize and drain piping systems before attempting to install, remove, adjust, or maintain any Victaulic products.
- Wear safety glasses, hardhat, foot protection, and hearing protection.

Failure to follow instructions and warnings could cause system failure, resulting in serious personal injury and/or property damage.

If you need additional copies of any instructions, or if you have questions about the safe and proper installation or operation of Victaulic products, contact Victaulic.

For the most up-to-date information on Victaulic products, visit our web site at: www.victaulic.com

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The following table provides a listing of products and installation information. If you need additional copies of any installation information, contact Victaulic at 1-800-PICK VIC.
NOTE: If two sources of instructions are referenced in this index, Victaulic recommends the use of both to ensure proper product installation.

Product	Where to Find Instructions
Series 785 TA TBVS Sweated-End, Mini-Circuit Balancing Valve	Instructions Shipped with Valve
Series 786 TA STAS Soldered-End Circuit Balancing Valve	Instructions Shipped with Valve
Series 787 TA STAD NPT Female-Threaded Circuit Balancing Valve	Instructions Shipped with Valve
Series 788 TA STAF Flanged-End Circuit Balancing Valve	Instructions Shipped with Valve
Series 789 TA STAG Grooved-End Circuit Balancing Valve	Instructions Shipped with Valve
Vic-300 Butterfly Valve	I-100
Vic-300 MasterSeal™ Butterfly Valve	I-100 and I-VIC300MS
Style 005 FireLock Rigid Coupling	I-100
Style 009/009V FireLock EZ™ Rigid Coupling	I-100
Style 07 Zero-Flex Rigid Coupling (1 – 12-inch/33.7 – 323.9-mm Sizes)	I-100
Style 07 Zero-Flex Rigid Coupling (14 – 24-inch/355.6 – 610.0-mm Sizes)	I-100 and IT-07
Style W07 AGS Rigid Coupling	I-100 and I-W07/W77
Style 22 Coupling for Vic-Ring Adapters and Shouldered-End Pipe	I-6000
Style 31 Coupling for AWWA Ductile Iron	I-300
Style 31 Coupling for Vic-Ring Adapters and Shouldered-End Pipe	I-6000
Style 41 Coupling for Vic-Ring Adapters and Shouldered-End Pipe	I-6000
Style 44 Coupling for Vic-Ring Adapters and Shouldered-End Pipe	I-6000
Style 72 Outlet Coupling	I-100
Style 74 OD Flexible Coupling	I-100
Style 75 Flexible Coupling	I-100
Style 77 Flexible Coupling	I-100
Style W77 AGS Flexible Coupling	I-100 and I-W07/W77
Style 78 Snap-Joint Coupling	I-100
Style 89 Rigid Coupling for Stainless Steel	I-100 and IT-89
Style 99 Roust-A-Bout Coupling for Plain-End Steel	I-100 and IT-99
Style 150 Mover Expansion Joint	Submittal 09.06
Style 155 Expansion Joint	Submittal 09.06
Style 307 Coupling for Grooved IPS Steel to Grooved AWWA Ductile Iron	I-300

Product	Where to Find Instructions
Style 341 Vic-Flange Adapter for AWWA Ductile Iron	I-300
Style 441 Vic-Flange for Stainless Steel	I-100 and I-441
Style 475 Lightweight, Flexible Stainless Steel Coupling	I-100
Style 489 Rigid Coupling for Stainless Steel (1½ – 4-inch/48.3 – 114.3-mm Sizes)	I-100 and IT-489.2-4
Style 489 Rigid Coupling for Stainless Steel (6 – 12-inch and 139.7 – 318.5-mm Metric and JIS Sizes)	I-100 and IT-489
Style 606 Rigid Coupling for Copper Tubing	I-600
Style 641 Vic-Flange Adapter for Copper Tubing	I-600
Style 707-IJ Transition Coupling for NPS to JIS	I-100
Style 720 TestMaster II Alarm Test Module	I-720
Style 720 TestMaster II Alarm Test Module with Pressure Relief Option	I-720PR
Style 730 Vic-Strainer Tee-Type	I-730/732
Style 731-G Suction Diffuser	I-731G
Style 731-I Suction Diffuser	I-731I
Style 732 Wye-Type Vic-Strainer	I-730/732
Style 733 Venturi Flow Metering Sensor	I-100
Style 734/734S Orifice/Indicator Flow Metering System	I-100
Style 735 Fire Pump Test Meter	I-100
Style 738 TA Portable Differential Meter	Instructions Shipped with Meter
Style 739 Portable Master Meter	Instructions Shipped with Meter
Style 740 TA CBI Meter	Instructions Shipped with Meter
Style 741 IPS and Metric Vic-Flange Adapter	I-100
Style W741 AGS Vic-Flange Adapter	I-100 and IT-W741
Style 743 Vic-Flange Adapter	I-100
Style 744 FireLock Flange Adapter	I-100
Style 750 Reducing Coupling	I-100
Style 770 Large-diameter Coupling	I-100 and IT-770
Style 791 Vic-Boltless Coupling	I-100
Style 808 Duo-Lock Coupling	I-808
Style 920 and 920N Mechanical-T Outlets	I-100 and I-920N

Product	Where to Find Instructions
Style 922 FireLock Outlet-T	I-100 and I-922
Style 923 Vic-Let Strapless Outlet	I-100 and I-923
Style 924 Vic-O-Well Strapless Thermometer Outlet	I-100
Style 926 Mechanical-T Spigot Assembly	I-100 and I-926
Style 931 Vic-Tap II Mechanical-T	VT-II
Style 994 Vic-Flange Adapter for HDPE	I-900 and IT-994
Style 995 Coupling for Plain-End IPS and Metric HDPE	I-900 and IT-995
Style 997 Transition Coupling for HDPE to Steel	I-900 and IT-997
Style 2970 Aquamine Coupling for Plain-end IPS PVC	IT-2970
Style 2971 Aquamine Transition Coupling for Plain-End IPS PVC to Plain-End HDPE	IT-2971
Style 2972 Aquamine Transition Coupling for Plain-End IPS PVC to Grooved IPS Steel	IT-2972
Style HP-70 Rigid Coupling (2 – 12-inch/60.3 – 323.9-mm Sizes)	I-100
Style HP-70 Rigid Coupling (14 – 16-inch/355.6 – 406.4-mm Sizes)	I-100 and IT-70
Style HP-70ES Rigid Coupling with EndSeal Gasket (2 – 12-inch/60.3 – 323.9-mm Sizes)	I-100

General Information

HAZARD IDENTIFICATION

Definitions for identifying the various hazard levels are provided below.

This safety alert symbol indicates important safety messages. When you see this symbol, be alert to the possibility of personal injury. Carefully read and fully understand the message that follows.

⚠ DANGER

- **The use of the word "DANGER" identifies an immediate hazard with a likelihood of death or serious personal injury if instructions, including recommended precautions, are not followed.**

⚠ WARNING

- **The use of the word "WARNING" identifies the presence of hazards or unsafe practices that could result in death or serious personal injury if instructions, including recommended precautions, are not followed.**

⚠ CAUTION

- **The use of the word "CAUTION" identifies possible hazards or unsafe practices that could result in personal injury and product or property damage if instructions, including recommended precautions, are not followed.**

NOTICE

- **The use of the word "NOTICE" identifies special instructions that are important but not related to hazards.**

INTRODUCTION

This field assembly and installation handbook is a basic field reference guide for Victaulic mechanical piping products for IPS and metric carbon steel, stainless steel, and aluminum pipe. This handbook provides easy reference to proper installation information. In addition to this handbook, Victaulic offers the following handbooks for other products/materials:

- I-300 – Installation Instructions for AWWA Products
- I-500 – Installation Instructions for Pressfit Products
- I-600 – Installation Instructions for Copper Connection Products
- I-800 – Installation Instructions for FireLock CPVC Sprinkler System Products
- I-900 – Installation Instructions for HDPE Products

Additional copies of installation information are available from Victaulic, or Victaulic stocking distributors, upon request.

Always follow good piping practices. Specified pressures, temperatures, external loads, internal loads, performance standards, and tolerances must never be exceeded.

Many applications require recognition of special conditions, code requirements, and the use of safety factors. Qualified engineers should reference Section 26 of the Victaulic General Catalog (G-100) and Victaulic publication 05.01, "Gasket Selection Guide," when determining requirements for special applications.

NOTICE

- **Victaulic Company maintains a continual policy of product improvement. Therefore, Victaulic reserves the right to change product specifications, designs, and standard equipment without notice and without incurring obligation.**
- **VICTAULIC IS NOT RESPONSIBLE FOR SYSTEM DESIGN, NOR DOES THE COMPANY ASSUME ANY RESPONSIBILITY FOR SYSTEMS THAT ARE DESIGNED IMPROPERLY.**
- **This handbook is not intended to be a substitute for competent, professional assistance, which is a prerequisite for any product application.**
- **The information published in this handbook and other Victaulic literature supersedes all previously published information.**
- **Drawings and/or pictures in this manual may be exaggerated for clarity.**
- **The field assembly handbook contains trademarks, copyrights, and products with patented features that are the exclusive property of Victaulic.**
- **WHILE EVERY EFFORT HAS BEEN MADE TO ENSURE ITS ACCURACY, VICTAULIC, ITS SUBSIDIARIES, AND ITS AFFILIATED COMPANIES MAKE NO EXPRESSED OR IMPLIED WARRANTY OF ANY KIND REGARDING THE INFORMATION CONTAINED OR REFERENCED IN THIS HANDBOOK. ANYONE WHO USES THE INFORMATION CONTAINED HEREIN DOES SO AT THEIR RISK AND ASSUMES ANY LIABILITY THAT RESULTS FROM SUCH USE.**

IMPORTANT INFORMATION

Victaulic grooved pipe couplings are designed for use only with pipe that is grooved to meet Victaulic specifications. In addition, Victaulic grooved pipe couplings are for use only with Victaulic grooved-end fittings, valves, and related grooved-end components. Victaulic grooved pipe couplings are not intended for use with plain-end pipe and/or fittings.

Victaulic plain-end pipe couplings are designed for use only with plain-end or beveled-end steel pipe and Victaulic plain-end fittings, unless indicated otherwise. Victaulic plain-end pipe couplings must not be used with grooved-end or threaded pipe and/or fittings.

Gaskets for Victaulic grooved and plain-end pipe couplings must be lubricated for proper assembly. Lubrication prevents gasket pinching and assists installation. A thin coat of Victaulic Lubricant or another compatible material, such as silicone or soap-based lubricants, is required.

Victaulic gaskets are designed to perform in a wide range of temperatures and operating conditions. As with all installations, there is a direct relationship between temperature, continuity of service, and gasket life. Victaulic publication 05.01, “Gasket Selection Guide,” must be referenced to determine gasket grade recommendations for each application.

Canadian Customers – Provincial Boilers and Pressure Vessels Acts: For piping applications that fall under the jurisdiction of the Provincial Boilers and Pressure Vessels Acts, intended users should obtain Victaulic Technical Sheet TS-226, which outlines approved services, products, pressure ratings, and temperature ratings.

OPERATOR SAFETY GUIDELINES FOR TOOLS

NOTICE

- **Although Victaulic pipe preparation tools are manufactured for safe, dependable operation, it is impossible to anticipate all combinations of circumstances that could result in an accident. The following instructions are recommended for safe operation of Victaulic pipe preparation tools. Always refer to the specific operating and maintenance instructions manual for complete safety guidelines.**

1. Read and understand the operating and maintenance instruction manual for the tool. Read the supplied manual carefully before operating or performing maintenance on any tool. Become familiar with the tool's features, operations, applications, and limitations. Be particularly aware of its specific hazards. Store the operator's manual in a readily available location. If you require additional copies of any literature, contact Victaulic.

2. Secure the tool, power drive, and equipment. Make sure that the tool and power drive are fastened securely to the floor.

3. Prevent accidental start-ups. Place any power switches in the "OFF" position before plugging the tool into the electrical system. Always use a safety foot switch for the power source.

4. Ground the power source. Make sure the power source is connected to an internally grounded electrical system.

5. Operating environment. Do not operate tools in damp locations. Wear hearing protection in noisy shop operations. Ensure that the work area is well lit.

6. Wear proper clothing. Do not wear unbuttoned jackets, loose sleeve cuffs, neckties, or anything else that can become tangled in moving parts. Always wear safety glasses and foot protection.

7. Stay alert. Do not operate tools if you are drowsy from medication or fatigue. Avoid horseplay around the equipment, and keep bystanders a safe distance away from the equipment.

8. Inspect the equipment. Before starting the tool, check all moveable parts for any obstructions. Make sure the guards and tool parts are installed and secured properly.

9. Keep work areas clean. Keep the work area around the tool clear of obstructions that could limit the movement of the operator. Clean up all oil and coolant spills. Remove shavings from the tool to maintain proper operation.

10. Use pipe supports. For long sections of pipe and heavier work, use floor-mounted pipe stands. Make sure that the work is secured properly in a pipe vise that is fastened securely to the floor.

11. Operate the tool on the switch side only. Operate tools with a safety foot switch located at an easily accessible area. Never reach across moving parts or material being worked on. The safety foot switch must always be accessible to the operator.

12. Do not misuse tools. Perform only the functions for which the tool was designed. Do not force the tool. Do not operate the tool at speeds exceeding those specified in the operating and maintenance instructions manual.

13. Disconnect the power cord before servicing tool. Only authorized personnel should attempt to service tools. Always disconnect the power source before servicing or making any adjustments.

14. Always maintain tools. Keep tools clean and cutting tools sharp for safe, dependable operation. Follow all lubricating instructions. Report any unsafe conditions to authorized personnel for immediate correction.

PIPE PREPARATION

The grooved piping method is based upon the proper preparation of grooves to receive the housings' keys. The groove serves as a recess in the pipe, which allows ample depth for secure engagement of the housings, yet ample wall thickness for full published Victaulic pressure ratings.

Victaulic cut grooving tools are designed for use on standard, heavy-wall metallic; cast gray iron; ductile iron; or plastic pipe. Roll grooving tools accommodate standard-wall pipe, light-wall pipe, and some X-Strong pipe.

⚠ WARNING

- **Before setting up and operating any Victaulic pipe preparation tools, read and understand the operating and maintenance instructions manual for the tool.**
- **Learn the operation, applications, and potential hazards peculiar to the tool.**

Failure to follow these instructions could cause improper product installation, resulting in serious personal injury and/or property damage.

Pipe must be prepared to Victaulic specifications outlined for each product style. Preparation may vary according to pipe material, wall thickness, outside dimensions, and other factors. Refer to pages 17 – 34 of this manual for pipe preparation requirements.

Victaulic recommends square-cut pipe for use with grooved-end and plain-end pipe products. Square-cut pipe MUST be used with Victaulic FlushSeal® and EndSeal® gaskets. Beveled-end pipe may be used, provided that the wall thickness is standard wall (ANSI B36.10) or less and that the bevel meets ANSI B16.25 (37½°) or ASTM A-53 (30°). **NOTE:** Roll grooving beveled-end pipe may result in unacceptable flare.

TOOL RATINGS

The tables on pages 8 – 16 contain general information about tool ratings. Certain tools are designed for high-use shop fabrication, while others are designed for field fabrication. For detailed information on tools, refer to Victaulic publication 24.01. For information about maintenance and operation of tools, refer to the applicable operating and maintenance instructions manual for the tool. **NOTE:** Victaulic cut grooving tools are designed for use on AWWA ductile iron pipe as well as IPS steel and other IPS materials.

PIPE LENGTH REQUIREMENTS FOR GROOVING

The following table identifies the minimum pipe lengths that can be grooved safely by using Victaulic Grooving Tools. In addition, this table identifies the maximum pipe lengths that can be grooved without the use of a pipe stand. Pipe that exceeds the maximum lengths listed in this table requires the use of a pipe stand. Always refer to the operating and maintenance manual for the applicable grooving tool for proper setup and grooving techniques.

(Refer to table on pages 6 and 7)

Size		Length	
Nominal Size inches/mm	Actual Outside Diameter inches/mm	Minimum inches/mm	Maximum inches/mm
¾ 20	1.050 26.9	8 205	36 915
1 25	1.315 33.7	8 205	36 915
1 ¼ 32	1.660 42.4	8 205	36 915
1 ½ 40	1.900 48.3	8 205	36 915
2 50	2.375 60.3	8 205	36 915
2 ½ 65	2.875 73.0	8 205	36 915
76.1 mm	3.000 76.1	8 205	36 915
3 80	3.500 88.9	8 205	36 915
3 ½ 90	4.000 101.6	8 205	36 915
108.0 mm	4.250 108.0	8 205	36 915
4 100	4.500 114.3	8 205	36 915
4 ½ 120	5.000 127.0	8 205	32 815
133.0 mm	5.250 133.0	8 205	32 815
139.7 mm	5.500 139.7	8 205	32 815
5 125	5.563 141.3	8 205	32 815
152.4 mm	6.000 152.4	10 255	30 765
159.0 mm	6.250 159.0	10 255	30 765
165.1 mm	6.500 165.1	10 255	30 765
6 150	6.625 168.3	10 255	28 715
203.2 mm	8.000 203.2	10 255	24 610
216.3 mm	8.500 216.3	10 255	24 610
8 200	8.625 219.1	10 255	24 610
254.0 mm	10.000 254.0	10 255	20 510
267.4 mm	10.500 267.4	10 255	20 510
10 250	10.750 273.0	10 255	20 510

Size		Length	
Nominal Size inches/mm	Actual Outside Diameter inches/mm	Minimum inches/mm	Maximum inches/mm
304.8 mm	12.000 304.8	12 305	18 460
318.5 mm	12.500 318.5	12 305	18 460
12 300	12.750 323.9	12 305	18 460
14 OD	14.000 355.6	12 305	16 410
377.0 mm	14.843 377.0	12 305	16 410
15 OD	15.000 381.0	12 305	16 410
16 OD	16.000 406.4	12 305	16 410
426.0 mm	16.772 426.0	12 305	16 410
18 OD	18.000 457.0		
480.0 mm	19.000 480.0		
20 OD	20.000 508.0		
530.0 mm	21.000 530.0		
22 OD	22.000 559.0		
24 OD	24.000 610.0		
650.0 mm	26.000 650.0		
26 OD	26.000 660.0		
28 OD	28.000 711.0		
30 OD	30.000 762.0		
32 OD	32.000 813.0		
36 OD	36.000 914.0		

NOTE: Always use a pipe stand when roll grooving pipe in these sizes. DO NOT roll groove pipe shorter than 18 inches/460 mm in these sizes.

If pipe is required that is shorter than the minimum length listed in this table, shorten the next-to-last piece so that the last piece is as long (or longer) than the minimum length specified.

EXAMPLE: A 20-foot, 4-inch/6.2-m length of 10-inch/250-mm diameter steel pipe is required to finish a section and only 20-foot/6.1-m lengths are available. Instead of roll grooving a 20-foot/6.1-m length of steel pipe and a 4-inch/102-mm length of steel pipe, follow these steps:

1. Refer to the table above, and note that for 10-inch/250-mm diameter steel pipe, the minimum length that should be roll grooved is 10 inches/255 mm.
2. Roll groove a 19-foot, 6-inch/5.9-m length of pipe and a 10-inch/255-mm length of pipe.

Roll Grooving Tool Capacities

Tool Model	Pipe Material	PIPE SIZE/SCHEDULE inches/mm																
		¾ 20	1 25	1 ¼ 32	1 ½ 40	2 50	2 ½ 65	3 80	3 ½ 90	4 100	4 ½ 120	5 125	6 150	8 200	10 250	12 300	14 350	16 400
VE12	Steel	5 – 10	5 – 40															
	Stainless		40S Only															
	Aluminum †	5 – 10	5 – 40															
	PVC Plastic		40															
VE26S	Steel					5 – 40			5 – 10									
	Stainless					40S Only												
VE26C	Copper					K, L, M, & DWV												
VE26P	Aluminum †					5 – 40			5 – 10									
	PVC Plastic					40												
VE26SS	Lt. Wall SS					5S – 10S												
VE46	Steel								5 – 40									
	Stainless								40S Only									
VE46P	Aluminum †								5 – 40									
	PVC Plastic								40	40 – 80								
VE106 (Groove-N-Go)	Steel			5 – 40 Std. Rolls														
	Stainless			40S Std. Rolls														
	Lt. Wall SS			5S – 10S RX Rolls														
	Copper					K, L, M, & DWV Copper Rolls												

See notes on Page 15.

Roll Grooving Tool Capacities

Tool Model	Pipe Material	PIPE SIZE/SCHEDULE inches/mm																
		¾ 20	1 25	1 ¼ 32	1 ½ 40	2 50	2 ½ 65	3 80	3 ½ 90	4 100	4 ½ 120	5 125	6 150	8 200	10 250	12 300	14 350	16 400
VE226S	Steel			5 – 40				5 – 10										
	Stainless			40S Only														
VE226B	Steel	5 – 40																
	Stainless	40S Only																
	Aluminum †	5 – 40																
	PVC Plastic	40	40 – 80															
VE226M	Steel					5 – 40					5 – 10							
	Stainless					40S Only												
VE226C	Copper					K, L, M, & DWV												
VE226BSS	Lt. Wall SS	5S – 10S																
VE226MSS	LT. Wall SS					5S – 10S												
VE226P	Aluminum †			5 – 40							5 – 10							
	PVC Plastic			40 – 80				40										
VE108H (Europe Only)	Steel		5 – 40								5-10							
	Stainless		40S Only					4.77mm Maximum										
	Lt. Wall SS					5S - 10S RX Rolls												
VE266FS ‡	Steel	5 – 40 Std. Rolls													5 – 20 Std. Rolls			
	Stainless	40S Std. Rolls																
	Lt. Wall SS	5S – 10S RX Rolls																
	Aluminum †*					5 – 40RP Rolls									5 – 20 RP Rolls			
	PVC Plastic *					40 * §	40 – 80 RP Rolls							40 *				
	Copper					K, L, M, & DWV Copper Rolls												

See notes on Page 15.

Roll Grooving Tool Capacities

Tool Model	Pipe Material	PIPE SIZE/SCHEDULE inches/mm																
		¾ 20	1 25	1 ¼ 32	1 ½ 40	2 50	2 ½ 65	3 80	3 ½ 90	4 100	4 ½ 120	5 125	6 150	8 200	10 250	12 300	14 350	16 400
VE268	Steel	5 – 40 Std. Rolls													5 – 20 Std. Rolls			
	Stainless	40S Std. Rolls																
	Lt. Wall SS	5S – 10S RX Rolls																
	Aluminum †*					5 – 40 RP Rolls									5 – 20 RP Rolls			
	PVC Plastic *					40 * §	40 – 80 RP Rolls							40 RP Rolls				
	Copper	K, L, M, & DWV Copper Rolls																
VE270FSD	Steel	5 – 40 Std. Rolls													5 – 20 Std. Rolls			
	Stainless	40S Std. Rolls																
	Lt. Wall SS	5S – 10S RX Rolls																
	Aluminum †*					5 – 40 RP Rolls									5 – 20 RP Rolls			
	PVC Plastic *					40 * §	40 – 80 RP Rolls							40 *				
	Copper	K, L, M, & DWV Copper Rolls																

See notes on Page 15.

Roll Grooving Tool Capacities

Tool Model	Pipe Material	PIPE SIZE/SCHEDULE inches/mm																
		¾ 20	1 25	1¼ 32	1½ 40	2 50	2½ 65	3 80	3½ 90	4 100	4½ 120	5 125	6 150	8 200	10 250	12 300	14 350	16 400
VE272SFS	Steel	5 – 40 Std. Rolls													5 – 20 Std. Rolls			
	Stainless	40S Std. Rolls																
	LT. Wall SS	5S – 10S RX Rolls																
	Aluminum †*					5 – 40 RP Rolls									5 – 20 RP Rolls			
	PVC Plastic*					40 * §	40 – 80 RP Rolls							40 *				
	Copper					K, L, M, & DWV Copper Rolls												
VE274 ‡	Steel					5 – 40 Std. Rolls									5 – 20 Std. Rolls			
	Stainless					40S Std. Rolls												
	Lt. Wall SS					5S – 10S RX Rolls												
	Aluminum †*					5 – 40 RP Rolls									5 – 20 RP Rolls			
	PVC Plastic *					40 * §	40 – 80 RP Rolls							40 *				
	Copper					K, L, M, & DWV Copper Rolls												

See notes on Page 15.

Roll Grooving Tool Capacities

Tool Model	Pipe Material	PIPE SIZE/SCHEDULE inches/mm																
		¾ 20	1 25	1 ¼ 32	1 ½ 40	2 50	2 ½ 65	3 80	3 ½ 90	4 100	4 ½ 120	5 125	6 150	8 200	10 250	12 300	14 350	16 400
VE276FSD ‡	Steel					5 – 40 Std. Rolls									5 – 20 Std. Rolls			
	Stainless					40S Std. Rolls												
	LT. Wall SS					5S – 10S RX Rolls												
	Aluminum †*					5 – 40 RP Rolls									5 – 20 RP Rolls			
	PVC Plastic *					40 * §	40 – 80 RP Rolls							40 *				
	Copper					K, L, M, & DWV Copper Rolls												
VE414MC	Steel					5 – 40 Std. Rolls									5 – Std. Wall			
	Stainless					40S Std. Rolls									Std. Wall Only			
	Lt. Wall SS					5S – 10S RX Rolls											5S – 10 RX Rolls	
	Aluminum †*					5 – 40 RP Rolls										5 – Std. Wall *		
	PVC Plastic *					40 – 80 RP Rolls								40 *				
	Copper					K, L, M, & DWV Copper Rolls												
	AGS Steel																Std. Wall , RW Rolls	
	AGS Stainless																Std. Wall, RW Rolls	
	AGS Lt. Wall SS																5S – 10S RWX Rolls #	

See notes on Page 15.

Roll Grooving Tool Capacities

Tool Model	Pipe Material	PIPE SIZE/SCHEDULE inches/mm																
		¾ 20	1 25	1 ¼ 32	1 ½ 40	2 50	2½ 65	3 80	3½ 90	4 100	4½ 120	5 125	6 150	8 200	10 250	12 300	14 350	16 400
VE416FS VE416FSD	Steel					5 – 40 Std. Rolls										5 – Std. Wall		
	Stainless					40S Std. Rolls										Std. Wall Only		
	Lt. Wall SS					5S – 10S RX Rolls											5S – 10 RX Rolls	
	Aluminum †*					5 – 40 RP Rolls										5 – Std. Wall*		
	PVC PLastic *					40 – 80 RP Rolls								40 *				
	Copper					K, L, M, & DWV Copper Rolls												
	AGS Steel																Std. Wall , RW Rolls	
	AGS Stainless																Std. Wall, RW Rolls	
	AGS Lt. Wall SS																5S – 10S RWX Rolls #	

See notes on Page 15.

Roll Grooving Tool Capacities

Tool Model	Pipe Material	PIPE SIZE/SCHEDULE inches/mm												
		4 100	4½ 120	5 125	6 150	8 200	10 250	12 300	14 350	16 400	18 450	20 500	22 550	24 600
VE424MC ‡	Steel	5 – 80			5 – Std. Wall									
	Stainless	40S Std. Rolls						Std. Wall, Std. Rolls						
	Lt. Wall SS	5S – 10S RX Rolls							5S/10S/10 RX Rolls					
	Aluminum †*	5 – 40 RP Rolls												
	PVC Plastic *	40 – 80 *				40 *								
	AGS Steel								Std. Wall, RW Rolls					
	AGS Stainless								Std. Wall, RW Rolls					
	AGS Lt. Wall SS								5S – 10S RWX Rolls #					

See notes on Page 15.

Roll Grooving Tool Capacities

Tool Model	Pipe Material	PIPE SIZE/SCHEDULE inches/mm																
		4 100	5 125	6 150	8 200	10 250	12 300	14 350	16 400	18 450	20 500	22 550	24 600	26 650	28 700	30 750	32 800	36 900
VE436MC	Steel	5 – 80		5 – 40 @					5 – Extra Strong (0.500 inch) @									
	Stainless	40S Std. Rolls						Std. Wall, Std. Rolls										
	Lt. Wall SS	5S – 10S RX Rolls						5S/10S/10 RX Rolls										
	Aluminum †*	5 – 40 RP Rolls																
	PVC Plastic	40 – 80 *			40 *													
	AGS Steel							Std. Wall, RW Rolls										
	AGS Stainless							Std. Wall, RW Rolls										
	AGS Lt. Wall SS							5S – 10S RWX Rolls #										

* Use RP Rolls.

† 6061-T4 or 6063-T4 must be used. RP Rolls must be used.

‡ Tool has been discontinued.

Special rolls for grooving true sch. 10 (0.250 – 6.4 mm) are available.

@ For 6 – 14-inch/150 – 350-mm sizes, special tooling is available for grooving extra-strong pipe. For 8 – 24-inch/200 – 600 mm-sizes, the maximum wall thickness is limited to standard wall for pipe lengths shorter than 4 feet/1.2 m

§ A special lower roll exclusively for grooving 2" Sch. 80 PVC is available.

Cut Grooving Tool Capacities

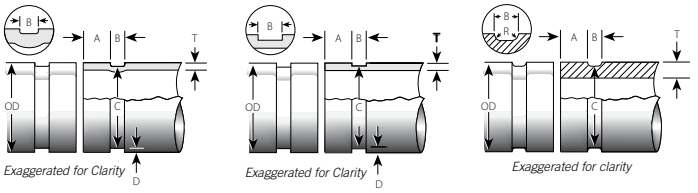
Tool Model	Pipe Material	PIPE SIZE/SCHEDULE inches/mm																					
		¾ 20	1 25	1¼ 32	1½ 40	2 50	2½ 65	3 80	3½ 90	4 100	4½ 120	5 125	6 150	8 200	10 250	12 300	14 350	16 400	18 450	20 500	22 550	24 600
Vic-Groover Individual	Steel	40 – 80																				
	Stainless	40 – 80																				
	Aluminum	40 – 80																				
	PVC	40 – 80																				
Vic-Groover Adjustable	Steel									40 – 80												
	Stainless									40 – 80												
	Aluminum									40 – 80												
Vic-Groover	Ductile Iron									Class 53			Class 53									
VG28GD Adjustable Groover	Steel					40 – 80																
	Stainless					40 – 80																
	Aluminum					40 – 80																
	Ductile Iron							Class 53														
VG824 Adjustable Groover	Steel													40 – 80				30 – Std. Wall				
	Stainless													30 – Std. Wall								
	Aluminum													30 – Std. Wall								
	Ductile Iron													Class 53								
VG412 Adjustable Groover	Steel									40 – 80												
	Ductile Iron									Class 53												
VPG26	PVC					40 – 80 PVC																
VPG824	PVC													40 – 80 PVC								

EXPLANATION OF CRITICAL ROLL GROOVE AND CUT GROOVE DIMENSIONS

⚠ WARNING

- **Pipe dimensions and groove dimensions must be within the tolerances specified in the tables on the following pages to ensure proper joint performance.**

Failure to follow these specifications could result in serious personal injury, property damage, joint leakage, and/or joint failure.



Standard Roll Groove **Standard Cut Groove** **Radius Cut Groove**

Illustrations are exaggerated for clarity - Refer to page 24 for the AGS groove

Pipe Outside Diameter – Nominal NPS Pipe Size (ANSI B36.10) and Basic Metric Pipe Size (ISO 4200) – The average pipe outside diameter must not vary from the specifications listed in the tables on the following pages. Maximum allowable pipe ovality should not vary by more than 1%. Greater variations between the major and minor diameters will result in difficult coupling assembly. For IPS pipe, the maximum allowable tolerance from square-cut pipe ends is 0.030 inch/0.8 mm for ¾ – 3½-inch/20 – 90-mm sizes; 0.045-inch/1.1-mm for 4 – 6-inch/100 – 150-mm sizes; and 0.060-inch/1.5-mm for 8-inch/200-mm and larger sizes. This is measured from the true square line. Any internal and external weld beads or seams must be ground flush to the pipe surface. The inside diameter of the pipe end must be cleaned to remove coarse scale, dirt, and other foreign material that might interfere with or damage grooving rolls.

For pipe being grooved to Advanced Groove System (AGS) specifications, the outside diameter must not vary from the specifications listed in the applicable table (API 5L end tolerance). The maximum allowable tolerance from square-cut ends is 0.063 inch/ 1.5 mm. This is measured from the true square line.

"A" Dimension – The "A" dimension, or the distance from the pipe end to the groove, identifies the gasket seating area. This area must be free from indentations, projections (including weld seams), and roll marks from the pipe end to the groove to ensure a leak-tight seal for the gasket. All foreign material, such as loose paint, scale, oil, grease, chips, rust, and dirt must be removed.

For AGS products, beveled carbon steel pipe may be used, provided the wall thickness is standard wall (0.375 inch/9.5 mm) and the bevel meets ASTM A53 and/or API 5L (30° +5°/-0°).

"B" Dimension – The "B" dimension, or groove width, controls expansion, contraction, and angular deflection of flexible couplings by the distance it is located from the pipe and its width in relation to the coupling housings' "key" width. The bottom of the groove must be free of all foreign material, such as dirt, chips, rust, and scale that may interfere with proper coupling assembly.

For pipe being grooved to AGS specifications, the corners at the bottom of the groove must be radiused R .09/R 2.3. The Groove Width "B" dimension will be achieved with properly maintained Victaulic tools that are equipped with special Victaulic AGS (RW) roll sets for carbon steel pipe or Victaulic AGS (RWX) roll sets for stainless steel pipe.

"C" Dimension – The "C" dimension is the proper diameter at the base of the groove. This dimension must be within the diameter's tolerance and concentric with the OD for proper coupling fit. The groove must be of uniform depth for the entire pipe circumference. For pipe being grooved to AGS specifications, Victaulic RW roll sets must be used for carbon steel pipe, and Victaulic RWX roll sets must be used for stainless steel pipe.

"D" Dimension – The "D" dimension is the normal depth of the groove and is a reference for a "trial groove" only. Variations in pipe OD affect this dimension and must be altered, if necessary, to keep the "C" dimension within tolerance. This groove must conform to the "C" dimension described above.

"F" Standard Roll Groove Only – Maximum allowable pipe-end flare diameter is measured at the extreme pipe-end diameter. **NOTE:** This applies to average (pi tape) and single-point readings.

"T" Dimension – The "T" dimension is the lightest grade (minimum, nominal wall thickness) of pipe that is suitable for cut or roll grooving. Pipe that is less than the minimum, nominal wall thickness for cut grooving may be roll grooved or adapted for Victaulic couplings by using Vic-Ring® adapters. Vic-Ring adapters can be used in the following situations (contact Victaulic for details):

- When the pipe is less than the minimum, nominal wall thickness suitable for roll grooving
- When the pipe outside diameter is too large to roll or cut groove
- When the pipe is used in abrasive services

For pipe being grooved to AGS specifications, the absolute minimum wall thickness is 0.290 inch/7.4 mm for 14-inch/355.6-mm pipe and 0.318 inch/8.1 mm for 16-inch/406.4-mm pipe, in accordance with EN 10217. The absolute minimum wall thickness for 18-inch/457.0-mm, 20-inch/508.0-mm, and 24-inch/610.0-mm pipe is 0.328 inch/8.3 mm, in accordance with ASTM A-53.

"R" Dimension – The "R" dimension is the radius necessary at the bottom of the groove to eliminate a point of stress concentration for cast pipe (gray and ductile) and PVC plastic pipe.

NOTICE

- **Coatings that are applied to the interior surfaces of Victaulic grooved and plain-end pipe couplings must not exceed 0.010 inch/0.25 mm. This includes the bolt pad mating surfaces.**
- **In addition, the coating thickness applied to the gasket-sealing surface and within the groove on the pipe exterior must not exceed 0.010 inch/0.25 mm.**

Roll Groove Specifications for Steel Pipe and All Materials Grooved with Standard and RX Rolls †

Size		Dimensions – inches/millimeters												
		Pipe Outside Diameter		Gasket Seat "A"			Groove Width "B"			Groove Diameter "C"				
Actual Out.Dia. inches/mm	Actual Out. Dia. inches/mm	Max.	Min.	Basic	Max.	Min.	Basic	Max.	Min.	Max.	Min.	Groove Depth "D" (ref.)	Min. Allow. Wall Thick. "T"	Max. Allow. Flare Dia.
¾ 20	1.050 26.9	1.060 26.9	1.040 26.4	0.625 15.9	0.656 16.7	0.594 15.1	0.281 7.1	0.312 7.9	0.250 6.4	0.938 23.8	0.923 23.4	0.056 1.5	0.049 1.2	1.15 29.2
1 25	1.315 33.7	1.328 33.7	1.302 33.1	0.625 15.9	0.656 16.7	0.594 15.1	0.281 7.1	0.312 7.9	0.250 6.4	1.190 30.2	1.175 29.9	0.063 1.6	0.049 1.2	1.43 36.3
1 ¼ 32	1.660 42.4	1.676 42.6	1.644 41.8	0.625 15.9	0.656 16.7	0.594 15.1	0.281 7.1	0.312 7.9	0.250 6.4	1.535 39.0	1.520 38.6	0.063 1.6	0.049 1.2	1.77 45.0
1 ½ 40	1.900 48.3	1.919 48.7	1.881 47.8	0.625 15.9	0.656 16.7	0.594 15.1	0.281 7.1	0.312 7.9	0.250 6.4	1.775 45.1	1.760 44.7	0.063 1.6	0.049 1.2	2.01 51.1
2 50	2.375 60.3	2.399 60.9	2.351 59.7	0.625 15.9	0.656 16.7	0.594 15.1	0.344 8.7	0.375 9.5	0.313 8.0	2.250 57.2	2.235 56.8	0.063 1.6	0.049 1.2	2.48 63.0
2 ½ 65	2.875 73.0	2.904 73.8	2.846 72.3	0.625 15.9	0.656 16.7	0.594 15.1	0.344 8.7	0.375 9.5	0.313 8.0	2.720 69.1	2.702 68.6	0.078 2.0	0.078 2.0	2.98 75.7
76.1 mm	3.000 76.1	3.030 77.0	2.970 75.4	0.625 15.9	0.656 16.7	0.594 15.1	0.344 8.7	0.375 9.5	0.313 8.0	2.845 72.3	2.827 71.8	0.078 2.0	0.078 2.0	3.10 78.7
3 80	3.500 88.9	3.535 89.8	3.469 88.1	0.625 15.9	0.656 16.7	0.594 15.1	0.344 8.7	0.375 9.5	0.313 8.0	3.344 84.9	3.326 84.5	0.078 2.0	0.078 2.0	3.60 91.4
3 ½ 90	4.000 101.6	4.040 102.6	3.969 100.8	0.625 15.9	0.656 16.7	0.594 15.1	0.344 8.7	0.375 9.5	0.313 8.0	3.834 97.4	3.814 96.9	0.083 2.2	0.078 2.0	4.10 104.1
108.0 mm	4.250 108.0	4.293 109.0	4.219 107.2	0.625 15.9	0.656 16.7	0.594 15.1	0.344 8.7	0.375 9.5	0.313 8.0	4.084 103.7	4.064 103.2	0.083 2.2	0.078 2.0	4.35 110.5

† See note on page 23.

Roll Groove Specifications for Steel Pipe and All Materials Grooved with Standard and RX Rolls (Continued) †

Size		Dimensions – inches/millimeters												
		Pipe Outside Diameter		Gasket Seat "A"			Groove Width "B"			Groove Diameter "C"				
Actual Out.Dia. inches/mm	Actual Out. Dia. inches/mm	Max.	Min.	Basic	Max.	Min.	Basic	Max.	Min.	Max.	Min.	Groove Depth "D" (ref.)	Min. Allow. Wall Thick. "T"	Max. Allow. Flare Dia.
4 100	4.500 114.3	4.545 115.4	4.469 113.5	0.625 15.9	0.656 16.7	0.594 15.1	0.344 8.7	0.375 9.5	0.313 8.0	4.334 110.1	4.314 109.6	0.083 2.2	0.078 2.0	4.60 116.8
4½ 120	5.000 127.0	5.050 128.3	4.969 126.2	0.625 15.9	0.656 16.7	0.594 15.1	0.344 8.7	0.375 9.5	0.313 8.0	4.834 122.8	4.814 122.3	0.083 2.2	0.078 2.0	5.10 129.5
133.0 mm	5.250 133.0	5.303 134.7	5.219 132.6	0.625 15.9	0.656 16.7	0.594 15.1	0.344 8.7	0.375 9.5	0.313 8.0	5.084 129.1	5.064 128.6	0.083 2.2	0.078 2.0	5.35 135.9
139.7 mm	5.500 139.7	5.556 141.1	5.469 138.9	0.625 15.9	0.656 16.7	0.594 15.1	0.344 8.7	0.375 9.5	0.313 8.0	5.334 135.5	5.314 135.0	0.083 2.2	0.078 2.0	5.60 142.2
5 125	5.563 141.3	5.619 142.7	5.532 140.5	0.625 15.9	0.656 16.7	0.594 15.1	0.344 8.7	0.375 9.5	0.313 8.0	5.395 137.0	5.373 136.5	0.084 2.2	0.078 2.0	5.66 143.8
152.4 mm	6.000 152.4	6.056 153.8	5.969 151.6	0.625 15.9	0.656 16.7	0.594 15.1	0.344 8.7	0.375 9.5	0.313 8.0	5.830 148.1	5.808 147.5	0.085 2.2	0.078 2.0	6.10 154.9
159.0 mm	6.250 159.0	6.313 160.4	6.219 158.0	0.625 15.9	0.656 16.7	0.594 15.1	0.344 8.7	0.375 9.5	0.313 8.0	6.032 153.2	6.002 152.5	0.109 2.8	0.109 2.8	6.35 161.3
165.1 mm	6.500 165.1	6.563 166.7	6.469 164.3	0.625 15.9	0.656 16.7	0.594 15.1	0.344 8.7	0.375 9.5	0.313 8.0	6.330 160.8	6.308 160.2	0.085 2.2	0.078 2.8	6.60 167.6
6 150	6.625 168.3	6.688 169.9	6.594 167.5	0.625 15.9	0.656 16.7	0.594 15.1	0.344 8.7	0.375 9.5	0.313 8.0	6.455 164.0	6.433 163.4	0.085 2.2	0.078 2.8	6.73 170.9
203.2 mm	8.000 203.2	8.063 204.8	7.969 202.4	0.750 19.1	0.781 19.8	0.719 18.3	0.469 11.9	0.500 12.7	0.438 11.1	7.816 198.5	7.791 197.9	0.092 2.4	0.109 2.8	8.17 207.5

† See note on page 23.

Roll Groove Specifications for Steel Pipe and All Materials Grooved with Standard and RX Rolls (Continued) †

Size		Dimensions – inches/millimeters												
		Pipe Outside Diameter		Gasket Seat "A"			Groove Width "B"			Groove Diameter "C"				
Nom. Size inches/ Actual mm	Actual Out.Dia. inches/mm	Max.	Min.	Basic	Max.	Min.	Basic	Max.	Min.	Max.	Min.	Groove Depth "D" (ref.)	Min. Allow. Wall Thick. "T"	Max. Allow. Flare Dia.
216.3 mm	8.515 216.3	8.578 217.9	8.484 215.5	0.750 19.1	0.781 19.8	0.719 18.3	0.469 11.9	0.500 12.7	0.438 11.1	8.331 211.6	8.306 211.0	0.092 2.4	0.109 2.8	8.69 220.7
8 200	8.625 219.1	8.688 220.7	8.594 218.3	0.750 19.1	0.781 19.8	0.719 18.3	0.469 11.9	0.500 12.7	0.438 11.1	8.441 214.4	8.416 213.8	0.092 2.4	0.109 2.8	8.80 223.5
254.0 mm	10.000 254.0	10.063 255.6	9.969 253.2	0.750 19.1	0.781 19.8	0.719 18.3	0.469 11.9	0.500 12.7	0.438 11.1	9.812 249.2	9.785 248.5	0.094 2.4	0.134 3.4	10.17 258.3
267.4 mm	10.528 267.4	10.591 269.0	10.497 266.6	0.750 19.1	0.781 19.8	0.719 18.3	0.469 11.9	0.500 12.7	0.438 11.1	10.340 262.6	10.313 262.0	0.094 2.4	0.134 3.4	10.70 271.8
10 250	10.750 273.0	10.813 274.7	10.719 272.3	0.750 19.1	0.781 19.8	0.719 18.3	0.469 11.9	0.500 12.7	0.438 11.1	10.562 268.3	10.535 267.6	0.094 2.4	0.134 3.4	10.92 277.4
304.8 mm	12.000 304.8	12.063 306.4	11.969 304.0	0.750 19.1	0.781 19.8	0.719 18.3	0.469 11.9	0.500 12.7	0.438 11.1	11.781 299.2	11.751 298.5	0.109 2.8	0.156 4.0	12.17 309.1
318.5 mm	12.539 318.5	12.602 320.1	12.508 317.7	0.750 19.1	0.781 19.8	0.719 18.3	0.469 11.9	0.500 12.7	0.438 11.1	12.321 313.0	12.291 312.2	0.109 2.8	0.156 4.0	12.71 322.8
12 300	12.750 323.9	12.813 325.5	12.719 323.1	0.750 19.1	0.781 19.8	0.719 18.3	0.469 11.9	0.500 12.7	0.438 11.1	12.531 318.3	12.501 317.5	0.109 2.8	0.156 4.0	12.92 328.2
14 OD *	14.000 355.6	14.063 357.2	13.969 354.8	0.938 23.8	0.969 24.6	0.907 23.0	0.469 11.9	0.500 12.7	0.438 11.1	13.781 350.0	13.751 349.3	0.109 2.8	0.156 4.0	14.16 359.7
377.0 mm	14.843 377.0	14.937 379.4	14.811 376.2	0.938 23.8	0.969 24.6	0.907 23.0	0.469 11.9	0.500 12.7	0.438 11.1	14.611 371.1	14.581 370.4	0.116 2.9	0.177 4.5	15.00 381.0

† See note on page 23.

Roll Groove Specifications for Steel Pipe and All Materials Grooved with Standard and RX Rolls (Continued) †

Size		Dimensions – inches/millimeters												
		Pipe Outside Diameter		Gasket Seat "A"			Groove Width "B"			Groove Diameter "C"				
Nom. Size inches/ Actual mm	Actual Out.Dia. inches/mm	Max.	Min.	Basic	Max.	Min.	Basic	Max.	Min.	Max.	Min.	Groove Depth "D" (ref.)	Min. Allow. Wall Thick. "T"	Max. Allow. Flare Dia.
15 OD	15.000 381.0	15.063 382.6	14.969 380.2	0.938 23.8	0.969 24.6	0.907 23.0	0.469 11.9	0.500 12.7	0.438 11.1	14.781 375.4	14.751 374.7	0.109 2.8	0.165 4.2	15.16 385.1
16 OD *	16.000 406.4	16.063 408.0	15.969 405.6	0.938 23.8	0.969 24.6	0.907 23.0	0.469 11.9	0.500 12.7	0.438 11.1	15.781 400.8	15.751 400.1	0.109 2.8	0.165 4.2	16.16 410.5
426.0 mm	16.772 426.0	16.866 428.4	16.740 425.2	0.938 23.8	0.969 24.6	0.907 23.0	0.469 11.9	0.500 12.7	0.438 11.1	16.514 419.5	16.479 418.6	0.129 3.3	0.177 4.5	16.93 430.0
18 OD *	18.000 457.0	18.063 458.8	17.969 456.4	1.000 25.4	1.031 26.2	0.969 24.6	0.469 11.9	0.500 12.7	0.438 11.1	17.781 451.6	17.751 450.9	0.109 2.8	0.165 4.2	18.16 461.3
20 OD *	20.000 508.0	20.063 509.6	19.969 507.2	1.000 25.4	1.031 26.2	0.969 24.6	0.469 11.9	0.500 12.7	0.438 11.1	19.781 502.4	19.751 501.7	0.109 2.8	0.188 4.8	20.16 512.1
22 OD	22.000 559.0	22.063 560.4	21.969 558.0	1.000 25.4	1.031 26.2	0.969 24.6	0.500 12.7	0.531 13.5	0.469 11.9	21.656 550.1	21.626 549.3	0.172 4.4	0.188 4.8	22.20 563.9
24 OD *	24.000 610.0	24.063 611.2	23.969 608.8	1.000 25.4	1.031 26.2	0.969 24.6	0.500 12.7	0.531 13.5	0.469 11.9	23.656 600.9	23.626 600.1	0.172 4.4	0.218 5.5	24.20 614.7
26 OD	26.000 660.0	26.093 662.8	25.969 659.6	1.750 44.5	1.781 45.2	1.687 42.8	0.625 15.9	0.656 16.7	0.594 15.1	25.000 647.7	25.437 646.1	0.250 6.4	0.250 6.4	26.20 665.5
28 OD	28.000 711.0	28.093 713.6	27.969 710.4	1.750 44.5	1.781 45.2	1.687 42.8	0.625 15.9	0.656 16.7	0.594 15.1	27.500 698.5	27.437 696.9	0.250 6.4	0.250 6.4	28.20 716.3

† See note on page 23.

* See note on page 23.

Roll Groove Specifications for Steel Pipe and All Materials Grooved with Standard and RX Rolls (Continued) †

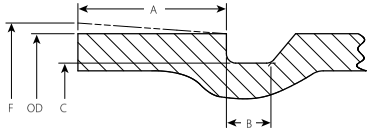
Size		Dimensions – inches/millimeters												
		Pipe Outside Diameter		Gasket Seat "A"			Groove Width "B"			Groove Diameter "C"				
Nom. Size inches/ Actual mm	Actual Out.Dia. inches/mm	Max.	Min.	Basic	Max.	Min.	Basic	Max.	Min.	Max.	Min.	Groove Depth "D" (ref.)	Min. Allow. Wall Thick. "T"	Max. Allow. Flare Dia.
30 OD	30.000 762.0	30.093 764.4	29.969 761.2	1.750 44.5	1.781 45.2	1.687 42.8	0.625 15.9	0.656 16.7	0.594 15.1	29.500 749.3	29.437 747.7	0.250 6.4	0.250 6.4	30.20 767.1
32 OD	32.000 813.0	32.093 815.2	31.969 812.0	1.750 44.5	1.781 45.2	1.687 42.8	0.625 15.9	0.656 16.7	0.594 15.1	31.500 800.1	31.437 798.5	0.250 6.4	0.250 6.4	32.20 817.9
36 OD	36.000 914.0	36.093 916.8	35.969 913.6	1.750 44.5	1.781 45.2	1.687 42.8	0.625 15.9	0.656 16.7	0.594 15.1	35.500 901.7	35.437 900.1	0.250 6.4	0.250 6.4	36.20 919.5
42 OD	42.000 1067.0	42.093 1069.2	41.969 1066.0	2.000 50.8	2.031 51.6	1.937 49.2	0.625 15.9	0.656 16.7	0.594 15.1	41.500 1054.1	41.437 1052.5	0.250 6.4	0.250 6.4	42.20 1071.9
48 OD	48.000 1219.0	48.093 1221.6	47.969 1218.4	2.000 50.8	2.031 51.6	1.937 49.2	0.625 15.9	0.656 16.7	0.594 15.1	47.500 1206.5	47.437 1204.9	0.250 6.4	0.250 6.4	48.20 1224.3

† Coatings applied to the interior surfaces, including bolt pad mating surfaces, must not exceed 0.010 inch/0.3 mm. In addition, the coating thickness applied to the gasket-sealing surface and within the groove on the pipe exterior must not exceed 0.010 inch/0.3 mm.

* Standard grooving specifications. For AGS grooving specifications in these sizes, refer to page 24.

NOTICE

- **Grooving pipe to Advanced Groove System (AGS) specifications enlarges the pipe length by approximately ⅛-inch/0.125-inch/3.2-mm for each groove. For a pipe length with an AGS groove at each end, the length will grow approximately ¼-inch 0.250-inch/6.4-mm total. Therefore, the cut length should be adjusted to accommodate this growth. EXAMPLE: If you need a 24-inch/610-mm length of pipe that will contain an AGS groove at each end, cut the pipe to a length of 23 ¾-inches/603-mm to allow for this growth.**
- **It is critical to measure the Groove Diameter "C" dimension, along with the Gasket Seat "A" dimension and the Flare Diameter "F" dimension. These measurements must be within the specifications listed in the tables below for proper joint performance.**



Advanced Groove System (AGS) Roll Groove (Exaggerated for clarity)

Advanced Groove System (AGS) Roll Grooving Specifications for Carbon Steel Pipe

Size	Dimensions – inches/millimeters										
Nom. Size inches/Actual mm	Outside Diameter "OD"		Gasket Seat "A"			Groove Width "B" ‡			Groove Diameter "C"		Max. Allow. Flare Dia. "F"
	Maximum	Minimum	Basic	Maximum	Minimum	Basic	Maximum	Minimum	Maximum	Minimum	
14 355.6	14.094 358.0	13.969 354.8	1.500 38.1	1.531 38.9	1.437 36.5	0.455 11.6	0.460 11.7	0.450 11.4	13.500 342.9	13.455 341.8	14.23 361.4
16 406.4	16.094 408.8	15.969 405.6	1.500 38.1	1.531 38.9	1.437 36.5	0.455 11.6	0.460 11.7	0.450 11.4	15.500 393.7	15.455 392.6	16.23 412.2
18 457.0	18.094 459.6	17.969 456.4	1.500 38.1	1.531 38.9	1.437 36.5	0.455 11.6	0.460 11.7	0.450 11.4	17.500 444.5	17.455 443.4	18.23 463.0
20 508.0	20.094 510.4	19.969 507.2	1.500 38.1	1.531 38.9	1.437 36.5	0.455 11.6	0.460 11.7	0.450 11.4	19.500 495.3	19.455 494.2	20.23 513.8
24 610.0	24.094 612.0	23.969 608.8	1.500 38.1	1.531 38.9	1.437 36.5	0.455 11.6	0.460 11.7	0.450 11.4	23.500 596.9	23.455 595.8	24.23 615.4

‡ The Groove Width "B" dimension is listed for information only. The Groove Width "B" dimension will be achieved with properly maintained Victaulic tools that are equipped with special Victaulic AGS (RW) roll sets made specifically for use with standard-weight pipe.

Advanced Groove System (AGS) Roll Grooving Specifications for Stainless Steel Pipe

Size	Dimensions – inches/millimeters										
Nom. Size inches/Actual mm	Outside Diameter "OD"		Gasket Seat "A"			Groove Width "B" ‡			Groove Diameter "C"		Max. Allow. Flare Dia. "F"
	Maximum	Minimum	Basic	Maximum	Minimum	Basic	Maximum	Minimum	Maximum	Minimum	
14 355.6	14.094 358.0	13.969 354.8	1.500 38.1	1.531 38.9	1.437 36.5	0.455 11.6	0.460 11.7	0.450 11.4	13.500 342.9	13.455 341.8	14.23 361.4
16 406.4	16.094 408.8	15.969 405.6	1.500 38.1	1.531 38.9	1.437 36.5	0.455 11.6	0.460 11.7	0.450 11.4	15.500 393.7	15.455 392.6	16.23 412.2
18 457.0	18.094 459.6	17.969 456.4	1.500 38.1	1.531 38.9	1.437 36.5	0.455 11.6	0.460 11.7	0.450 11.4	17.500 444.5	17.455 443.4	18.23 463.0
20 508.0	20.125 511.2	19.969 507.2	1.500 38.1	1.531 38.9	1.437 36.5	0.455 11.6	0.460 11.7	0.450 11.4	19.500 495.3	19.455 494.2	20.23 513.8
24 610.0	24.125 612.8	23.969 608.8	1.500 38.1	1.531 38.9	1.437 36.5	0.455 11.6	0.460 11.7	0.450 11.4	23.500 596.9	23.455 595.8	24.23 615.4

‡ The Groove Width "B" dimension is listed for information only. The Groove Width "B" dimension will be achieved with properly maintained Victaulic tools that are equipped with special Victaulic AGS (RWX) roll sets made specifically for use with stainless steel pipe.

Standard Cut Groove Specifications for Steel and Other NPS Pipe †

Size		Dimensions – inches/millimeters											
		Pipe Outside Diameter		Gasket Seat "A"			Groove Width "B"			Groove Diameter "C"		Groove Depth "D" (ref.)	Min. Allow. Wall Thick. "T"
Nom. Size inches/mm	Act. OD inches/mm	Max.	Min.	Basic	Max.	Min.	Basic	Max.	Min.	Max.	Min.		
¾ 20	1.050 26.9	1.060 26.9	1.040 26.4	0.625 15.9	0.656 16.7	0.594 15.1	0.313 8.0	0.344 8.7	0.282 7.2	0.938 23.8	0.923 23.4	0.056 1.5	0.113 2.9
1 25	1.315 33.7	1.328 33.7	1.302 33.1	0.625 15.9	0.656 16.7	0.594 15.1	0.313 8.0	0.344 8.7	0.282 7.2	1.190 30.2	1.175 29.9	0.063 1.6	0.133 3.4
1 ¼ 32	1.660 42.4	1.676 42.6	1.644 41.8	0.625 15.9	0.656 16.7	0.594 15.1	0.313 8.0	0.344 8.7	0.282 7.2	1.535 39.0	1.520 38.6	0.063 1.6	0.140 3.6
1 ½ 40	1.900 48.3	1.919 48.7	1.881 47.8	0.625 15.9	0.656 16.7	0.594 15.1	0.313 8.0	0.344 8.7	0.282 7.2	1.775 45.1	1.760 44.7	0.063 1.6	0.145 3.7
2 50	2.375 60.3	2.399 60.9	2.351 59.7	0.625 15.9	0.656 16.7	0.594 15.1	0.313 8.0	0.344 8.7	0.282 7.2	2.250 57.2	2.235 56.8	0.063 1.6	0.154 3.9
2 ½ 65	2.875 73.0	2.904 73.8	2.846 72.3	0.625 15.9	0.656 16.7	0.594 15.1	0.313 8.0	0.344 8.7	0.282 7.2	2.720 69.1	2.702 68.6	0.078 2.0	0.188 4.8
76.1 mm	3.000 76.1	3.030 77.0	2.970 75.4	0.625 15.9	0.656 16.7	0.594 15.1	0.313 8.0	0.344 8.7	0.282 7.2	2.845 72.3	2.827 71.8	0.078 2.0	0.188 4.8
3 80	3.500 88.9	3.535 89.8	3.469 88.1	0.625 15.9	0.656 16.7	0.594 15.1	0.313 8.0	0.344 8.7	0.282 7.2	3.344 84.9	3.326 84.5	0.078 2.0	0.188 4.8
3 ½ 90	4.000 101.6	4.040 102.6	3.969 100.8	0.625 15.9	0.656 16.7	0.594 15.1	0.313 8.0	0.344 8.7	0.282 7.2	3.834 97.4	3.814 96.9	0.083 2.2	0.188 4.8
108.0	4.250 108.0	4.293 109.0	4.219 107.2	0.625 15.9	0.656 16.7	0.594 15.1	0.375 9.5	0.406 10.3	0.344 8.7	4.084 103.7	4.064 103.2	0.083 2.2	0.203 5.2

† See note on page 30.

Standard Cut Groove Specifications for Steel and Other NPS Pipe †

Size		Dimensions – inches/millimeters											
		Pipe Outside Diameter		Gasket Seat "A"			Groove Width "B"			Groove Diameter "C"		Groove Depth "D" (ref.)	Min. Allow. Wall Thick. "T"
Nom. Size inches/mm	Act. OD inches/mm	Max.	Min.	Basic	Max.	Min.	Basic	Max.	Min.	Max.	Min.		
4 100	4.500 114.3	4.545 115.4	4.469 113.5	0.625 15.9	0.656 16.7	0.594 15.1	0.375 9.5	0.406 10.3	0.344 8.7	4.334 110.1	4.314 109.6	0.083 2.2	0.203 5.2
4 ½ 120	5.000 127.0	5.050 128.3	4.969 126.2	0.625 15.9	0.656 16.7	0.594 15.1	0.375 9.5	0.406 10.3	0.344 8.7	4.834 122.8	4.814 122.3	0.083 2.2	0.203 5.2
5 ¼ OD	5.250 133.0	5.303 134.7	5.219 132.6	0.625 15..9	0.656 16.7	0.594 15.1	0.375 9.5	0.406 10.3	0.344 8.7	5.084 129.1	5.064 128.6	0.083 2.2	0.203 5.2
5 ½ OD	5.500 139.7	5.556 141.1	5.469 138.9	0.625 15.9	0.656 16.7	0.594 15.1	0.375 9.5	0.406 10.3	0.344 8.7	5.334 135.5	5.314 135.0	0.083 2.2	0.203 5.2
5 125	5.563 141.3	5.619 142.7	5.532 140.5	0.625 15.9	0.656 16.7	0.594 15.1	0.375 9.5	0.406 10.3	0.344 8.7	5.395 137.0	5.373 136.5	0.084 2.2	0.203 5.2
6 OD	6.000 152.4	6.056 153.8	5.969 151.6	0.625 15.9	0.656 16.7	0.594 15.1	0.375 9.5	0.406 10.3	0.344 8.7	5.830 148.1	5.808 147.5	0.085 2.2	0.219 5.6
6 ¼ OD	6.250 159.0	6.313 160.4	6.219 158.0	0.625 15.9	0.656 16.7	0.594 15.1	0.375 9.5	0.406 10.3	0.344 8.7	6.032 153.2	6.002 152.5	0.109 2.8	0.249 6.3
6 ½ OD	6.500 165.1	6.563 166.7	6.469 164.3	0.625 15.9	0.656 16.7	0.594 15.1	0.375 9.5	0.406 10.3	0.344 8.7	6.330 160.8	6.308 160.2	0.085 2.2	0.219 5.6
6 150	6.625 168.3	6.688 169.9	6.594 167.5	0.625 15.9	0.656 16.7	0.594 15.1	0.375 9.5	0.406 10.3	0.344 8.7	6.455 164.0	6.433 163.4	0.085 2.2	0.219 5.6
8 OD	8.000 203.2	8.063 204.8	7.969 202.4	0.750 19.1	0.781 19.8	0.719 18.3	0.438 11.1	0.469 11.9	0.407 10.3	7.816 198.5	7.791 197.9	0.092 2.4	0.238 6.1

† See note on page 30.

Standard Cut Groove Specifications for Steel and Other NPS Pipe †

Size		Dimensions – inches/millimeters											
		Pipe Outside Diameter		Gasket Seat "A"			Groove Width "B"			Groove Diameter "C"		Groove Depth "D" (ref.)	Min. Allow. Wall Thick. "T"
Nom. Size inches/mm	Act. OD inches/mm	Max.	Min.	Basic	Max.	Min.	Basic	Max.	Min.	Max.	Min.		
216.3 mm	8.515 216.3	8.578 217.9	8.484 215.5	0.750 19.1	0.781 19.8	0.719 18.3	0.438 11.1	0.469 11.9	0.407 10.3	8.331 211.6	8.306 211.0	0.092 2.4	0.238 6.1
8 200	8.625 219.1	8.688 220.7	8.594 218.3	0.750 19.1	0.781 19.8	0.719 18.3	0.438 11.1	0.469 11.9	0.407 10.3	8.441 214.4	8.416 213.8	0.092 2.4	0.238 6.1
10 OD	10.000 254.0	10.063 255.6	9.969 253.2	0.750 19.1	0.781 19.8	0.719 18.3	0.500 12.7	0.531 13.5	0.469 11.9	9.812 249.2	9.785 248.5	0.094 2.4	0.250 6.4
267.4 mm	10.528 267.4	10.591 269.0	10.497 266.6	0.750 19.1	0.781 19.8	0.719 18.3	0.500 12.7	0.531 13.5	0.469 11.9	10.340 262.6	10.313 262.0	0.094 2.4	0.250 6.4
10 250	10.750 273.0	10.813 274.7	10.719 272.3	0.750 19.1	0.781 19.8	0.719 18.3	0.500 12.7	0.531 13.5	0.469 11.9	10.562 268.3	10.535 267.6	0.094 2.4	0.250 6.4
304.8 mm	12.000 304.8	12.063 306.4	11.969 304.0	0.750 19.1	0.781 19.8	0.719 18.3	0.500 12.7	0.531 13.5	0.469 11.9	11.781 299.2	11.751 298.5	0.109 2.8	0.279 7.1
318.5 mm	12.539 318.5	12.602 320.1	12.508 317.7	0.750 19.1	0.781 19.8	0.719 18.3	0.500 12.7	0.531 13.5	0.469 11..9	12.321 313.0	12.291 312.2	0.109 2.8	0.279 7.1
12 300	12.750 323.9	12.813 325.5	12.719 323.1	0.750 19.1	0.781 19.8	0.719 18.3	0.500 12.7	0.531 13.5	0.469 11.9	12.531 318.3	12.501 317.5	0.109 2.8	0.279 7.1
14 OD	14.000 355.6	14.063 357.2	13.969 354.8	0.938 23.8	0.969 24.6	0.907 23.0	0.500 12.7	0.531 13.5	0.469 11.9	13.781 350.0	13.751 349.3	0.109 2.8	0.281 7.1
377.0 mm	14.843 377.0	14.937 379.4	14.811 376.2	0.938 23.8	0.969 24.6	0.907 23.0	0.500 12.7	0.531 13.5	0.469 11.9	14.611 371.1	14.581 370.4	0.116 2.9	0.315 8.0

† See note on page 30.

Standard Cut Groove Specifications for Steel and Other NPS Pipe †

Size		Dimensions – inches/millimeters											
		Pipe Outside Diameter		Gasket Seat "A"			Groove Width "B"			Groove Diameter "C"		Groove Depth "D" (ref.)	Min. Allow. Wall Thick. "T"
Nom. Size inches/mm	Act. OD inches/mm	Max.	Min.	Basic	Max.	Min.	Basic	Max.	Min.	Max.	Min.		
15 OD	15.000 381.0	15.063 382.6	14.969 380.2	0.938 23.8	0.969 24.6	0.907 23.0	0.500 12.7	0.531 13.5	0.469 11.9	14.781 375.4	14.751 374.7	0.109 2.8	0.312 7.9
16 OD	16.000 406.4	16.063 408.0	15.969 405.6	0.938 23.8	0.969 24.6	0.907 23.0	0.500 12.7	0.531 13.5	0.469 11.9	15.781 400.8	15.751 400.1	0.109 2.8	0.312 7.9
426.0 mm	16.772 426.0	16.866 428.4	16.740 425.2	0.938 23.8	0.969 24.6	0.907 23.0	0.500 12.7	0.531 13.5	0.469 11.9	16.514 419.5	16.479 418.6	0.129 3.3	0.335 8.5
18 OD	18.000 457.0	18.063 458.8	17.969 456.4	1.000 25.4	1.031 26.2	0.969 24.6	0.500 12.7	0.531 13.5	0.469 11.9	17.781 451.6	17.751 450.9	0.109 2.8	0.312 7.9
20 OD	20.000 508.0	20.063 509.6	19.969 507.2	1.000 25.4	1.031 26.2	0.969 24.6	0.500 12.7	0.531 13.5	0.469 11.9	19.781 502.4	19.751 501.7	0.109 2.8	0.312 7.9
22 OD	22.000 559.0	22.063 560.4	21.969 558.0	1.000 25.4	1.031 26.2	0.969 24.6	0.563 14.3	0.594 15.1	0.532 13.5	21.656 550.1	21.626 549.3	0.172 4.4	0.375 9.5
24 OD	24.000 610.0	24.063 611.2	23.969 608.8	1.000 25.4	1.031 26.2	0.969 24.6	0.563 14.3	0.594 15.1	0.532 13.5	23.656 600.9	23.626 600.1	0.172 4.4	0.375 9.5
26 OD	26.000 660.0	26.093 662.8	25.969 659.6	1.750 44.5	1.781 45.2	1.687 42.8	0.625 15.9	0.656 16.7	0.594 15.1	25.500 647.7	25.437 646.1	0.250 6.4	0.625 15.9
28 OD	28.000 711.0	28.093 713.6	27.969 710.4	1.750 44.5	1.781 45.2	1.687 42.8	0.625 15.9	0.656 16.7	0.594 15.1	27.500 698.5	27.437 696.9	0.250 6.4	0.625 15.9
28 ID	28.875 733.4	28.938 735.0	28.844 732.6	1.000 25.4	1.031 26.2	0.969 24.6	0.625 15.9	0.656 16.7	0.594 15.1	28.531 724.7	28.501 723.9	0.172 4.4	0.437 11.1

† See note on page 30.

Standard Cut Groove Specifications for Steel and Other NPS Pipe †

Size		Dimensions – inches/millimeters											
		Pipe Outside Diameter		Gasket Seat "A"			Groove Width "B"			Groove Diameter "C"		Groove Depth "D" (ref.)	Min. Allow. Wall Thick. "T"
Nom. Size inches/mm	Act. OD inches/mm	Max.	Min.	Basic	Max.	Min.	Basic	Max.	Min.	Max.	Min.		
30 OD	30.000 762.0	30.093 764.4	29.969 761.2	1.750 44.5	1.781 45.2	1.687 42.8	0.625 15.9	0.656 16.7	0.594 15.1	29.500 749.3	29.437 747.7	0.250 6.4	0.625 15.9
30 ID	31.000 787.4	31.063 789.0	30.969 786.6	1.250 25.4	1.281 32.5	1.219 31.0	0.625 15.9	0.656 16.7	0.594 15.1	30.594 777.1	30.564 776.3	0.203 5.2	0.500 12.7
32 OD	32.000 813.0	32.093 815.2	31.969 812.0	1.750 44.5	1.781 45.2	1.687 42.8	0.625 15.9	0.656 16.7	0.594 15.1	31.500 800.1	31.437 798.5	0.250 6.4	0.625 15.9
36 OD	36.000 914.0	36.093 916.8	35.969 913.6	1.750 44.5	1.781 45.2	1.687 42.8	0.625 15.9	0.656 16.7	0.594 15.1	35.500 901.7	35.437 900.1	0.250 6.4	0.625 15.9
42 OD	42.000 1067.0	42.093 1069.2	41.969 1066.0	2.000 50.8	2.031 51.6	1.937 49.2	0.625 15.9	0.656 16.7	0.594 15.1	41.500 1054.1	41.437 1052.5	0.250 6.4	0.625 15.9
48 OD	48.000 1219.0	48.093 1221.6	47.969 1218.4	2.000 50.8	2.031 51.6	1.937 49.2	0.625 15.9	0.656 16.7	0.594 15.1	47.500 1206.5	47.437 1204.9	0.250 6.4	0.625 15.9

† Coatings applied to the interior surfaces, including bolt pad mating surfaces, must not exceed 0.010 inch/0.3 mm. In addition, the coating thickness applied to the gasket-sealing surface and within the groove on the pipe exterior must not exceed 0.010 inch/0.3 mm.

Roll Groove Specifications for Standard-Wall Pipe or Plastic-Coated Pipe Joined with Style HP-70ES EndSeal Couplings †

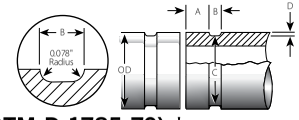
Size		Dimensions – inches/millimeters										
		Pipe Outside Diameter		Gasket Seat "A"		Groove Width "B"		Groove Diameter "C"				
Nom. Size inches/mm	Act. Out Dia. inches/mm	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Groove Depth "D" (ref.)	Min. Allow.Wall Thick. "T"	Max. Allow Flare Dia.
2 50	2.375 60.3	2.399 60.9	2.351 59.7	0.572 14.5	0.552 14.0	0.265 6.7	0.250 6.4	2.250 57.2	2.235 56.8	0.063 1.6	0.154 3.9	2.480 63.0
2½ 65	2.875 73.0	2.904 73.8	2.846 72.3	0.572 14.5	0.552 14.0	0.265 6.7	0.250 6.4	2.720 69.1	2.702 68.6	0.078 2.0	0.203 5.2	2.980 75.7
3 80	3.500 88.9	3.535 89.8	3.469 88.1	0.572 14.5	0.552 14.0	0.265 6.7	0.250 6.4	3.344 84.9	3.326 84.5	0.083 2.1	0.216 5.5	3.600 91.4
4 100	4.500 114.3	4.545 115.4	4.469 113.5	0.610 15.5	0.590 15.0	0.320 8.1	0.300 7.6	4.334 110.1	4.314 109.6	0.083 2.1	0.237 6.0	4.600 116.8
6 150	6.625 168.3	6.688 169.9	6.594 167.5	0.610 15.5	0.590 15.0	0.320 8.1	0.300 7.6	6.455 164.0	6.433 163.4	0.085 2.2	0.280 7.1	6.730 170.9
8 200	8.625 219.1	8.688 220.7	8.594 218.3	0.719 18.3	0.699 17.8	0.410 10.4	0.390 9.9	8.441 214.4	8.416 213.8	0.092 2.3	0.322 8.2	8.800 223.5
10 250	10.750 273.0	10.813 274.7	10.719 272.3	0.719 18.3	0.699 17.8	0.410 10.4	0.390 9.9	10.562 268.3	10.535 267.6	0.094 2.4	0.365 9.3	10.920 277.4
12 300	12.750 323.9	12.813 325.5	12.719 323.1	0.719 18.3	0.699 17.8	0.410 10.4	0.390 9.9	12.531 318.3	12.501 317.5	0.109 2.8	0.375 9.5	12.920 328.2

† Coatings applied to the interior surfaces, including bolt pad mating surfaces, must not exceed 0.010 inch/0.3 mm. In addition, the coating thickness applied to the gasket-sealing surface and within the groove on the pipe exterior must not exceed 0.010 inch/0.3 mm.

Cut Groove Specifications for Standard or Heavier-Wall Pipe or Plastic-Coated Pipe Joined with Style HP-70ES EndSeal Couplings †

Size		Dimensions – inches/millimeters											
		Pipe Outside Diameter		Gasket Seat "A"			Groove Width "B"			Groove Diameter "C"			
Nom. Size inches/mm	Actual Out. Dia. inches/mm	Max.	Min.	Basic	Max.	Min.	Basic	Max.	Min.	Max.	Min.	Groove Depth "D" (ref.)	Min. Allow. Wall Thick. "T"
2 50	2.375 60.3	2.399 60.9	2.351 59.7	0.562 14.3	0.572 14.5	0.552 14.0	0.255 6.5	0.265 6.7	0.250 6.4	2.250 57.2	2.235 56.8	0.063 1.6	0.154 3.9
2½ 65	2.875 73.0	2.904 73.8	2.846 72.3	0.562 14.3	0.572 14.5	0.552 14.0	0.255 6.5	0.265 6.7	0.250 6.4	2.720 69.1	2.702 68.6	0.078 2.0	0.203 5.2
3 80	3.500 88.9	3.535 89.8	3.469 88.1	0.562 14.3	0.572 14.5	0.552 14.0	0.255 6.5	0.265 6.7	0.250 6.4	3.344 84.9	3.326 84.5	0.078 2.0	0.216 5.5
4 100	4.500 114.3	4.545 115.4	4.469 113.5	0.605 15.4	0.620 15.7	0.590 15.0	0.305 7.7	0.315 8.0	0.300 7.6	4.334 110.1	4.314 109.6	0.083 2.1	0.237 6.0
6 150	6.625 168.3	6.688 169.9	6.594 167.5	0.605 15.4	0.620 15.7	0.590 15.0	0.305 7.7	0.315 8.0	0.300 7.6	6.455 164.0	6.433 163.4	0.085 2.2	0.280 7.1
8 200	8.625 219.1	8.688 220.7	8.594 218.3	0.714 18.1	0.729 18.5	0.699 17.8	0.400 10.2	0.410 10.4	0.390 9.9	8.441 214.4	8.416 213.8	0.092 2.3	0.322 8.2
10 250	10.750 273.0	10.813 274.7	10.719 272.3	0.714 18.1	0.729 18.5	0.699 17.8	0.400 10.2	0.410 10.4	0.390 9.9	10.562 268.3	10.535 267.6	0.094 2.4	0.365 9.3
12 300	12.750 323.9	12.813 325.5	12.719 323.1	0.714 18.1	0.729 18.5	0.699 17.8	0.400 10.2	0.410 10.4	0.390 9.9	12.531 318.3	12.501 317.5	0.109 2.8	0.375 9.5

† Coatings applied to the interior surfaces, including bolt pad mating surfaces, must not exceed 0.010 inch/0.3 mm. In addition, the coating thickness applied to the gasket-sealing surface and within the groove on the pipe exterior must not exceed 0.010 inch/0.3 mm.

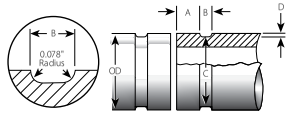


Standard Radius Cut Grooving Specifications for Schedule 80 or Schedule 40 PVC Plastic Pipe (ASTM D-1785-70) †

Size		Dimensions – inches/millimeters									
		Pipe Outside Diameter		Gasket Seat "A"		Groove Width "B"			Groove Diameter "C"		
Nom. Size inches/mm	Actual Out. Dia. inches/mm	Max.	Min.	Max.	Min.	Basic	Max.	Min.	Max.	Min.	Groove Depth "D" (ref.)
¾ 20	1.050 26.9	1.062 27.0	1.038 26.4	0.656 16.7	0.594 15.1	0.312 7.9	0.343 8.7	0.281 7.1	0.938 23.8	0.923 23.4	0.056 1.4
1 25	1.315 33.7	1.327 33.7	1.303 33.1	0.656 16.7	0.594 15.1	0.312 7.9	0.343 8.7	0.281 7.1	1.190 30.2	1.175 29.8	0.062 1.6
1 ¼ 32	1.660 42.4	1.672 42.5	1.648 41.9	0.656 16.7	0.594 15.1	0.312 7.9	0.343 8.7	0.281 7.1	1.535 39.0	1.520 38.6	0.062 1.6
1 ½ 40	1.900 48.3	1.912 48.6	1.888 48.0	0.656 16.7	0.594 15.1	0.312 7.9	0.343 8.7	0.281 7.1	1.775 45.1	1.760 44.7	0.062 1.6
2 50	2.375 60.3	2.387 60.6	2.363 60.0	0.656 16.7	0.594 15.1	0.312 7.9	0.343 8.7	0.281 7.1	2.250 57.2	2.235 56.8	0.062 1.6
2 ½ 65	2.875 73.0	2.887 73.3	2.863 72.7	0.656 16.7	0.594 15.1	0.312 7.9	0.343 8.7	0.281 7.1	2.720 69.1	2.702 68.6	0.078 2.0
3 80	3.500 88.9	3.515 89.3	3.485 88.5	0.656 16.7	0.594 15.1	0.312 7.9	0.343 8.7	0.281 7.1	3.344 84.9	3.326 84.5	0.078 2.0
4 100	4.500 114.3	4.520 114.8	4.480 113.8	0.656 16.7	0.594 15.1	0.375 9.5	0.406 10.3	0.344 8.7	4.334 110.1	4.314 109.6	0.083 2.1

† See note on page 34

Style 07 Zero-Flex® Couplings are not recommended for use with PVC plastic pipe.



Standard Radius Cut Grooving Specifications for Schedule 80 or Schedule 40 PVC Plastic Pipe (ASTM D-1785-70) †

Size		Dimensions – inches/millimeters									
		Pipe Outside Diameter		Gasket Seat "A"		Groove Width "B"			Groove Diameter "C"		
Nom. Size inches/mm	Actual Out. Dia. inches/mm	Max.	Min.	Max.	Min.	Basic	Max.	Min.	Max.	Min.	Groove Depth "D" (ref.)
6	6.625	6.660	6.590	0.656	0.594	0.375	0.406	0.344	6.455	6.433	0.085
150	168.3	169.2	167.4	16.7	15.1	9.5	10.3	8.7	164.0	163.4	2.2
8	8.625	8.687	8.594	0.781	0.719	0.437	0.468	0.406	8.441	8.416	0.092
200	219.1	220.6	218.3	19.8	18.3	11.1	11.9	10.3	214.4	213.8	2.3
10	10.750	10.812	10.719	0.781	0.719	0.500	0.531	0.469	10.562	10.535	0.094
250	273.0	274.6	272.3	19.8	18.3	12.7	13.5	11.9	268.3	267.6	2.4
12	12.750	12.812	12.719	0.781	0.719	0.500	0.531	0.469	12.531	12.501	0.109
300	323.9	325.4	323.1	19.8	18.3	12.7	13.5	11.9	318.3	317.5	2.8
14	14.000	14.062	13.969	0.969	0.907	0.500	0.531	0.469	13.781	13.751	0.109
350	355.6	357.2	354.8	24.6	23.0	12.7	13.5	11.9	350.0	349.3	2.8
16	16.000	16.062	15.969	0.969	0.907	0.500	0.531	0.469	15.781	15.751	0.109
400	406.4	408.0	405.6	24.6	23.0	12.7	13.5	11.9	400.8	400.1	2.8

† PVC plastic pipe is based upon modified PVC plastic pipe that conforms to ASTM D-1785-70; Type 1, Grade 1 - PVC 1120; or Grade 11 - PVC 1220 at operating temperatures of 75˚F/24˚C maximum. For other types of PVC pipe and other operating temperatures, contact Victaulic.

Style 07 Zero-Flex® Couplings are not recommended for use with PVC plastic pipe.

GASKET SELECTION

⚠ CAUTION

- **To ensure maximum gasket performance, always specify the proper gasket grade for the intended service.**

Failure to select the proper gasket for the service may cause joint failure, resulting in property damage.

Many factors must be considered for optimum gasket performance. Do not subject gaskets to temperatures beyond the recommended limits, since excessive temperatures will degrade gasket life and performance.

The services listed below are general service recommendations, and they apply only to Victaulic gaskets. Recommendations for a particular service do not necessarily imply compatibility of the coupling housings, related fittings, or other components for the same service. Always refer to the latest Victaulic Gasket Selection Guide (05.01) for gasket service recommendations.

NOTE: These recommendations do not apply to rubber-lined valves or other rubber-lined products. Refer to the applicable product literature, or contact Victaulic for recommendations.

Standard Gaskets (IPS)

Grade	Temp. Range	Compound	Color Code	General Service Recommendation
E	–30°F/–34°C to +230°F/ +110°C	EPDM	Green Stripe	Recommended for hot water service within the specified temperature range, plus a variety of dilute acids, oil-free air, and many chemical services. UL classified in accordance with ANSI/NSF 61 for cold +86°F/+30°C and hot +180°F/+82°C potable water service. **NOT RECOMMENDED FOR PETROLEUM SERVICES.**
T	–20°F/–29°C to +180°F/ +82°C	Nitrile	Orange Stripe	Recommended for petroleum products, hydrocarbons, air with oil vapors, vegetable oil, and mineral oil, within the specified temperature range. **NOT RECOMMENDED FOR HOT WATER SERVICES OVER +150°F/ +66°C OR FOR HOT, DRY AIR OVER +140°F/+60°C.**
E (Type A)	Ambient	EPDM	Violet Stripe	Applicable for wet and dry (oil-free air) sprinkler services only. For dry services, Victaulic recommends the use of FlushSeal® gaskets. **NOT RECOMMENDED FOR HOT WATER SERVICES.**

Special Gaskets (IPS)

Grade	Temp. Range	Compound	Color Code	General Service Recommendation
M-2	–40°F/–40°C to +160°F/+71°C	Epichloro-hydrin	White Stripe	Specially compounded to provide superior service for common, aromatic fuels at low temperatures. Also suitable for certain ambient-temperature water services.
V	+30°F/–1°C to +180°F/+82°C	Neoprene	Yellow Stripe	Recommended for hot lubricating oils and certain chemicals. Good oxidation resistance. Will not support combustion.
O	+20°F/–7°C to +300°F/+149°C	Fluoroelas-tomer	Blue Stripe	Recommended for many oxidizing acids, petroleum oils, halogenated hydrocarbons, lubricants, hydraulic fluids, organic liquids, and air with hydrocarbons to +300°F/+149°C.
L	–30°F/–34°C to +350°F/+177°C	Silicone	Red Gasket	Recommended for dry heat, air without hydrocarbons to +350°F, and certain chemical services. Silicone gaskets are recommended for dry fire protection systems, all systems operating below 0°F/–18°C, dry heat, air without hydrocarbons, certain chemical services, and water to +160°F/+71°C.
A	+20°F/–7°C to +180°F/+82°C	White Nitrile	White Gasket	Contanis no carbon black. May be used for food services. Meets FDA requirements. Conforms to CFR Title 21, Part 177.2600.
T (EndSeal)	–20°F/–29°C to +150°F/+66°C	Nitrile	Black Gasket No External Identifica-tion	Specially compounded with excellent oil resistance and a high modulus for extrusion resistance. Temperature range –20°F/–7°C to + 150°F/+66°C. Recommended for petroleum products, air with oil vapors, vegetable oil, and mineral oil, within the specified temperature range. For maximum gasket life under extreme pressures, limit temperatures to +120°F/+49°C. Special EndSeal® gaskets are available that are qualified to API 607 standards. Contact Victaulic for details. **NOT RECOMMENDED FOR HOT WATER SERVICES OVER +150°F/+66°C OR FOR HOT, DRY AIR OVER +140°F/ +60°C.**

LUBRICATION

Lubrication of the gasket exterior/gasket sealing lips or the housings' interiors/pipe ends is essential to prevent gasket pinching. In addition, lubrication eases installation of the gasket onto the pipe end. Use Victaulic Lubricant or another compatible material, such as silicone, on Grade "E" and Grade "L" gaskets. **NOTE:** Victaulic Lubricant is not recommended for use with polyethylene pipe. Refer to Victaulic publication 05.02 for the Victaulic Lubricant MSDS sheet.

Canadian Customers – Canadian WHMIS Requirements: Canadian customers should contact Victaulic Company of Canada for a Victaulic Lubricant MSDS sheet that meets Canadian WHMIS requirements.

NOTICE

For Victaulic FireLock Products Only:

- **Victaulic FireLock Couplings are designed for use ONLY on wet and dry fire-protection systems. Certain Victaulic FireLock products may be provided with the Vic-Plus™ gasket system. If the product is provided with the Vic-Plus™ gasket system. Additional lubrication is not required for the initial installation of wet pipe systems that are installed at or continuously operating above 0°F/ -18° C. Refer to Victaulic publication 05.03 for the Vic-Plus MSDS sheet.**

Supplemental lubrication is required for Vic-Plus gaskets only if any of the following conditions exist. If any of the following conditions exist, apply a thin coat of Victaulic lubricant or silicone lubricant to the gasket lips and exterior.

- **If the gasket has been exposed to fluids prior to installation**
- **If the surface of the gasket does not have a hazy appearance**
- **If the gasket is installed at or continuously operating below 0°F/-18°C.**
- **If the gasket is being installed into any dry pipe system. Refer to the "Dry Pipe Fire Protection System Notes" section on the following page.**
- **If the system will be subjected to air tests prior to being filled with water**
- **If the gasket was involved in a previous installation**
- **If the gasket sealing surface of the pipe contains raised or undercut weld seams, or cracks or voids at the weld seams. However, lubricated gaskets may not enhance sealing capabilities on all adverse pipe conditions. Pipe condition and pipe preparation must conform to the requirements listed in the product installation instructions.**

VICTAULIC LUBRICANT USAGE GUIDE

The following table provides approximations for the number of gaskets that can be lubricated with a 4.5-ounce/125-gram tube or a 1-quart/32-ounce/907-gram container of Victaulic Lubricant.

Coupling Size		Number of Gaskets	
Nominal Size inches/mm	Actual Outside Diameter inches/mm	Per Tube	Per Quart
2 50	2.375 60.3	55	400
3 80	3.500 88.9	36	270
4 100	4.500 114.3	26	200
6 150	6.625 168.3	17	125
8 200	8.625 219.1	13	100
10 250	10.750 273.0	11	80
12 300	12.750 323.9	8	60
14 OD	14.000 355.6	7	50
16 OD	16.000 406.4	6	45
18 OD	18.000 457.0	5	35
20 OD	20.000 508.0	4	30
24 OD	24.000 610.0	3	20

NOTE: Victaulic Lubricant has full WRAS approval (Approval No. 0507514).

DRY PIPE FIRE PROTECTION SYSTEMS NOTES

Victaulic Grade “E”, (Type A) FireLock gaskets are Factory Mutual (FM) Approved and Underwriters Laboratories, Inc. (UL) Listed for dry pipe fire protection systems. In freezers or systems subject to freezing temperatures, pipe end surface preparation becomes critical. EPDM will harden as freezing temperatures approach the lower temperature limitation of the gasketing material (–40º). Therefore, all indentations, projections, loose paint, scale, dirt, chips, grease, and rust must be removed from the end of the pipe to the groove to provide a leak-tight seal for the gasket.

Victaulic recommends Grade “E” (Type A) FireLock FlushSeal® gaskets (or Style 009/009V gaskets) in systems subject to both freezing temperatures and hydrostatic pressure tests. The center leg in the gasket cavity reduces the potential for ice formation from residual water that can become trapped in the gasket cavity during hydrostatic pressure testing.

As a practical alternative to strict adherence to Victaulic’s surface preparation requirements, or where pipe joint flexibility may be required, Grade “L” (silicone) gaskets are recommended. At low temperatures, Grade “L” gaskets remain soft and pliable, which helps the gasket seal on pipe surfaces that are less than ideal. In addition, Grade “L” gaskets adapt more readily to temperature swings that generate both linear and radial expansion/contraction and increases reliability on joints subject to movement, such as rack piping, etc.

It is the system designer, material specifier, and/or the installing contractor’s responsibility to select the gasket suitable for the intended service.

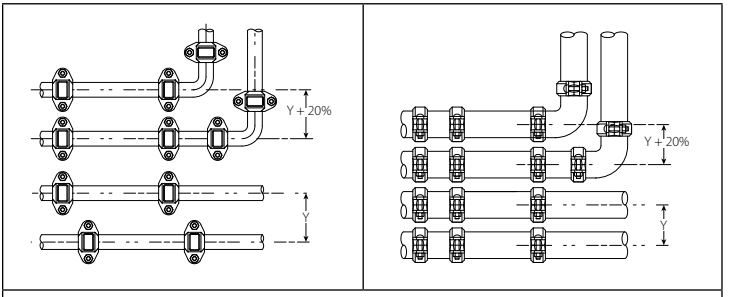
Dry pipe fire protection systems are subject to the supplemental lubrication issues mentioned above.

SPACING REQUIREMENTS FOR GROOVED PIPING SYSTEMS

Since the grooved piping method incorporates externally mounted housings, consideration must be given to external dimensions beyond the pipe OD.

NOTE: Allowance for insulation, when necessary, is not included in the following examples.

Recommended Minimum Pipe Spacing



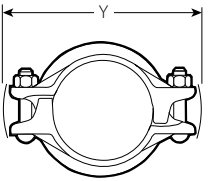
Example with Bolt Pads Facing Each Other

Example with Bolt Pads Facing Out

Exaggerated for clarity

To allow for easy installation, insulation, and maintenance, consideration must be given to proper spacing between pipelines. Since Victaulic grooved pipe couplings are externally mounted housings that contain bolt pads, allow enough access space to tighten the bolts. In addition, provide enough space to prevent interference between piping and adjacent couplings.

The pipe centerline must be spaced with the width of the coupling housings ("Y" dimension) for systems where couplings are staggered. Add an additional 20% to the width (Y) when couplings are inline, as shown above.



NOTE: The "Y" dimension is the maximum dimension across the coupling. Bolt pads can be positioned in any orientation to provide adequate clearance if the orientation shown causes interference with other system components.

External Clearance Allowance

When installing grooved piping systems in confined areas, such as a pipe shaft, a tunnel, a narrow trench, or when joining riser pipe and dropping it through riser holes, consideration must be given to the external clearance of the housings. This clearance must be slightly greater than the "Y" dimension of the widest point. The necessary clearance will vary depending upon installation procedures, the proximity of other pipes, and other factors. **NOTE:** When installing Style 791 Vic-Boltless Couplings, sufficient room must be provided to allow clearance for the Style 792 Assembly Tool (refer to page 96 for more information).

INSTALLATION TO ACHIEVE MAXIMUM LINEAR MOVEMENT CAPABILITIES OF FLEXIBLE SYSTEMS

To achieve maximum expansion/contraction allowance, pipe joints must be installed with proper spacing between the pipe ends. The following is a brief overview of methods to accommodate expansion/contraction. Refer to Section 26, Design Data, of the G-100 General Catalog for complete details.

For maximum expansion, pipe ends must be at their maximum gap within the coupling.

1. Vertical systems can be installed as the pipe is lowered by assembling the couplings and using the weight of the pipe to pull the pipe ends open.

2. Anchor the system at one end, and install the couplings and proper guides. Cap the system, pressurize it to fully open the pipe ends, then anchor the other end with the pipe ends fully gapped.

3. Install the couplings. Use a "come-along" to pull the pipe for full end separation, then secure the pipe to maintain the opening.

For maximum contraction, pipe ends must be butted within the coupling.

1. In vertical systems, stack the pipe by using the weight to butt the pipe ends, then anchor the pipe to maintain the position.

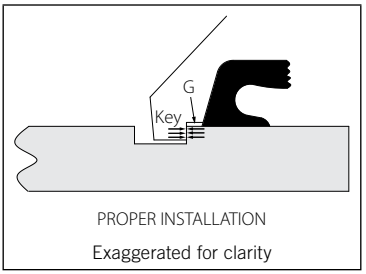
2. In horizontal systems, install the joints with the pipe ends butted by using a "come-along" to draw the pipe ends together, if necessary, then secure the pipe in position.

For Expansion and Contraction

1. Alternate the above procedures in proportion to the need for expansion and contraction.

Groove/Coupling Gapping

For expansion, visible gaps on either side of the coupling (between the housings and the rear edge of the groove) can be used to ensure proper installation of most couplings for maximum movement. These gaps are approximately equal to half the linear movement capability.



PROPER INSTALLATION

Exaggerated for clarity

For pipe contraction, virtually no gaps should be visible at the outside of the couplings. The pipe must be secured to maintain these positions.

PIPING SUPPORT FOR RIGID AND FLEXIBLE SYSTEMS

Piping that is joined with grooved pipe couplings, like all other piping systems, requires support to carry the weight of pipes, equipment, and fluid. The support or hanging method must minimize stress on joints, piping, and other components. In addition, the method of support must allow pipeline movement, where required, along with other design requirements, such as drainage or venting. The designer must also consider the special requirements of flexible couplings while designing a support system.

The following tables list the suggested maximum span between pipe supports for horizontal, straight runs of standard-weight steel pipe that carries water or similarly dense liquids.

NOTICE

- **These values are not intended to be used as specifications for all installations, and they DO NOT apply where critical calculations are made or where there are concentrated loads between supports.**
- **DO NOT attach supports directly to couplings. Attach supports only to adjoining pipe and equipment.**
- **Victaulic Company is not responsible for system design, nor does the Company assume any responsibility for systems that are designed improperly.**

RIGID SYSTEMS

For Victaulic rigid couplings, refer to the chart below for maximum hanger spacing.

Size		Suggested Maximum Span Between Supports feet/meters					
		Water Service			Gas or Air Service		
Nominal Size inches/mm	Pipe Outside Diameter inches/mm	*	†	‡	*	†	‡
1 25	1.315 33.7	7 2.1	9 2.7	12 3.7	9 2.7	9 2.7	12 3.7
1 ¼ 32	1.660 42.4	7 2.1	11 3.4	12 3.7	9 2.7	11 3.4	12 3.7
1 ½ 40	1.900 48.3	7 2.1	12 3.7	15 4.6	9 2.7	13 4.0	15 4.6
2 50	2.375 60.3	10 3.1	13 4.0	15 4.6	13 4.0	15 4.6	15 4.6
3 80	3.500 88.9	12 3.7	15 4.6	15 4.6	15 4.6	17 5.2	15 4.6
4 100	4.500 114.3	14 4.3	17 5.2	15 4.6	17 5.2	21 6.4	15 4.6
6 150	6.625 168.3	17 5.2	20 6.1	15 4.6	21 6.4	25 7.6	15 4.6
8 200	8.625 219.1	19 5.3	21 6.4	15 4.6	24 7.3	28 8.5	15 4.6
10 250	10.750 273.0	19 5.8	21 6.4	15 4.6	24 7.3	31 9.5	15 4.6
12 300	12.750 323.9	23 7.0	21 6.4	15 4.6	30 9.1	33 10.1	15 4.6
14 350	14.000 355.6	23 7.0	21 6.4	15 4.6	30 9.1	33 10.1	15 4.6
16 400	16.000 406.4	27 8.2	21 6.4	15 4.6	35 10.7	33 10.1	15 4.6
18 450	18.000 457.0	27 8.2	21 6.4	15 4.6	35 10.7	33 10.1	15 4.6
20 500	20.000 508.0	30 9.1	21 6.4	15 4.6	39 11.9	33 10.1	15 4.6
24 600	24.000 610.0	32 9.8	21 6.4	15 4.6	42 12.8	33 10.1	15 4.6

*Spacing corresponds to ASME B31.1 Power Piping Code

†Spacing corresponds to ASME B31.9 Building Services Piping Code

‡Spacing corresponds to NFPA 13 Fire Sprinkler Systems

Minimum Number of Pipe Hangers Per Pipe Length for Straight Runs Without Concentrated Loads and Where Full Linear Movement IS REQUIRED

Size		Pipe Length in feet/meters									
Nominal Size inches/mm	Pipe Outside Diameter inches/mm	7 2.1	10 3.0	12 3.7	15 4.6	20 6.1	22 6.7	25 7.6	30 9.1	35 10.7	40 12.2
		*Average Hangers Per Pipe Length – Evenly Spaced									
¾ – 1 20 – 25	1.050 – 1.315 26.9 – 33.7	1	2	2	2	3	3	4	4	5	6
1 ¼ – 2 32 – 50	1.660 – 2.375 42.4 – 60.3	1	2	2	2	3	3	4	4	5	5
2 ½ – 4 65 – 100	2.875 – 4.500 73.0 – 114.3	1	1	2	2	2	2	2	3	4	4
5 – 8 125 – 200	5.563 – 8.625 139.7 – 219.1	1	1	1	2	2	2	2	3	3	3
10 – 12 250 – 300	10.750 – 12.750 273.0 – 323.9	1	1	1	2	2	2	2	3	3	3
14 – 16 350 – 400	14.000 – 16.000 355.6 – 406.4	1	1	1	2	2	2	2	3	3	3
18 – 24 450 – 600	18.000 – 24.000 457.0 – 508.0	1	1	1	2	2	2	2	3	3	3
28 – 42 700 – 1050	28.000 – 42.000 711.0 – 1067.0	1	1	1	1	2	2	2	3	3	3

*No pipe length should be left unsupported between any two couplings

Maximum Hanger Spacing for Straight Runs Without Concentrated Loads and Where Full Linear Movement IS NOT REQUIRED

Size		Suggested Maximum Span Between Supports
Nominal Size inches/mm	Pipe Outside Diameter inches/mm	feet/meters
¾ – 1 20 – 25	1.050 – 1.315 26.9 – 33.7	8 2.4
1 ¼ – 2 32 – 50	1.660 – 2.375 42.4 – 60.3	10 3.0
2 ½ – 4 65 – 100	2.875 – 4.500 73.0 – 114.3	12 3.7
5 – 8 125 – 200	5.563 – 8.625 139.7 – 219.1	14 4.3
10 – 12 250 – 300	10.750 – 12.750 273.0 – 323.9	16 4.9
14 – 16 350 – 400	14.000 – 16.000 355.6 – 406.4	18 5.5
18 – 30 450 – 750	18.000 – 30.000 457.0 – 762.0	20 6.1
32 – 42 800 – 1050	32.000 – 42.000 813.0 – 1067.0	21 6.4

Light-Wall, Stainless Steel Rigid System Hanger Spacing

Light-wall, stainless steel piping requires hangers to meet the following spacing requirements. For flexible systems, refer to the preceding tables under the "Flexible System" section. For rigid systems, refer to the table below for maximum hanger spacing.

Size		Wall Thickness		Suggested Maximum Span Between Supports
Nominal Size inches/mm	Pipe Outside Diameter inches/mm	inches/mm	Schedule	feet/meters
2 50	2.375 60.3	0.065 1.65	5S	9 2.7
		0.079 2.00	—	10 3.1
		0.109 2.77	10S	10 3.1
76.1 mm	3.000 76.1	0.079 2.00	—	10 3.1
3 80	3.500 88.9	0.079 2.00	—	10 3.1
		0.083 2.11	5S	10 3.1
		0.120 3.05	10S	12 3.7
4 100	4.500 114.3	0.079 2.00	—	11 3.4
		0.083 2.11	5S	11 3.4
		0.120 3.05	10S	12 3.7
139.7 mm	5.500 139.7	0.079 2.00	—	13 4.0
		0.102 2.60	—	13 4.0
		0.118 3.00	—	15 4.6
6 150	6.625 168.3	0.079 2.00	—	13 4.0
		0.102 2.60	—	13 4.0
		0.109 2.77	5S	13 4.0
		0.118 3.00	—	15 4.6
		0.134 3.40	10S	14 4.3
8 200	8.625 219.1	0.102 2.60	—	13 4.0
		0.109 2.77	5S	13 4.0
		0.118 3.00	—	15 4.6
		0.148 3.76	10S	15 4.6

Size		Wall Thickness		Suggested Maximum Span Between Supports
Nominal Size inches/mm	Pipe Outside Diameter inches/mm	inches/mm	Schedule	feet/meters
10 250	10.750 273.0	0.118 3.00	—	15 4.6
		0.134 3.40	5S	15 4.6
		0.165 4.19	10S	16 4.9
12 300	12.750 323.9	0.118 3.00	—	15 4.6
		0.156 3.96	5S	16 4.9
		0.180 4.57	10S	17 5.2
14* 350	14.000 355.6	0.156 3.96	5S	21 6.4
16* 400	16.000 406.4	0.165 4.19	5S	22 6.7
18* 450	18.00 457.0	0.165 4.19	5S	22 6.7
20* 500	20.000 508.0	0.187 4.76	5S	24 7.3
24* 600	24.000 610.0	0.218 5.54	5S	25 7.6

* Hanger spacing for these sizes applies to Style W89 and Style W489 AGS Rigid Couplings.

ALLOWABLE PIPE-END SEPARATION FOR STANDARD, RIGID, ANGLE-BOLT-PAD COUPLINGS

Victaulic standard rigid couplings have an angle-bolt-pad design that constricts the coupling housings' keys into the groove around the entire pipe circumference. The housings slide on the angle bolt pads, rather than mating squarely.

In addition, the sliding of the housings forces the key sections into opposed contact on the inside and outside groove edges, which results in pipe-end separation during assembly (refer to the table below).

Rigid couplings provide a rigid joint that allows no angular deflection or linear movement. The design/allowable pipe separation MUST be considered during assembly.

Size		Allowable Pipe-End Separation †
Nominal Size inches/mm	Actual Outside Diameter inches/mm	inches/mm
1 25	1.315 33.7	0.05 1.2
1 ¼ 32	1.660 42.4	0.05 1.2
1 ½ 40	1.900 48.3	0.05 1.2
2 50	2.375 60.3	0.07 1.7
2 ½ 65	2.875 73.0	0.07 1.7
76.1 mm	3.000 76.1	0.07 1.7
3 80	3.500 88.9	0.07 1.7
4 100	4.500 114.3	0.16 4.1
108.0 mm	4.250 108.0	0.16 4.1
5 125	5.563 141.3	0.16 4.1
133.0 mm	5.250 133.0	0.16 4.1
139.7 mm	5.500 139.7	0.16 4.1
6 150	6.625 168.3	0.16 4.1
159.0 mm	6.250 159.0	0.16 4.1
165.1 mm	6.500 165.1	0.16 4.1
8 200	8.625 219.1	0.19 4.8
10 250	10.750 273.0	0.13 3.3
12 300	12.750 323.9	0.13 3.3
14 * 350	14.000 355.6	0.13 3.2

† See note on page 48.

* See note on page 48.

Size		Allowable Pipe-End Separation †
Nominal S`ize inches/mm	Actual Outside Diameter inches/mm	inches/mm
16 * 400	16.000 406.4	0.13 3.2
18 * 450	18.000 457.0	0.13 3.2
20 * 500	20.000 508.0	0.13 3.2
24 * 600	24.000 610.0	0.09 2.3

† Allowable pipe-end separation is different for Style 307 Transition Couplings. Refer to the I-300 Field Installation Handbook for details.

* Applies only to pipe **roll or cut** grooved to standard specifications for Style 07 (non-AGS) rigid couplings. For pipe roll grooved to AGS specifications, refer to the separate table on the following page.

ALLOWABLE PIPE-END SEPARATION FOR AGS RIGID, FLAT-BOLT-PAD COUPLINGS

Victaulic AGS rigid couplings contain flat bolt pads. The housings' wedge-shaped key profile increases the allowable pipe-end separation and eases initial assembly alignment (refer to the table below).

Rigid couplings provide a rigid joint that allows no angular deflection or linear movement. The design/allowable pipe separation MUST be considered during assembly.

Size		Allowable Pipe-End Separation
Nominal Size inches/mm	Actual Outside Diameter inches/mm	inches/mm
14 * 350	14.000 355.6	0.25 6.4
16 * 400	16.000 406.4	0.25 6.4
18 * 450	18.000 457.0	0.25 6.4
20 * 500	20.000 508.0	0.25 6.4
24 * 600	24.000 610.0	0.25 6.4

* Applies only to pipe **roll** grooved to AGS specifications for Style W07 (AGS) rigid couplings. For pipe roll or cut grooved to standard specifications, refer to the separate table, starting on page 47.

ALLOWABLE PIPE-END SEPARATION AND PIPELINE DEFLECTION FOR STANDARD FLEXIBLE COUPLINGS

Allowable pipe-end separation and deflection values are the maximum nominal range of movement available at each joint for standard roll-grooved pipe. **Values for cut-grooved pipe may be doubled.**

These values are maximums. For design and installation purposes, these values should be reduced by 50% for ¾ – 3½-inch/20 – 90-mm sizes and 25% for 4-inch/100-mm and larger sizes.

Size		STANDARD ROLL-GROOVED PIPE		
			Deflection from Centerline	
Nominal Size inches/mm	Actual Outside Diameter inches/mm	Maximum Allowable Pipe-End Separation inches/mm	Degrees Per Coupling †	inches/one foot of Pipe mm/one meter of Pipe
¾ 20	1.050 26.9	0 – 0.06 0 – 1.6	3° – 24'	0.72 60
1 25	1.315 33.7	0 – 0.06 0 – 1.6	2° – 43'	0.57 48
1 ¼ 32	1.660 42.4	0 – 0.06 0 – 1.6	2° – 10'	0.45 38
1 ½ 40	1.900 48.3	0 – 0.06 0 – 1.6	1° – 56'	0.40 33
2 50	2.375 60.3	0 – 0.06 0 – 1.6	1° – 31'	0.32 26
2 ½ 65	2.875 73.0	0 – 0.06 0 – 1.6	1° – 15'	0.26 22
76.1 mm	3.000 76.1	0 – 0.06 0 – 1.6	1° – 12'	0.26 22
3 80	3.500 88.9	0 – 0.06 0 – 1.6	1° – 2'	0.22 18
3 ½ 90	4.000 101.6	0 – 0.06 0 – 1.6	0° – 54'	0.19 16
4 100	4.500 114.3	0 – 0.13 0 – 3.2	1° – 36'	0.34 28
108.0 mm	4.250 108.0	0 – 0.13 0 – 3.2	1° – 41'	0.35 29
5 125	5.563 141.3	0 – 0.13 0 – 3.2	1° – 18'	0.27 23
133.0 mm	5.250 133.0	0 – 0.13 0 – 3.2	1° – 21'	0.28 24
139.7 mm	5.500 139.7	0 – 0.13 0 – 3.2	1° – 18'	0.28 24
6 150	6.625 168.3	0 – 0.13 0 – 3.2	1° – 5'	0.23 18
159.0 mm	6.250 159.0	0 – 0.13 0 – 3.2	1° – 9'	0.24 20
165.1 mm	6.500 165.1	0 – 0.13 0 – 3.2	1° – 6'	0.23 19
8 200	8.625 219.1	0 – 0.13 0 – 3.2	0° – 50'	0.18 14

† Refer to note on the following page.

Size		STANDARD ROLL-GROOVED PIPE		
			Deflection from Centerline	
Nominal Size inches/mm	Actual Outside Diameter inches/mm	Maximum Allowable Pipe-End Separation inches/mm	Degrees Per Coupling †	inches/one foot of Pipe mm/one meter of Pipe
10 250	10.750 273.0	0 – 0.13 0 – 3.2	0° – 40'	0.14 12
12 300	12.750 323.9	0 – 0.13 0 – 3.2	0° – 34'	0.12 9
14 * 350	14.000 355.6	0 – 0.13 0 – 3.2	0° – 31'	0.11 9
15 375	15.000 381.0	0 – 0.13 0 – 3.2	0° – 29'	0.10 9
16 * 400	16.000 406.4	0 – 0.13 0 – 3.2	0° – 27'	0.10 9
18 * 450	18.000 457.0	0 – 0.13 0 – 3.2	0° – 24'	0.08 7
20 * 500	20.000 508.0	0 – 0.13 0 – 3.2	0° – 22'	0.08 7
22 550	22.000 559.0	0 – 0.13 0 – 3.2	0° – 19'	0.07 6
24 * 600	24.000 610.0	0 – 0.13 0 – 3.2	0° – 18'	0.07 6
26 § 650	26.000 660.0	0 – 0.38 0 – 9.7	0° – 50'	0.17 14
28 § 700	28.000 711.0	0 – 0.38 0 – 9.7	0° – 46'	0.16 13
30 § 750	30.000 762.0	0 – 0.38 0 – 9.7	0° – 43'	0.15 13
32 § 800	32.000 813.0	0 – 0.38 0 – 9.7	0° – 40'	0.14 12
36 § 900	36.000 914.0	0 – 0.38 0 – 9.7	0° – 36'	0.12 10
42 § 1050	42.000 1067.0	0.31 – 0.69 7.9 – 17.5	0° – 31'	0.20 17

† These values are presented in degrees and minutes. To convert these values to decimal format, divide the minutes by 60 and add that number to the degrees shown. For example: 1° + (48 ÷ 60) = 1.8°.

* Applies only to pipe **roll** grooved to standard specifications for Style 77 (non-AGS) flexible couplings. For pipe roll grooved to AGS specifications, refer to the separate table on the following page.

§ Applies only to pipe **roll** grooved for Style 770 Large Diameter Couplings.

ALLOWABLE PIPE-END SEPARATION AND PIPELINE DEFLECTION FOR AGS FLEXIBLE COUPLINGS

Allowable pipe-end separation and deflection values are the maximum nominal range of movement available at each joint for pipe that is roll grooved to AGS specifications.

These values are maximums. For design and installation purposes, these values should be reduced by 25%.

Size		PIPE ROLL GROOVED TO AGS SPECIFICATIONS		
			Deflection from Centerline	
Nominal Size inches/mm	Actual Outside Diameter inches/mm	Maximum Allowable Pipe-End Separation inches/mm	Degrees Per Coupling †	inches/one foot of Pipe mm/one meter of Pipe
14 * 350	14.000 355.6	0.13 – 0.31 3.3 – 7.9	0° – 44'	0.15 13
16 * 400	16.000 406.4	0.13 – 0.31 3.3 – 7.9	0° – 38'	0.13 11
18 * 450	18.000 457.0	0.13 – 0.31 3.3 – 7.9	0° – 34'	0.12 10
20 * 500	20.000 508.0	0.13 – 0.31 3.3 – 7.9	0° – 30'	0.10 9
24 * 600	24.000 610.0	0.13 – 0.31 3.3 – 7.9	0° – 25'	0.09 8

† These values are presented in degrees and minutes. To convert these values to decimal format, divide the minutes by 60 and add that number to the degrees shown. For example: 1° + (48 ÷ 60) = 1.8°.

* Applies only to pipe **roll** grooved to AGS specifications for Style W77 (AGS) flexible couplings. For pipe roll grooved to standard specifications, refer to the separate table, starting on page 47.

GROOVED PRODUCT INSTALLATION GUIDELINES

⚠ WARNING

- **Depressurize and drain the piping system before attempting to install, remove, or adjust any Victaulic piping products.**
- **DO NOT attach supports directly to couplings. Attach supports only to adjoining pipe and equipment.**

Failure to follow these instructions could cause joint failure, resulting in serious personal injury, property damage, and product damage.

The following instructions are a general guideline for the installation of Victaulic piping products. These instructions must be followed to ensure proper pipe-joint assembly.

1. Always check the supplied gasket to ensure it is suitable for the intended service. Refer to pages 35 – 36 for details.

2. Valve bodies, discs, and other wetted components must be compatible with the material flowing through the system. Refer to the most current Victaulic literature, or contact Victaulic for details.

3. Always read the operating and maintenance instruction manuals for the pipe preparation tools.

4. The outside diameter and grooving dimensions of pipe must be within the current specifications published by Victaulic. Refer to pipe preparation specifications on pages 5 and 17 – 34 for details.

5. Rigid, angle-pad couplings must have nuts tightened evenly by alternating sides until metal-to-metal contact at the bolt pads is achieved. In addition, there must be equal offset at the bolt pads.

6. Style 07 Zero-Flex® Couplings are not recommended for use with PVC plastic pipe.

7. Flexible couplings with flat bolt pads must have nuts tightened evenly by alternating sides until metal-to-metal contact at the bolt pads is achieved.

8. Couplings that contain a tongue-and-recess feature must be mated properly, tongue-to-recess.

9. When a torque value is specified for coupling installation, this torque **MUST** be applied to the nuts in order to achieve proper installation. However, torque beyond specified values will not improve sealing. Exceeding the specified torque by more than 25% may cause damage to the product, resulting in pipe-joint failure.

10. Placement of check valves too close to sources of unstable flow will shorten the life of the valve and may potentially damage the system. To extend valve life, valves should be installed a reasonable distance away from pumps, elbows, expanders, reducers, or other similar devices. Piping practices dictate a minimum distance of five times the pipe diameter for general use. Distances between three and five diameters are allowable, provided the flow velocity is less than 8 feet per second/2.4 meters per second. Distances of less than three diameters are not recommended.

11. Victaulic female threaded products are designed to accommodate standard ANSI male pipe threads only. **NOTE:** BSPT threads are available (specify upon ordering). Use of male threaded products with special features, such as probes, dry-pendent sprinkler heads, etc., must be checked for suitability with the Victaulic piping product being installed. Failure to verify suitability in advance may result in difficult installation or joint failure.

IMPACT WRENCH USAGE GUIDELINES

⚠ WARNING

- **Nuts must be tightened evenly by alternating sides until metal-to-metal contact occurs at the bolt pads. For angle-bolt-pad couplings, even offsets must be present at the bolt pads to obtain pipe-joint rigidity.**
- **DO NOT continue to use an impact wrench after the visual installation guidelines for the coupling are achieved.**

Failure to follow these instructions could cause gasket pinching and coupling damage, resulting in joint failure, serious personal injury, and property damage.

When using an impact wrench, the speed of assembly may require extra care to ensure nuts are tightened evenly by alternating sides until proper assembly is complete. Refer to the Victaulic assembly instructions supplied with the product.

Impact wrenches do not provide the installer with direct “wrench feel” or torque to judge nut tightness. Since some impact wrenches are capable of high output, it is important to develop a familiarity with the impact wrench to avoid damaging or fracturing bolts or coupling bolt pads during installation. DO NOT continue to use an impact wrench after the visual installation guidelines for the coupling are achieved.

Perform trial assemblies with the impact wrench and socket or torque wrenches to help determine the capability of the impact wrench. Using the same method, periodically check additional nuts throughout the system installation.

For safe and proper use of impact wrenches, always refer to the impact wrench manufacturer’s operating instructions. In addition, verify that proper impact grade sockets are being used for coupling installation.

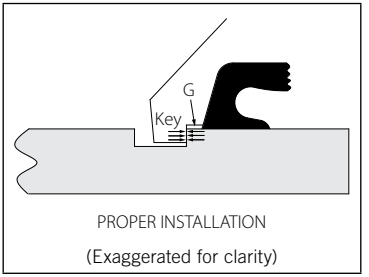
INSTALLATION INSPECTION

⚠ WARNING

- **Always inspect each joint to ensure that the product was properly installed.**
- **Undersized or oversized pipes/fittings, shallow grooves, eccentric grooves, bolt pad gaps, etc. are unacceptable. Any of these conditions must be corrected before attempting to pressurize the system.**

Failure to follow these instructions could result in serious personal injury, property damage, joint leakage, and/or joint failure.

Proper Installation



PROPER INSTALLATION

(Exaggerated for clarity)

Proper pipe preparation and coupling installation is essential for maximum joint performance. **THE FOLLOWING CONDITIONS MUST BE PRESENT TO ENSURE PROPER JOINT ASSEMBLY.**

1. The pipe OD and groove dimensions must be within the tolerance published in current Victaulic grooving specifications.

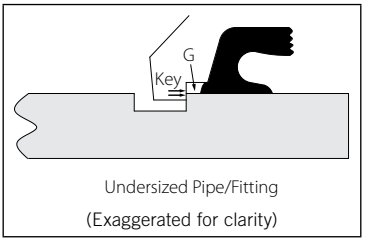
2. Unless stated otherwise in specific product instructions, Victaulic grooved pipe couplings **MUST** be properly assembled with the bolt pads in firm, metal-to-metal contact.

3. The housings' keys must be fully engaged in both grooves.

4. The gasket must be slightly compressed, which adds to the strength of the seal.

Installations with Undersized Pipes/Fittings – NOT ACCEPTABLE

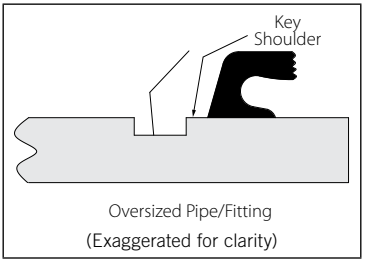
When the OD of the pipe or fitting is below tolerance, engagement of the housings' key sections is considerably lowered. **THIS RESULTS IN REDUCED WORKING PRESSURE FOR THE JOINT.**



Undersized Pipe/Fitting
(Exaggerated for clarity)

Additionally, there is little or no added compression of the gasket. The increased gap "G" between the pipe and the housing may also result in gasket extrusion. These factors can contribute to reduced gasket life and joint leakage.

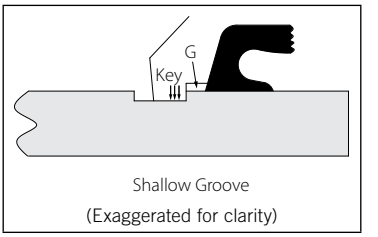
Installations with Oversized Pipes/Fittings – NOT ACCEPTABLE



Oversized Pipe/Fitting
(Exaggerated for clarity)

When the OD of the pipe or fitting exceeds the allowable tolerance, engagement of the housings' key sections is increased to the point that the shoulder can grip onto the pipe. This can result in reduced linear or angular movement. Under these conditions, the bolt pads may not join with metal-to-metal contact, the gasket can possibly extrude, the working pressure of the joint can be reduced, and the life of the gasket can be reduced.

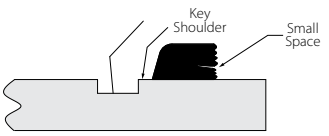
Installations on Pipe with Shallow Grooves – NOT ACCEPTABLE



Shallow Groove
(Exaggerated for clarity)

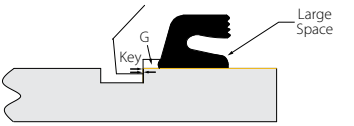
A groove that is not deep enough will have the same effect as the conditions described in the "Installations with Undersized Pipes/Fittings" section above. In addition, this condition may prevent couplings from being fully assembled, leaving gaps between the bolt pad connections.

Installations on Pipe with Deep Grooves – NOT ACCEPTABLE



Pipe with Deep Grooves – Figure 1

(Exaggerated for clarity)

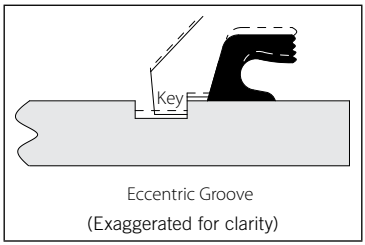


Pipe with Deep Grooves – Figure 2

(Exaggerated for clarity)

A groove that is too deep will allow the coupling to shift so that one housing will have full key engagement (Figure 1 above) and the other housing will have significantly reduced key engagement (Figure 2 above). This will have the same effect as the conditions described in the "Installations with Undersized Pipe/Fittings" section. Additionally, roll grooving pipe to an undersized dimension may overstress and weaken the pipe wall. Cut grooving pipe to an undersized dimension will result in insufficient wall thickness under the groove.

Installations on Pipe with Eccentric Grooves – NOT ACCEPTABLE

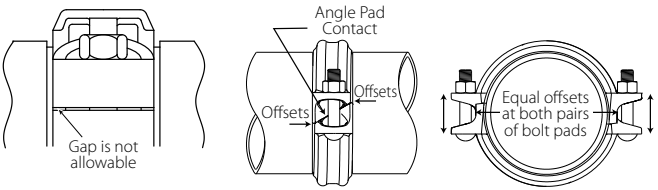


Eccentric Groove

(Exaggerated for clarity)

Eccentric grooves generally occur because of out-of-round pipe that is grooved with a stationary tool bit (such as a lathe). Tools that rotate the pipe, rather than rotate around the pipe, may affect this condition. In addition, this can occur when roll grooving pipe with large wall thickness variations. An eccentric groove means that the groove is too shallow on one side and too deep on the other. This may lead to a combination of the conditions outlined in the "Installations with Oversized Pipes/Fittings" section and the "Installations on Pipes with Shallow Grooves" section.

Bolt Pad Gaps – NOT ACCEPTABLE



(Illustrations are exaggerated for clarity)

Unless stated otherwise in specific product instructions, Victaulic grooved pipe couplings **MUST** be properly assembled with the bolt pads in firm, metal-to-metal contact. The only exceptions are couplings that have torque values specified. These torque values must be achieved, but it does not necessarily mean that the bolt pads will have full metal-to-metal contact. If you have any questions concerning an installation, contact Victaulic.

If the bolt pads are not in full metal-to-metal contact:

1. Make sure coupling keys are engaged in the grooves. Coupling keys must not rest on the outside surface of the pipe.

2. Make sure the bolts have been tightened fully.

3. Make sure the gasket is not pinched. If the gasket is pinched, replace it immediately.

4. Make sure an oversized pipe or fitting was not used.

5. Make sure the groove conforms to Victaulic specifications. If the groove is shallow, groove the pipe to Victaulic specifications. If the groove is too deep, discard that section of pipe, and groove another section to Victaulic specifications.

Always re-inspect joints before and after the field test to identify points of possible failure. Look for gaps at the bolt pads and/or keys that ride up on the shoulders. If any of these conditions exist, depressurize the system, and replace any questionable joints.

NOTICE

- **A SUCCESSFUL INITIAL SYSTEM PRESSURE TEST DOES NOT VALIDATE PROPER INSTALLATION AND IS NOT A GUARANTEE OF LONG-TERM PERFORMANCE.**
- **Victaulic will not assume any liability for pipe joint leakage or failure that may result from an installer's failure to follow Victaulic Company's installation instructions.**
- **As with any pipe joining method, success is determined by close attention to details. Careful adherence to the instructions found in this handbook is critical to ensure maximum system reliability.**

Standard Couplings for Grooved-End Pipe

Installation Instructions

Style 005 FireLock Rigid Coupling

Style 07 Zero-Flex Rigid Coupling

Style 75 Coupling

Style 77 Standard, Flexible Coupling

Style 89 Rigid Coupling

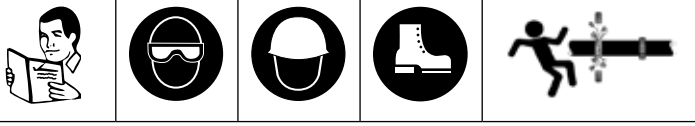
Style 750 Reducing Coupling

NOTE: More coupling styles are featured in this section

Victaulic®

PREPARATORY STEPS FOR COUPLING INSTALLATION

⚠ WARNING



- **Read and understand all instructions before attempting to install any Victaulic piping products.**
- **Depressurize and drain the piping system before attempting to install, remove, or adjust any Victaulic piping products.**
- **Wear safety glasses, hardhat, and foot protection.**

Failure to follow these instructions could result in serious personal injury, improper product installation, and/or property damage.

1. CHECK PIPE ENDS: The outside surface of the pipe from the pipe end to the groove must be smooth and free from indentations, projections (including weld seams), and roll marks to ensure a leak-tight seal for the gasket. All oil, grease, loose paint, and dirt must be removed.

2. CHECK GASKET AND LUBRICATE: Check the gasket to make sure it is suitable for the intended service. Apply a thin coat of Victaulic Lubricant or silicone lubricant to the gasket lips and exterior.

⚠ CAUTION

- **Always use a compatible lubricant to prevent the gasket from pinching/tearing during installation.**

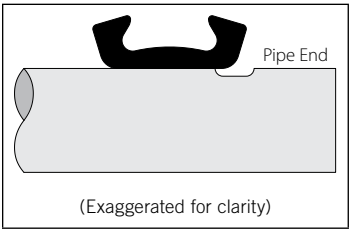
Failure to follow this instruction could result in joint leakage.

NOTICE

<u>For FireLock Products Only:</u>

- **Some Victaulic FireLock products may be provided with the Vic-Plus™ gasket system. If the coupling is provided with the Vic-Plus gasket system, additional lubrication is not required for the initial installation of wet pipe systems that are installed at or continuously operating above 0° F/-18° C.**
- **REFER TO THE "LUBRICATION" SECTION AND THE "DRY PIPE FIRE PROTECTION SYSTEM" NOTES ON PAGES 38 AND 39 FOR MORE INFORMATION.**

3. POSITION GASKET: Position the gasket over the pipe end. Make sure the gasket does not overhang the pipe end.



3a. For larger size (non-AGS) couplings (i.e. 14-inch/355.6-mm and larger): It may be easier to turn the gasket inside out, then slide it over the pipe end. Make sure the gasket does not overhang the pipe end.

4. JOIN PIPE ENDS: Align and bring the two pipe ends together. Slide the gasket into position, and make sure it is centered between the grooves in each pipe. Make sure no portion of the gasket extends into the groove in either pipe.

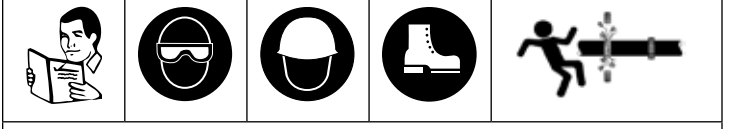
4a. If the gasket was turned inside out in step 3a for larger size (non-AGS) couplings: Roll the gasket into position, and make sure it is centered between the grooves in each pipe. Make sure no portion of the gasket extends into the groove in either pipe.

Style 005
FireLock® Rigid Coupling

Style 07
Zero-Flex® Rigid Coupling – Up to 12-inch/323.9-mm Size

Style 489
Rigid, Stainless Steel Coupling for Stainless Steel Pipe – Up to 4-inch/114.3-mm Size

⚠ WARNING



- **Read and understand all instructions before attempting to install any Victaulic piping products.**
- **Depressurize and drain the piping system before attempting to install, remove, or adjust any Victaulic piping products.**
- **Wear safety glasses, hardhat, and foot protection.**

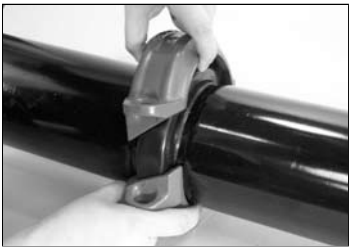
Failure to follow these instructions could result in serious personal injury, improper product installation, and/or property damage.

NOTICE

- **The following installation steps feature photos of a Style 005 Coupling. However, the same installation steps apply to Style 489 Rigid, Stainless Steel Couplings and Style 07 Couplings, as listed above.**

1. Follow steps 1 – 4 of the "Preparatory Steps for Coupling Installation" section, starting on page 60.

2. ASSEMBLE HOUSINGS: Insert one bolt into the housings, and thread the nut loosely onto the bolt (nut should be flush with end of bolt) to allow for the "swing-over" feature, as shown above.



3. INSTALL HOUSINGS: Using the "swing-over" feature, install the housings over the gasket. Make sure the housings' keys engage the grooves properly on both pipes.

⚠ CAUTION

- **Make sure the gasket does not become rolled or pinched while installing the housings.**

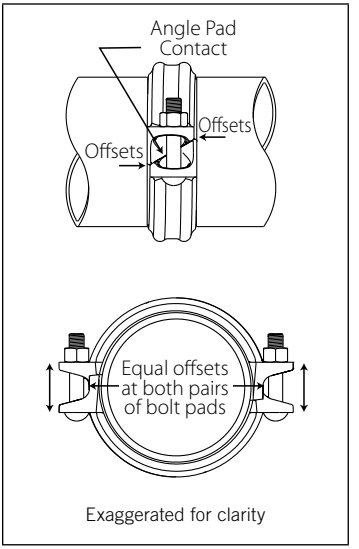
Failure to follow this instruction could cause damage to the gasket, resulting in joint leakage.

NOTICE

For Style 489 Couplings Supplied with Stainless Steel Bolts and Nuts:

- **Apply an anti-seize compound to the bolt threads before tightening the nuts.**

4. INSTALL REMAINING BOLT/NUT: Install the remaining bolt, and thread the nut finger-tight onto the bolt. **NOTE:** Make sure the oval necks of the bolts seat properly in the bolt holes.



5. TIGHTEN NUTS: Tighten all nuts evenly by alternating sides until metal-to-metal contact occurs at the angle bolt pads. Make sure the housings' keys completely engage the grooves. Make sure the offsets are equal at the bolt pads. This is necessary to ensure a rigid joint (refer to the example above). **NOTE:** It is important to tighten all nuts evenly to prevent gasket pinching.

⚠ WARNING

- **Victaulic rigid, angle-pad couplings must have the nuts tightened evenly by alternating sides until metal-to-metal contact occurs at the bolt pads.**
- **Victaulic rigid, angle-pad couplings must have equal offsets at both bolt pads.**

Failure to follow these instructions could cause joint failure, resulting in serious personal injury and/or property damage.

5a. FOR STYLE 489 COUPLINGS ONLY: The Style 489 coupling assembly has a torque requirement (refer to the table below).

Style 489 Torque Requirements

Size	Torque Requirements
Nominal Size inches/Actual mm	ft-lbs/N•m
1 ½ – 2 ½ 48.3 – 73.0	18 25
76.1 mm	18 25
3 – 4 88.9 – 114.3	45 61

⚠ WARNING

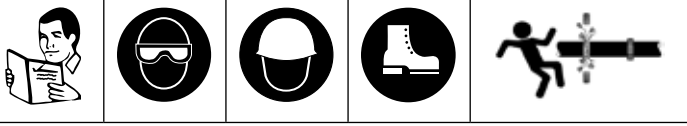
- **Victaulic Style 489 Couplings must have the nuts tightened evenly by alternating sides until metal-to-metal contacts occurs at the bolt pads and until the required torque value is achieved.**
- **Victaulic rigid, angle-pad couplings must have equal offsets at both bolt pads.**

Failure to follow these instructions could cause joint failure, resulting in serious personal injury and/or property damage.

Style 005, 07, and 489 Helpful Information

Size		Style 005		Style 07		Style 489	
Nominal Size inches/mm	Actual Outside Diameter inches/mm	Nut Size inches/ Metric	Socket Size inches/ Metric	Nut Size inches/ Metric	Socket Size inches/ Metric	Nut Size inches/ Metric	Socket Size inches/ Metric
1	1.315 33.7	—	—	3/8 M10	11/16 17	—	—
1 1/4	1.660 42.4	3/8 M10	9/16 15	3/8 M10	11/16 17	—	—
1 1/2	1.900 48.3	3/8 M10	9/16 15	3/8 M10	11/16 17	3/8 M10	11/16 17
2	2.375 60.3	3/8 M10	9/16 15	1/2 M12	7/8 22	3/8 M10	11/16 17
2 1/2	2.875 73.0	3/8 M10	9/16 15	1/2 M12	7/8 22	3/8 M10	11/16 17
76.1 mm	3.000 76.1	3/8 M10	9/16 15	1/2 M12	7/8 22	3/8 M10	11/16 17
3	3.500 88.9	3/8 M10	9/16 15	1/2 M12	7/8 22	1/2 M12	7/8 22
3 1/2	4.000 101.6	—	—	1/2 M12	7/8 22	—	—
4	4.500 114.3	3/8 M10	9/16 15	1/2 M12	7/8 22	1/2 M12	7/8 22
108.0 mm	4.250 108.0	3/8 M10	9/16 15	1/2 M12	7/8 22	—	—
5	5.563 141.3	1/2 M12	3/4 18	5/8 M16	1 1/16 27	—	—
133.0 mm	5.250 133.0	1/2 M12	3/4 18	5/8 M16	1 1/16 27	—	—
139.7 mm	5.500 139.7	1/2 M12	3/4 18	5/8 M16	1 1/16 27	—	—
6	6.625 168.3	1/2 M12	3/4 18	5/8 M16	1 1/16 27	—	—
159.0 mm	6.250 159.0	1/2 M12	3/4 18	5/8 M16	1 1/16 27	—	—
165.1 mm	6.500 165.1	1/2 M12	3/4 18	5/8 M16	1 1/16 27	—	—
8	8.625 219.1	3/4 M20	1 1/4 32	3/4 M20	1 1/4 32	—	—
8 (005H)	8.625 219.1	5/8 M16	1 5/16 24	—	—	—	—
10	10.750 273.0	—	—	7/8 M22	1 7/16 36	—	—
12	12.750 323.9	—	—	7/8 M22	1 7/16 36	—	—
200A (JIS)	— 216.3	5/8 M16	15/16 24	3/4 M20	1 1/4 32	—	—
250A (JIS)	— 267.4	—	—	7/8 M22	1 7/16 36	—	—
300A (JIS)	— 318.5	—	—	7/8 M22	1 7/16 36	—	—

⚠ WARNING



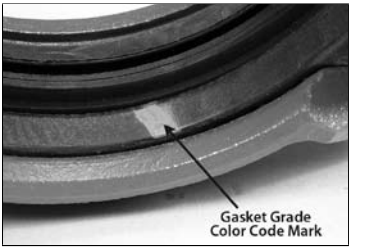
- **Read and understand all instructions before attempting to install any Victaulic piping products.**
- **Depressurize and drain the piping system before attempting to install, remove, or adjust any Victaulic piping products.**
- **Wear safety glasses, hardhat, and foot protection.**

Failure to follow these instructions could result in serious personal injury, improper product installation, and/or property damage.

Instructions for the Initial Installation of Style 009/009V Couplings

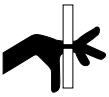
1. DO NOT DISASSEMBLE THE COUPLING: Style 009/009V Couplings are installation ready. The coupling is designed to allow clearance over the mating component ends without having to remove either nut from the bolts. This permits installation by "stabbing" the grooved end of mating components into the coupling.

2. CHECK PIPE ENDS: The outside surface of the pipe from the pipe end to the groove must be smooth and free from indentations, projections (including weld seams), and roll marks to ensure a leak-tight seal for the gasket. All oil, grease, and dirt must be removed. Measurements taken across grooved pipe ends must not exceed the maximum allowable flare diameter. Refer to the grooving dimensions on page 19 for the maximum allowable flare diameter.



3. CHECK GASKET: Check the gasket to make sure it is suitable for the intended service. The color code identifies the gasket grade. Refer to the **"NOTICE"** on page 67 for details concerning operating temperatures and other requirements. Refer to the "Gasket Selection" section, starting on page 35, for the color code chart.

⚠ WARNING



- **Never leave a Style 009/009V Coupling partially assembled. A partially assembled Style 009/009V Coupling poses a drop hazard.**
- **Keep hands away from the pipe ends and the openings of the coupling when attempting to "stab" the grooved end of mating components into the coupling.**

Failure to follow these instructions could cause serious personal injury and/or property damage.

4. ASSEMBLE JOINT: Assemble the joint by inserting ("stabbing") the grooved end of a mating component into each opening of the coupling. The ends of the grooved mating components must be inserted into the coupling until they contact the center leg of the gasket. A visual check is required to ensure the coupling keys align with the grooves in the mating components.

NOTICE

Victaulic Style 009/009V Couplings:

- **Victaulic Style 009/009V Couplings are designed for use ONLY on wet and dry fire-protection systems. See "Dry Pipe Fire Protection System" notes on page 39.**
- **Victaulic Style 009/099V Couplings are provided with the Vic-Plus™ gasket system. Additional lubrication is not required for the initial installation of wet pipe systems that are installed at or continuously operating above 0° F/-18° C. Refer to Victaulic publication 05.03 for the Vic-Plus MSDS sheet.**

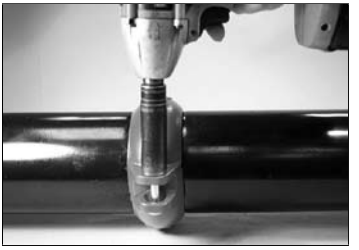
Supplemental lubrication is required for Vic-Plus gaskets only if any of the following conditions exist. If any of these conditions exist, apply a thin coat of Victaulic lubricant or silicone lubricant to the sealing lips of the gasket interior only.

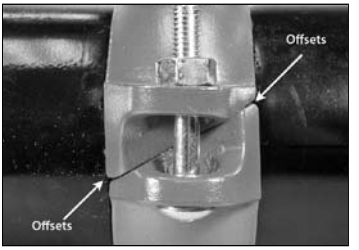
- **If the gasket has been exposed to fluids prior to installation**
- **If the surface of the gasket does not have a hazy appearance**
- **If the gasket is being installed into any dry pipe system**
- **If the system will be subjected to air tests prior to being filled with water**
- **If the gasket was involved in a previous installation**
- **If the gasket sealing surface of the pipe contains raised or undercut weld seams, or cracks or voids at the weld seams. However, lubricated gaskets may not enhance sealing capabilities on all adverse pipe conditions. Pipe condition and pipe preparation must conform to the requirements listed in the product installation instructions.**

⚠ WARNING

- **For Victaulic rigid, angle-pad couplings, the nuts must be tightened evenly by alternating sides until metal-to-metal contact occurs at the bolt pads.**
- **For Victaulic rigid, angle-pad couplings, equal offsets must be present at the bolt pads.**
- **Keep hands away from coupling openings during tightening.**

Failure to follow these instructions could cause joint failure, resulting in serious personal injury and/or property damage.

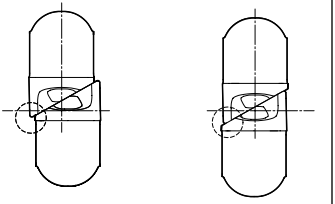




5. TIGHTEN NUTS: Tighten the nuts evenly by alternating sides until metal-to-metal contact occurs at the angle bolt pads. Make sure the housings' keys completely engage the grooves and the offsets are equal at the bolt pads. This is necessary to ensure a rigid joint. Visually inspect the bolt pads at each joint to ensure pad-to-pad metal contact is achieved. PAD GAPS, REGARDLESS OF THEIR SIZE, ARE NOT PERMITTED. **NOTE:** It is important to tighten the nuts evenly to prevent gasket pinching and "negative" bolt pad offsets (refer to "NOTICE" on this page). A standard socket wrench or impact wrench can be used to bring the bolt pads into metal-to-metal contact. Refer to page 54 for impact wrench usage guidelines.

NOTICE

Visual inspection is critical in order to identify properly and improperly assembled joints.



PROPERLY ASSEMBLED JOINT
POSITIVE OFFSET

IMPROPERLY ASSEMBLED JOINT
NEGATIVE OFFSET

Drawings are exaggerated for clarity

- **"Negative" bolt pad offsets can occur when the nuts are not tightened evenly, which produces over-tightening of one side and under-tightening of the other side. In addition, "negative" offsets can occur if both nuts are under-tightened.**

Style 009/009V Helpful Information

Size		Nut Size	Socket Size
Nominal Size inches	Actual Outside Diameter inches/ mm	inches/ Metric	inches/ Metric
1 ¼ – 4	1.660 – 4.500 42.4 – 114.3	⅜ M10	11⁄16 17

Instructions for Re-Installation of Style 009/009V Couplings

Since the coupling housings conform to the pipe outside diameter during an initial installation, "stabbing" the mating components into the coupling may not be possible upon re-installation. If this is the case, refer to the following steps for re-installing the coupling.

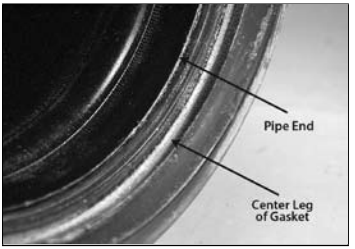
1. Make sure the system is depressurized and drained before attempting to disassemble the coupling.

2. Follow steps 2 – 3 of the previous instruction on page 66.

NOTICE

- **When using FireLock end caps with Style 009/009V FireLock EZ Rigid Couplings, make sure the cap is fully seated against the center leg of the gasket. If pad-to-pad metal contact and equal bolt pad offsets cannot be accomplished, the coupling is not correctly engaged with the end cap.**
- **For FireLock EZ Style 009 and Style 009V couplings, use FireLock No. 006 end caps containing the "EZ" marking on the inside face or No. 60 end caps containing the "QV EZ" marking on the inside face. Non-Victaulic end cap products shall not be used with Style 009/009V couplings.**

3. FOR RE-INSTALLATION OF STYLE 009/009V COUPLINGS: Apply a thin coat of Victaulic lubricant or silicone lubricant to the gasket sealing lips and exterior.



4. INSTALL GASKET: Insert the grooved end of a mating component into the gasket until it contacts the center leg of the gasket.

5. JOIN MATING COMPONENTS: Align the two grooved ends of the mating components. Insert the other mating component into the gasket until it contacts the center leg of the gasket. **NOTE:** Make sure no portion of the gasket extends into the groove on either pipe.

6. ASSEMBLE HOUSINGS: Insert one bolt into the housings, and thread the nut loosely onto the bolt (nut should be flush with end of bolt) to allow for the "swing-over" feature, as shown above.

7. INSTALL HOUSINGS: Using the "swing-over" feature, install the housings over the gasket. Make sure the housings' keys engage the grooves properly on both pipes.

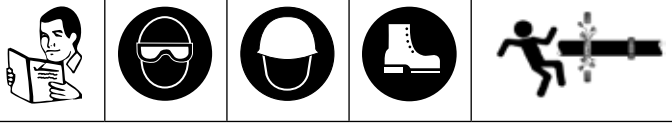
8. INSTALL REMAINING BOLT/ NUT: Install the remaining bolt, and thread the nut finger-tight onto the bolt. **NOTE:** Make sure the oval necks of the bolts seat properly in the bolt holes.

9. TIGHTEN NUTS: Follow step 5 from the previous instruction on page 68 to tighten the nuts.

Style 07 (Non-AGS)

Zero-Flex Rigid Coupling – 14-inch/355.6-mm and Larger Sizes

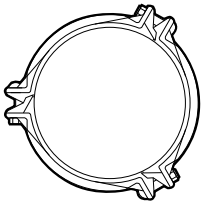
⚠ WARNING



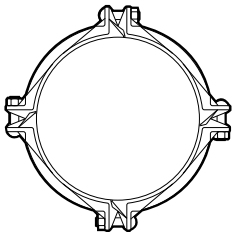
- **Read and understand all instructions before attempting to install any Victaulic piping products.**
- **Depressurize and drain the piping system before attempting to install, remove, or adjust any Victaulic piping products.**
- **Wear safety glasses, hardhat, and foot protection.**

Failure to follow these instructions could result in serious personal injury, improper product installation, and/or property damage.

Style 07 Couplings, in 14-inch/355.6-mm and larger sizes, are cast in segments to ease handling.



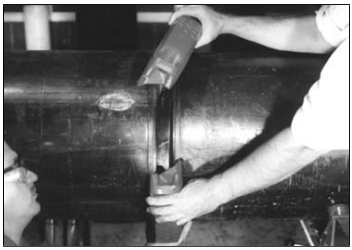
Typical 14 – 18-inch/ 355.6 – 457.0-mm Sizes



Typical 20 – 24-inch/ 508.0 – 610.0-mm Sizes

1. Follow steps 1 – 4 of the "Preparatory Steps for Coupling Installation" section, starting on page 60.

2. ASSEMBLE SEGMENTS: Assemble the segments loosely (nuts should be flush with ends of bolts), leaving one bolt and nut off to allow for the "swing-over" feature, or assemble the segments loosely into two equal halves (whichever permits easier handling).



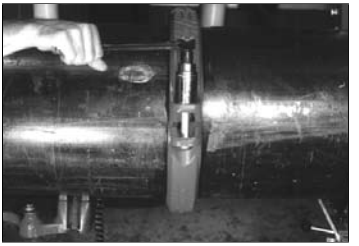
3. INSTALL HOUSINGS: Using the "swing-over" feature, install the housings over the gasket. Make sure the housings' keys engage the grooves properly on both pipes.

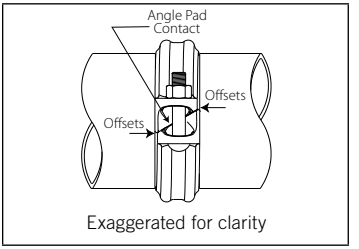
⚠ CAUTION

- **Make sure the gasket does not become rolled or pinched while installing the housings.**

Failure to follow this instruction could cause damage to the gasket, resulting in joint leakage.

4. INSTALL REMAINING BOLT/NUT: While supporting the weight of the assembly, install the remaining bolt, and thread the nut finger-tight onto the bolt. **NOTE:** Make sure the oval necks of all bolts seat properly in the bolt holes.





Exaggerated for clarity

5. TIGHTEN NUTS: Tighten all nuts evenly by alternating sides until metal-to-metal contact occurs at the angle bolt pads. Make sure the housings' keys completely engage the grooves. Make sure the offsets are equal at the bolt pads. This is necessary to ensure a rigid joint (refer to example above). **NOTE:** It is important to tighten all nuts evenly to prevent gasket pinching.

5a. APPLY TORQUE: Apply torque to each nut with a torque wrench. Refer to the following table for the torque requirement. **NOTE:** If the required torque is achieved before metal-to-metal contact occurs at the angle bolt pads, check the assembly by referring to the requirements in the "Installation Inspection" section on pages 54 – 57.

Style 07 Torque Requirements

Size	Torque Requirements
Nominal Size inches/ Actual mm	ft-lbs/N•m
14 – 18 355.6 – 457.0	250 339
20 – 24 508.0 – 610.0	300 407

⚠ WARNING

- **Victaulic Style 07 Couplings in 14-inch/355.6-mm and larger sizes must have the nuts tightened evenly by alternating sides until metal-to-metal contacts occurs at the bolt pads and the required torque value is achieved.**
- **Victaulic rigid, angle-pad couplings must have equal offsets at both bolt pads.**

Failure to follow these instructions could cause joint failure, resulting in serious personal injury and/or property damage.

Style 07 Helpful Information

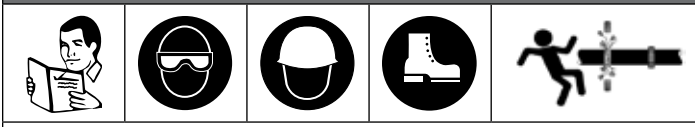
Size		Style 07	
Nominal Size inches	Actual Outside Diameter inches/ mm	Nut Size inches/ Metric	Socket Size inches/ Metric
14 – 18	14.000 – 18.000 355.6 – 457.0	⅞ M22	1 7/16 36
20 – 24	20.000 – 24.000 508.0 – 610.0	1 M24	1 ⅝ 41

Style HP-70
Rigid Coupling – Up to 12-inch/323.9-mm Size

Style 89
Rigid Coupling for Stainless Steel Pipe

Style 489
Rigid, Stainless Steel Coupling for Stainless Steel Pipe – 165.1-mm and Larger Sizes

⚠ WARNING



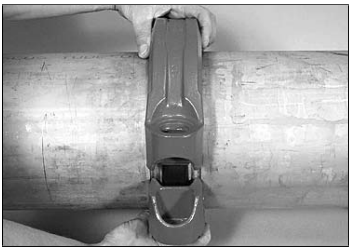
- **Read and understand all instructions before attempting to install any Victaulic piping products.**
- **Depressurize and drain the piping system before attempting to install, remove, or adjust any Victaulic piping products.**
- **Wear safety glasses, hardhat, and foot protection.**

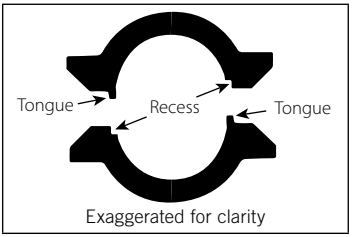
Failure to follow these instructions could result in serious personal injury, improper product installation, and/or property damage.

NOTICE

- **The following installation steps feature photos of a Style 89 rigid coupling. However, the same installation steps apply to Style HP-70, HP-70ES, and 489 Couplings, as listed above.**

1. Follow steps 1 – 4 of the "Preparatory Steps for Coupling Installation" section, starting on page 60.





2. INSTALL HOUSINGS: Install the housings over the gasket, and make sure the tongue and recess features mate properly (tongue in recess). Make sure the housings' keys engage the grooves properly on both pipes.

⚠ CAUTION

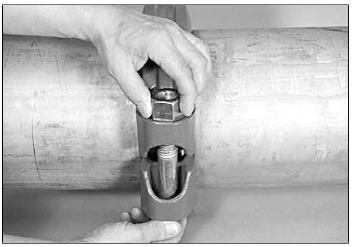
- **Make sure the gasket does not become rolled or pinched while installing the housings.**

Failure to follow this instruction could cause damage to the gasket, resulting in joint leakage.

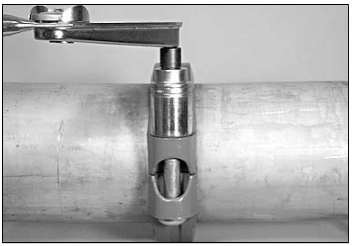
NOTICE

For Style 489 Couplings Supplied with Stainless Steel Bolts and Nuts:

- **Apply an anti-seize compound to the bolt threads before tightening the nuts.**



3. INSTALL BOLTS/NUTS: Install the bolts, and thread the nuts finger-tight onto the bolts. **NOTE:** Make sure the oval necks of the bolts seat properly in the bolt holes.



4. TIGHTEN NUTS: Tighten the nuts evenly by alternating sides. Make sure the housings' keys completely engage the grooves. Torque the nuts to the values listed in the chart below.

NOTE: It is important to tighten all nuts evenly to prevent gasket pinching.

NOTICE

- **For 6 – 12-inch/168.3 – 323.9-mm Style HP-70 Couplings, there is no torque requirement. However, the nuts must be tightened evenly by alternating sides until firm, metal-to-metal contact occurs at the bolt pads. It is important to tighten all nuts evenly to prevent gasket pinching.**

Style HP-70, 89, and 489 Torque Requirements

Size	Style HP-70 Torque Requirement	Style 89 Torque Requirement	Style 489 Torque Requirement
Nominal Size inches/Actual mm	ft-lbs/ N•m	ft-lbs/ N•m	ft-lbs/ N•m
2 – 3 60.3 – 88.9	60 – 80 81 – 109	60 – 90 80 – 120	—
4 114.3	60 – 80 81 – 109	85 – 125 115 – 170	—
139.7 mm	—	—	75 – 100 100 – 137
165.1 mm	—	175 – 250 240 – 340	125 – 200 170 – 275
6 168.3	†	175 – 250 240 – 340	125 – 200 170 – 275
216.3 mm	—	200 – 300 275 – 400	200 – 300 275 – 400
8 219.1	†	200 – 300 275 – 400	200 – 300 275 – 400
267.4 – 318.5 mm	—	250 – 350 340 – 475	200 – 300 275 – 400
10 – 12 273.0 – 323.9	†	250 – 350 340 – 475	200 – 300 275 – 400

† For 6 – 12-inch/150 – 300-mm Style HP-70 Couplings, there is no torque requirement. However, the nuts must be tightened evenly by alternating sides until firm, metal-to-metal contact occurs at the bolt pads.

NOTE: It is important to tighten all nuts evenly to prevent gasket pinching.

⚠ WARNING

- **The housings' tongue and recess features must mate properly (tongue in recess).**
- **Victaulic Style HP-70, 89, and 489 Couplings must have the nuts tightened to the required torque values, listed in these instructions, for proper assembly.**

Failure to follow this instruction could cause joint failure, resulting in serious personal injury and/or property damage.

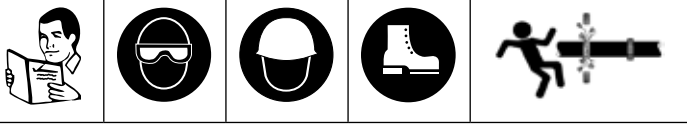
Style HP-70, 89, and 489 Helpful Information

Size		Style HP-70		Style 89		Style 489	
Nominal Size inches/ mm	Actual Outside Diameter inches/ mm	Nut Size inches/ Metric	Socket Size inches/ Metric	Nut Size inches/ Metric	Socket Size inches/ Metric	Nut Size inches/ Metric	Socket Size inches/ Metric
2	2.375 60.3	5/8 M16	1 1/16 27	5/8 M16	1 1/16 27	—	—
2½	2.875 73.0	5/8 M16	1 1/16 27	5/8 M16	1 1/16 27	—	—
76.1 mm	3.000 76.1	—	—	5/8 M16	1 1/16 27	—	—
3	3.500 88.9	5/8 M16	1 1/16 27	5/8 M16	1 1/16 27	—	—
4	4.500 114.3	3/4 M20	1 1/4 32	3/4 M20	1 1/4 32	—	—
139.7 mm	5.500 139.7	—	—	3/4 M20	1 1/4 32	3/4 M20	1 1/4 32
165.1 mm	6.500 165.1	—	—	7/8 M22	1 7/16 36	7/8 M22	1 7/16 36
6	6.625 168.3	7/8 M22	1 7/16 36	7/8 M22	1 7/16 36	7/8 M22	1 7/16 36
216.3 mm	8.515 216.3	—	—	1 M24	1 5/8 41	1 M24	1 5/8 41
8	8.625 219.1	1 M24	1 5/8 41	1 M24	1 5/8 41	1 M24	1 5/8 41
267.4 mm	10.528 267.4	—	—	1 M24	1 5/8 41	1 M24	1 5/8 41
10	10.750 273.0	1 M24	1 5/8 41	1 M24	1 5/8 41	1 M24	1 5/8 41
318.5 mm	12.539 318.5	—	—	1 M24	1 5/8 41	1 M24	1 5/8 41
12	12.750 323.9	1 M24	1 5/8 41	1 M24	1 5/8 41	1 M24	1 5/8 41

Style HP-70

Rigid Coupling – 14-inch/355.6-mm and Larger Sizes

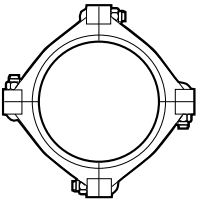
⚠ WARNING



- **Read and understand all instructions before attempting to install any Victaulic piping products.**
- **Depressurize and drain the piping system before attempting to install, remove, or adjust any Victaulic piping products.**
- **Wear safety glasses, hardhat, and foot protection.**

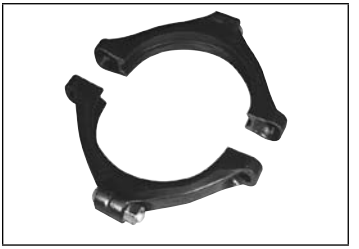
Failure to follow these instructions could result in serious personal injury, improper product installation, and/or property damage.

Style HP-70 Couplings, in 14-inch/355.6-mm and larger sizes, are cast in segments to ease handling.



Typical 14 – 18-inch/355.6 – 457.0-mm Sizes

1. Follow steps 1 – 4 of the "Preparatory Steps for Coupling Installation" section, starting on page 60.



2. ASSEMBLE SEGMENTS:
Assemble the segments loosely into two equal halves, as shown above. Allow slight clearance between the segments to ease assembly onto the pipe.

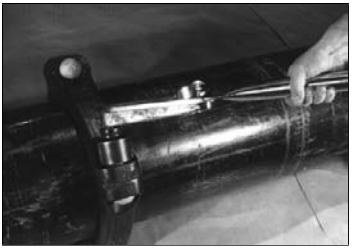
⚠ CAUTION

- **Make sure the gasket does not become rolled or pinched while installing the housings.**

Failure to follow this instruction could cause damage to the gasket, resulting in joint leakage.

3. INSTALL FIRST SEGMENT ASSEMBLY: Install one of the pre-assembled halves over the gasket. Make sure the housings' keys engage the grooves properly on both pipes.

3a. INSTALL REMAINING SEGMENT ASSEMBLY: Install the second assembly onto the pipe. Make sure the housings' keys engage the grooves properly on both pipes. While supporting the weight of the assembly, install the remaining bolts, and thread the nuts finger-tight onto the bolts. **NOTE:** Make sure the oval necks of all bolts seat properly in the bolt holes.



4. TIGHTEN NUTS: Tighten all nuts evenly by alternating sides until metal-to-metal contact occurs at the bolt pads. Make sure the housings' keys completely engage the grooves. **NOTE:** It is important to tighten all nuts evenly to prevent gasket pinching.

4a. APPLY TORQUE: Apply torque to each nut with a torque wrench. Refer to the following table for the torque requirement. The use of a geared torque multiplier is strongly recommended, due to the high torque requirement.

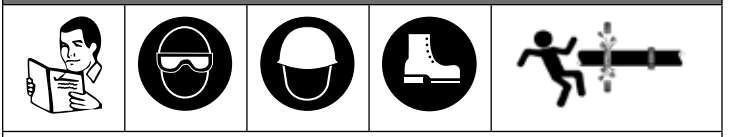
Style HP-70 Torque Requirements

Size	Torque Requirements
Nominal Size inches/Actual mm	ft-lbs/N•m
14 355.6	600 814
16 406.4	700 949

Style HP-70 Helpful Information

Size		Style HP-70	
Nominal Size inches	Actual Outside Diameter inches/ mm	Nut Size inches/ Metric	Socket Size inches/ Metric
14 – 16	14.000 – 16.000	1 ¼	2
	355.6 – 406.4	M30	50

⚠ WARNING



- **Read and understand all instructions before attempting to install any Victaulic piping products.**
- **Depressurize and drain the piping system before attempting to install, remove, or adjust any Victaulic piping products.**
- **Wear safety glasses, hardhat, and foot protection.**

Failure to follow these instructions could result in serious personal injury, improper product installation, and/or property damage.

NOTICE

- **Style HP-70ES Couplings must be used only with pipe or fittings that are grooved to Victaulic "ES" dimensions.**
- **Style HP-70ES Couplings must not be used with Victaulic Series 700 Butterfly Valves.**

1. CHECK PIPE ENDS: The outside surface of the pipe groove and pipe end must be smooth and free from indentations, projections, and roll marks to ensure a leak-tight seal for the gasket. All oil, grease, and dirt must be removed.

2. CHECK GASKET AND LUBRICATE: Check the gasket to make sure it is suitable for the intended service. The Style HP-70ES gasket is molded with a central leg that fits between the pipe ends for pipe-end protection. Apply a thin coat of Victaulic Lubricant or silicone lubricant to the gasket lips and exterior.

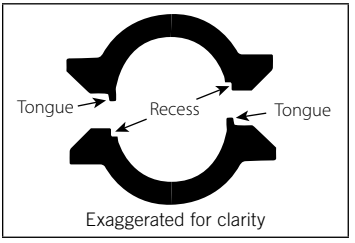
⚠ CAUTION

- **Always use a compatible lubricant to prevent the gasket from pinching/tearing during installation.**

Failure to follow this instruction could cause damage to the gasket, resulting in joint leakage.

3. INSTALL GASKET: Insert the pipe end into the gasket until it contacts the center leg of the gasket.

4. JOIN PIPE ENDS: Align the two pipe ends. Insert the other pipe end into the gasket until it contacts the center leg of the gasket. **NOTE:** Make sure no portion of the gasket extends into the groove on either pipe.



5. INSTALL HOUSINGS: Install the housings over the gasket, and make sure the tongue and recess features mate properly (tongue in recess). Make sure the housings' keys engage the grooves properly on both pipes.

⚠ CAUTION

- **Make sure the gasket does not become rolled or pinched while installing the housings.**

Failure to follow this instruction could cause damage to the gasket, resulting in joint leakage.

6. INSTALL BOLTS/NUTS: Install the bolts, and thread the nuts finger-tight onto the bolts. **NOTE:** Make sure the oval necks of the bolts seat properly in the bolt holes.

7. TIGHTEN NUTS: Tighten the nuts evenly by alternating sides until metal-to-metal contact occurs at the bolt pads. Make sure the housings' keys completely engage the grooves. **NOTE:** It is important to tighten all nuts evenly to prevent gasket pinching.

⚠ WARNING

- **The housings' tongue and recess features must mate properly (tongue in recess).**
- **The nuts must be tightened to bring the flat bolt pads into firm, metal-to-metal contact.**

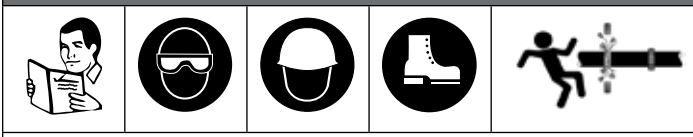
Failure to follow this instruction could cause joint failure, resulting in serious personal injury and/or property damage.

Style HP-70ES Helpful Information

Size		Style HP-70ES	
Nominal Size inches	Actual Outside Diameter inches/ mm	Nut Size inches/ Metric	Socket Size inches/ Metric
2 - 3	2.375 – 3.500 60.3 – 88.9	⅝ M16	1 1⁄16 27
4	4.500 114.3	¾ M20	1 ¼ 32
6	6.625 168.3	⅞ M22	1 7⁄16 36
8 – 12	8.625 – 12.750 219.1 – 323.9	1 M24	1 ⅝ 41

Style 72
Outlet Coupling

⚠ WARNING



- **Read and understand all instructions before attempting to install any Victaulic piping products.**
- **Depressurize and drain the piping system before attempting to install, remove, or adjust any Victaulic piping products.**
- **Wear safety glasses, hardhat, and foot protection.**

Failure to follow these instructions could result in serious personal injury, improper product installation, and/or property damage.

NOTICE

- **Style 72 Outlet Couplings are not recommended for vacuum services. In addition, Victaulic #60 End Caps must not be used with Style 72 Outlet Couplings in systems where vacuums may develop.**
- **The Style 72 gasket contains a plated "neck ring" to aid sealing. DO NOT remove this ring, since leakage may result.**
- **Style 72 Outlet Couplings are designed for use on straight runs of pipe. For installations onto fittings, contact Victaulic for information.**

1. CHECK PIPE ENDS: The outside surface of the pipe groove and pipe end must be smooth and free from indentations, projections, and roll marks to ensure a leak-tight seal for the gasket. All oil, grease, and dirt must be removed.

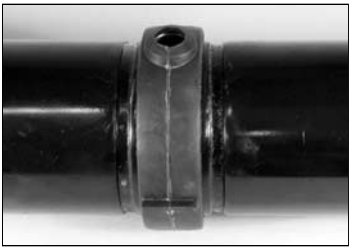
2. CHECK GASKET AND LUBRICATE: Check the gasket to make sure it is suitable for the intended service. Apply a thin coat of Victaulic Lubricate or silicone lubricant to the gasket lips and exterior.

⚠ CAUTION

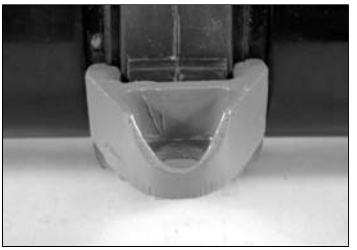
- **Always use a compatible lubricant to prevent the gasket from pinching/tearing during installation.**

Failure to follow this instruction could result in joint leakage.

3. INSTALL GASKET: Install the gasket onto the pipe end so that the lips on one side cover the area between the groove and the pipe end. **NOTE:** The pipe end should not contact the reinforcement ribs inside the gasket.



4. JOIN PIPE ENDS: Insert the other pipe end into the gasket. Make sure the gasket is centered between the grooves on each pipe and that no portion of the gasket extends into the groove on either pipe.



5. INSTALL LOWER HOUSING: Install the lower housing (without the outlet) around the lower portion of the gasket. Make sure the housings' keys engage the grooves properly on both pipes. **NOTE:** Tabs are located on the gasket, which are designed to rest in the recesses on both the upper and lower housings. These tabs ensure proper gasket positioning within the housings.

6. INSTALL UPPER HOUSING: Install the upper housing over the gasket. Make sure the housings' keys engage the grooves properly on both pipes. Check through the outlet opening to make sure the outlet neck of the gasket is properly positioned in the housing.

7. INSTALL BOLTS/NUTS: Insert the bolts, and thread the nuts finger-tight onto the bolts. **NOTE:** Make sure the oval necks of the bolts seat properly in the bolt holes.

8. TIGHTEN NUTS: Tighten the nuts evenly by alternating sides until metal-to-metal contact occurs at the flat bolt pads. **NOTE:** It is important to tighten the nuts evenly to prevent gasket pinching.

⚠ WARNING

- **The nuts must be tightened to bring the flat bolt pads into firm, metal-to-metal contact.**

Failure to follow this instruction could cause joint failure, resulting in serious personal injury and/or property damage.

Style 72 Helpful Information

Nominal Outlet Size Run x Red. Outlet Nominal inches/Actual mm			Nut Size	Socket Size
FPT		Gr/MPT	inches/ Metric	inches/ Metric
1 ½ 48.3	x ½ – 1 21.3 – 33.7	—	⅜ M10	11/16 17
2 60.3	x ½ – 1 21.3 – 33.7	1 33.7	⅜ M10	11/16 17
2½ 73.0	x ½ – 1 21.3 – 33.7	—	½ M12	⅞ 22
	1 ¼ 42.4	1 ½ 48.3	⅝ M16	1 1/16 27
3 88.9	x ¾ 26.9	1 33.7	½ M12	⅞ 22
	1 33.7	1 ½ 48.3	⅝ M16	1 1/16 27
4 114.3	x ¾ 26.9	1 33.7	½ M12	⅞ 22
	1 ½ 48.3	2 60.3	⅝ M16	1 1/16 27
6 168.3	x 1 – 1 ½ 33.7 – 48.3	2 60.3	¾ M20	1 ¼ 32

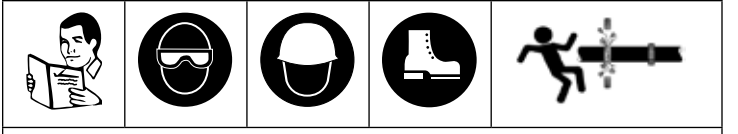
Style 74
Coupling

Style 75
Coupling

Style 77
Standard, Flexible Coupling - Up to 12-inch/323.9-mm Size

Style 475
Lightweight, Flexible Stainless Steel Coupling

⚠ WARNING



- **Read and understand all instructions before attempting to install any Victaulic piping products.**
- **Depressurize and drain the piping system before attempting to install, remove, or adjust any Victaulic piping products.**
- **Wear safety glasses, hardhat, and foot protection.**

Failure to follow these instructions could result in serious personal injury, improper product installation, and/or property damage.

NOTICE

- **The following installation steps feature photos of a Style 77 flexible coupling. However, the same installation steps apply to Style 74, 75, and 475 couplings, as listed above.**

NOTICE

<u>For Style 475 Couplings in Sizes 2 inch/60.3 mm and Larger Only:</u>

- **Style 475 Couplings in sizes 2 inch/60.3 mm and larger sizes have a tongue-and-recess feature at the bolt pads. The housings must be mated tongue-to recess for properly assembly.**

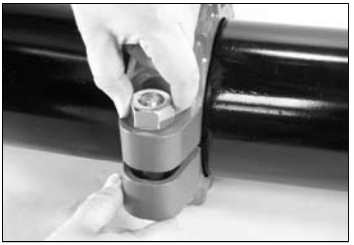
1. Follow steps 1 – 4 of the "Preparatory Steps for Coupling Installation" section, starting on page 60.

2. INSTALL HOUSINGS: Install the housings over the gasket. Make sure the housings' keys engage the grooves properly on both pipes. Refer to the notice on this page for Style 475 Couplings.

⚠ CAUTION

- **Make sure the gasket does not become rolled or pinched while installling the housings.**

Failure to follow this instruction could cause damage to the gasket, resulting in joint leakage.



3. INSTALL BOLTS/NUTS: Install the bolts, and thread the nuts finger-tight onto the bolts. **NOTE:** Make sure the oval necks of the bolts seat properly in the bolt holes.

4. TIGHTEN NUTS: Tighten all nuts evenly by alternating sides until metal-to-metal contact occurs at the bolt pads. Make sure the housings' keys completely engage the grooves. NOTE: It is important to tighten all nuts evenly to prevent gasket pinching.

⚠ WARNING

- **Victaulic flexible couplings must have the nuts tightened until metal-to-metal contact occurs at the bolt pads.**

Failure to follow this instruction could cause joint failure, resulting in serious personal injury and/or property damage.

Style 74, 75, 77, and 475 Helpful Information

Size		Style 74/75		Style 77		Style 475	
Nominal Size inches/ mm	Actual Outside Diameter inches/ mm	Nut Size inches/ Metric	Socket Size inches/ Metric	Nut Size inches/ inches	Socket Size inches/ Metric	Nut Size inches/ Metric	Socket Size inches/ Metric
¾	1.050 26.9	—	—	⅜ M10	11⁄16 17	—	—
1	1.315 33.7	⅜ M10	11⁄16 17	⅜ M10	11⁄16 17	⅜ M10	11⁄16 17
1 ¼	1.660 42.4	⅜ M10	11⁄16 17	½ M12	⅞ 22	⅜ M10	11⁄16 17
1 ½	1.900 48.3	⅜ M10	11⁄16 17	½ M12	⅞ 22	⅜ M10	11⁄16 17
2	2.375 60.3	⅜ M10	11⁄16 17	½ M12	⅞ 22	⅜ M10	11⁄16 17
2 ½	2.875 73.0	⅜ M10	11⁄16 17	½ M12	⅞ 22	⅜ M10	11⁄16 17
76.1 mm	3.000 76.1	⅜ M10	11⁄16 17	½ M12	⅞ 22	⅜ M10	1 11⁄16 17
3	3.500 88.9	½ M12	⅞ 22	½ M12	⅞ 22	½ M12	⅞ 22
3 ½	4.000 101.6	½ M12	⅞ 22	⅝ M16	1 1⁄16 27	—	—
4	4.500 114.3	½ M12	⅞ 22	⅝ M16	1 1⁄16 27	½ M12	⅞ 22

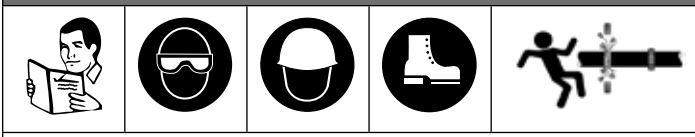
Style 74, 75, 77, and 475 Helpful Information (Continued)

Size		Style 74/75		Style 77		Style 475	
Nominal Size inches/ mm	Actual Outside Diameter inches/ mm	Nut Size inches/ Metric	Socket Size inches/ Metric	Nut Size inches/ inches	Socket Size inches/ Metric	Nut Size inches/ Metric	Socket Size inches/ Metric
108.0 mm	4.250 108.0	½ M12	⅞ 22	⅝ M16	1 1⁄16 27	—	—
127.0 mm	5.000 127.0	⅝ M16	1 1⁄16 27	—	—	—	—
5	5.563 141.3	⅝ M16	1 1⁄16 27	¾ M20	1 ¼ 32	—	—
133.0 mm	5.250 133.0	⅝ M16	1 1⁄16 27	¾ M20	1 ¼ 32	—	—
139.7 mm	5.500 139.7	⅝ M16	1 1⁄16 27	¾ M20	1 ¼ 32	½ M12	⅞ 22
152.4 mm	6.000 152.4	⅝ M16	1 1⁄16 27	—	—	—	—
6	6.625 168.3	⅝ M16	1 1⁄16 27	¾ M20	1 ¼ 32	—	—
159.0 mm	6.250 159.0	⅝ M16	1 1⁄16 27	¾ M20	1 ¼ 32	—	—
165.1 mm	6.500 165.1	⅝ M16	1 1⁄16 27	¾ M20	1 ¼ 32	⅝ M16	1 1⁄16 27
203.2 mm	8.000 203.2	¾ M20	1 ¼ 32	—	—	—	—
8	8.625 219.1	¾ M20	1 ¼ 32	⅞ M22	1 7⁄16 36	—	—
254.0 mm	10.000 254.0	⅞ M22	1 7⁄16 36	—	—	—	—
10	10.750 273.0	—	—	1 M24	1 ⅝ 41	—	—
304.8 mm	12.000 304.8	⅞ M22	1 7⁄16 36	—	—	—	—
12	12.750 323.9	—	—	1 M24	1 ⅝ 41	—	—
13½ OD	13.000 342.9	—	—	1 M24	1 ⅝ 41	—	—
200A (JIS)	— 216.3	¾ M20	1 ¼ 32	⅞ M22	1 7⁄16 36	—	—
250A (JIS)	— 267.4	—	—	1 M24	1 ⅝ 41	—	—
300A (JIS)	— 318.5	—	—	1 M24	1 ⅝ 41	—	—

Style 77 (Non-AGS)

Standard, Flexible Coupling – 14-inch/355.6-mm and Larger Sizes

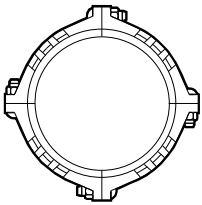
⚠ WARNING



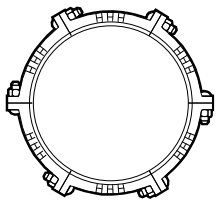
- **Read and understand all instructions before attempting to install any Victaulic piping products.**
- **Depressurize and drain the piping system before attempting to install, remove, or adjust any Victaulic piping products.**
- **Wear safety glasses, hardhat, and foot protection.**

Failure to follow these instructions could result in serious personal injury, improper product installation, and/or property damage.

Style 77 Couplings, in 14-inch/355.6-mm and larger sizes, are cast in segments to ease handling.

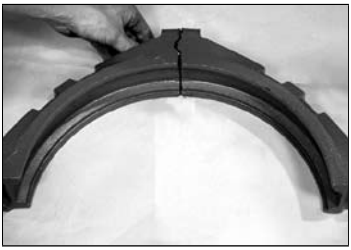


14 – 22-inch/355.6 – 559.0-mm Sizes



24-inch/610.0-mm Size

1. Follow steps 1 – 4 of the "Preparatory Steps for Coupling Installation" section, starting on page 60.



2. ASSEMBLE SEGMENTS: To ease installation, assemble the segments loosely into "pairs." Allow slight clearance between the segments to ease assembly onto the pipe.

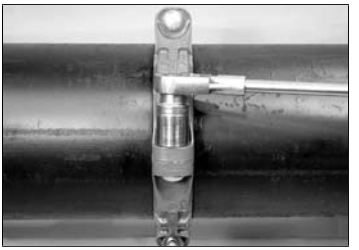
3. INSTALL FIRST SEGMENT ASSEMBLY: Install one of the pre-assembled halves over the gasket. Make sure the housings' keys engage the grooves properly on both pipes.

3a. INSTALL REMAINING SEGMENT ASSEMBLY: Install the second assembly onto the pipe. Make sure the housings' keys engage the grooves properly on both pipes. While supporting the weight of the assembly, install the remaining bolts, and thread the nuts finger-tight onto the bolts.
NOTE: Make sure the oval necks of all bolts seat properly in the bolt holes.

⚠ CAUTION

- **Make sure the gasket does not become rolled or pinched while installing the housings.**

Failure to follow this instruction could cause damage to the gasket, resulting in joint leakage.



4. TIGHTEN NUTS: Tighten all nuts evenly by alternating sides until firm, metal-to-metal contact occurs at the bolt pads. Make sure the housings fully engage the groove during tightening.
NOTE: It is important to tighten all nuts evenly to prevent gasket pinching.

⚠ CAUTION

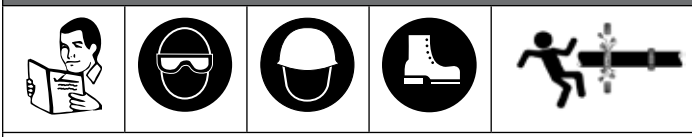
- **The Style 77 Coupling MUST be installed with the flat bolt pads in firm, metal-to-metal contact.**

Failure to follow these instructions could cause joint failure, resulting in serious personal injury and/or property damage.

Style 77 Helpful Information

Size		Style 77	
Nominal Size inches/ mm	Actual Outside Diameter inches/ mm	Nut Size inches/ Metric	Socket Size inches/ Metric
14 – 18	14.000 – 18.000 355.6 – 457.0	1 M24	1 5/8 41
20 – 24	20.000 – 24.000 508.0 – 610.0	1 1/8 M27	1 13/16 46
28 – 30	28.000 – 30.000 711.0 – 762.0	1 M24	1 5/8 41
377.0 mm	14.842 377.0	1 M24	1 5/8 41
426.0 mm	16.771 426.0	1 M24	1 5/8 41
480.0 mm	18.897 480.0	1 1/8 M27	1 13/16 46
530.0 mm	20.866 530.0	1 1/8 M27	1 13/16 46
630.0 mm	24.803 630.0	1 1/8 M27	1 13/16 46

⚠ WARNING



- **Read and understand all instructions before attempting to install any Victaulic piping products.**
- **Depressurize and drain the piping system before attempting to install, remove, or adjust any Victaulic piping products.**
- **Wear safety glasses, hardhat, and foot protection.**

Failure to follow these instructions could result in serious personal injury, improper product installation, and/or property damage.

NOTICE

- **When Style 78 Snap-Joint Couplings are used in concrete pumping, the working pressure must include shock load. This coupling must be used within all design parameters.**
- **Style 78 Snap-Joint Couplings and pipe used in concrete pumping must be free from concrete and foreign material in the pipe grooves and the keys and gasket cavity of the couplings.**
- **Style 78 Snap-Joint Couplings are not designed for eccentric loading. These couplings are not recommended for use at the end of concrete pumping booms or on vertical risers above 30 feet/9.1 m. Sound anchoring and lashing practices must be observed.**

1. Follow steps 1 – 4 of the "Preparatory Steps for Coupling Installation" section, starting on page 60.

2. INSTALL HOUSINGS: Install one side of the hinged housing over the gasket, making sure the keys engage the grooves. Swing the other side of the housing into position. Squeeze the housing to further center the gasket and seat the housing.

3. POSITION LOCKING HANDLE: Lift the locking handle to position the nose in the cradle tab of the opposite housing.

3a. Push the locking handle down firmly until the entire handle assembly contacts the coupling housing. The entire handle assembly must contact the coupling housing to ensure a properly locked joint.

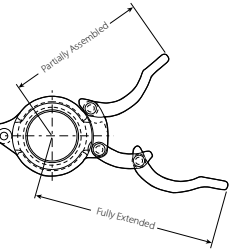
⚠ WARNING

- **DO NOT use hammers/heavy instruments to close the locking handle. The use of hammers/heavy instruments to close the locking handle can crack, distort, or misalign components.**

Failure to follow this instruction could cause product failure, resulting in serious personal injury and/or property damage.

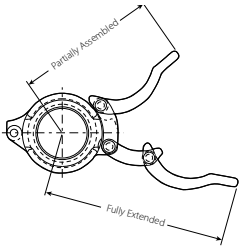
Assembly Clearance Information for Style 78 Snap-Joint Coupling

Size		Dimensions inches/mm	
Nominal Size inches	Actual Outside Diameter inches/mm	Partially Assembled	Fully Extended
1	1.315 33.7	3.38 85.9	4.50 114.3
1 ¼	1.660 42.4	3.80 96.5	4.88 124.0
1 ½	1.900 48.3	5.50 139.7	7.63 193.8
2	2.375 60.3	6.25 158.8	7.75 196.9
2 ½	2.875 73.0	7.16 181.9	10.72 272.3
3	3.500 88.9	7.88 200.2	10.25 260.4
4	4.500 114.3	10.63 270.0	12.88 327.2
5	5.563 141.3	13.66 347.0	16.88 428.8
6	6.625 168.3	14.88 378.0	18.38 466.9
8	8.625 219.1	15.38 390.7	18.91 480.3



Assembly Clearance Information for Style 78A Snap-Joint Aluminum Coupling

Size		Dimensions inches/mm	
Nominal Size inches	Actual Outside Diameter inches/mm	Partially Assembled	Fully Extended
2	2.375 60.3	3.22 81.8	4.06 103.1
10	10.750 273.0	21.00 533.4	23.00 584.2



Disassembly and Re-Use Instructions for Style 78 Snap-Joint Couplings

⚠ WARNING

- **Depressurize and drain the piping system before attempting to remove any Victaulic piping products.**

Failure to follow this instruction could result in serious personal injury and/or property damage.

1. After depressurizing and draining the system, slide a screwdriver or similar pry tool underneath the locking handle for leverage during disassembly.

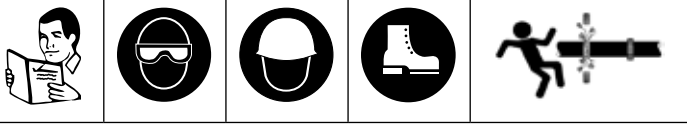
2. Check the gasket to make sure it is not damaged. If the gasket is damaged, it must be replaced with a new, Victaulic-supplied gasket of a grade that is suitable for the intended service.

3. Check the housing hinge and locking handle to make sure they have not become loosened, distorted, bent, or damaged in any way. If there is any doubt about the condition of the coupling, do not reuse.

4. Follow all installation instructions, listed in this section, for re-assembly. **NOTE:** Be sure to check pipe and groove conditions, lubricate the gasket, etc.

Style 750
Reducing Coupling

⚠ WARNING



- **Read and understand all instructions before attempting to install any Victaulic piping products.**
- **Depressurize and drain the piping system before attempting to install, remove, or adjust any Victaulic piping products.**
- **Wear safety glasses, hardhat, and foot protection.**

Failure to follow these instructions could result in serious personal injury, improper product installation, and/or property damage.

NOTICE

- **Victaulic #60 End Caps must not be used on the smaller end of Style 750 Reducing Couplings in systems where vacuums may develop.**

1. CHECK PIPE ENDS: The outside surface of the pipe groove and pipe end must be smooth and free from indentations, projections, and roll marks to ensure a leak-tight seal for the gasket. All oil, grease, and dirt must be removed.

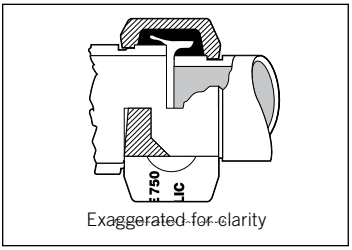
2. CHECK GASKET AND LUBRICATE: Check the gasket to make sure it is suitable for the intended service. Apply a thin coat of Victaulic Lubricant or silicone lubricant to the gasket lips and exterior.

⚠ CAUTION

- **Always use a compatible lubricant to prevent the gasket from pinching/tearing during installation.**

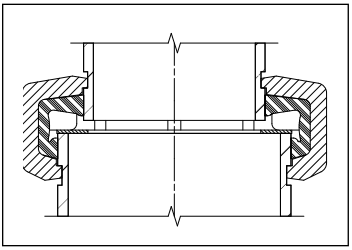
Failure to follow this instruction could result in joint leakage.

3. INSTALL GASKET: Install the larger opening of the gasket over the larger pipe end. Make sure no portion of the gasket extends into the pipe groove.



Exaggerated for clarity

4. JOIN PIPE ENDS: Align the centerlines of the pipes and insert the smaller pipe end into the gasket. Make sure no portion of the gasket extends into the pipe groove.



FOR VERTICAL INSTALLATIONS: An assembly washer is recommended to prevent smaller pipe from telescoping inside larger pipe in vertical installations (refer to graphic above). Contact Victaulic for details.

5. INSTALL HOUSINGS: Install the housings over the gasket. Make sure the larger openings of the housings face the larger pipe and that the housings' keys engage the grooves properly on both pipes.

⚠ CAUTION

- **Make sure the gasket does not become rolled or pinched while installing the housings.**

Failure to follow this instruction could cause damage to the gasket, resulting in joint leakage.

6. INSTALL BOLTS/NUTS: Insert the bolts, and thread the nuts finger-tight onto the bolts. **NOTE:** Make sure the oval necks of the bolts seat properly in the bolt holes.

7. TIGHTEN NUTS: Tighten the nuts evenly by alternating sides until metal-to-metal contact occurs at the flat bolt pads. NOTE: It is important to tighten the nuts evenly to prevent gasket pinching.

⚠ WARNING

- **The nuts must be tightened to bring the flat bolt pads into firm, metal-to-metal contact.**

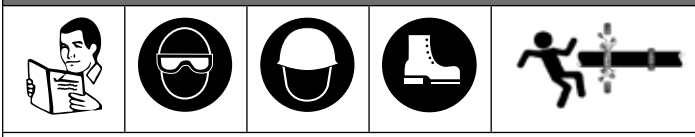
Failure to follow this instruction could cause joint failure, resulting in serious personal injury and/or property damage.

Style 750 Helpful Information

Size	Nut Size	Socket Size
Nominal inches/ Actual mm	inches/ Metric	inches/ Metric
2 / 60.3 x 1 – 1½ / 33.7 – 48.3	⅜ M10	11/16 17
2½ / 73.0 x 2 / 60.3	⅜ M10	11/16 17
76.1 mm x 2 / 60.3	½ M12	⅞ 22
3 / 88.9 x 2 – 2½ / 60.3 – 73.0	½ M12	⅞ 22
76.1 mm	½ M12	⅞ 22
4 / 114.3 x 2 – 3 / 60.3 – 88.9	⅝ M16	1 1/16 27
114.3 mm x 76.1 mm	⅝ M16	1 1/16 27
5 / 141.3 x 4 / 114.3	¾ M20	1 ¼ 32
6 / 168.3 x 4 – 5 / 114.3 – 141.3	¾ M20	1 ¼ 32
165.1 mm x 114.3 mm	¾ M20	1 ¼ 32
8 / 219.1 x 6 / 168.3	⅞ M22	1 7/16 36
10 / 273.0 x 8 / 219.1	1 M24	1 ⅝ 41

Style 770
Large Diameter Coupling

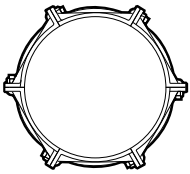
⚠ WARNING



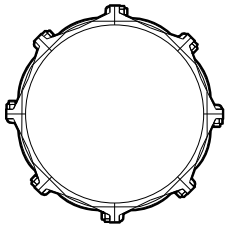
- **Read and understand all instructions before attempting to install any Victaulic piping products.**
- **Depressurize and drain the piping system before attempting to install, remove, or adjust any Victaulic piping products.**
- **Wear safety glasses, hardhat, and foot protection.**

Failure to follow these instructions could result in serious personal injury, improper product installation, and/or property damage.

Style 770 Couplings, in 26-inch/660.4-mm and larger sizes, are cast in segments to ease handling.



26 – 36-inch/660.4 – 914.0-mm Sizes



42-inch/1067.0-mm Sizes

NOTICE

- **For 42-inch/1067.0-mm couplings, a space of approximately ½ inch/13 mm must be maintained between the pipe ends or 5 ¾ inches/146 mm from the far side of one groove to the far side of the other groove.**

1. Follow steps 1 – 4 of the "Preparatory Steps for Coupling Installation" section, starting on page 60.

2. ASSEMBLE SEGMENTS:
To ease installation, assemble the segments loosely into "pairs." Allow slight clearance between the segments to ease assembly onto the pipe.

3. INSTALL SEGMENT ASSEMBLIES: Install the pre-assembled segment "pairs" over the gasket. Make sure the housings' keys engage the grooves properly on both pipes. While supporting the weight of the assembly, install the remaining bolts, and thread the nuts finger-tight onto the bolts.
NOTE: Make sure the oval necks of all bolts seat properly in the bolt holes.

⚠ CAUTION

- **Make sure the gasket does not become rolled or pinched while installing the housings.**

Failure to follow this instruction could cause damage to the gasket, resulting in joint leakage.

4. TIGHTEN NUTS: Tighten all nuts evenly by alternating sides until firm, metal-to-metal contact occurs at the bolt pads. Make sure the housings fully engage the grooves during tightening.
NOTE: It is important to tighten all nuts evenly to prevent gasket pinching.

5. APPLY TORQUE: Apply 600 ft-lbs/814 N•m of torque to each nut with a torque wrench. The use of a geared torque multiplier is strongly recommended, due to the high torque requirement.

⚠ CAUTION

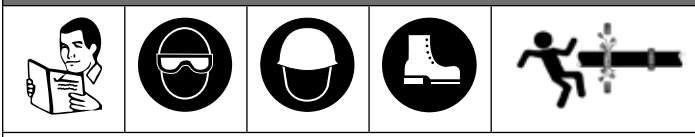
- **The Style 770 Coupling MUST be installed with the flat bolt pads in firm, metal-to-metal contact.**
- **ALL nuts must be torqued to 600 ft-lbs/815 N•m for proper installation.**

Failure to follow these instructions could cause joint failure, resulting in serious personal injury and/or property damage.

Style 770 Helpful Information

Size		Style 770	
Nominal Size inches	Actual Outside Diameter inches/ mm	Nut Size inches/ Metric	Socket Size inches/ Metric
26 – 36	26.000 – 36.000	1 ¼	2
	660.4 – 914.0	M30	50
42	42.000 1067.0	1 ½ M36	2 ⅜ 60

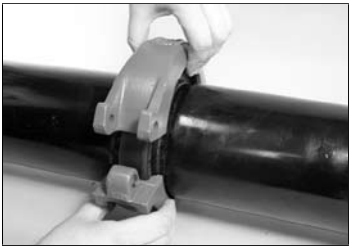
⚠ WARNING



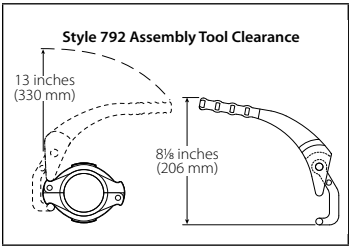
- **Read and understand all instructions before attempting to install any Victaulic piping products.**
- **Depressurize and drain the piping system before attempting to install, remove, or adjust any Victaulic piping products.**
- **Wear safety glasses, hardhat, and foot protection.**

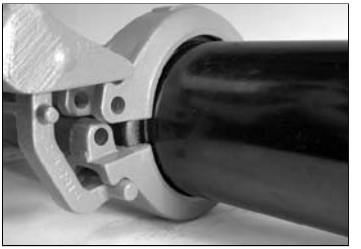
Failure to follow these instructions could result in serious personal injury, improper product installation, and/or property damage.

1. Follow steps 1 – 4 of the "Preparatory Steps for Coupling Installation" section, starting on page 60.



2. INSTALL HOUSINGS: Install one side of the hinged housing over the gasket, making sure the keys engage the grooves. Swing the other side of the housing into position. Squeeze the housings to further center the gasket and seat the housing.





3. POSITION ASSEMBLY TOOL: Engage the "T" bar of the Style 792 Assembly Tool into the cradles on the one housing. Engage the nose of the assembly tool into the cradles on the other housing.

NOTE: For ease of installation, an extension for the assembly tool can be used for couplings in size 6-inches/168.3-mm and larger. This extension can be fabricated from standard 3/4 inch/19 mm steel or aluminum pipe (not to exceed 10-inches/254-mm long that can slip over the handgrip of the assembly tool.

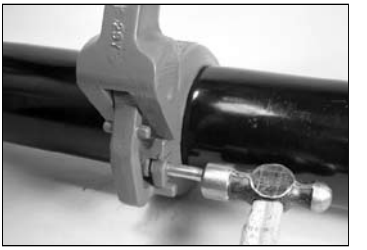
⚠ WARNING

- **DO NOT use excessive force in assembling this product. If the assembly tool resists closure or the locking pin cannot be seated, check the gasket position and make sure the pipe ends are within Victaulic specifications.**
- **DO NOT use hammers/heavy instruments to close the assembly tool. The use of hammers/heavy instruments to close the assembly tool can crack, distort, or misalign components.**
- **Use only the proper size Victaulic locking pin, which is supplied with each coupling.**

Failure to follow these instructions could cause product failure, resulting in serious personal injury and/or property damage.

4. ALIGN HOLES: Push the assembly tool down firmly to bring the housings together and to align the holes for the locking pin.

5. INSERT LOCKING PIN: Make sure the proper size locking pin is available (refer to chart below). Set the locking pin by inserting the plain end of the pin into the hole.



6. DRIVE LOCKING PIN: Using a hammer, drive the pin through the holes on both sides, and set the fluted notches into the hole. **NOTE:** The pin position should be similar to the permanent pin on the opposite side of the coupling.

6a. Remove the assembly tool by lifting it up and away from the coupling.

Style 791 Locking Pin Sizes

Size	Locking Pin †	
Nominal Size inches/ Actual mm	Size (Diameter x Length) inches	Color Code
2 60.3	5⁄16 x 1 7⁄8	White
2 1⁄2 73.0	3⁄8 x 1 7⁄8	Red
3 88.9	3⁄8 x 1 7⁄8	Red
4 114.3	7⁄16 x 2	Yellow
6 168.3	1⁄2 x 2 1⁄16	Green
8 219.1	5⁄16 x 2 5⁄16	Blue

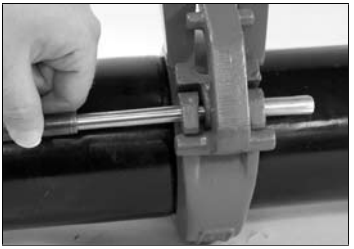
†Extra Vic-Boltless Coupling locking pins are available in color-coded strips of 10 pins.

Disassembly and Re-Use Instructions for Style 791 Vic-Boltless Couplings

⚠ WARNING

- **Depressurize and drain the piping system before attempting to remove any Victaulic piping products.**

Failure to follow this instruction could result in serious personal injury and/or property damage.



1. Engage the "T" bar of the Style 792 Assembly Tool into the machined cradles (not "as-cast" side) with the longer pin. Engage the nose of the tool into the center cradle. Press the tool down until it hits the housing. Hold the tool in position.

2. Using a hammer and a drive pin punch (or a similar device that is smaller in diameter than the pin) on the plain end, drive the locking pin out of the hole to completely remove it from the coupling. **NOTE:** It may be necessary to rotate the coupling to gain access to the pin when the coupling is installed with certain valves and fittings.

3. Lift the assembly tool up and away from the coupling. Remove the housings and the gasket.

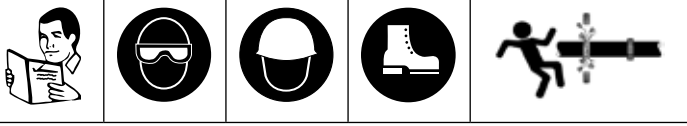
4. Check the gasket to make sure it is not damaged. If the gasket is damaged, it must be replaced with a new, Victaulic-supplied gasket of a grade that is suitable for the intended service.

5. Check the housing hinge and locking pin to make sure they have not become loosened, distorted, bent, or damaged in any way. If there is any doubt about the condition of the coupling, do not reuse.

6. Follow all installation instructions, listed in this section, for re-assembly. **NOTE:** Be sure to check pipe and groove conditions, lubricate the gasket, etc.

Style 707-IJ
ANSI and ISO 4200-to-JIS Transition Coupling

⚠ WARNING



- **Read and understand all instructions before attempting to install any Victaulic piping products.**
- **Depressurize and drain the piping system before attempting to install, remove, or adjust any Victaulic piping products.**
- **Wear safety glasses, hardhat, and foot protection.**

Failure to follow these instructions could result in serious personal injury, improper product installation, and/or property damage.

1. CHECK PIPE ENDS: The outside surface of the pipe groove and pipe end must be smooth and free from indentations, projections, and roll marks to ensure a leak-tight seal for the gasket. All oil, grease, and dirt must be removed.

2. CHECK GASKET AND LUBRICATE: Check the gasket to make sure it is suitable for the intended service. Apply a thin coat of Victaulic Lubricant or silicone lubricant to the gasket lips and exterior. lubricant to the gasket lips and exterior.

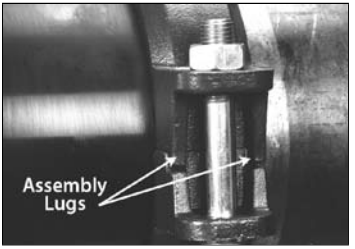
⚠ CAUTION

- **Always use a compatible lubricant to prevent the gasket from pinching/tearing during installation.**

Failure to follow this instruction could result in joint leakage.

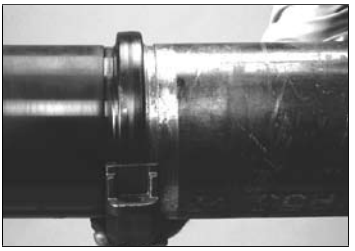
3. INSTALL GASKET: Install the larger opening of the gasket (marked NPS) over the larger pipe end (NPS side). Make sure the gasket lip does not overhang the pipe end.

4. JOIN PIPE ENDS: Align and bring the NPS and JIS pipe ends together. Slide the gasket into position by centering it between the grooves on each pipe. **NOTE:** Make sure no portion of the gasket extends into the groove on either pipe. Make sure the NPS side of the gasket is facing the NPS pipe.



NOTICE

- **Victaulic Style 707-IJ Transition Couplings are designed with assembly lugs to ensure proper assembly of housings (NPS to NPS and JIS to JIS). These lugs must be on opposite sides for proper assembly.**



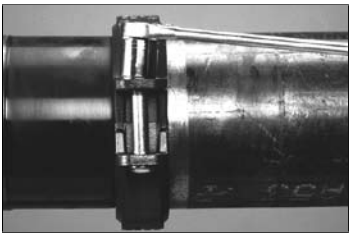
5. INSTALL HOUSINGS: Install the housings over the gasket. Make sure the larger openings of the housings (marked NPS) face the larger pipe (NPS side) and that the housings' keys engage the grooves properly on both pipes.

⚠ CAUTION

- **Make sure the gasket does not become rolled or pinched while installing the housings.**

Failure to follow this instruction could cause damage to the gasket, resulting in joint leakage.

6. INSTALL BOLTS/NUTS: Insert the bolts, and thread the nuts finger-tight onto the bolts. **NOTE**: Make sure all bolt track heads seat properly in the bolt holes.



7. Tighten Nuts: Tighten the nuts evenly by alternating sides untill metal-to-metal contact occurs at the bolt pads. NOTE: It is important to tighten the nuts evenly to prevent gasket pinching.

⚠ WARNING

- **The nuts must be tightened to bring the flat bolt pads into firm, metal-to-metal contact.**

Failure to follow this instruction could cause joint failure, resulting in serious personal injury and/or property damage.

Style 707-IJ Helpful Information

Size			Nut Size	Socket Size
Nom. Size	NPS OD	JIS OD	Metric/ inches	Metric/ inches
200A 8	219.1 8.625	216.3 8.515	M20 ¾	32 1¼
250A 10	273.0 10.750	267.4 10.528	M22 ⅞	36 1 7⁄16
300A 12	323.9 12.750	318.5 12.539	M22 ⅞	36 1 7⁄16

Advanced Groove System (AGS) Couplings for Grooved-End Pipe

Installation Instructions

Style W07 AGS Rigid Coupling

Style W77 AGS Flexible Coupling

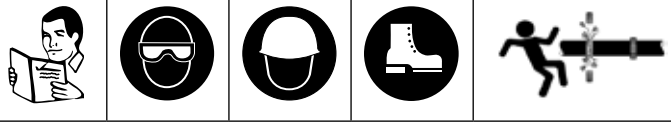
Victaulic®

I-100_102

Style W07
AGS Rigid Coupling

Style W77
AGS Flexible Coupling

⚠ WARNING



- **Read and understand all instructions before attempting to install any Victaulic piping products.**
- **Depressurize and drain the piping system before attempting to install, remove, or adjust any Victaulic piping products.**
- **Wear safety glasses, hardhat, and foot protection.**

Failure to follow these instructions could result in serious personal injury, improper product installation, and/or property damage.

NOTICE

- **The following installation steps feature photos of a Style W07 AGS Rigid Coupling. However, the same installation steps apply to Style W77 AGS Flexible Couplings.**

⚠ WARNING

- **This product must be used only on pipe that is prepared to Victaulic Advanced Groove System (AGS) specifications. DO NOT attempt to assemble this coupling on pipe that is prepared to standard groove dimensions.**

Failure to follow these instructions will cause improper assembly and joint failure, resulting in serious personal injury and/or property damage.

Style W07 and W77 AGS Couplings require pipe that is prepared with a new grooving technology called the Victaulic Advanced Groove System (AGS). For this reason, special Victaulic AGS (RW) roll sets, made specifically for use with standard-weight pipe, are required to produce grooves in accordance with this new technology. Refer to the installation instructions within this section and page 24 for grooving dimensions.

1. Groove the pipe in accordance with the Victaulic AGS grooving specifications listed on page 24. **NOTE: PIPE MUST BE ROLL GROOVED WITH VICTAULIC AGS (RW) ROLL SETS MADE SPECIFICALLY FOR USE WITH STANDARD-WEIGHT PIPE.**

2. Follow steps 1 – 4 of the "Preparatory Steps for Coupling Installation" section, starting on page 60.

3. INSTALL HOUSINGS: Install the housings over the gasket. Make sure the housings' keys engage the grooves completely on both pipes. Make sure the lower segment is supported while preparing to install the bolts and nuts.

⚠ CAUTION

- **Make sure the gasket does not become rolled or pinched while installing the housings.**

Failure to follow this instruction could cause damage to the gasket, resulting in joint leakage.

4. LUBRICATE BOLT THREADS: Apply a thin coat of Victaulic lubricant or silicone lubricant to the bolt threads.

5. INSTALL BOLTS/NUTS: Install the bolts, and thread the nuts finger-tight onto the bolts. **NOTE:** Make sure the oval necks of the bolts seat properly in the bolt holes

⚠ WARNING

- **Nuts must be tightened evenly until both conditions of metal-to-metal contact AND the specified torque value are achieved.**
- **To prevent lubrication from drying out and causing gasket pinching, always bring the bolt pads into metal-to-metal contact immediately after assembling the coupling onto the pipe.**

Failure to follow these instructions could cause joint failure, resulting in serious personal injury and/or property damage.

6. TIGHTEN NUTS: Tighten the nuts evenly by alternating sides. Make sure the housings' keys completely engage the grooves. Continue to tighten the nuts evenly until metal-to-metal bolt pad contact **AND** the specified torque value are achieved (refer to the "Style W07 and W77 Torque Requirements" table on the following page). **NOTE: Both conditions of metal-to-metal bolt pad contact AND the specified torque value are required for proper coupling assembly.**

NOTE: It is important to tighten the nuts evenly to prevent gasket pinching.

TO PREVENT LUBRICATION FROM DRYING OUT AND CAUSING GASKET PINCHING, ALWAYS BRING THE BOLT PADS INTO METAL-TO-METAL CONTACT IMMEDIATELY AFTER ASSEMBLING THE COUPLING ONTO THE PIPE.

Style W07 and W77
Torque Requirements

Size		Torque Requirement
Nominal Size inches	Actual Outside Diameter inches /mm	ft lbs/N•m
14 – 18	14.000 – 18.000	250
	355.6 – 457.0	340
20 – 24	20.000 – 24.000	375
	508.0 – 610.0	500

Style W07 and W77
Helpful Information

Size		Nut Size	Socket Size
Nominal Size inches	Actual Outside Diameter inches /mm	inches/ Metric	inches/ Metric
14 – 18	14.000 – 18.000	1	1 5/8
	355.6 – 457.0	M24	41
20 – 24	20.000 – 24.000	1 1/8	1 13/16
	508.0 – 610.0	M27	46

Flange Adapters for Grooved-End Pipe

Installation Instructions

Style 741 Vic-Flange Adapter

Style 743 Vic-Flange Adapter

Style 744 FireLock Flange Adapter

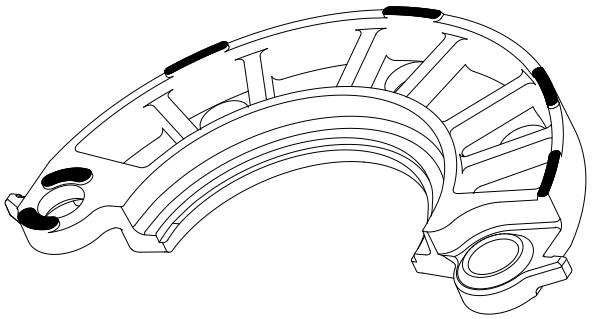
Style 441 Vic-Flange Adapter

Victaulic®

I-100_106

STYLE 441 STAINLESS STEEL VIC-FLANGE® ADAPTER NOTES

2 inch/60.3 mm and Larger Sizes



Exaggerated for clarity

The Style 441 is designed for use with Class 150 raised-face flanges, in accordance with ANSI B16.5. When a Style 441 is used with a flat-faced flange, the raised projections on the outside edge and around the mating holes of the flange adapter must be ground flush to the body. The shaded areas on the sketch above identify the projections that must be ground flush on both segments.

The Style 441 cannot be used, unless it mounts flush to the mating flange. Flange washers, or anything else that prevents flush mounting, cannot be used.

The Style 441 must not be used as anchor points for tie rods across non-restrained joints.

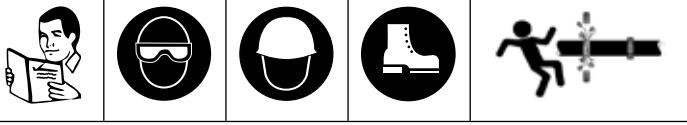
The Style 441 must not be used against rubber coated surfaces or with wafer or lug-type valves, or when the flange adapter does not mount flush with the mating flange.

Because of the outside flange dimension, the Style 441 must not be used 90° to one another on a standard fitting.

STANDARD, FULL-SHANK DIAMETER ASSEMBLY BOLTS ARE REQUIRED FOR PROPER INSTALLATION OF VIC-FLANGE ADAPTERS.

Style 441
Stainless Steel Vic-Flange Adapter
Patented

⚠ WARNING



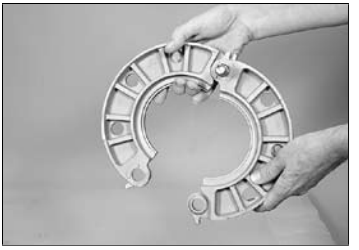
- **Read and understand all instructions before attempting to install any Victaulic piping products.**
- **Depressurize and drain the piping system before attempting to install, remove, or adjust any Victaulic piping products.**
- **Wear safety glasses, hardhat, and foot protection.**

Failure to follow these instructions could result in serious personal injury, improper product installation, and/or property damage.

NOTICE

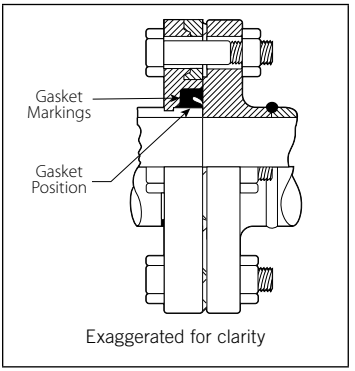
- **Make sure there is sufficient clearance behind the pipe groove to permit proper assembly of the Vic-Flange Adapter.**

1. CHECK PIPE ENDS: The outside surface of the pipe groove and pipe end must be smooth and free from indentations, projections, and roll marks to ensure a leak-tight seal for the gasket. All oil, grease, and dirt must be removed.



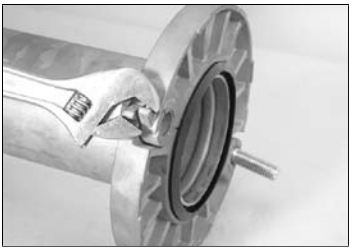
2. INSERT MATING BOLT: Insert a standard, full-shank diameter assembly bolt through a mating hole to act as a hinge, as shown above.

3. CHECK GASKET AND LUBRICATE: Check the gasket supplied to make sure it is suitable for the intended service. The color code identifies the gasket grade. Apply a thin coat of Victaulic lubricant or silicone lubricant to the gasket lips and exterior.



4. INSTALL GASKET: Install the gasket onto the pipe end. Make sure the gasket is properly positioned, as shown above. **NOTE:** The lettering on the outside of the gasket must face the gasket seating area of the Style 441 Vic-Flange Adapter.

5. INSTALL VIC-FLANGE ADAPTER: Place the hinged flange around the grooved pipe end. Make sure the key section of the flange adapter engages in the pipe groove.

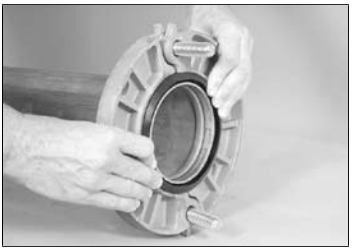


5a. Closure lugs are provided to ease installation. Clamp both lugs with a wrench or pliers, and pull the two segments together until the bolt holes align.

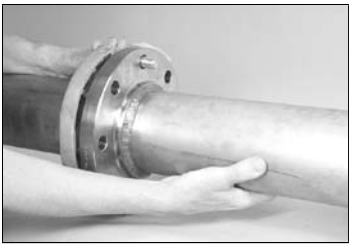
NOTICE

- **When using stainless steel bolts/ nuts, use an anti-seize lubricant on the bolt threads.**

5b. When the bolt holes are aligned, insert a standard, full-shank diameter assembly bolt through the other mating hole.

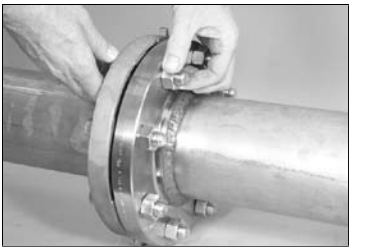


5c. Make sure the gasket is still seated properly in the flange adapter.

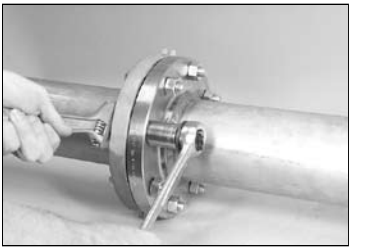


6. JOIN VIC-FLANGE ADAPTER AND MATING FLANGE: Join the mating flange with the Vic-Flange by aligning the two bolts with the holes in the mating flange.

7. THREAD NUTS ONTO MATING BOLTS: Thread a nut onto each mating bolt. Tighten the nuts until they are finger-tight.



8. INSTALL REMAINING BOLTS/ NUTS: Insert a standard, full-shank diameter assembly bolt through each remaining hole in the Vic-Flange and the mating flange. Thread a nut onto each bolt until they are finger-tight.



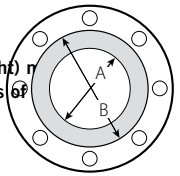
9. TIGHTEN NUTS: Tighten all nuts evenly in a crossing pattern, as with a standard flange assembly. Continue to tighten all nuts until the standard, flange-joint torque recommendation is achieved.

Style 441 Helpful Information

Size		Number of Assembly Bolts/ Nuts	Assembly Bolt/Nut Size x Length	Required Mating Face Sealing Surface inches/mm	
Nominal inches/mm	Actual Outside Diameter inches/mm	Required †	inches/metric †	"A" Maximum	"B" Minimum
2	2.375 60.3	4	⅝ x 2¾	2.38 61	3.41 87
2½	2.875 73.0	4	⅝ x 3	2.88 73	3.91 99
3	3.500 88.9	4	⅝ x 3	3.50 89	4.53 11.5
4	4.500 114.3	8	⅝ x 3	4.50 114	5.53 141
6	6.625 168.3	8	¾ x 3½	6.63 168	7.78 198

† Victaulic does not supply assembly bolts/nuts. Bolt/nut sizes are for conventional flange-to-flange connections. Full-shank diameter assembly bolts are required for proper installation of Victaulic flange adapters

The shaded area of the mating face (shown at right) m be free from gouges, undulations, and deformities of type for proper sealing



VIC-FLANGE ADAPTER NOTES FOR 2 – 12-INCH/60.3 – 323.9-MM SIZES

Style 741 Vic-Flange Adapter

Style 744 FireLock Flange Adapter

Style 743 Vic-Flange Adapter

- The Vic-Flange Adapter design incorporates small teeth on the ID of the key section to resist rotation. These teeth must be removed when the Vic-Flange Adapter is used with the grooved-end Victaulic Series 700 Butterfly Valves, Schedule 5 pipe, and plastic pipe.
- Vic-Flange Adapters must be assembled so there is no interference with mating components.
- Because of the outside flange dimension, Vic-Flange Adapters must not be used within 90° of one another on a standard fitting.
- Vic-Flange Adapters cannot be used on FireLock fittings.
- When wafer or lug-type valves are used adjoining a Victaulic fitting, check disc dimensions to ensure proper clearance.
- Vic-Flange Adapters must not be used as anchor points for tie rods across non-restrained joints.
- Mating Vic-Flange Adapters to rubber faced flanges, valves, etc. requires the use of a Vic-Flange Washer. Refer to the "Vic-Flange Washer Notes" section on the following page.
- The face of the mating flange must be free from gouges, undulations, and deformities of any type for proper sealing. Refer to the installation instructions for complete information.
- The lettering on the outside of the gasket must face the gasket pocket of the Vic-Flange Adapter. When installed correctly, the lettering on the gasket will not be visible.
- The hinge points of Vic-Flange Adapters must be oriented approximately 90° to each other when mated.
- Style 741 Vic-Flange Adapters can be used on all sizes of Vic-300 MasterSeal Butterfly Valves.
- Style 741 Vic-Flange Adapters can be used only on one side of 2 – 8-inch/60.3 – 219.1-mm Series 705W/708W Butterfly Valves that will not interfere with mating components and handle operation.
- Style 741 Vic-Flange Adapters cannot be used on 10 – 12-inch/273.0 – 323.9-mm Series 705W/708W Butterfly Valves.
- Vic-300 MasterSeal Butterfly Valves cannot be directly connected to flanged components with Style 743 Vic-Flange Adapters. A No. 46 ANSI 300 groove-by-flange adapter is required for this application.
- Series 705W/708W Butterfly Valves cannot be directly connected to flanged components with Style 743 Vic-Flange Adapters.
- Series 763 Butterfly Valves cannot be directly connected to flanged components with Style 743 Vic-Flange Adapters.
- Style 743 Vic-Flange Adapters are designed to mate with raised-face flanges. For connections to flat-faced flanges, the raised projections on the outside face of the Style 743 Vic-Flange Adapter must be removed.
- Style 743 Vic-Flange Adapters in 2, 2½, and 3-inch/60.3, 73.0, and 88.9-mm sizes must be ordered as a factory assembly when connected to a Victaulic fitting or valve. Contact Victaulic for details.
- **STANDARD, FULL-SHANK DIAMETER ASSEMBLY BOLTS ARE REQUIRED FOR PROPER INSTALLATION OF VIC-FLANGE ADAPTERS.**

VIC-FLANGE WASHER NOTES FOR 2 – 12-INCH/60.3 – 323.9-MM SIZES

Style 741 Vic-Flange Adapter

Style 744 FireLock™ Flange Adapter

Style 743 Vic-Flange Adapter

Vic-Flange Adapters require a smooth, hard surface at the mating flange face for proper sealing. Some applications, for which the Vic-Flange Adapter is otherwise well suited, do not provide an adequate mating surface. In such cases, a metal Vic-Flange Washer (Type F phenolic when joining to copper systems) is recommended for insertion between the Vic-Flange Adapter and the mating flange to provide the necessary sealing surface. To ensure the proper Vic-Flange Washer is supplied, always specify the product style and size when ordering.

A. When mating to a serrated flange – a flange gasket should be used against the serrated flange. The Vic-Flange Washer should then be inserted between the Vic-Flange Adapter and the flange gasket.

B. When mating to a wafer-type valve that is rubber-lined and partially rubber-faced (smooth or not) – the Vic-Flange Washer should be placed between the valve and the Vic-Flange Adapter.

C. When mating to a rubber-faced flange, valve, etc. – the Vic-Flange Washer must be placed between the Vic-Flange Adapter and the rubber-faced flange.

D. When mating to components (valves, strainers, etc.) where the component flange face has an insert – follow the same arrangement as if the Vic-Flange Adapter was being mated to a serrated flange. Refer to application "A" above.

E. When mating AWWA cast flanges to IPS flanges – the Vic-Flange Washer is placed between the two Vic-Flange Adapters with the hinge points oriented 90° to each other. If one flange is not a Vic-Flange Adapter (i.e. flanged valve), a flange gasket must be placed against that flange. The Vic-Flange Washer must then be inserted between the flange gasket and the Vic-Flange Gasket.

F. STYLE 741 AND STYLE 744 VIC-FLANGE WASHERS ARE DIFFERENT DIMENSIONS THAN STYLE 743 VIC-FLANGE WASHERS. DIRECT SUBSTITUTION IS PROHIBITED.

Style 741
Vic-Flange Adapter – Up to 12-inch/323.9-mm Size
- ANSI 125, 150/DIN PN10 Class
- DIN PN16 Class

Style 743
Vic-Flange Adapter ANSI Class 300

Style 744
FireLock Flange Adapter ANSI Class 150

⚠ WARNING

- **Read and understand all instructions before attempting to install any Victaulic piping products.**
- **Depressurize and drain the piping system before attempting to install, remove, or adjust any Victaulic piping products.**
- **Wear safety glasses, hardhat, and foot protection.**

Failure to follow these instructions could result in serious personal injury, improper product installation, and/or property damage.

NOTICE

- **The following installation steps feature photos of a Style 741 Vic-Flange Adapter. However, the same installation steps apply to Style 743 Vic-Flange Adapters and Style 744 FireLock Flange Adapters, except where noted.**
- **Make sure there is sufficient clearance behind the pipe groove to permit proper assembly of the Vic-Flange Adapter**

1. CHECK PIPE ENDS: The outside surface of the pipe groove and pipe end must be smooth and free from indentations, projections, and roll marks to ensure a leak-tight seal for the gasket. All oil, grease, and dirt must be removed.

NOTICE

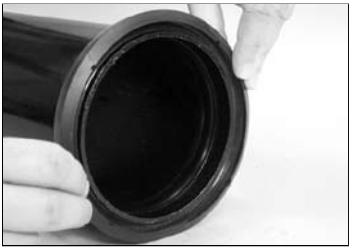
<u>For FireLock Products Only:</u>
- **Some Victaulic FireLock products may be provided with the Vic-Plus™ gasket system. If the coupling is provided with the Vic-Plus gasket system, additional lubrication is not required for the initial installation of wet pipe systems that are installed at or continuously operating above 0°F/-18°C.**
- **Refer to the "Lubrication" section on page 37 for complete information.**

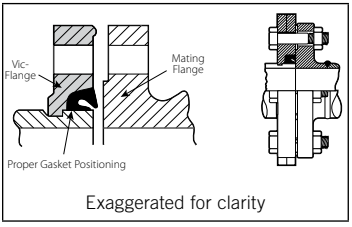
2. CHECK GASKET AND LUBRICATE: Check the gasket to make sure it is suited for the intended service. Apply a thin coat of Victaulic Lubricant or silicone lubricant to the gasket lips and exterior. **NOTE:** This gasket is designed to provide the sole seal. Refer to pages 112 – 113 for special applications.

⚠ CAUTION

- **Always use a compatible lubricant to prevent the gasket from pinching/tearing during installation.**

Failure to follow this instruction could result in joint leakage.





Exaggerated for clarity

3. INSTALL GASKET: Install the gasket over the pipe end. Make sure the gasket is positioned properly, as shown above. **NOTE:** The lettering on the outside of the gasket must face the flange-adapter gasket pocket. When installed correctly, the lettering on the gasket will not be visible.

4. INSTALL VIC-FLANGE ADAPTER: Open the hinged Vic-Flange Adapter fully, and install the flange over the gasket. Make sure the flange key section engages the pipe groove properly.

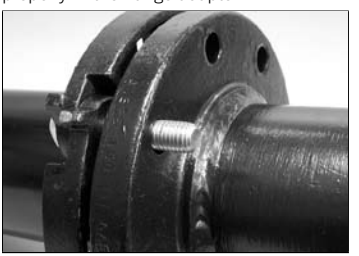
4a. FOR STYLE 741 AND STYLE 744 FLANGE ADAPTERS ONLY: Closure lugs are provided for ease of installation. If necessary, use an adjustable wrench to bring the flange holes into alignment. This will ease the insertion of standard flange bolts into the mating holes

Style 741 and Style 744

Style 743

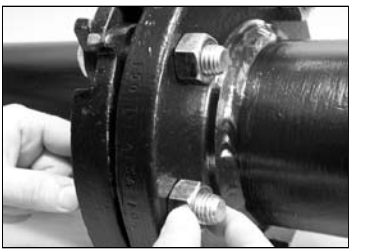
5. INSERT MATING BOLTS: Insert a standard, full-shank diameter assembly bolt through each of the two mating holes in the flange adapter. This will maintain the position of the flange in the pipe groove.

5a. Make sure the gasket is seated properly in the flange adapter.



6. JOIN FLANGE ADAPTER AND MATING FLANGE: Join the flange adapter with the mating flange by aligning the bolt holes.

6a. Thread standard flange nuts finger-tight onto the two mating bolts.



7. INSTALL REMAINING BOLTS/ NUTS: Insert a standard, full-shank diameter assembly bolt through each remaining hole in the flange adapter/ mating flange. Thread standard flange nuts finger-tight onto all bolts.

8. TIGHTEN NUTS: Tighten the nuts evenly, as with a regular flange assembly. Continue tightening until the flange faces come into firm, metal-to-metal contact or the standard, flange-joint torque requirement is achieved.

Style 741, 743, and 744 Helpful Information

Size		Number of Assembly Bolts/ Nuts Required †			Assembly Bolt/Nut Size x Length inches/metric †			Required Mating Face Sealing Surface inches/mm	
Nominal Size inches/mm	Actual Outside Diameter inches/mm	Style 741	Style 743	Style 744	Style 741	Style 743	Style 744	"A" Maximum	"B" Minimum
2	2.375 60.3	4	8	4	⅝ x 2¾	⅝ x 3	⅝ x 2¾	2.38 61	3.41 87
2½	2.875 73.0	4	8	4	⅝ x 3	¾ x 3¼	⅝ x 3	2.88 73	3.91 99
3	3.500 88.9	4	8	4	⅝ x 3	¾ x 3½	⅝ x 3	3.50 89	4.53 115
4	4.500 114.3	8	8	8	⅝ x 3	¾ x 3¾	⅝ x 3	4.50 114	5.53 141
5	5.563 141.3	8	8	8	¾ x 3½	¾ x 4	¾ x 3½	5.56 141	6.71 170
6	6.625 168.3	8	12	8	¾ x 3½	¾ x 4½	¾ x 3½	6.63 168	7.78 198
165.1 mm ‡ *	6.500 165.1	8	—	—	¾ x 3½	—	—	6.50 165	7.66 195
8	8.625 219.1	8	12	8	¾ x 3½	⅞ x 4¾	¾ x 3½	8.63 219	9.94 253
10 *	10.750 273.0	12	16	—	⅞ x 4	1 x 5¼	—	10.75 273	12.31 313
12 *	12.750 323.9	12	16	—	⅞ x 4	1⅛ x 5¾	—	12.75 324	14.31 364

† Victaulic does not supply assembly bolts/nuts. Bolt/nut sizes are for conventional flange-to-flange connections. Longer bolts are required when Vic-Flange Adapters are used with wafer-type valves. Full-shank diameter assembly bolts are required for proper installation of Victaulic flange adapters.

‡ Style 743 Vic-Flange Adapters are not available in the 165.1-mm size.

* Style 744 FireLock Flange Adapters are not available in the 165.1-mm; 10-inch/273.0-mm; and 12-inch/323.9-mm sizes.

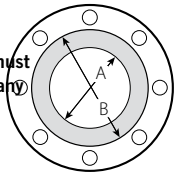
NOTE: Style 741 and Style 743 Vic-Flange Adapters provide rigid joints when used on pipe that is standard cut or roll grooved to Victaulic specifications. Consequently, no linear or angular movement is allowed at the joint.

When a Style 741 Vic-Flange Adapter is used with Victaulic Series 700 Butterfly Valves, plastic pipe, or light-wall metallic pipe, the small teeth on the ID key section of the Vic-Flange Adapter must be removed.

When a Style 741 Vic-Flange Adapter is used with Series 700 Butterfly Valves, the Vic-Flange Adapter must be used only on the side of the butterfly valve that does not interfere with handle operation.

Style 743 Vic-Flange Adapters must be ordered as a factory assembly when connected to a Victaulic fitting or valve. Contact Victaulic for details.

The shaded area of the mating face (shown at right) must be free from gouges, undulations, and deformities of any type for proper sealing.



Style 741 Metric PN10 and PN16 Helpful Information

Size		PN10		PN16		Required Mating Face Sealing Surface mm/inches	
Nominal Size mm	Actual Outside Diameter mm/ inches	Number of Assembly Bolts/Nuts Required †	Assembly Bolt/Nut Size metric †	Number of Assembly Bolts/Nuts Required †	Assembly Bolt/Nut Size metric †	"A" Maximum	"B" Minimum
50	60.3 2.375	4	M16	4	M16	60 2.38	87 3.41
65	73.0 2.875	4	M16	4	M16	76 3.00	103 4.05
76.1	76.1 3.000	4	M16	4	M16	76 3.00	103 4.05
80	88.9 3.500	8	M16	8	M16	89 3.50	115 4.53
100	114.3 4.500	8	M16	8	M16	114 4.50	141 5.55
108.0	108.0 4.250	8	M16	8	M16	108 4.25	133 5.24
133.0	133.0 5.250	8	M16	8	M16	133 5.24	160 6.30
139.7	139.7 5.500	8	M16	8	M16	140 5.51	168 6.61
150	168.3 6.625	8	M20	8	M20	168 6.63	198 7.78
159.0	159.0 6.250	8	M20	8	M20	159 6.25	187 7.36
165.1	165.1 6.500	8	M20	8	M20	165 6.50	195 7.68
200	219.1 8.625	8	M20	12	M20	219 8.63	252 9.94
250	273.0 10.750	12	M20	12	M24	273 10.75	313 12.31
300	323.9 12.750	12	M20	12	M24	324 12.75	365 14.31

† Victaulic does not supply assembly bolts/nuts. Bolt/nut sizes are for conventional flange-to-flange connections. Longer bolts are required when Vic-Flange Adapters are used with wafer-type valves. Full-shank diameter assembly bolts are required for proper installation of Victaulic flange adapters.

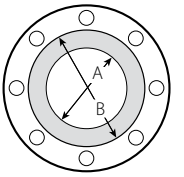
NOTES: Style 741 Vic-Flange Adapters provide rigid joints when used on pipe that is standard cut or roll grooved to Victaulic specifications. Consequently, no linear or angular movement is allowed at the joint.

When a Style 741 Vic-Flange Adapter is used with Victaulic Series 700 Butterfly Valves, plastic pipe, or light-wall metallic pipe, the small teeth on the ID key section of the Vic-Flange Adapter must be removed.

When a Style 741 Vic-Flange Adapter is used with Series 700 Butterfly Valves, the Vic-Flange Adapter must be used only on the side of the butterfly valve that does not interfere with handle operation.

Contact Victaulic for information on AS2129 – Table E; ISO 2084 (PN10); DIN 2532 (PN10); and JIS B-2210 (10K) flanges.

The shaded area of the mating face (shown at right) must be free from gouges, undulations, and deformities of any type for proper sealing.



Style 741 Metric JIS 10K Helpful Information

Size		JIS 10K		Required Mating Face Seating Surface mm/inches	
Nominal Size mm	Actual Outside Diameter mm/inches	Number of Assembly Bolts/Nuts Required †	Assembly Bolt/Nut Size metric †	"A" Maximum	"B" Minimum
73	73.0 2.880	4	M16	73 2.88	99 3.91
65	76.1 3.000	4	M16	76 3.00	103 4.05
80	88.9 3.500	8	M16	89 3.50	115 4.53
100	114.3 4.500	8	M16	114 4.50	141 5.53
141.3	141.3 5.560	8	M20	141 5.56	171 6.71
165.1	165.1 6.500	8	M20	165 6.50	195 7.66
150	168.3 6.625	8	M20	168 6.63	198 7.78

† Victaulic does not supply assembly bolts/nuts. Bolt/nut sizes are for conventional flange-to-flange connections. Longer bolts are required when Vic-Flange Adapters are used with wafer-type valves. Full-shank diameter assembly bolts are required for proper installation of Victaulic flange adapters.

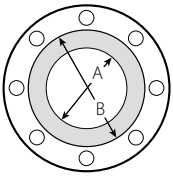
NOTES: Style 741 Vic-Flange Adapters provide rigid joints when used on pipe that is standard cut or roll grooved to Victaulic specifications. Consequently, no linear or angular movement is allowed at the joint.

When a Style 741 Vic-Flange Adapter is used with Victaulic Series 700 Butterfly Valves, plastic pipe, or light-wall metallic pipe, the small teeth on the ID key section of the Vic-Flange Adapter must be removed.

When a Style 741 Vic-Flange Adapter is used with Series 700 Butterfly Valves, the Vic-Flange Adapter must be used only on the side of the butterfly valve that does not interfere with handle operation.

Contact Victaulic for information on AS2129 – Table E; ISO 2084 (PN10); DIN 2532 (PN10); and JIS B-2210 (10K) flanges.

The shaded area of the mating face (shown at right) must be free from gouges, undulations, and deformities of any type for proper sealing.



VIC-FLANGE ADAPTER NOTES FOR 14 – 24-INCH/355.6 – 610.0-MM SIZES

Style 741 Vic-Flange Adapte

- Vic-Flange Adapters must be assembled so there is no interference with mating components.
- Because of the outside flange dimension, Vic-Flange Adapters must not be used within 90° of one another on a standard fitting.
- When wafer or lug-type valves are used adjoining a Victaulic fitting, check disc dimensions to ensure proper clearance.
- Vic-Flange Adapters cannot be used on 14 – 24-inch/355.6 – 610.0-mm Series 706 and Series 709 Butterfly Valves.
- Vic-Flange Adapters must not be used as anchor points for tie rods across non-restrained joints.
- Mating Vic-Flange Adapters to rubber-faced flanges, valves, etc. requires the use of a Vic-Flange Washer. Refer to the "Vic-Flange Washer Notes" section on the following page.
- The face of the mating flange must be free from gouges, undulations, and deformities of any type for proper sealing. Refer to the installation instructions for complete information.
- The lettering on the outside of the gasket must face the gasket pocket of the Vic-Flange Adapter. When installed correctly, the lettering on the gasket will not be visible.
- When mating two Vic-Flange Adapters in sizes 14 – 24-inches/355.6 – 610.0-mm, the draw bolt locations must be staggered, and a transition ring must be used between the two Vic-Flange Adapters.
- **STANDARD, FULL-SHANK DIAMETER ASSEMBLY BOLTS ARE REQUIRED FOR PROPER INSTALLATION OF VIC-FLANGE ADAPTERS**.

VIC-FLANGE WASHER NOTES FOR 14 – 24-INCH/355.6 – 610.0-MM SIZES

Style 741 Vic-Flange Adapter

Vic-Flange Adapters require a smooth, hard surface at the mating flange face for proper sealing. Some applications, for which the Vic-Flange Adapter is otherwise well suited, do not provide an adequate mating surface. In such cases, a metal Vic-Flange Washer is recommended for insertion between the Vic-Flange Adapter and the mating flange to provide the necessary sealing surface. To ensure the proper Vic-Flange Washer is supplied, always specify the product style and size when ordering.

A. When mating to a serrated flange – a flange gasket should be used against the serrated flange. The Vic-Flange Washer should then be inserted between the Vic-Flange Adapter and the flange gasket.

B. When mating to a wafer-type valve that is rubber-lined and partially rubber-faced (smooth or not) – the Vic-Flange Washer should be placed between the valve and the Vic-Flange Adapter.

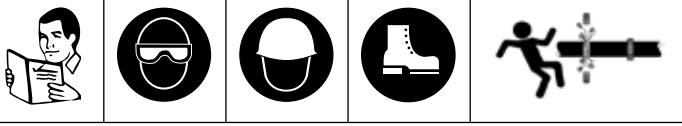
C. When mating to a rubber-faced flange, valve, etc. – the Vic-Flange Washer must be placed between the Vic-Flange Adapter and the rubber-faced flange.

D. When mating to components (valves, strainers, etc.) where the component flange face has an insert – follow the same arrangement as if the Vic-Flange Adapter was being mated to a serrated flange. Refer to application "A" above.

E. When mating AWWA cast flanges to IPS flanges – the Vic-Flange Transition Ring is placed between the two Vic-Flange Adapters with the draw bolt locations staggered. If one flange is not a Vic-Flange Adapter (i.e. flanged valve), a flange gasket must be placed against that flange. The Vic-Flange Washer must then be inserted between the flange gasket and the Vic-Flange gasket. **NOTE:** Transition rings, rather than Vic-Flange Washers, must be used when mating Style 741 Vic-Flange Adapters to Style 341 Vic-Flange Adapters in sizes 14 – 24-inches/355.6 – 610.0-mm.

Style 741
Vic-Flange Adapter – 14-inch/355.6-mm and Larger Sizes (ANSI Class 150)

⚠ WARNING



- **Read and understand all instructions before attempting to install any Victaulic piping products.**
- **Depressurize and drain the piping system before attempting to install, remove, or adjust any Victaulic piping products.**
- **Wear safety glasses, hardhat, and foot protection.**

Failure to follow these instructions could result in serious personal injury, improper product installation, and/or property damage.

NOTICE

- **Make sure there is sufficient clearance behind the pipe groove to permit proper assembly of the Vic-Flange Adapter.**

1. CHECK PIPE ENDS: The outside surface of the pipe groove and pipe end must be smooth and free from indentations, projections, and roll marks to ensure a leak-tight seal for the gasket. All oil, grease, and dirt must be removed.

2. ADD FIRST SEGMENT: Place the first segment onto the pipe, making sure that the key engages in the groove properly. **NOTE:** On vertical pipe, the segments must be held in place until all segments are fastened together. For horizontal pipe, the segments can be balanced on top of the pipe, as shown above.

3. ADD ADDITIONAL SEGMENTS: Add each segment by inserting the draw bolts (provided) into the flange adapter with the nuts (provided) loosely and uniformly tightened. This will permit the flange adapter to be rotated for bolt hole alignment in later steps.

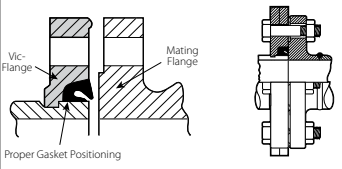
4. CHECK GASKET AND LUBRICATE: Check the gasket to make sure it is suited for the intended service. Apply a thin coat of Victaulic Lubricant or silicone lubricant to the gasket lips and exterior. **NOTE:** This gasket is designed to provide the sole seal. Refer to pages 120 – 121 for special applications.

⚠ CAUTION

- **Always use a compatible lubricant to prevent the gasket from pinching/tearing during installation.**

Failure to follow this instruction could result in joint leakage.

5. INSTALL GASKET: Install the gasket into the cavity between the pipe OD and the flange recess. Make sure the gasket is positioned properly, as shown below. **NOTE:** The lettering on the outside of the gasket must face the flange-adapter gasket pocket of the Style 741 Vic-Flange Adapter. When installed correctly, the lettering on the gasket will not be visible.



Exaggerated for clarity

6. ALIGN VIC-FLANGE AND MATING FLANGE: Rotate the Vic-Flange on the pipe end, as required, to align the holes with the mating flange.

7. INSERT STANDARD FULL-SHANK DIAMETER ASSEMBLY BOLTS AT LAP JOINTS: Insert a standard, full-shank diameter assembly bolt into each of the four lap joint holes. **NOTE:** It may be necessary to tighten the draw bolts to line up the lap joint bolt holes for insertion of the bolts.

8. TIGHTEN DRAW BOLTS: After the four assembly bolts are inserted into the lap-joint bolt holes, torque the draw bolts to approximately 150 ft lbs/203 N•m. **NOTE:** It is normal to have a small amount of shift as these bolts are being torqued.

9. JOIN VIC-FLANGE ADAPTER AND MATING FLANGE: Direct the four assembly bolts, installed in step 7, into the mating flange holes. Hand-tighten a nut onto each of the four assembly bolts to prevent the bolts from pulling out.

10. INSTALL REMAINING BOLTS/ NUTS: Insert a standard, full-shank diameter assembly bolt through each remaining hole in the flange adapter/ mating flange. Thread standard flange nuts finger-tight onto all bolts.

11. TORQUE ASSEMBLY BOLTS: Tighten all assembly bolts evenly until the required torque value is achieved. Refer to the "Style 741 Torque Requirements" table below for the torque requirement.

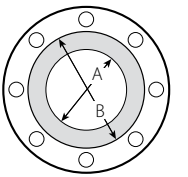
Style 741 Helpful Information

Size		Assembly Bolts/Nuts †		Draw Bolts/Nuts §			Required Mating Face Sealing Surface inches/mm	
Nominal Size inches	Actual Outside Diameter inches/ mm	Number of Bolts/ Nuts Required	Bolt/Nut Size X Length inches/ metric	Number of Bolts/ Nuts Required	Bolt/Nut Size X Length inches/ metric	Socket Size inches/ metric	"A" Maximum	"B" Minimum
14	14.000 355.6	12	1 x 4 ½ M24 x 114	4	⅝ x 3 ½ M16 x 89	15⁄16 24	14.00 355.6	16.39 416.3
16	16.000 406.4	16	1 x 4 ½ M24 x 114	4	⅝ x 3 ½ M16 x 89	15⁄16 24	16.00 406.4	18.39 467.1
18	18.000 457.0	16	1 ⅛ x 4 ¾ M27 x 121	4	¾ x 4 ¼ M20 x 108	1⅛ 30	18.00 457.2	20.00 208.0
20	20.000 508.0	20	1 ⅛ x 5 ¼ M27 x 133	4	¾ x 4 ¼ M20 x 108	1 ⅛ 30	20.00 508.0	22.50 571.5
24	24.000 610.0	20	1 ¼ x 5 ¾ M30 x 146	4	¾ x 4 ¼ M20 x 108	1⅛ 30	24.00 610.0	27.75 704.9

† Victaulic does not supply assembly bolts/nuts. Bolt/nut sizes are for conventional flange-to-flange connections. Longer bolts are required when Vic-Flange Adapters are used with wafer-type valves. Full-shank diameter assembly bolts are required for proper installation of Style 741 Vic-Flange Adapters.

§ Draw bolts/nuts are supplied with 14 – 24-inch/355.6 – 610.0-mm Style W741 Vic-Flange Adapters.

The shaded area of the mating face (shown at right) must be free from gouges, undulations, and deformities of any type for proper sealing.



Style 741 Torque Requirements

Size	Torque Requirements
Nominal Size inches/mm	ft-lbs/N•m
14 – 16 350 – 400	200 – 300 271 – 407
18 – 20 450 – 500	300 – 400 407 – 542
24 600	400 – 500 542 – 678

Couplings for Plain-End Pipe

Installation Instructions

Style 99
Roust-A-Bout Coupling

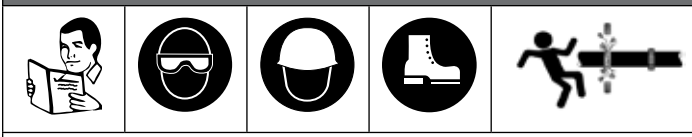
Victaulic®

I-100_126

Style 99

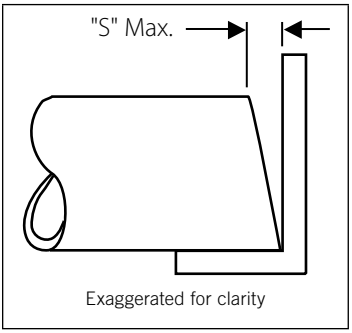
Roust-A-Bout® Coupling – Up to 12-inch/323.9-mm Size

⚠ WARNING



- **Read and understand all instructions before attempting to install any Victaulic piping products.**
- **Depressurize and drain the piping system before attempting to install, remove, or adjust any Victaulic piping products.**
- **Wear safety glasses, hardhat, and foot protection.**

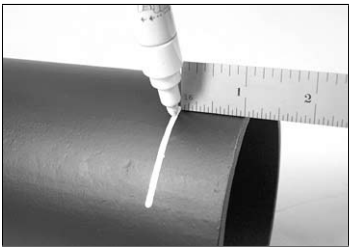
Failure to follow these instructions could result in serious personal injury, improper product installation, and/or property damage.



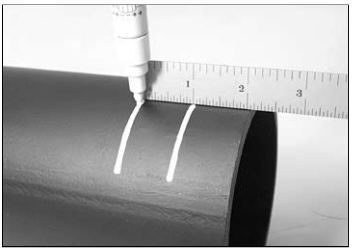
Exaggerated for clarity

1. PREPARE PIPE ENDS: Square cut the pipe ends ("S" dimension shown) within 1/32 inch/0.030 inch/0.8 mm for 1 – 6-inch/33.7 – 168.3-mm sizes and 1/16 inch/0.060 inch/1.5 mm for 8 – 12-inch/219.1 – 323.9-mm sizes.

1a. Make sure pipe ends are clean and free from damage or scratches within 1 ½ inches/38 mm from the ends. Remove cutting particles.



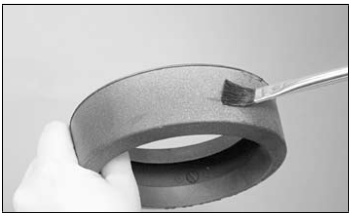
2. MARK PIPE ENDS: Using a measuring tape and a bright-colored marking pencil or paint stick, place a mark 1 inch/25 mm from the pipe ends. Make at least four of these marks equally spaced around the circumference of the pipe.



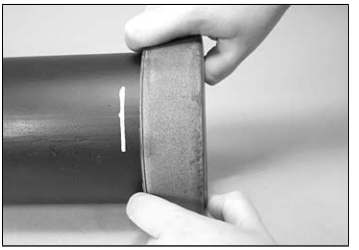
2a. Make a second mark on the pipe ends, per the "Style 99 Insertion Depth Requirements" table on the following page. Make at least four of these marks equally spaced around the circumference of the pipe.

Style 99 Insertion Depth Requirements

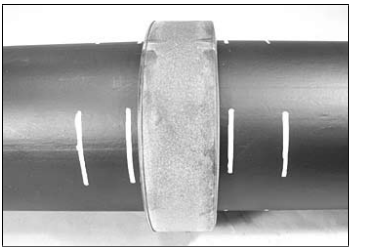
Size	Insertion Depth (2nd Mark)
Nominal Size inches/Actual mm	inches/mm
1 33.7	1 ¼ 32
1 ½ 48.3	1 ½ 38
2 – 2 ½ 60.3 – 73.0	1 ¾ 45
76.1 mm	1 ½ 38
3 88.9	1 ¾ 45
3 ½ 101.6	1 ⅞ 48
4 114.3	2 ⅛ 54
139.7 mm	1 ¾ 45
5 – 6 141.3 – 168.3	2 ¼ 57
165.1 mm	2 ¼ 57
8 – 10 219.1 – 273.0	2 ⅜ 61
12 323.9	2 ¼ 57



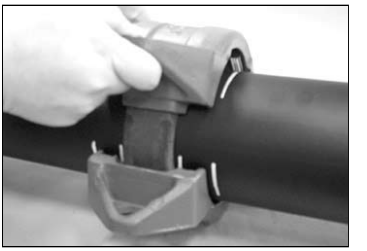
3. CHECK GASKET AND LUBRICATE: Check the gasket to make sure it is suitable for the intended service. Apply a thin coat of Victaulic Lubricant or silicone lubricant to the gasket lips and exterior.

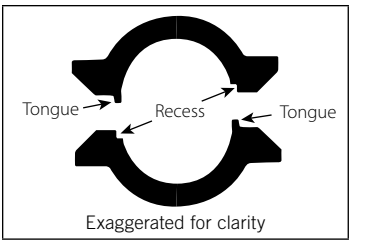


4. INSTALL GASKET: Install the gasket over one pipe end. Make sure the gasket lip does not overhang the pipe end.



5. JOIN PIPE ENDS: Align and bring the two pipe ends together. Slide the gasket into position by centering it between the first set of pipe marks.



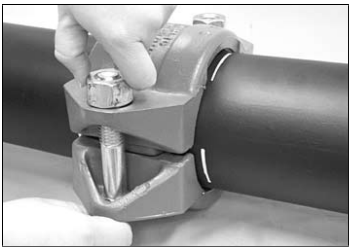


6. INSTALL HOUSINGS: Install the housings over the gasket, making sure the tongue-and-recess features mate properly (tongue in recess). Make sure the housings are centered between the second set of pipe marks. **NOTE:** All sizes of Style 99 Couplings contain the tongue-and-recess features, except for the 1-inch/33.7-mm; 76.1 mm; 1 ½-inch/48.3-mm; and 139.7-mm sizes.

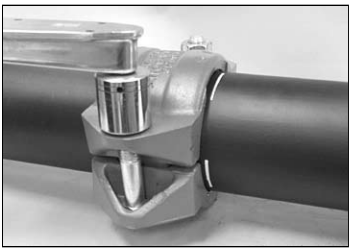
⚠ CAUTION

- **Make sure the gasket does not become rolled or pinched while installing the housings.**

Failure to follow this instruction could cause damage to the gasket, resulting in joint leakage.



7. INSTALL BOLTS/NUTS: Insert the bolts, and thread the nuts finger-tight onto the bolts. **NOTE:** Make sure all bolt track heads seat properly in the bolt holes.



8. TIGHTEN NUTS: Tighten all nuts evenly until the required torque value is achieved at each nut. Refer to the "Style 99 Torque Requirements" table below for the required torque value. **The use of a torque wrench is strongly recommended for proper assembly of Style 99 Roust-A-Bout Couplings. NOTE:** It is important to tighten all nuts evenly to prevent gasket pinching.

Style 99 Torque Requirements

Size	Torque Requirements
Nominal Size inches/Actual mm	ft lbs/N•m
1 33.7	35 48
1 ½ 48.3	60 81
2 – 2 ½ 60.3 – 73.0	150 203
76.1 mm	95 129
3 – 4 88.9 – 114.3	200 271
139.7 mm	160 217
5 141.3	250 339

Style 99 Torque Requirements

Size	Torque Requirements
Nominal Size inches/Actual mm	ft lbs/N•m
165.1 mm	250 339
6 – 8 168.3 – 219.1	250 339
10 273.0	300 407
12 323.9	350 475

⚠ WARNING

- **Housings must be mated properly tongue-to-recess.**
- **Torque requirements, specified in these instructions, must be achieved for proper coupling installation.**
- **Bolt pad gaps must be equal on both sides of the coupling.**

Failure to follow these instructions could cause joint separation, resulting in serious personal injury and/or property damage.

Style 99 Helpful Information

Size		Style 99	
Nominal Size inches/ mm	Actual Outside Diameter inches/ mm	Nut Size inches/ Metric	Socket Size inches/ Metric
1	1.315 33.7	⅜ M10	11/16 17
1 ½	1.900 48.3	½ M12	⅞ 22
2 – 2 ½	2.375 – 2.875 60.3 – 73.0	⅝ M16	1 1/16 27
76.1 mm	3.000 76.1	½ M12	⅞ 22
3 – 4	3.500 – 4.500 88.9 – 114.3	¾ M20	1 ¼ 32
139.7 mm	5.500 139.7	¾ M20	1 ¼ 32
5	5.563 141.3	⅞ M22	1 7/16 36
6	6.625 168.3	1 M24	1 ⅝ 41
165.1 mm	6.500 165.1	1 M24	1 ⅝ 41

Style 99 Helpful Information

Size		Style 99	
Nominal Size inches/ mm	Actual Outside Diameter inches/ mm	Nut Size inches/ metric	Socket Size inches/ metric
8 – 10	8.625 – 10.750	⅞	1 7⁄16
	219.1 – 273.0	M22	36
12	12.750 323.9	1 M24	1 5⁄8 41

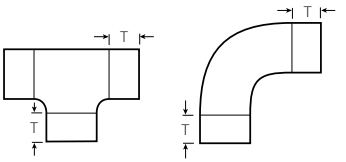
Required Tangent Lengths for Plain-End Pipe Fittings (for Style 99 Roust-A-Bout Couplings)

⚠ WARNING

- **The required tangent lengths, listed below, must be used when connecting Style 99 Roust-A-Bout Couplings to fittings for plain-end pipe.**

Failure to follow this instruction could cause joint failure, resulting in serious personal injury and/or property damage.

Style 99 Roust-A-Bout Couplings require sufficient tangent lengths for proper assembly to fittings. The following table applies to all fittings for plain-end pipe used with Style 99 Roust-A-Bout Couplings (elbows, tees, laterals, wyes, crosses, bull plugs, and nipples).



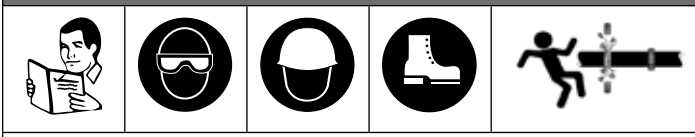
Size		Required Minimum Tangent Length "T"
Nominal Size inches/mm	Actual Outside Diameter inches/mm	inches/mm
1 ½ 40	1.900 48.3	1.50 38.1
2 50	2.375 60.3	1.75 44.5
2 ½ 65	2.875 73.0	1.75 44.5

Size		Required Minimum Tangent Length "T"
Nominal Size inches/mm	Actual Outside Diameter inches/mm	inches/mm
76.1 mm	3.00 76.1	1.50 38.1
3 80	3.500 88.9	1.75 44.5
3 ½ 90	4.000 101.6	1.75 44.5
4 100	4.500 114.3	2.00 50.8
139.7 mm	5.500 139.7	1.75 44.5
5 125	5.563 141.3	2.13 54.1
6 150	6.625 168.3	2.13 54.1
165.1 mm	6.500 165.1	2.13 54.1
8 200	8.625 219.1	2.25 57.2
10 250	10.750 273.0	2.25 57.2
12 300	12.750 323.9	2.25 57.2

Style 99

Roust-A-Bout Coupling – 14-inch/355.6-mm and Larger Sizes

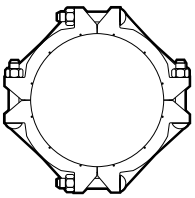
⚠ WARNING



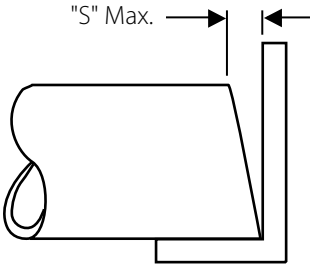
- **Read and understand all instructions before attempting to install any Victaulic piping products.**
- **Depressurize and drain the piping system before attempting to install, remove, or adjust any Victaulic piping products.**
- **Wear safety glasses, hardhat, and foot protection.**

Failure to follow these instructions could result in serious personal injury, improper product installation, and/or property damage.

Style 99 Couplings, in 14-inch/355.6-mm and larger sizes, are cast in segments to ease handling.



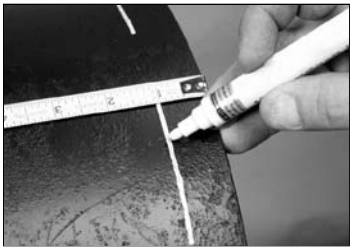
Typical 14 – 18-inch/355.6 – 457.0-mm Sizes



Exaggerated for clarity

1. PREPARE PIPE ENDS: Square cut the pipe ends ("S" dimension shown) within 1/16 inch/0.060 inch/1.5 mm.

1a. Make sure pipe ends are clean and free from damage or scratches within 1 ½ inches/38 mm from the ends. Remove cutting particles.

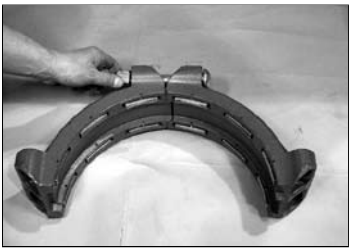


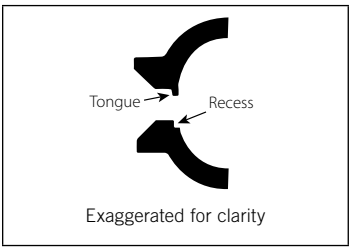
2. MARK PIPE ENDS: Using a measuring tape and a bright-colored marking pencil or paint stick, place a mark 1 inch/25 mm from the pipe ends. Make at least four of these marks equally-spaced around the circumference of the pipe.

2a. Make a second mark on the pipe ends, per the "Style 99 Insertion Depth Requirements" table below. Make at least four of these marks equally spaced around the circumference of the pipe.

Style 99 Insertion Depth Requirements

Size	Insertion Depth (2nd Mark)
Nominal Size inches/Actual mm	inches/mm
14 – 18 355.6 – 457.0	2⅜ 61





Exaggerated for clarity

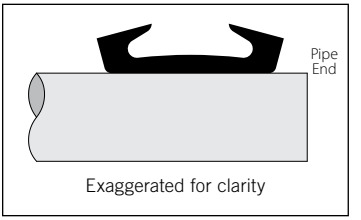
3. ASSEMBLE SEGMENTS: Assemble the segments loosely into two equal halves, as shown above. Make sure the tongue and recess features mate properly (tongue-to-recess). Allow slight clearance between the segments to ease assembly onto the pipe.

4. CHECK GASKET AND LUBRICATE: Check the gasket to make sure it is suitable for the intended service. Apply a thin coat of Victaulic Lubricant or silicone lubricant to the gasket lips and exterior.

⚠ CAUTION

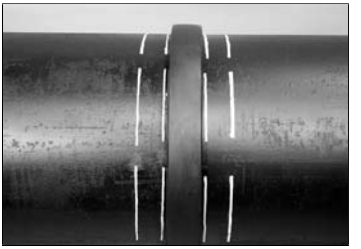
- **Always use a compatible lubricant to prevent the gasket from pinching/tearing during installation.**

Failure to follow this instruction could result in joint leakage.



Exaggerated for clarity

5. INSTALL GASKET: For larger-size couplings, it may be easier to turn the gasket inside out, then slide it over the pipe end. Make sure the gasket does not overhang the pipe end.



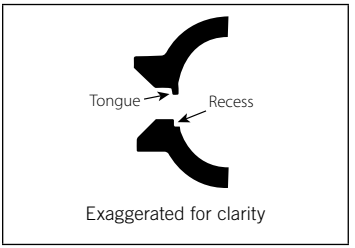
6. JOIN PIPE ENDS: Align and bring the two pipe ends together. Roll the gasket into position by centering it between the first set of pipe marks.

⚠ CAUTION

- **Make sure the gasket does not become rolled or pinched while installing the housings.**

Failure to follow this instruction could cause damage to the gasket, resulting in joint leakage.

7. INSTALL FIRST SEGMENT ASSEMBLY: Install one of the pre-assembled halves over the gasket.



Exaggerated for clarity

7a. INSTALL REMAINING SEGMENT ASSEMBLY: Install the second assembly onto the pipe, making sure the tongue-and-recess features mate properly (tongue to recess). Make sure the housings are centered between the second set of pipe marks. While supporting the weight of the assembly, install the remaining bolts, and thread the nuts finger-tight onto the bolts. **NOTE:** Make sure all bolt track heads seat properly in the bolt holes.

8. TIGHTEN NUTS: Tighten all nuts evenly until the required torque value is achieved at each nut. Refer to the "Style 99 Torque Requirements" table below for the required torque value. **The use of a torque wrench is strongly recommended for proper assembly of Style 99 Roust-A-Bout Couplings. NOTE:** It is important to tighten all nuts evenly to prevent gasket pinching.

Style 99 Torque Requirements

Size	Torque Requirements
Nominal Size Actual mm	ft lbs/N•m
14 – 18 355.6 – 457.0	350 475

⚠ WARNING

- **Housings must be mated properly tongue-to-recess.**
- **Torque requirements, specified in these instructions, must be achieved for proper coupling installation.**
- **Bolt pad gaps must be equal on both sides of the coupling.**

Failure to follow these instructions could cause joint separation, resulting in serious personal injury and/or property damage.

Style 99 Helpful Information

Size		Style 99	
Nominal Size inches	Actual Outside Diameter inches/ mm	Nut Size inches/ Metric	Socket Size inches/ Metric
14 – 18	14.000 – 18.000 355.6 – 457.0	1 M24	1 5/8 41

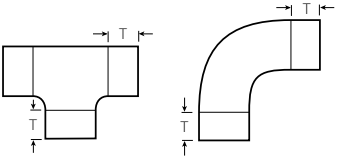
Required Tangent Lengths for Plain-End Pipe Fittings (for Style 99 Roust-A-Bout Couplings)

⚠ WARNING

- **The required tangent lengths, listed below, must be used when connecting Style 99 Roust-A-Bout Couplings to fittings for plain-end pipe.**

Failure to follow this instruction could result in serious personal injury and/or property damage.

Style 99 Roust-A-Bout Couplings require sufficient tangent lengths for proper assembly to fittings. The following table applies to all fittings for plain-end pipe used with Style 99 Roust-A-Bout Couplings (elbows, tees, laterals, wyes, crosses, bull plugs, and nipples).



Size		Required Minimum Tangent Length "T"
Nominal Size inches/mm	Actual Outside Diameter inches/mm	inches/mm
14 350	14.000 355.6	2.25 57.2
16 400	16.000 406.4	2.25 57.2
18 450	18.000 457.0	2.25 57.2

Advanced Groove System (AGS) Flange Adapter for Grooved-End Pipe

Installation Instructions

Style W741 AGS Vic-Flange Adapter

Victaulic®

AGS VIC-FLANGE ADAPTER NOTES FOR 14 – 24-INCH/355.6 – 610.0-MM SIZES

Style W741 AGS Vic-Flange Adapter

- AGS Vic-Flange Adapters must be assembled so there is no interference with mating components.
- Because of the outside flange dimensions, AGS Vic-Flange Adapters must not be used within 90º of one another on an AGS fitting.
- When wafer or lug-type valves are used adjoining a Victaulic AGS fitting, check disc dimensions to ensure proper clearance.
- AGS Vic-Flange Adapters must not be used as anchor points for tie rods across non-restrained joints.
- Mating AGS Vic-Flange Adapters to rubber-faced flanges, valves, etc. requires the use of a Vic-Flange Washer. Refer to the "AGS Vic-Flange Washer Notes" section on the following page.
- The face of the mating flange must be free from gouges, undulations, and deformities of any type for proper sealing. Refer to the AGS Vic-Flange Adapter installation instructions for complete information.
- The lettering on the outside of the gasket must face the gasket pocket of the AGS Vic-Flange Adapter. When installed correctly, the lettering on the gasket will not be visible.
- When mating two AGS Vic-Flange Adapters in 14 – 24-inch/355.6 – 610.0-mm sizes, the draw bolt locations must be staggered, and a transition ring must be used between the two Vic-Flange Adapters.

AGS VIC-FLANGE WASHER NOTES FOR 14 – 24-INCH/355.6 – 610.0-MM SIZES

Style W741 AGS Vic-Flange Adapter

AGS Vic-Flange Adapters require a smooth, hard surface at the mating flange face for proper sealing. Some applications, for which the AGS Vic-Flange Adapter is otherwise well suited, do not provide an adequate mating surface. In such cases, a metal AGS Vic-Flange Washer is recommended for insertion between the AGS Vic-Flange Adapter and the mating flange to provide the necessary sealing surface. To ensure the proper AGS Vic-Flange Adapter is supplied, always specify the product style and size when ordering.

A. When mating to a serrated flange – a flange gasket should be used against the serrated flange. The AGS Vic-Flange Washer should then be inserted between the AGS Vic-Flange Adapter and the flange gasket.

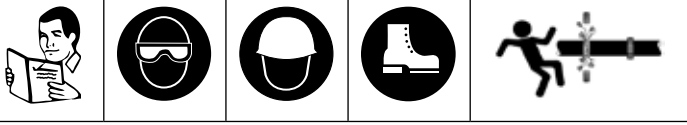
B. When mating to a wafer-type valve that is rubber lined and partially rubber faced (smooth or not) – the AGS Vic-Flange Washer should be placed between the valve and the AGS Vic-Flange Adapter.

C. When mating to a rubber-faced flange, valve, etc. – the AGS Vic-Flange Washer must be placed between the AGS Vic-Flange Adapter and the rubber-faced flange.

D. When mating to components (valves, strainers, etc.) where the component flange face has an insert – follow the same arrangement as if the AGS Vic-Flange Adapter was being mated to a serrated flange. Refer to application "A" above.

E. When mating AWWA cast flanges to IPS flanges – the AGS Vic-Flange Transition Ring is placed between the two AGS Vic-Flange Adapters with the draw bolt locations staggered. If one flange is not an AGS Vic-Flange Adapter (i.e. flanged valve), a flange gasket must be placed against that flange. The AGS Vic-Flange Washer must then be inserted between the flange gasket and the AGS Vic-Flange gasket. **NOTE:** AGS Transition Rings, rather than AGS Vic-Flange Washers, must be used when mating Style 741 AGS Vic-Flange Adapters to Style 341 Vic-Flange Adapters in sizes 14 – 24 inches/355.6 – 610.0 mm.

⚠ WARNING



- **Read and understand all instructions before attempting to install any Victaulic piping products.**
- **Depressurize and drain the piping system before attempting to install, remove, or adjust any Victaulic piping products.**
- **Wear safety glasses, hardhat, and foot protection.**

Failure to follow these instructions could result in serious personal injury, improper product installation, and/or property damage.

⚠ WARNING

- **This product must be used only on pipe that is prepared to Victaulic Advanced Groove System (AGS) specifications. DO NOT attempt to assemble this product on pipe that is prepared to standard groove dimensions.**

Failure to follow these instructions will cause improper assembly and joint failure, resulting in serious personal injury and/or property damage.

Style W741 AGS Vic-Flange Adapters require pipe that is prepared with a new grooving technology called the Victaulic Advanced Groove System (AGS). For this reason, special Victaulic AGS (RW) roll sets, made specifically for use with standard-weight pipe, are required to produce grooves in accordance with this new technology. Refer to the installation instructions within this section and page 24 for grooving dimensions.

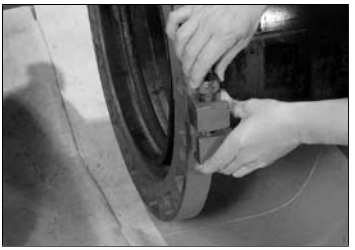
1. Groove the pipe in accordance with the Victaulic AGS grooving specifications listed on page 24. **NOTE: PIPE MUST BE ROLL GROOVED WITH VICTAULIC AGS (RW) ROLL SETS MADE SPECIFICALLY FOR USE WITH STANDARD-WEIGHT PIPE.**

1a. CHECK PIPE ENDS: The outside surface of the pipe from the pipe end to the groove must be smooth and free from indentations, projections (including weld seams), and roll marks to ensure a leak-tight seal for the gasket. All oil grease, loose paint, and dirt must be removed.

NOTICE

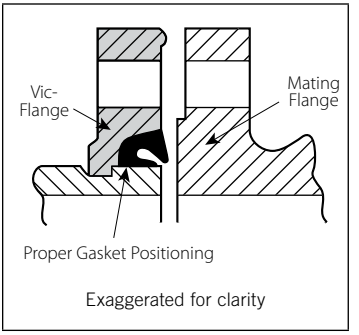
- **Make sure there is sufficient clearance behind the pipe groove to permit proper assembly of the Vic-Flange Adapter.**

2. ADD FIRST SEGMENT: Place the first segment onto the pipe, making sure the key engages completely in the groove. **NOTE:** On vertical pipe, the first segment must be held in place until the second segment is installed and fastened to the first segment. For horizontal pipe, the first segment can be balanced on top of the pipe, as shown above.

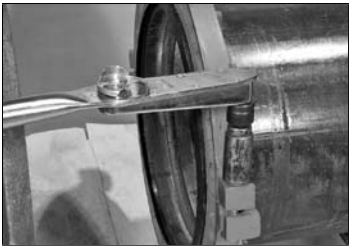


3. ADD SECOND SEGMENT: Add the second segment by inserting the draw bolts (provided) into the flange adapter with the nuts (provided) loosely and uniformly tightened. This will permit the flange adapter to be rotated for bolt hole alignment in later steps. Make sure the key of both segments engages completely in the groove.

4. CHECK GASKET: Check the gasket to make sure it is suitable for the intended service. Apply a thin coat of Victaulic lubricant or silicone lubricant to the gasket lips and exterior. **NOTE:** This gasket is designed to provide the primary seal. Refer to pages 136 – 137 for special applications.



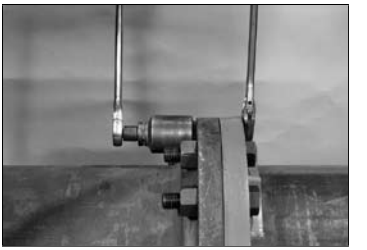
5. INSTALL GASKET: Install the gasket into the cavity between the pipe OD and the flange recess. Make sure the gasket is positioned properly, as shown above. **NOTE:** The lettering on the outside of the gasket must face the flange-adapter gasket pocket of the Style W741 AGS Vic-Flange Adapter. When installed correctly, the lettering on the gasket will not be visible.



6. TIGHTEN DRAW BOLTS: Apply approximately 150 ft lbs/203 N•m of torque to the draw bolts.

7. INSERT STANDARD, FULL-SHANK DIAMETER ASSEMBLY BOLTS AT LAP JOINTS: Insert a standard, full-shank diameter bolt into each of the lap-joint bolt holes (refer to the "Style W741 Helpful Information" on page 141).

8. JOIN VIC-FLANGE ADAPTER AND MATING FLANGE: Direct the standard, full-shank diameter assembly bolts, installed in step 7, into the mating flange holes. Hand-tighten a nut onto each bolt to prevent the bolts from pulling out.



9. ADD REMAINING STANDARD, FULL-SHANK DIAMETER ASSEMBLY BOLTS: Insert standard, full-shank diameter assembly bolts into the remaining holes in the Vic-Flange and mating flange. Apply the nuts hand tight.

9a. TORQUE ALL STANDARD, FULL-SHANK DIAMETER ASSEMBLY BOLTS: Tighten all standard, full-shank diameter assembly bolts evenly until the required torque value is achieved. Refer to the "Style W741 Torque Requirements" table for the torque requirement.

Style W741 Torque Requirements

Size		Torque Requirement
Nominal Size inches	Actual Outside Diameter inches/ mm	ft lbs/N•m
14 – 16	14.000 – 16.000	200 – 300
	355.6 – 406.4	271 – 407
18 – 20	18.000 – 20.000	300 – 400
	457.0 – 508.0	407 – 542
24	24.000 610.0	400 – 500 542 – 678

Style W741 Helpful Information

Size		Assembly Bolts/Nuts †		Draw Bolts/Nuts §			Required Mating Face Sealing Surface inches/mm	
Nominal Size	Actual Outside Diameter inches/mm	Number of Bolts/Nuts Required	Bolt/Nut Size X Length inches/Metric	Number of Bolts/Nuts Required	Bolt/Nut Size X Length inches/Metric	Socket Size inches/Metric	"A" Maximum	"B" Minimum
14	14.000 355.6	12	1 x 4½ M24 x 114	2	⅝ x 3½ M16 x 89	15⁄16 24	14.00 356	16.00 406
16	16.000 406.4	16	1 x 4½ M16 x 114	2	⅝ x 3½ M16 x 89	15⁄16 24	16.00 406	18.00 457
18	18.000 457.0	16	1⅛ x 4¾ M27 x 121	2	¾ x 4¼ M20 x 108	1⅛ 30	18.00 457	20.00 508
20	20.000 508.0	20	1⅛ x 5¼ M27 x 133	2	¾ x 4¼ M20 x 108	1⅛ 30	20.00 508	22.00 559
24	24.000 610.0	20	1¼ x 5¾ M30 x 146	2	¾ x 4¼ M20 x 108	1⅛ 30	24.00 610	26.00 660

† Victaulic does not supply assembly bolts/nuts. Bolt/nut sizes are for conventional flange-to-flange connections. Longer bolts are required when Vic-Flange Adapters are used with wafer-type valves. Standard, full-shank diameter assembly bolts are required for proper installation of Style W741 AGS Vic-Flange Adapters.

§ Draw bolts/nuts are supplied with 14 – 24-inch/355.6 – 610.0-mm Style W741 AGS Vic-Flange Adapters.

Hole-Cut Products

Installation Instructions

Style 920 and 920N Mechanical-T

Style 922 FireLock Outlet-T

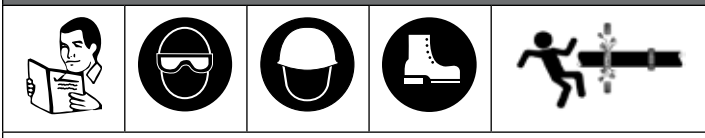
Style 923 Vic-Let Strapless Outlet

Style 924 Vic-O-Well Strapless Thermometer Outlet

Style 920
Mechanical-T® Bolted Branch Outlet

Style 920N
Mechanical-T Bolted Branch Outlet

⚠ WARNING



- **Read and understand all instructions before attempting to install any Victaulic piping products.**
- **Depressurize and drain the piping system before attempting to install, remove, or adjust any Victaulic piping products.**
- **Wear safety glasses, hardhat, and foot protection.**

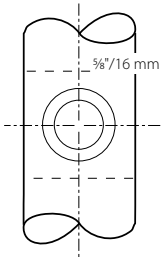
Failure to follow these instructions could result in serious personal injury, improper product installation, and/or property damage.

Pipe Preparation for Mechanical-T Outlet and Mechanical-T Cross Installation

NOTICE

- **Victaulic hole cutting tools are recommended for proper hole preparation.**

- Proper preparation of the hole is essential for sealing and performance. Make sure the correct hole saw size is being used. Refer to the "Style 920/920N Mechanical-T Outlet and Mechanical-T Cross Pipe Preparation Requirements" table for the proper hole saw size.
- Holes MUST be drilled on the centerline of the pipe. Holes for Mechanical-T Cross assemblies must be cut on the centerline of the pipe at predetermined locations for each branch. Holes for Mechanical-T Cross assemblies must be in line within 1/16 inch/1.6 mm of each other.
- Ensure that a 5/8-inch/16-mm area around the hole is clean, smooth, and free from indentations and/or projections that could affect gasket sealing (refer to the sketch above). Remove any burrs and sharp or rough edges from the hole. Burrs and sharp edges might affect assembly, proper seating of the locating collar, flow from the outlet, or gasket sealing.



Exaggerated for clarity

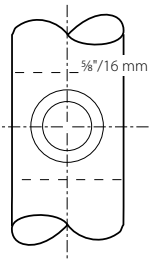
- The pipe around the entire circumference, within the "A" dimension shown on this page, must be free from any dirt, scale, or projections that might prevent the housing from seating fully on the pipe. Refer to the "Style 920/920N Mechanical-T Outlet and Mechanical-T Cross Pipe Preparation Requirements" table on the following page for the "A" dimension.

NOTICE

- **For proper installation, some new sizes of Style 920N products require a different hole size than the Style 920 or Style 921 it replaces. Make sure the proper size hole is prepared for the size and style being installed (refer to the tables on the following page for requirements).**

Style 920/920N Mechanical-T Outlet and Mechanical-T Cross Pipe Preparation Requirements

Size	Hole Dimensions inches/mm		Surface Preparation "A" Dimension
Nominal Outlet Size inches/ Actual mm	Minimum Hole Diameter/Hole Saw Size	Maximum Allowable Diameter	inches/mm
All ½-inch/ 21.3 Outlets	1.50 38.1	1.63 41.4	3.50 88.9
All ¾-inch/ 26.9 Outlets	1.50 38.1	1.63 41.4	3.50 88.9
All 1-inch/ 33.7 Outlets	1.50 38.1	1.63 41.4	3.50 88.9
All 1 ¼-inch/ 42.4 Outlets	1.75 44.5	1.88 47.8	4.00 101.6
All 1 ½-inch/ 48.3 Outlets	2.00† 50.8	2.13 54.1	4.00 101.6
All 2-inch/ 60.3 Outlets	2.50† 63.5	2.63 66.8	4.50 114.3
All 2 ½-inch/ 73.0 Outlets	2.75 69.9	2.88 73.2	5.00 127.0
All 76.1-mm Outlets	2.75 69.9	2.88 73.2	5.50 139.7
All 3-inch/ 88.9 Outlets	3.50 88.9	3.63 92.2	5.50 139.7
All 4-inch/ 114.3 Outlets	4.50 114.3	4.63 117.6	6.50 165.1
All 108.0-mm Outlets	4.50 114.3	4.63 117.6	6.50 165.1



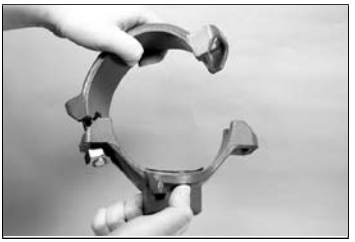
Exaggerated for clarity

† 2 x 1 ½-inch/60.3 x 48.3-mm Style 920N products require a 1 ¾-inch/44.5-mm hole.

‡ 8 x 2-inch/219.1 x 60.3-mm Style 920 products require a 2 ¾-inch/69.9-mm size hole.

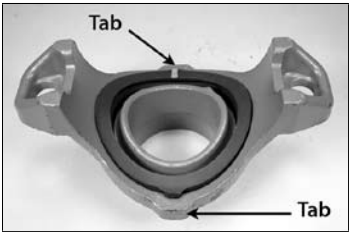
NOTE: Style 920 and Style 920N housings CANNOT be mated to each other to achieve cross connections.

Mechanical-T Installation



1. ASSEMBLE HOUSINGS: Insert a bolt into the two housings. Thread a nut loosely onto the end of the bolt.

Style 920 Gasket



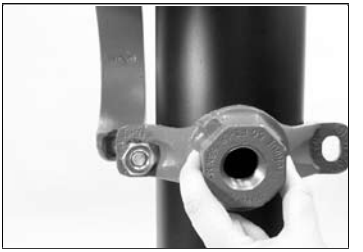
Style 920N Gasket

2. CHECK GASKET AND LUBRICATE: Inspect the sealing surface of the gasket to make sure no debris is present. For Style 920N Mechanical-T Outlets, it is not necessary to remove the gasket from the housing. **GASKETS FOR THE STYLE 920 ARE NOT INTERCHANGEABLE WITH GASKETS FOR THE STYLE 920N. THE CORRECT GASKET IS SHIPPED WITH THE APPROPRIATE PRODUCT.**

Style 920 Gaskets have a narrower gasket sealing area and two pronounced alignment tabs for proper positioning inside the housing. Style 920N gaskets have a wider gasket sealing area. Refer to the above photos for differences between the gaskets.

2a. For Metal Pipe: Lubricate the exposed sealing surface of the gasket with a thin coat of Victaulic lubricant or silicone lubricant. **DO NOT** use petroleum-based lubricants.

2b. For HDPE Pipe: Lubricate the exposed sealing surface of the gasket with a thin coat of soybean oil, glycerin, or silicone hydrocarbon lubricants. **DO NOT** use soap-based lubricants or Victaulic lubricant for HDPE pipe.



3. INSTALL HOUSINGS: Rotate the lower housing so that it is positioned approximately 90° to the upper (outlet) housing, as shown above. Place the upper (outlet) housing onto the face of the pipe in line with the outlet hole cut into the pipe. Rotate the lower housing around the pipe.

3a. Make sure the locating collar engages the outlet hole properly. Check this engagement by rocking the upper (outlet) housing in the hole.

4. INSTALL REMAINING BOLT/NUT: Insert the remaining bolt, and thread a nut onto the bolt finger-tight. Make sure the bolt track heads seat properly in the bolt holes.

5. TIGHTEN NUTS: Make sure the locating collar is still positioned properly in the outlet hole. Tighten the nuts evenly by alternating sides until the upper (outlet) housing contacts the pipe completely.

5a. For Metal Pipe: The nuts must be torqued to 50 ft-lbs/68 N•m with even gaps between the bolt pads. **DO NOT** exceed 70 ft-lbs/95 N•m of torque on the nuts.

5b. For HDPE Pipe: The nuts must be torqued to 50 ft-lbs/68 N•m. **NOTE:** On HDPE pipe, it is normal for bolt pads to contact when the nuts are tightened to 50 ft-lbs/68 N•m. **DO NOT** exceed 70 ft-lbs/95 N•m of torque on the nuts.

NOTICE

- **For grooved outlets, refer to the applicable coupling installation instructions.**
- **For threaded outlets, complete the assembly using standard threading practices.**

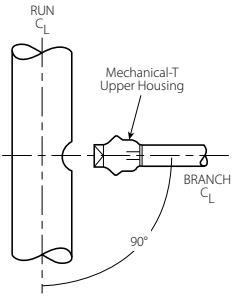
⚠ WARNING

- **Nuts must be torqued to 50 ft-lbs/68 N•m.**
- **DO NOT exceed 70 ft-lbs/95 N•m of torque on the nuts. Increased bolt torque will not improve sealing and may cause product failure.**

Failure to torque nuts properly could cause product failure, resulting in serious personal injury and/or property damage.

Branch Connections

- If a branch connection is made to the upper housing before the Mechanical-T is installed on the pipe, make sure the branch connection is 90° to the pipe run before completing the tightening sequence of the Mechanical-T assembly.
- When the Mechanical-T is used as a transition piece between two runs, it must be assembled onto the runs before the branch connection is made.
- Victaulic female threaded products are designed to accommodate standard ANSI male pipe threads only. Use of male threaded products with special features, such as probes, dry pendent sprinkler heads, etc., should be verified as suitable for use with this Victaulic product. Failure to verify suitability in advance may result in assembly problems or leakage.



Exaggerated for clarity

Style 920N Mechanical-T Crosses

- Cross connections can be made **ON METAL PIPE ONLY** by using two upper housings of the same size. Different branch sizes are allowable. **DO NOT make cross assemblies on HDPE pipe.**
- Install the cross connection in accordance with the instructions in this section. Make sure the locating collar on each side is securely positioned inside the hole. Nuts must be torqued to 50 ft-lbs/68 N•m, with even gaps between the bolt pads, to ensure the cross assembly is rigid. DO NOT exceed 70 ft-lbs/95 N•m of torque on the nuts.
- **DO NOT mix Style 920 Outlets with Style 920N Outlets when making cross assemblies.**

Style 920 Helpful Information

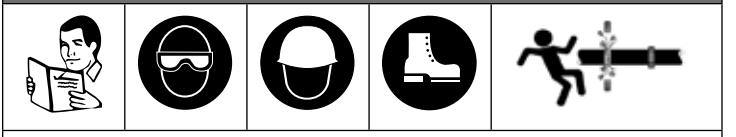
Size		Nut Size	Socket Size
Nominal Size inches/mm	Actual Outside Diameter inches/mm	inches/ Metric	inches/ Metric
76.1 mm	3.000 76.1	½ M12	⅞ 22
108.0 mm	4.250 108.0	½ M12	⅞ 22
4 100	4.500 114.3	½ M12	⅞ 22
133.0 mm	5.250 133.0	⅝ M16	1 – 1 1⁄16 27
139.7 mm	5.500 139.7	⅝ M16	1 – 1 1⁄16 27
5 – 6 125 – 150	5.563 – 6.625 141.3 – 168.3	⅝ M16	1 – 1 1⁄16 27
159.0 mm	6.250 159.0	⅝ M16	1 – 1 1⁄16 27
165.1 mm	6.500 165.1	⅝ M16	1 – 1 1⁄16 27
200A (JIS)	— 216.3	¾ M20	1 ¼ 32
8 200	8.625 219.1	¾ M20	1 ¼ 32

Style 920N Helpful Information

Size		Nut Size	Socket Size
Nominal Size inches/mm	Actual Outside Diameter inches/mm	inches/ Metric	inches/ Metric
2 – 6	2.375 – 6.625 60.3 – 168.3	½ M12	⅞ 22
76.1 – 139.7 mm	3.000 – 5.500 76.1 – 139.7	½ M12	⅞ 22
159.0 mm	6.250 159.0	⅝ M16	1 1⁄16 27
165.1 mm	6.500 165.1	½ M12	⅞ 22

Style 922 FireLock Outlet-T

⚠ WARNING



- **Read and understand all instructions before attempting to install any Victaulic piping products.**
- **Depressurize and drain the piping system before attempting to install, remove, or adjust any Victaulic piping products.**
- **Wear safety glasses, hardhat, and foot protection.**

Failure to follow these instructions could result in serious personal injury, improper product installation, and/or property damage.

The Style 922 FireLock Outlet-T is UL Listed and FM Approved up to 300 psi/2068 kPa and VdS approved up to 16 Bar at ambient temperatures that are typical for fire protection systems.

Pipe Preparation for Outlet-T Installation

- The Style 922 FireLock Outlet-T is designed for direct connection of sprinkler heads, drop nipples, sprigs, drains, gauges, and other outlet products.

NOTICE

- **Victaulic hole cutting tools are recommended for proper hole preparation.**

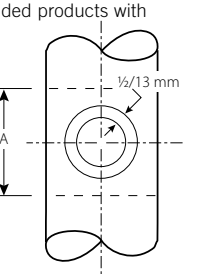
- Proper preparation of the hole is essential for sealing and performance. Make sure the correct hole size is drilled in the pipe. Refer to the "Style 922 FireLock Outlet-T Hole Size Requirements" table below for the proper hole size

Style 922 FireLock Outlet-T Hole Size Requirements

Run X Branch FPT †	Hole Diameter inches/mm +0.06 -0.00
All Sizes	1 3/16 30.2

† Victaulic female threaded products are designed to accommodate standard NPT or BSPT (Optional) male pipe threads only. Use of male threaded products with special features, such as probes, dry pendent sprinkler heads, etc., should be verified as suitable for use with this Victaulic product. Failure to verify suitability in advance may result in assembly problems or leakage.

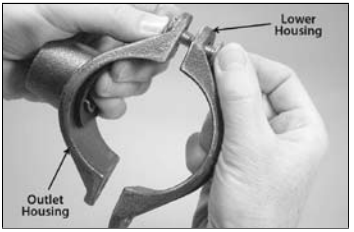
- Holes MUST be cut on the centerline of the pipe.
- Ensure that a ½-inch/13-mm area around the hole is clean, smooth, and free from indentations and/or projections that could affect gasket sealing (refer to the sketch to the right). Remove any burrs and sharp or rough edges from the hole. Burrs and sharp edges might affect assembly, proper seating of the locating collar, flow from the outlet, or gasket seating.



Exaggerated for clarity

Installation

1. INSTALL GASKET: Install the gasket into the gasket pocket, as shown above. Press the gasket along the full circumference to ensure that it fully seats in the gasket pocket. **DO NOT LUBRICATE THE GASKET.**

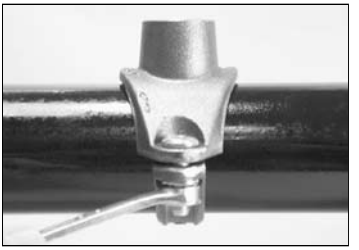


2. ASSEMBLE HOUSINGS: Insert a bolt into the two housings. Thread a flange nut loosely onto the end of the bolt (nut should be flush with end of bolt) to allow for the "swing-over" feature.

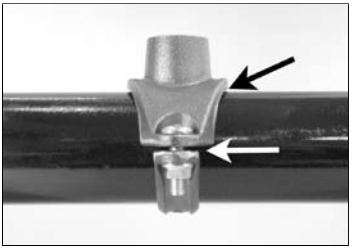
3. INSTALL HOUSINGS: Install the outlet housing onto the pipe by centering the locating collar in the pipe hole. To check for proper engagement, slide the outlet housing back and forth while pushing down. A properly positioned outlet housing can be moved only a small amount in any direction.

3a. Rotate the lower housing around the pipe, while holding the outlet housing in place. Make sure the locating collar remains seated properly in the pipe hole.

4. INSTALL REMAINING BOLT/ NUT: Insert the other track bolt into the outlet housing and lower housing. Thread the flange nut onto the bolt finger-tight.



5. TIGHTEN NUTS: Tighten the flange nuts evenly to an approximate torque value of 20 ft-lbs/27 N•m to ensure proper gasket compression. **NOTE:** To avoid over-tightening the flange nuts, use a wrench with a maximum length of 8 inches/200 mm. **DO NOT** over-tighten the flange nuts.



5a. The outlet housing, near the gasket, should not make metal-to-metal contact with the pipe. In addition, a small gap is expected between the outlet housing and the lower housing, as shown above.

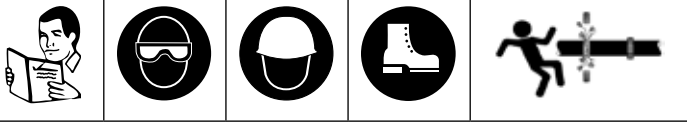
Style 922 Helpful Information

Run X Branch	Nut Size inches/Metric	Socket Size inches/Metric
All Sizes	3/8 M10	9/16 15

Style 923
Vic-Let™ Strapless Outlet

Style 924
Vic-O-Well™ Strapless Thermometer Outlet

⚠ WARNING



- **Read and understand all instructions before attempting to install any Victaulic piping products.**
- **Depressurize and drain the piping system before attempting to install, remove, or adjust any Victaulic piping products.**
- **Wear safety glasses, hardhat, and foot protection.**

Failure to follow these instructions could result in serious personal injury, improper product installation, and/or property damage.

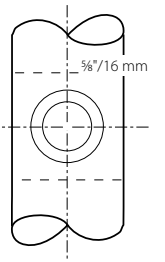
- Victaulic Style 923 Vic-Let Strapless Outlets are rated to 300-psi/2068-kPa working pressure on standard-weight steel pipe in sizes 4 – 8 inches/114.3 – 219.1-mm and Schedule 10 through 40 steel pipe in sizes 10-inches/273.0-mm and larger. In addition, Style 923 Vic-Let Strapless Outlets are UL/ULC Listed for 175-psi/1206 kPa fire protection service.
- Victaulic Style 924 Vic-O-Well Strapless Thermometer Outlets are rated to 300-psi/2068-kPa working pressure on standard weight steel pipe. In addition, Style 924 Vic-O-Well Strapless Thermometer Outlets contain 1¼ - 18 NEF extra-fine threads to receive thermometers with a 6-inch/152-mm nominal bulb length only.

Pipe Preparation for Strapless Outlets

NOTICE

- **Victaulic hole cutting tools are recommended for proper hole preparation.**

- Proper preparation of the hole is essential for sealing and performance. Make sure the correct hole saw size is being used. Refer to the "Style 923 and Style 924 Pipe Preparation Requirements" table on the following page for the proper hole saw size.
- Holes MUST be cut on the centerline of the pipe.
- Ensure that a ⅝-inch/16-mm area around the hole is clean, smooth, and free from indentations and/or projections that could affect gasket sealing (refer to the sketch to the right). Remove any burrs and sharp or rough edges from the hole. Burrs and sharp edges might affect assembly, flow from the outlet, or gasket seating.
- The pipe, within the "A" dimension shown above, must be free from any dirt, scale, or projections that might prevent the strapless outlet from seating fully on the pipe.



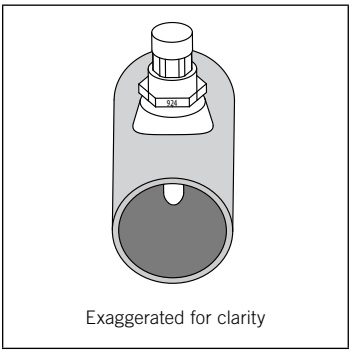
Exaggerated for clarity

Style 923 and Style 924 Pipe Preparation Requirements

Size	Hole Preparation	
Run X Branch	Hole Saw Size inches/mm	Maximum Allowable Hole Diameter inches/mm
All Sizes	1 ½ 38.1	1 9⁄16 39.7

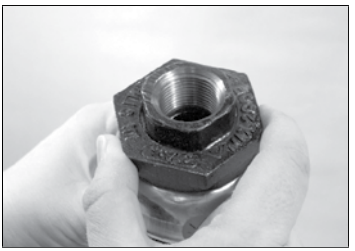
NOTICE

- **The following installation steps show photos of the Style 923 Vic-Let Strapless Outlet. In addition, these steps apply to the Style 924 Vic-O-Well Strapless Thermometer Outlets.**



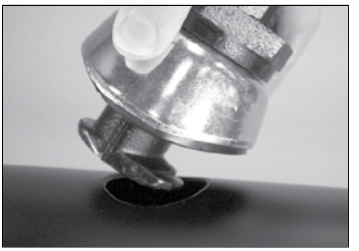
Exaggerated for clarity

1. CHECK PRODUCT: Make sure the "923" or "924" marking on the top hex nut is facing toward the curvature of the collar (along pipe axis), as shown above.



2. POSITION ASSEMBLY NUT: Position the lettered face of the assembly nut at the top of the threads, as shown above. **DO NOT** remove the assembly nut.

3. LUBRICATE GASKET: Apply a thin coat of Victaulic lubricant or silicone lubricant to the exposed gasket sealing lip to ensure proper seating. **DO NOT** use petroleum-based lubricants on the gasket.



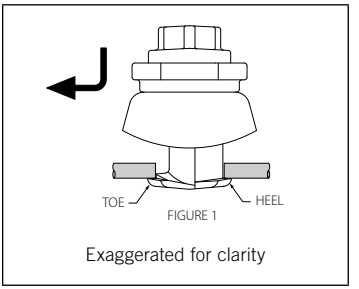


FIGURE 1

Exaggerated for clarity

4. SEAT OUTLET: Align the "foot" of the outlet with the pipe. Tilt the "toe" into the hole to insert the outlet (refer to Figure 1 above).

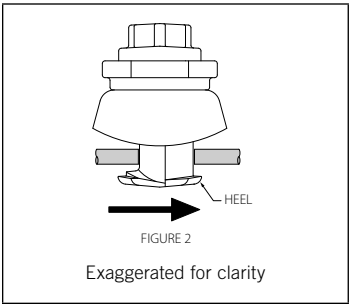
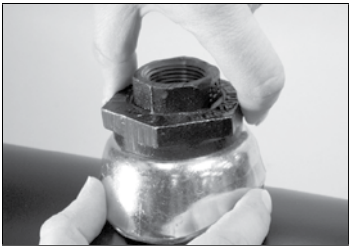
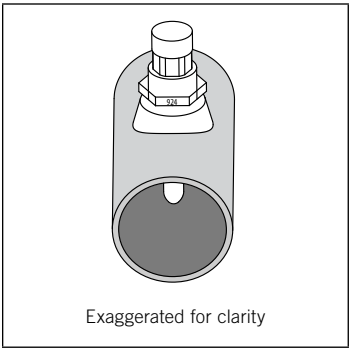


FIGURE 2

Exaggerated for clarity

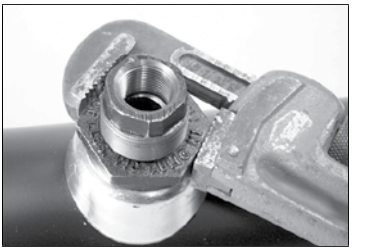
5. POSITION OUTLET: Shift the outlet to position the "heel" inside the pipe, as shown in Figure 2 above. **NOTE:** The heel must be positioned, as shown in Figure 2 above, to ensure proper performance under operating conditions.





Exaggerated for clarity

6. HAND-TIGHTEN ASSEMBLY NUT: Hold the collar in position, and hand-tighten the assembly nut. Check for proper positioning after tightening by attempting to tilt the outlet in the hole. The outlet should not shift. If the outlet shifts, loosen the assembly nut, re-position the outlet, and hand-tighten the assembly nut again. **NOTE:** Make sure the "923" or "924" marking on the top hex nut is still facing toward the curvature of the collar (along pipe axis), as shown above.



7. WRENCH-TIGHTEN NUT: Wrench-tighten the assembly nut until the collar deforms and contacts the pipe evenly on all sides. Maintain collar/gasket alignment to prevent gasket pinching. **DO NOT** exceed 200 ft-lbs/271 N•m. **NOTE:** For 4 – 8-inch/114.3 – 219.1-mm size outlets, a "ratcheting" motion will help maintain alignment with the collar.

NOTICE

- **Due to deformation of the collar, Style 923 Vic-Let Outlets and Style 924 Vic-O-Well Outlets should not be reused after the initial installation.**

8. CHECK ASSEMBLY: After wrench-tightening the assembly nut, check to make sure the curvature of the collar conforms to the curvature of the pipe. In addition, make sure the collar contacts the pipe evenly on all sides and that no portion of the gasket is exposed.

⚠ WARNING

- **The collar must deform to contact the pipe evenly on all sides.**
- **DO NOT exceed 200 ft-lbs/271-N•m on the assembly nut during installation.**
- **DO NOT exceed 1½ times the working pressure during system tests.**

Failure to follow these instructions could cause joint failure, resulting in serious personal injury and/or property damage.

9. MAKE CONNECTION: Make the required connection by using a second wrench on the top hex only. To prevent loosening of the outlet in the hole, **DO NOT** use the assembly nut for tightening this connection.

NOTICE

- **Victaulic Style 923 Vic-Let Strapless Outlets contain female threads that are designed to accommodate standard ANSI male threads only. Use of male threaded products that contain special features such as probes, dry pendent sprinkler heads, etc., must be checked for compatibility with this product.**
- **Victaulic Style 924 Vic-O-Well Strapless Thermometer Outlets contain 1¼ - 18 NEF 2B extra-fine threads to receive thermometers with a 6-inch/152-mm nominal bulb length only.**

Valve Installation and Operation

Butterfly Valves, Check Valves, Ball Valves, Plug Valves

Vic®-300 MasterSeal™ Butterfly Valve

Series 709 Butterfly Valve

Series 763 Butterfly Valve with Gear Operator

Series 712/712S Swing Check Valve

Series 717 FireLock Check Valve

Series 779 Venturi Check Valve

Series 728 FireLock Ball Valve

Series 726 Vic-Ball Valve

Series 722 Ball Valve

Series 377 Vic-Plug Balancing Valve

NOTE: More valve series are featured in this section.

Victaulic®

BUTTERFLY VALVE INSTALLATION AND OPERATION

For installing a Victaulic butterfly valve into a piping system, follow the instructions supplied with the coupling. Refer to the notes below for applications/limitations.

DO NOT INSTALL BUTTERFLY VALVES INTO THE SYSTEM WITH THE DISC IN THE FULLY OPEN POSITION.

When using butterfly valves for throttling service, Victaulic recommends the disc to be positioned no less than 30 degrees open. For best results, the disc should be between 30 and 70 degrees open. High pipeline velocities and/or throttling with the disc less than 30 degrees open may result in noise, vibration, cavitation, severe line erosion, and/or loss of control. For details regarding throttling services, contact Victaulic.

Victaulic recommends limiting the flow velocities for water service to 20 feet/second/6.1 meters/second. When higher flow velocities are necessary, contact Victaulic. When dealing with flow media other than water, contact Victaulic.

When directly connecting an end cap to a butterfly valve, use only a tapped end cap for pressure relief. If the butterfly valve is opened then closed unknowingly while the end cap is attached, the space between the disc and end cap will be filled and pressurized. A sudden release of energy can occur if the end cap is removed while the space behind it is pressurized. **PRESSURE MUST BE VENTED THROUGH THE TAP BEFORE ATTEMPTING TO REMOVE THE CAP.**

⚠ DANGER

- **When directly connecting an end cap to a butterfly valve, use only a tapped end cap for pressure relief.**
- **Pressure must be vented through the tap before attempting to remove the cap.**

Failure to follow these instructions could result in death or serious personal injury.

Victaulic Butterfly Valves are designed with grooved ends for use with grooved pipe couplings. If flange connections are required, refer to the following notes regarding Vic-Flange Adapter restrictions.

Vic-300 MasterSeal Butterfly Valves and Series 705W/708W Butterfly Valves

- For Vic-300 MasterSeal Butterfly Valves, lubricated nitrile "T" seat seals are recommended for dry or lubricated gas services.
- Style 741 Vic-Flange Adapters can be used on all sizes of Vic-300 MasterSeal Butterfly Valves.
- Style 741 Vic-Flange Adapters can be used only on one side of 2 – 8-inch/60.3 – 219.1-mm Series 705W/708W Butterfly Valves that will not interfere with mating components and handle operation.
- Style 741 Vic-Flange Adapters cannot be used on 10 – 12-inch/273.0 – 323.9-mm Series 705W/708W Butterfly Valves.

- Vic-300 MasterSeal Butterfly Valves cannot be directly connected to flanged components with Style 743 Vic-Flange Adapters. A No. 46 ANSI 300 groove-by-flange adapter is required for this application.
- Series 705W/708W Butterfly Valves cannot be directly connected to flanged components with Style 743 Vic-Flange Adapters.

Series 706 Butterfly Valve

- Series 706 Butterfly Valves CANNOT be directly connected to flanged components with Style 741 Vic-Flange Adapters.

Series W706 AGS Butterfly Valve

- Series W706 AGS Butterfly Valves CAN be directly connected to flanged components with Style W741 AGS Vic-Flange Adapters.
- When connecting a Series W706 AGS Butterfly Valve to a Series W715 AGS Dual-Disc Vic-Check® Valve, a pipe spool is required between the two valves to prevent disc interference.
- When a Series W715 AGS Dual-Disc Vic-Check Valve is placed near a Series W706 AGS Butterfly Valve, orient the center brace/disc shaft of the Series W715 at right angles to the butterfly valve stem. Failure to do so will cause uneven and unstable flow through the Series W715, resulting in noise and reduced valve life.

Series 709 Butterfly Valve

- Series 709 Butterfly Valves CANNOT be directly connected to flanged components with Style 741 Vic-Flange Adapters.

Series W709 AGS Butterfly Valve

- Series W709 AGS Butterfly Valves CAN be directly connected to flanged components with Style W741 Vic-Flange Adapters.
- When connecting a Series W709 AGS Butterfly Valve to a Series W715 AGS Dual-Disc Vic-Check Valve, a pipe spool is required between the two valves to prevent disc interference.
- When a Series W715 AGS Dual-Disc Vic-Check Valve is placed near a Series W709 AGS Butterfly Valve, orient the center brace/disc shaft of the Series W715 at right angles to the butterfly valve stem. Failure to do so will cause uneven and unstable flow through the Series W715, resulting in noise and reduced valve life.

Series 763 Butterfly Valve

- Series 763 Butterfly Valves CANNOT be directly connected to flanged components with Style 743 Vic-Flange Adapters.

CHECK VALVE INSTALLATION AND OPERATION

For installing a Victaulic check valve into a piping system, follow the instructions supplied with the coupling. Refer to the notes below for applications/limitations.

Placement of check valves too close to sources of unstable flow will shorten the life of the valve and may potentially damage the system. To extend valve life, valves should be installed a reasonable distance downstream from pumps, elbows, expanders, reducers, or other similar devices. Sound piping practices dictate a minimum of five times the pipe diameter for general use. Distances between three and five diameters are allowable, provided the flow velocity is less than 8 feet per second/2.4 meters per second. Distances less than three diameters are not recommended and will violate the Victaulic product warranty.

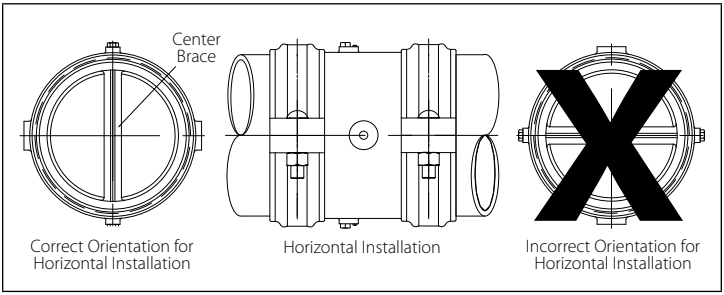
Series 712/712S Swinger Check Valve

- Series 712/712S Swinger Check Valves SHOULD NOT be installed vertically.

Series 713 Swinger Check Valve

- Series 713 Swinger Check Valves SHOULD NOT be installed vertically.

Series W715 AGS Dual-Disc Vic-Check® Valve



- Series W715 AGS Dual-Disc Vic-Check Valves can be installed either vertically (flow up) or horizontally.
- For horizontal installations, the center brace inside the Series W715 AGS Dual-Disc Vic-Check Valve must be in the vertical position, as shown above.
- Style W741 AGS Vic-Flange Adapters can be installed on either end of a Series W715 AGS Dual-Disc Vic-Check Valve.
- When connecting a Series W715 AGS Dual-Disc Vic-Check® Valve to a Series W706 or Series W709 AGS Butterfly Valve, a pipe spool is required between the two valves to prevent disc interference.
- When a Series W715 AGS Dual-Disc Vic-Check Valve is placed near a Series W706 or Series W709 AGS Butterfly Valve, orient the center brace/disc shaft of the Series W715 at right angles to the butterfly valve stem. Failure to do so will cause uneven and unstable flow through the Series W715, resulting in noise and reduced valve life.

Series 716 Vic-Check Valve

- Series 716 Vic-Check Valves can be installed either vertically (flow up) or horizontally by making sure the flow arrow marking matches the flow direction through the pipeline.
- Style 741 Vic-Flange Adapters can be installed on either end of a Series 716 Vic-Check Valve.

Series 717/717R FireLock Check Valves

- Series 717/717R FireLock Check Valves can be installed either vertically (flow up) or horizontally by making sure the flow arrow marking matches the flow direction through the pipeline.
- Style 741 and Style 744 Vic-Flange Adapters can be installed on either end of a Series 717/717R FireLock Check Valve.

Series 779 Venturi Check Valve

- Series 779 Venturi Check Valves can be installed either vertically (flow up) or horizontally by making sure the flow arrow marking matches the flow direction through the pipeline.

BALL VALVE INSTALLATION AND OPERATION

Series 722 Threaded Ball Valve

Series 723 Diverter Ball Valve

Series 726 Vic-Ball Valve

Series 728 FireLock Ball Valve

For installing a Victaulic ball valve into a piping system, follow the instructions supplied with the coupling. For threaded valves, follow standard threading practices for proper installation. **NOTE:** Victaulic ball valves are intended for open/closed services only and MUST NOT be used for throttling services.

When directly connecting an end cap to a ball valve, use only a tapped end cap for pressure relief. If the ball valve is opened then closed unknowingly while the end cap is attached, the space between the ball and end cap will be filled and pressurized. A sudden release of energy can occur if the end cap is removed while the space behind it is pressurized. **PRESSURE MUST BE VENTED THROUGH THE TAP BEFORE ATTEMPTING TO REMOVE THE CAP.**

⚠ DANGER

- **When directly connecting an end cap to a butterfly valve, use only a tapped end cap for pressure relief.**
- **Pressure must be vented through the tap before attempting to remove the cap.**

Failure to follow these instructions could result in death or serious personal injury.

PLUG VALVE INSTALLATION AND OPERATION

Series 377 Vic-Plug Balancing Valve

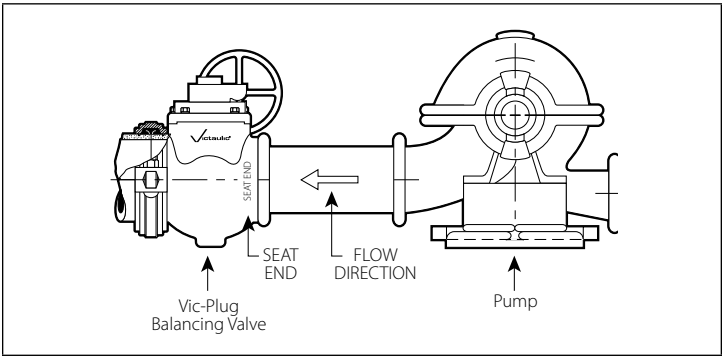
- The Series 377 Vic-Plug Balancing Valve is an eccentric, grooved-end plug valve designed specifically for throttling services.
- For 3 – 12-inch/88.9 – 323.9-mm sizes, the Victaulic Style 307 Transition Coupling is available to directly connect the Series 377 to grooved-end steel and other IPS pipe. For installing these sizes of Vic-Plug valves into a piping system, follow the instructions supplied for the Style 307 Transition Coupling.
- The 14 – 18-inch/355.6 – 457.0-mm sizes of Series 377 Vic-Plug Valves have IPS ends. For installing these sizes of Vic-Plug valves into a piping system, follow the instructions supplied with the coupling.

When directly connecting an end cap to a plug valve, use only a tapped end cap for pressure relief. If the plug valve is opened then closed unknowingly while the end cap is attached, the space between the plug and end cap will be filled and pressurized. A sudden release of energy can occur if the end cap is removed while the space behind it is pressurized. **PRESSURE MUST BE VENTED THROUGH THE TAP BEFORE ATTEMPTING TO REMOVE THE CAP.**

⚠ DANGER

- **When directly connecting an end cap to a butterfly valve, use only a tapped end cap for pressure relief.**
- **Pressure must be vented through the tap before attempting to remove the cap.**

Failure to follow these instructions could result in death or serious personal injury.



Series 377 Vic-Plug Balancing Valves must be installed with the seat upstream (closest to the pump discharge).

Flow Metering Products

Installation Information

Style 733 Venturi
Flow Metering Sensor

Style 734 Orifice/Indicator
Flow Metering System

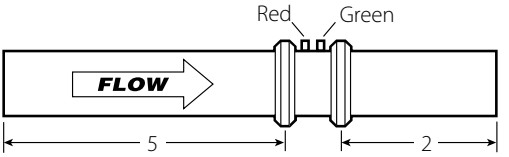
Style 735 Fire Pump Test Meter

Victaulic®

STYLE 733 VENTURI FLOW METERING SENSOR

Victaulic Style 733 Venturi Flow Metering Sensors contain grooved ends for easy installation with two standard Victaulic couplings. Victaulic venturi-type devices are accurate to ± 1%, and the standard rating for the system is 250-psi/1725-kPa at +230°/+110° C water.

To ensure proper installation and accurate flow readings, all sizes of Style 733 Venturi Flow Metering Sensors have a minimum, straight-pipe requirement of five diameters upstream and two diameters downstream from any valve or fitting (refer to the drawing below).

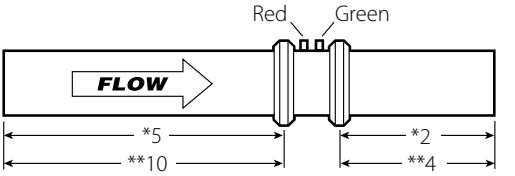


Minimum pipe diameters from fitting or valve.

STYLE 734/734S ORIFICE/INDICATOR FLOW METERING SYSTEM

Victaulic Style 734/734S Orifice/Indicator Flow Metering Systems contain grooved ends for easy installation with two standard Victaulic couplings. Victaulic orifice/indicator-type devices are accurate to ± 1%, and the standard rating for the system is 250-psi/1725-kPa at +230°/+110° C water.

To ensure proper installation and accurate flow readings, 2½ – 4-inch/73.0 – 114.3-mm Style 734/734S Orifice/Indicator Flow Metering Systems have a minimum, straight-pipe requirement of five diameters upstream and two diameters downstream from any valve or fitting. For 5-inch/141.3-mm and larger sizes, the minimum, straight-pipe requirement is 10 diameters upstream and four diameters downstream from any valve or fitting (refer to the drawing below).

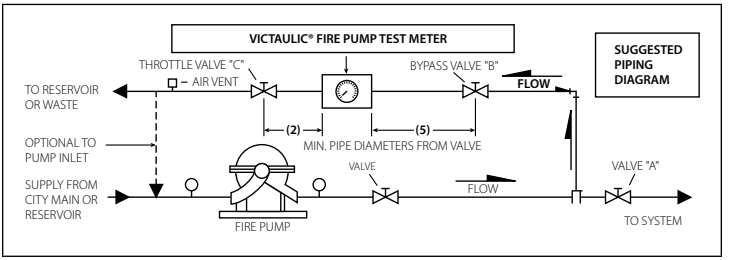


Minimum pipe diameters from fitting or valve.
*2½ – 4"/73.0 – 114.3 mm **5"/141.3 mm and larger

STYLE 735 FIRE PUMP TEST METER

Victaulic Style 735 Fire Pump Test Meters are designed specifically for monitoring fire protection systems. The Style 735 contains grooved ends for easy installation with Victaulic couplings that are FM Approved. The maximum working pressure for Model "L" Style 735 Fire Pump Test Meters is 175 psi/1200 kPa, and the Model "S" is rated to 500 psi/3450 kPa.

To ensure proper installation and accurate flow readings, all sizes of Style 735 Fire Pump Test Meters have a minimum, straight-pipe requirement of five diameters upstream and two diameters downstream from any valve or fitting (refer to the drawing below).



Operating Instructions for Victaulic Style 735 Fire Pump Test Meters

1. Close the system valve "A."

2. Open the bypass valve "B," and throttle valve "C."

3. Purge the meter, which is located on the Style 735 Fire Pump Test Meter, as follows:

3a. Open the station shutoff valves (below meter), and vent the valves (above meter). When a steady stream of water passes through each plastic hose, the meter is purged of air. Close all valves after the air is purged.

4. Start the fire pump, and read the meter in gpm (m^3/hr).

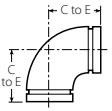
5. Refer to the gpm requirement for the pump, and adjust the throttle valve to achieve various flow readings. Record the gpm, suction pressure, and discharge pressures, etc., in accordance with requirements established by the local authority having jurisdiction.

Product Data

The following information contains center-to-end, end-to-end, take-out, and similar overall dimensions for couplings, flange adapters, and fittings. Refer to the current Victaulic publication for complete dimensional information and for products not shown.

STANDARD FITTINGS

No. 10 – 90° Elbow
No. 11 – 45° Elbow
No. 12 – 22½° Elbow
No. 13 – 11¼° Elbow
No. 20 – Tee
No. 35 – Cross
(Ductile iron, except where noted)

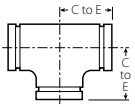


No. 10 – 90° Elbow

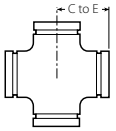
No. 11 – 45° Elbow

No. 12 – 22½° Elbow

No. 13 – 11¼° Elbow



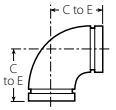
No. 20 – Tee



No. 35 – Cross

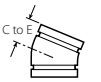
Size		No. 10 90° Elbow	No. 11 45° Elbow	No. 12 22½° Elbow	No. 13 11¼° Elbow	No. 20 Tee	No. 35 Cross (sw)
Nominal Size inches/mm	Actual Outside Dia. inches/mm	C to E inches/ mm	C to E inches/ mm	C to E inches/ mm	C to E inches/ mm	C to E inches/ mm	C to E inches/ mm
¾ 20	1.050 26.9	2.25 57.2	1.50 38.1	1.63 sw 41.4	1.38 sw 35.1	2.25 57.2	2.25 57.2
1 25	1.315 33.7	2.25 57.2	1.75 44.5	3.25 @ 82.6	1.38 sw 35.1	2.25 57.2	2.25 57.2
1 ¼ 32	1.660 42.4	2.75 69.9	1.75 44.5	1.75 44.5	1.38 sw 35.1	2.75 69.9	2.75 69.9
1 ½ 40	1.900 48.3	2.75 69.9	1.75 44.5	1.75 44.5	1.38 sw 35.1	2.75 69.9	2.75 69.9
2 50	2.375 60.3	3.25 82.6	2.00 50.8	3.75 @ 95.3	1.38 35.1	3.25 82.6	3.25 82.6
2 ½ 65	2.875 73.0	3.75 95.3	2.25 57.2	4.00 @ 101.6	1.50 38.1	3.75 95.3	3.75 95.3
76.1 mm	3.000 76.1	3.75 95.3	2.25 57.2	—	—	3.75 95.3	—
3 80	3.500 88.9	4.25 108.0	2.50 63.5	4.50 @ 114.3	1.50 38.1	4.25 108.0	4.25 108.0
3 ½ 90	4.000 101.6	4.50 114.3	2.75 69.9	2.50 sw 63.5	1.75 sw 44.5	4.50 sw 114.3	4.50 114.3
108.0 mm	4.250 108.0	5.00 127.0	3.00 76.2	—	—	5.00 127.0	—
4 100	4.500 114.3	5.00 127.0	3.00 76.2	2.88 73.2	1.75 44.5	5.00 127.0	5.00 114.3
4 ½ 120	5.000 127.0	5.25 sw 133.4	3.13 sw 79.5	3.50 88.9	1.88 sw 47.8	5.25 sw 133.4	5.25 133.4
133.0 mm	5.250 133.0	5.50 139.7	3.25 82.6	—	—	5.50 139.7	—
139.7 mm	5.500 139.7	5.50 139.7	3.25 82.6	—	—	5.50 139.7	—

STANDARD FITTINGS



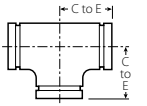
No. 10 – 90° Elbow

No. 11 – 45° Elbow

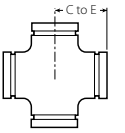


No. 12 – 22½° Elbow

No. 13 – 11¼° Elbow



No. 20 – Tee



No. 35 – Cross

Size		No. 10 90° Elbow	No. 11 45° Elbow	No. 12 22½° Elbow	No. 13 11¼° Elbow	No. 20 Tee	No. 35 Cross (sw)
Nominal Size inches/mm	Actual Outside Dia. inches/mm	C to E inches/ mm	C to E inches/ mm	C to E inches/ mm	C to E inches/ mm	C to E inches/ mm	C to E inches/ mm
5 125	5.563 141.3	5.50 139.7	3.25 82.6	2.88 sw 73.2	2.00 sw 50.8	5.50 139.7	5.50 139.7
159.0 mm	6.250 159.0	6.50 165.1	3.50 88.9	—	—	6.50 165.1	—
165.1 mm	6.500 165.1	6.50 165.1	3.50 88.9	3.13 79.5	2.00 50.8	6.50 165.1	6.50 165.1
6 150	6.625 168.3	6.50 165.1	3.50 88.9	6.25 @ 158.8	2.00 50.8	6.50 165.1	6.50 165.1
8 200	8.625 219.1	7.75 196.9	4.25 108.0	7.75 @ 196.9	2.00 50.8	7.75 196.9	7.75 196.9
10 250	10.750 273.0	9.00 228.6	4.75 120.7	4.38 sw 111.3	2.13 sw 54.1	9.00 228.6	9.00 228.6
12 300	12.750 323.9	10.00 254.0	5.25 133.4	4.88 sw 124.0	2.25 sw 57.2	10.00 254.0	10.00 245.0
14 # 350	14.000 355.6	21.00 533.4	8.75 222.3	5.00 sw 127.0	3.50 sw 88.9	11.00 sw 279.4	11.00 279.4
16 # 400	16.000 406.4	24.00 609.6	10.00 254.0	5.00 sw 127.0	4.00 sw 101.6	12.00 sw 304.8	12.00 304.8
18 # 450	18.000 457.0	27.00 685.8	11.25 285.8	5.50 sw 139.7	4.50 sw 114.3	15.50 sw 393.7	15.50 393.7
20 # 500	20.000 508.0	30.00 762.0	12.50 317.5	6.00 sw 152.4	5.00 sw 127.0	17.25 sw 438.2	17.25 438.2
24 # 600	24.000 610.0	36.00 914.4	15.00 381.0	7.00 sw 177.8	6.00 sw 152.4	20.00 sw 508.0	20.00 508.0

14, 16, 18, 20, and 24-inch/350, 400, 450, 500, and 600-mm elbows (90° and 45°) are 1½ D long radius, forged steel elbows No. 100 and No. 110.

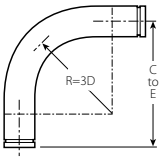
For 1D radius elbows, contact Victaulic.

(sw) Segmentally welded steel

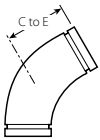
@ Gooseneck design end-to-end dimension

STANDARD FITTINGS

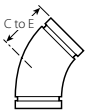
No. 10 – 3D 90° Long-Radius, Steel Elbow
No. 14 – 3D 60° Long-Radius, Steel Elbow
No. 11 – 3D 45° Long-Radius, Steel Elbow
No. 15 – 3D 30° Long-Radius, Steel Elbow
No. 12 – 3D 22½° Long-Radius, Steel Elbow
No. 13 – 3D 11¼° Long-Radius, Steel Elbow



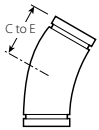
No. 10 – 3D 90°



No. 14 – 3D 60°



No. 11 – 3D 45°



No. 15 – 3D 30°

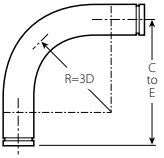
No. 12 – 3D 22½°

No. 13 – 3D 11¼°

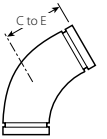
Size		No. 10 – 3D 90°	No. 14 – 3D 60°	No. 11 – 3D 45°	No. 15 – 3D 30°	No. 12 – 3D 22½°	No. 13 – 3D 11¼°
Nominal Size inches/mm	Actual Outside Dia. inches/ mm	C to E inches/ mm	C to E inches/ mm	C to E inches/ mm	C to E inches/ mm	C to E inches/ mm	C to E inches/ mm
2 50	2.375 60.3	10.00 254.0	7.50 190.5	6.50 165.1	5.75 146.1	5.25 133.4	4.50 114.3
2½ 65	2.875 73.0	11.50 292.1	8.25 209.6	7.25 184.2	6.00 152.4	5.50 139.7	4.75 120.7
3 80	3.500 88.9	13.00 330.2	9.25 235.0	7.75 196.9	6.50 165.1	5.75 146.1	5.00 127.0
3½ 90	4.000 101.6	14.50 368.3	10.00 254.0	8.50 215.9	6.75 171.5	6.00 152.4	5.00 127.0
4 100	4.500 114.3	16.00 406.4	11.00 279.4	9.00 228.6	7.25 184.2	6.50 165.1	5.25 133.4
4½ 120	5.000 127.0	18.00 457.2	12.25 311.2	10.00 254.0	8.25 209.6	7.25 184.2	5.75 146.1
5 125	5.563 141.3	20.00 508.0	13.75 349.3	11.25 285.8	9.00 228.6	8.00 203.2	6.50 165.1
6 150	6.625 168.3	24.00 609.6	16.50 419.1	13.50 342.9	10.75 273.1	9.50 241.3	7.75 196.9
8 200	8.625 219.1	32.00 812.8	22.00 558.8	18.00 457.2	14.50 368.3	12.75 323.9	10.50 266.7
10 250	10.750 273.0	40.00 1016.0	27.25 692.2	22.50 571.5	18.00 457.2	16.00 406.4	13.00 330.2
12 300	12.750 323.9	48.00 1219.2	32.75 831.9	27.00 685.8	21.75 552.5	19.25 489.0	15.50 393.7
14 350	14.000 355.6	56.00 1422.4	38.25 971.6	31.50 800.1	25.25 641.4	22.50 571.5	18.25 463.6
15 375	15.000 381.0	60.00 1524.0	41.00 1041.4	33.75 857.3	27.00 685.8	24.00 609.6	19.50 495.3

Refer to notes on following page.

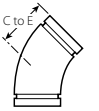
STANDARD FITTINGS



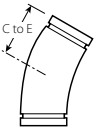
No. 10 – 3D 90°



No. 14 – 3D 60°



No. 11 – 3D 45°



No. 15 – 3D 30°

No. 12 – 3D 22½°

No. 13 – 3D 11¼°

Size		No. 10 – 3D 90°	No. 14 – 3D 60°	No. 11 – 3D 45°	No. 15 – 3D 30°	No. 12 – 3D 22½°	No. 13 – 3D 11¼°
Nominal Size inches/mm	Actual Outside Dia. inches/mm	C to E inches/ mm	C to E inches/ mm	C to E inches/mm	C to E inches/ mm	C to E inches/ mm	C to E inches/ mm
16 400	16.000 406.4	64.00 1625.6	43.75 1111.3	36.00 914.4	29.00 736.6	25.50 647.7	20.75 527.1
18 450	18.000 457.0	72.00 1828.8	49.25 1251.0	40.50 1028.7	32.50 825.5	28.75 730.3	23.25 590.6
20 500	20.000 508.0	80.00 2032.0	54.75 1390.7	45.00 1143.0	36.00 914.4	32.00 812.8	26.00 660.4
22 550	22.000 559.0	88.00 2235.2	60.25 1530.4	49.25 1251.0	39.75 1009.7	35.25 895.4	28.50 723.9
24 600	24.000 610.0	96.00 2438.4	65.50 1663.7	53.75 1365.3	43.25 1098.6	38.25 971.6	31.00 787.4

Long-radius, steel elbows (3D, 5D, and 6D) in sizes 2 – 4 inches/50 – 100 mm are provided with a 4-inch integral tangent. The remaining sizes are provided with integral tangents in lengths equal to the nominal pipe size.

Grooved and plain-end are available. Specify your choice on the order.

Pipe material is standard-wall steel that conforms to ASTM A-53, Grade B. Other materials are available upon request.

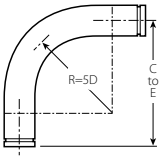
Bends conform to above radii.

C to E tolerances are ± ⅛ inch/3.2 mm on sizes 2 – 6 inches/50 – 150 mm; ± ¼ inch/6.4 mm on sizes 8 – 16 inches/200 – 400 mm; and ± ⅜ inch/9.5 mm on sizes 18 – 24 inches/450 – 600 mm.

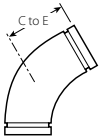
All weights are approximate, based upon the calculated weight of pipe.

STANDARD FITTINGS

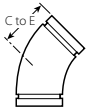
No. 10 – 5D 90° Long-Radius, Steel Elbow
No. 14 – 5D 60° Long-Radius, Steel Elbow
No. 11 – 5D 45° Long-Radius, Steel Elbow
No. 15 – 5D 30° Long-Radius, Steel Elbow
No. 12 – 5D 22½° Long-Radius, Steel Elbow
No. 13 – 5D 11¼° Long-Radius, Steel Elbow



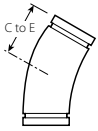
No. 10 – 5D 90°



No. 14 – 5D 60°



No. 11 – 5D 45°



No. 15 – 5D 30°

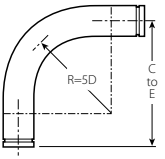
No. 12 – 5D 22½°

No. 13 – 5D 11¼°

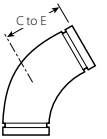
Size		No. 10 – 5D 90°	No. 14 – 5D 60°	No. 11 – 5D 45°	No. 15 – 5D 30°	No. 12 – 5D 22½°	No. 13 – 5D 11¼°
Nominal Size inches/mm	Actual Outside Dia. inches/mm	C to E inches/ mm	C to E inches/ mm	C to E inches/ mm	C to E inches/ mm	C to E inches/ mm	C to E inches/ mm
2 50	2.375 60.3	14.00 355.6	9.75 247.7	8.25 209.6	6.75 171.5	6.00 152.4	5.00 127.0
2½ 65	2.875 73.0	16.00 406.4	11.25 285.8	9.25 235.0	7.50 190.5	6.50 165.1	5.25 133.4
3 80	3.500 88.9	19.00 482.6	12.75 323.9	10.25 260.4	8.00 203.2	7.00 177.8	5.50 139.7
3½ 90	4.000 101.6	21.50 546.1	14.25 362.0	11.25 285.8	8.75 222.3	7.50 190.5	5.75 146.1
4 100	4.500 114.3	24.00 609.6	15.50 393.7	12.50 317.5	9.50 241.3	8.00 203.2	6.00 152.4
4½ 120	5.000 127.0	27.00 685.8	17.50 444.5	13.75 349.3	10.50 266.7	9.00 228.6	6.75 171.5
5 125	5.563 141.3	30.00 762.0	19.50 495.3	15.50 393.7	11.75 298.5	10.00 254.0	7.50 190.5
6 150	6.625 168.3	36.00 914.4	23.25 590.6	18.50 469.9	14.00 355.6	12.00 304.8	9.00 228.6
8 200	8.625 219.1	48.00 1219.2	31.00 787.4	24.50 622.3	18.75 476.3	16.00 406.4	12.00 304.8
10 250	10.750 273.0	60.00 1524.0	39.00 990.6	30.75 781.1	23.50 596.9	20.00 508.0	15.00 381.0
12 300	12.750 323.9	72.00 1828.8	46.75 1187.5	37.00 939.8	28.00 711.2	24.00 609.6	18.00 457.2
14 350	14.000 355.6	84.00 2133.6	54.50 1384.3	43.00 1092.2	32.75 831.9	28.00 711.2	21.00 533.4
15 375	15.000 381.0	90.00 2286.0	58.25 1479.6	46.00 1168.4	35.25 895.4	30.00 762.0	22.50 571.5

Refer to notes on following page.

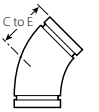
STANDARD FITTINGS



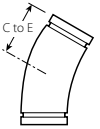
No. 10 – 5D 90°



No. 14 – 5D 60°



No. 11 – 5D 45°



No. 15 – 5D 30°

No. 12 – 5D 22½°

No. 13 – 5D 11¼°

Size		No. 10 – 5D 90°	No. 14 – 5D 60°	No. 11 – 5D 45°	No. 15 – 5D 30°	No. 12 – 5D 22½°	No. 13 – 5D 11¼°
Nominal Size inches/mm	Actual Outside Dia. inches/mm	C to E inches/ mm	C to E inches/ mm	C to E inches/ mm	C to E inches/ mm	C to E inches/ mm	C to E inches/ mm
16 400	16.000 406.4	96.00 2438.4	62.25 1581.2	49.25 1251.0	37.50 952.5	32.00 812.8	24.00 609.6
18 450	18.000 457.0	108.00 2743.2	70.00 1778.0	55.25 1403.4	42.25 1073.2	36.00 914.4	27.00 685.8
20 500	20.000 508.0	120.00 3048.0	77.75 1974.9	61.50 1562.1	46.75 1187.5	40.00 1016.0	30.00 762.0
22 550	22.000 559.0	132.00 3352.8	85.50 2171.7	67.50 1714.5	51.50 1308.1	44.00 1117.6	32.75 831.9
24 600	24.000 610.0	144.00 3657.6	93.25 2368.6	73.75 1873.3	56.25 1428.8	48.00 1219.2	35.75 908.1

Long-radius, steel elbows (3D, 5D, and 6D) in sizes 2 – 4 inches/50 – 100 mm are provided with a 4-inch integral tangent. The remaining sizes are provided with integral tangents in lengths equal to the nominal pipe size.

Grooved and plain-end are available. Specify your choice on the order.

Pipe material is standard-wall steel that conforms to ASTM A-53, Grade B. Other materials are available upon request.

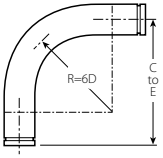
Bends conform to above radii.

C to E tolerances are ± ⅛ inch/3.2 mm on sizes 2 – 6 inches/50 – 150 mm; ± ¼ inch/6.4 mm on sizes 8 – 16 inches/200 – 400 mm; and ± ⅜ inch/9.5 mm on sizes 18 – 24 inches/450 – 600 mm.

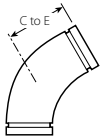
All weights are approximate, based upon the calculated weight of pipe.

STANDARD FITTINGS

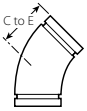
No. 10 – 6D 90° Long-Radius, Steel Elbow
No. 14 – 6D 60° Long-Radius, Steel Elbow
No. 11 – 6D 45° Long-Radius, Steel Elbow
No. 15 – 6D 30° Long-Radius, Steel Elbow
No. 12 – 6D 22½° Long-Radius, Steel Elbow
No. 13 – 6D 11¼° Long-Radius, Steel Elbow



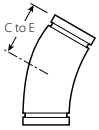
No. 10 – 6D 90°



No. 14 – 6D 60°



No. 11 – 6D 45°



No. 15 – 6D 30°

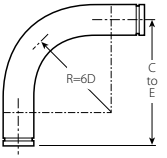
No. 12 – 6D 22½°

No. 13 – 6D 11¼°

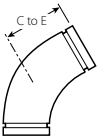
Size		No. 10 – 6D 90°	No. 14 – 6D 60°	No. 11 – 6D 45°	No. 15 – 6D 30°	No. 12 – 6D 22½°	No. 13 – 6D 11¼°
Nominal Size inches/mm	Actual Outside Dia. inches/mm	C to E inches/ mm	C to E inches/ mm	C to E inches/ mm	C to E inches/ mm	C to E inches/ mm	C to E inches/ mm
2 50	2.375 60.3	16.00 406.4	11.00 279.4	9.00 228.6	7.25 184.2	6.50 165.1	5.25 133.4
2½ 65	2.875 73.0	19.00 482.6	12.75 323.9	10.25 260.4	8.00 203.2	7.00 177.8	5.50 139.7
3 80	3.500 88.9	22.00 558.8	14.50 368.3	11.50 292.1	8.75 222.3	7.50 190.5	5.75 146.1
3½ 90	4.000 101.6	25.00 635.0	16.25 412.8	12.75 323.9	9.75 247.7	8.25 209.6	6.00 152.4
4 100	4.500 114.3	28.00 711.2	18.00 457.2	14.00 355.6	10.50 266.7	8.75 222.3	6.50 165.1
4½ 120	5.000 127.0	31.50 800.1	20.00 508.0	15.75 400.1	11.75 298.5	10.00 254.0	7.25 184.2
5 125	5.563 141.3	35.00 889.0	22.25 565.2	17.50 444.5	13.00 330.2	11.00 279.4	8.00 203.2
6 150	6.625 168.3	42.00 1066.8	26.75 679.5	21.00 533.4	15.75 400.1	13.25 336.6	9.50 241.3
8 200	8.625 219.1	56.00 1422.4	35.75 908.1	28.00 711.2	21.00 533.4	17.50 444.5	12.75 323.9
10 250	10.750 273.0	70.00 1778.0	44.75 1136.7	35.00 889.0	26.00 660.4	22.00 558.8	16.00 406.4
12 300	12.750 323.9	84.00 2133.6	53.50 1358.9	41.75 1060.5	31.25 793.8	26.25 666.8	19.00 482.6
14 350	14.000 355.6	98.00 2489.2	62.50 1587.5	48.75 1238.3	36.50 927.1	30.75 781.1	22.25 565.2
15 375	15.000 381.0	105.00 2667.0	67.00 1701.8	52.25 1327.2	39.25 997.0	33.00 838.2	24.00 609.6

Refer to notes on following page.

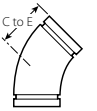
STANDARD FITTINGS



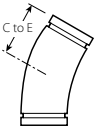
No. 10 – 6D 90°



No. 14 – 6D 60°



No. 11 – 6D 45°



No. 15 – 6D 30°

No. 12 – 6D 22½°

No. 13 – 6D 11¼°

Size		No. 10 – 6D 90°	No. 14 – 6D 60°	No. 11 – 6D 45°	No. 15 – 6D 30°	No. 12 – 6D 22½°	No. 13 – 6D 11¼°
Nominal Size inches/mm	Actual Outside Dia. inches/mm	C to E inches/ mm	C to E inches/ mm	C to E inches/ mm	C to E inches/ mm	C to E inches/ mm	C to E inches/ mm
16 400	16.000 406.4	112.00 2844.8	71.50 1816.1	55.75 1416.1	41.75 1060.5	35.25 895.4	25.50 647.7
18 450	18.000 457.0	126.00 3200.4	80.50 2044.7	62.75 1593.9	47.00 1193.8	39.50 1003.3	28.75 730.3
20 500	20.000 508.0	140.00 3556.0	89.25 2267.0	69.75 1771.7	52.25 1327.2	44.00 1117.6	31.75 806.5
22 550	22.000 559.0	154.00 3911.6	98.25 2495.6	76.75 1949.5	57.50 1460.5	48.25 1225.6	35.00 889.0
24 600	24.000 610.0	168.00 4267.2	107.25 2724.2	83.75 2127.3	62.50 1587.5	52.75 1339.9	38.25 971.6

Long-radius, steel elbows (3D, 5D, and 6D) in sizes 2 – 4 inches/50 – 100 mm are provided with a 4-inch integral tangent. The remaining sizes are provided with integral tangents in lengths equal to the nominal pipe size.

Grooved and plain-end are available. Specify your choice on the order.

Pipe material is standard-wall steel that conforms to ASTM A-53, Grade B. Other materials are available upon request.

Bends conform to above radii.

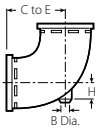
C to E tolerances are ± ⅛ inch/3.2 mm on sizes 2 – 6 inches/50 – 150 mm; ±¼ inch/6.4 mm on sizes 8 – 16 inches/200 – 400 mm; and ± ⅜ inch/9.5 mm on sizes 18 – 24 inches/450 – 600 mm.

All weights are approximate, based upon the calculated weight of pipe.

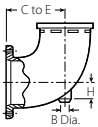
No. 10-R Reducing Base Support Elbow

(Ductile Iron)

Size inches/ Actual mm			Dimensions – inches/mm C to E	H	"B" Diameter
6 168.3	x	4 114.3	9.00 228.6	1.25 31.8	1.50 38.1
		5 141.3	9.00 228.6	1.50 38.1	1.50 38.1
8 219.1	x	6 168.3	10.50 266.7	2.13 54.1	1.50 38.1
10 273.0	x	8 219.1	12.00 304.8	2.40 61.0	1.50 38.1



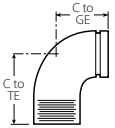
Grooved x Grooved (G x G)



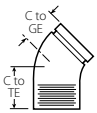
Grooved x Flanged (G x F)

No. 18 – 90° Adapter Elbow
No. 19 – 45° Adapter Elbow

(Ductile iron)



No. 18 – 90°



No. 19 – 45°

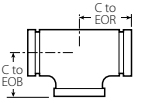
Size Nominal Size inches/mm	Actual Outside Diameter inches/mm	No. 18 90° Adapter Elbow § C to GE inches/ mm	C to TE inches/ mm	No. 19 45° Adapter Elbow § C to GE inches/ mm	C to TE inches/ mm
¾ 20	1.050 26.9	2.25 57.2	2.25 57.2	1.50 38.1	1.50 38.1
1 25	1.315 33.7	2.25 57.2	2.25 57.2	1.75 44.5	1.75 44.5
1 ¼ 32	1.660 42.4	2.75 69.9	2.75 69.9	1.75 44.5	1.75 44.5
1 ½ 40	1.900 48.3	2.75 69.9	2.75 69.9	1.75 44.5	1.75 44.5
2 50	2.375 60.3	3.25 82.6	4.25 108.0	2.00 50.8	3.00 76.2
2 ½ 65	2.875 73.0	3.75 95.3	3.75 95.3	2.25 57.2	2.25 57.2
3 80	3.500 88.9	4.25 108.0	6.00 152.4	2.50 63.5	4.25 108.0
3 ½ 90	4.000 101.6	4.50 114.3	6.25 158.8	5.25 133.4	5.25 133.4
4 100	4.500 114.3	5.00 127.0	7.25 184.2	3.00 76.2	5.25 133.4
6 150	6.625 168.3	6.50 165.1	6.50 165.1	3.50 88.9	3.50 88.9

§ No. 18 and 19 Adapter Elbows are supplied NPT and are available with British Standard Pipe Threads (BSPT). For British Standard Threads, specify "BSPT" clearly on order.

No. 21 Bullhead Tee

(Ductile iron)

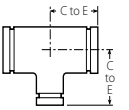
Size						C to EOR	C to EOB
inches/Actual		mm				inches/ mm	inches/mm
5	x	5	x	8		7.75	5.50
141.3		141.3		219.1		196.9	139.7
6	x	6	x	8		7.75	6.50
168.3		168.3		219.1		196.9	165.1



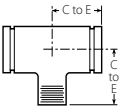
No. 25 Standard Reducing Tee
No. 29 Reducing Tee with Threaded Branch

(Segmentally welded steel, except where noted)

Size						C to E Dimension inches/mm	
inches/Actual		mm				No. 25 Standard	No. 29 with Threaded Branch
2	x	2	x	¾		3.25 d	3.25 d
60.3		60.3		26.9		82.6	82.6
				1		3.25 d	3.25 d
				33.7		82.6	82.6
				1 ½		3.25 d	3.25
				48.3		82.6	82.6
2 ½	x	2 ½	x	1		3.75 d	3.75
73.0		73.0		33.7		95.3	95.3
				1 ½		3.75 d	3.75 d
				48.3		95.3	95.3
				2		3.75 d	3.75
				60.3		95.3	95.3
3	x	3	x	1		4.25 d	4.25 d
88.9		88.9		33.7		108.0	108.0
				1 ½		4.25 d	4.25
				48.3		108.0	108.0
				2		4.25 d	4.25
				60.3		108.0	108.0
				2 ½		4.25 d	4.25
				73.0		108.0	108.0
4	x	4	x	1		5.00 d	5.00 d
114.3		114.3		33.7		127.0	127.0
				1 ½		5.00 d	5.00 d
				48.3		127.0	127.0
				2		5.00 d	5.00 d
				60.3		127.0	127.0
				2 ½		5.00 d	5.00 d
				73.0		127.0	127.0
				3		5.00 d	5.00 d
				88.9		127.0	127.0



No. 25

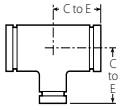


No. 29

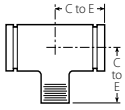
Refer to notes on page 170

STANDARD FITTINGS

Size					C to E Dimension inches/mm	
inches/Actual mm					No. 25 Standard	No. 29 with Threaded Branch
5 141.3	x	5 141.3	x	2 60.3	5.50 139.7	5.50 139.7
				2½ 73.0	5.50 d 139.7	5.50 d 139.7
				3 88.9	5.50 d 139.7	5.50 139.7
				4 114.3	5.50 d 139.7	5.50 139.7
6 168.3	x	6 168.3	x	2 60.3	6.50 d 165.1	6.50 d 165.1
				2½ 73.0	6.50 d 165.1	6.50 d 165.1
				3 88.9	6.50 d 165.1	6.50 d 165.1
				4 114.3	6.50 d 165.1	6.50 d 165.1
				5 141.3	6.50 d 165.1	6.50 d 165.1
165.1	x	165.1	x	3 88.9	6.50 d 165.1	6.50 165.1
				4 114.3	6.50 d 165.1	6.50 165.1
8 219.1	x	8 219.1	x	2 60.3	7.75 196.9	7.75 196.9
				3 88.9	7.75 196.9	7.75 196.9
				4 114.3	7.75 d 196.9	7.75 d 196.9
				5 141.3	7.75 196.9	7.75 196.9
				6 168.3	7.75 d 196.9	7.75 d 196.9
				165.1	7.75 196.9	7.75 196.9
10 273.0	x	10 273.0	x	2 60.3	9.00 228.6	9.00 228.6
				4 114.3	9.00 228.6	9.00 228.6
				5 141.3	9.00 228.6	9.00 228.6
				6 168.3	9.00 228.6	9.00 228.6
				8 219.1	9.00 228.6	9.00 228.6



No. 25

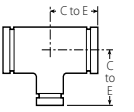


No. 29

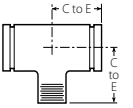
Refer to notes on page 170.

STANDARD FITTINGS

Size					C to E Dimension inches/mm	
inches/Actual mm					No. 25 Standard	No. 29 with Threaded Branch
12 323.9	x	12 323.9	x	3 88.9	10.00 254.0	10.00 254.0
				4 114.3	10.00 254.0	10.00 254.0
				5 141.3	10.00 254.0	10.00 254.0
				6 168.3	10.00 254.0	10.00 254.0
				8 219.1	10.00 254.0	10.00 254.0
				10 273.0	10.00 254.0	10.00 254.0
14 355.6	x	14 355.6	x	8 219.1	11.00 279.4	11.00 279.4
				10 273.0	11.00 279.4	11.00 279.4
				12 323.9	11.00 279.4	11.00 279.4
16 406.4	x	16 406.4	x	8 219.1	12.00 304.8	12.00 304.8
				10 273.0	12.00 304.8	12.00 304.8
				12 323.9	12.00 304.8	12.00 304.8
18 457.0	x	18 457.0	x	10 273.0	15.50 393.7	15.50 393.7
				12 323.9	15.50 393.7	15.50 393.7
				14 355.6	15.50 393.7	—
				16 406.4	15.50 393.7	—
20 508.0	x	20 508.0	x	14 355.6	17.25 438.2	—
				16 406.4	17.25 438.2	—
				18 457.0	17.25 438.2	—



No. 25

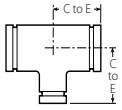


No. 29

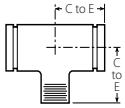
Refer to notes on page 170.

STANDARD FITTINGS

Size					C to E Dimension inches/mm	
inches/Actual		mm			No. 25 Standard	No. 29 with Threaded Branch
24 610.0	x	24 610.0	x	8 219.1	20.00 508.0	20.00 508.0
				10 273.0	20.00 508.0	20.00 508.0
				12 323.9	20.00 508.0	20.00 508.0
				14 355.6	20.00 508.0	—
				16 406.4	20.00 508.0	—
				18 457.0	20.00 508.0	—
				20 508.0	20.00 508.0	—



No. 25



No. 29

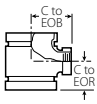
(d) Ductile iron

No. 29 Threaded Outlet Reducing Tees are supplied NPT and are available with British Standard Pipe Threads (BSPT). For British Standard Threads, specify "BSPT" clearly on order.

No. 27 Standpipe Tee

(Ductile iron)

Size					C to EOR	C to EOB
inches/Actual		mm			inches/mm	inches/mm
4 114.3	x	4 114.3	x	2½ 73.0	3.25 82.6	4.00 101.6
6 168.3	x	6 163.3	x	2½ 73.0	3.25 82.6	5.13 130.3

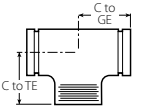


No. 27 Standpipe Tees are supplied NPT and are available with British Standard Pipe Threads (BSPT). For British Standard Threads, specify "BSPT" clearly on order.

No. 29M Tee with Threaded Branch

(Ductile iron, except where noted)

Size		Dimensions inches/mm	
Nominal Size inches/mm	Actual Outside Diameter inches/mm	C to GE	C to TE
¾ 20	1.050 26.9	2.25 57.2	2.25 57.2
1 25	1.315 33.7	2.25 57.2	2.25 57.2
1¼ 32	1.660 42.4	2.75 69.9	2.75 69.9
1½ 40	1.900 48.3	2.75 69.9	2.75 69.9
2 50	2.375 60.3	3.25 82.6	4.25 108.0
2½ 65	2.875 73.0	3.75 95.3	3.75 95.3
76.1 mm	3.000 76.1	3.75 95.3	3.75 95.3
3 80	3.500 88.9	4.25 108.0	6.00 152.4
3½ (sw) 90	4.000 101.6	4.50 114.3	4.50 114.3
108.0 mm	4.250 108.0	5.00 127.0	5.00 127.0
4 100	4.500 114.3	5.00 127.0	7.25 184.2
4½ (sw) 120	5.000 127.0	5.25 133.4	5.25 133.4
133.0 mm	5.250 133.0	5.50 139.7	5.50 139.7
139.7 mm	5.500 139.7	5.50 139.7	5.50 139.7
5 (sw) 125	5.563 141.3	5.50 139.7	5.50 139.7
159.0 mm	6.250 159.0	6.50 165.1	6.50 165.1
165.1 mm	6.500 165.1	6.50 165.1	6.50 165.1
6 (sw) 150	6.625 168.3	6.50 165.1	6.50 165.1
8 (sw) 200	8.625 219.1	7.75 196.9	7.75 196.9
10 250	10.750 273.0	9.00 228.6	9.00 228.6
12 300	12.750 323.9	10.00 254.0	10.00 254.0

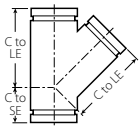


(sw) Segmentally welded steel

No. 29M Tee with Threaded Branches are supplied NPT and are available with British Standard Pipe Threads (BSPT). For British Standard Threads, specify “BSPT” clearly on order.

No. 30 – 45° Lateral

(Segmentally welded steel, except where noted)



Size		Dimensions inches/mm	
Nominal Size inches/mm	Actual Outside Diameter inches/mm	C to LE	C to SE
¾ 20	1.050 26.9	4.50 114.3	2.00 50.8
1 25	1.315 33.7	5.00 127.0	2.25 57.2
1 ¼ (d) 32	1.660 42.4	5.75 146.1	2.50 63.5
1 ½ 40	1.900 48.3	6.25 158.8	2.75 69.9
2 (d) 50	2.375 60.3	7.00 177.8	2.75 69.9
2 ½ 65	2.875 73.0	7.75 196.9	3.00 76.2
76.1 mm	3.000 76.1	8.50 215.9	3.25 82.6
3 (d) 80	3.500 88.9	8.50 215.9	3.25 82.6
3½ 90	4.000 101.6	10.00 254.0	3.50 88.9
4 (d) 100	4.500 114.3	10.50 266.7	3.75 95.3
5 125	5.563 141.3	12.50 317.5	4.00 101.6
6 150	6.625 168.3	14.00 355.6	4.50 114.3
8 200	8.625 219.1	18.00 457.2	6.00 152.4
10 250	10.750 273.0	20.50 520.7	6.50 165.1
12 300	12.750 323.9	23.00 584.2	7.00 177.8
14 350	14.000 355.6	26.50 673.1	7.50 190.5
16 400	16.000 406.4	29.00 736.6	8.00 203.2
18 450	18.000 457.0	32.00 812.8	8.50 215.9
20 500	20.000 508.0	35.00 889.0	9.00 228.6
24 600	24.000 610.0	40.00 1016.0	10.00 254.0

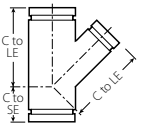
(d) Ductile iron

STANDARD FITTINGS

No. 30-R Reducing Lateral

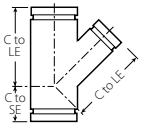
(Segmentally welded steel)

Size						C to LE	C to SE
inches/Actual mm						inches/mm	inches/mm
3	88.9	x	3	88.9	x 2 60.3	8.50 215.9	3.25 82.6
					2½ 73.0	8.50 215.9	3.25 82.6
4	114.3	x	4	114.3	x 2 60.3	10.50 266.7	3.75 95.3
					2½ 73.0	10.50 266.7	3.75 95.3
					3 88.9	10.50 266.7	3.75 95.3
5	141.3	x	5	141.3	x 2 60.3	12.50 317.5	4.00 101.6
					3 88.9	12.50 317.5	4.00 101.6
					4 114.3	12.50 317.5	4.00 101.6
6	168.3	x	6	168.3	x 3 88.9	14.00 355.6	4.50 114.3
					4 114.3	14.00 355.6	4.50 114.3
					5 141.3	14.00 355.6	4.50 114.3
8	219.1	x	8	219.1	x 4 114.3	18.00 457.2	6.00 152.4
					5 141.3	18.00 457.2	6.00 152.4
					6 168.3	18.00 457.2	6.00 152.4
10	273.0	x	10	273.0	x 4 114.3	20.50 520.7	6.50 165.1
					5 141.3	20.50 520.7	6.50 165.1
					6 168.3	20.50 520.7	6.50 165.1
					8 219.1	20.50 520.7	6.50 165.1
12	323.9	x	12	323.9	x 5 141.3	23.00 584.2	7.00 177.8
					6 168.3	23.00 584.2	7.00 177.8
					8 219.1	23.00 584.2	7.00 177.8
					10 273.0	23.00 584.2	7.00 177.8



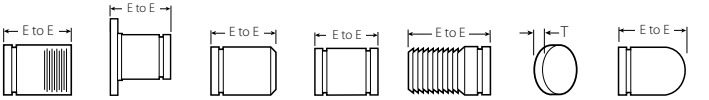
STANDARD FITTINGS

Size					C to LE	C to SE
inches/Actual mm					inches/mm	inches/mm
14 355.6	x	14 355.6	x	4 114.3	26.50 673.1	7.50 190.5
				6 168.3	26.50 673.1	7.50 190.5
				8 219.1	26.50 673.1	7.50 190.5
				10 273.0	26.50 673.1	7.50 190.5
				12 323.9	26.50 673.1	7.50 190.5
16 406.4	x	16 406.4	x	6 168.3	29.00 736.6	8.00 203.2
				8 219.1	29.00 736.6	8.00 203.2
				10 273.0	29.00 736.6	8.00 203.2
				12 323.9	29.00 736.6	8.00 203.2
				14 355.6	29.00 736.6	8.00 203.2
18 457.0	x	18 457.0	x	6 168.3	32.00 812.8	8.50 215.9
				8 219.1	32.00 812.8	8.50 215.9
				12 323.9	32.00 812.8	8.50 215.9
				14 355.6	32.00 812.8	8.50 215.9
				16 406.4	32.00 812.8	8.50 215.9
20 508.0	x	20 508.0	x	12 323.9	35.00 889.0	9.00 228.6
				14 355.6	35.00 889.0	9.00 228.6
				16 406.4	35.00 889.0	9.00 228.6
24 610.0	x	24 610.0	x	16 406.4	40.00 1016.0	10.00 254.0
				20 508.0	40.00 1016.0	10.00 254.0



STANDARD FITTINGS

No. 40 Nipple (Steel)
No. 41 Flanged Adapter Nipple – ANSI 125 (Cast Iron)
No. 42 Nipple (Steel)
No. 43 Nipple (Steel)
No. 45 Flanged Adapter Nipple – ANSI 150 (Steel)
No. 46 Flanged Adapter Nipple – ANSI 300 (Steel)
No. 48 Hose Nipple (Steel)
No. 60 Cap (Steel)
No. 61 Bull Plug (Steel)

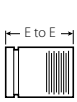


No. 40 | **No. 41 45, 46** | **No. 42** | **No. 43** | **No. 48** | **No. 60** | **No. 61**

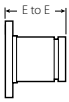
Size		E to E – inches/mm			No. 60 Cap*	No. 61 Bull Plug*
Nominal Size inches/ mm	Actual Outside Diameter inches/ mm	No. 40 @, 42, 43 Nipples #	No. 41, 45, 46 Flanged Adapter Nipples	No. 48 Hose Nipple	Thickness "T" inches/ mm	E to E inches/ mm
¾ 20	1.050 26.9	3.00 76.2	3.00 76.2	3.120 79.2	0.88 22.4	—
1 25	1.315 33.7	3.00 76.2	3.00 76.2	3.380 85.9	0.88 22.4	—
1 ¼ 32	1.660 42.4	4.00 101.6	4.00 101.6	3.880 98.6	0.88 22.4	—
1 ½ 40	1.900 48.3	4.00 101.6	4.00 101.6	3.880 98.6	0.88 22.4	—
2 50	2.375 60.3	4.00 101.6	4.00 101.6	4.500 114.3	0.88 22.4	4.00 101.6
2 ½ 65	2.875 73.0	4.00 101.6	4.00 101.6	5.380 136.7	0.88 22.4	5.00 127.0
76.1 mm	3.000 76.1	—	—	—	0.88 22.4	—
3 80	3.500 88.9	4.00 101.6	4.00 101.6	5.75 146.1	0.88 22.4	6.00 152.4
3 ½ 90	4.000 101.6	4.00 101.6	4.00 101.6	—	0.88 22.4	—
108.0 mm	4.250 108.0	—	—	—	1.00 25.4	—
4 100	4.500 114.3	6.00 152.4	6.00 152.4	7.000 177.8	1.00 25.4	7.00 177.8
4 ½ 120	5.000 127.0	—	—	—	1.00 25.4	—
133.0 mm	5.250 133.0	—	—	—	1.00 25.4	—
139.7 mm	5.500 139.7	—	—	—	1.00 25.4	—
5 125	5.563 141.3	6.00 152.4	6.000 152.4	8.750 222.3	1.00 25.4	8.00 203.2
159.0 mm	6.250 159.0	—	—	—	1.00 25.4	—

Refer to notes on following page.

STANDARD FITTINGS



No. 40



No. 41 45, 46

No. 42

No. 43

No. 48

No. 60

No. 61

Size		E to E – inches/mm			No. 60 Cap*	No. 61 Bull Plug*
Nominal Size inches/ mm	Actual Outside Diameter inches/ mm	No. 40 @, 42, 43 Nipples #	No. 41, 45, 46 Flanged Adapter Nipples	No. 48 Hose Nipple	Thickness "T" inches/ mm	E to E inches/ mm
165.1 mm	6.500 165.1	—	—	—	1.00 25.4	—
6 150	6.625 168.3	6.00 152.4	6.00 152.4	10.120 257.0	1.00 25.4	10.00 254.0
8 200	8.625 219.1	6.00 152.4	6.00 152.4	11.880 301.8	1.19 30.2	—
10 250	10.750 273.0	8.00 203.2	8.00 203.2	12.500 317.5	1.25 31.8	—
12 300	12.750 323.9	8.00 203.2	8.00 203.2	14.500 368.3	1.25 31.8	—
14 350	14.000 355.6	—	8.00 203.2	—	9.50 241.3	—
16 400	16.000 406.4	—	8.00 203.2	—	10.00 254.0	—
18 450	18.000 457.0	—	8.00 203.2	—	11.00 279.4	—
20 500	20.000 508.0	—	8.00 203.2	—	12.00 304.8	—
24 600	24.000 610.0	—	8.00 203.2	—	*	—

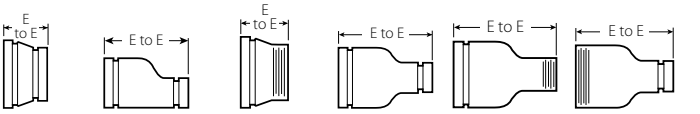
For pump package nipples with a 1½-inch/38-mm hole to receive Victaulic Style 923 Vic-Let™ Outlets or Style 924 Vic-O-Well™ Outlets, request special No. 40, 42, or 43 nipple prices, and request No. 40-H, 42-H, or 43-H on the order. **NOTE:** For 4 – 12 inch/100 – 300 mm diameters, an 8-inch/203-mm minimum nipple length is required.

@ Available with British Standard Pipe Threads (BSPT). Specify "BSPT" clearly on order.

* Steel dish caps are available through 24 inches/600 mm. Contact Victaulic for details. The No. 60 cap is not suitable for use in vacuum services with Style 72 or Style 750 Couplings. For this type of service, No. 61 Bull Plugs should be used.

STANDARD FITTINGS

No. 50 Concentric Reducer (Steel, except where noted)
No. 51 Eccentric Reducer (Steel, except where noted)
No. 52 Small Threaded Reducer (Ductile iron, except where noted)
No. 53 Swaged Nipple (Steel)
No. 54 Swaged Nipple (Steel)
No. 55 Swaged Nipple (Steel)

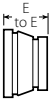


No. 50 **No. 51** **No. 52** **No. 53** **No. 54** **No. 55**

Size			E to E – inches/mm			
inches/mm			No. 50	No. 51 @	No. 52	No. 53, 54, and 55
1 ½ 40	x	1 25	2.50 * d 63.5	8.50 215.9	2.50 63.5	—
		1 ¼ 32	2.50 * d 63.5	—	2.50 63.5	—
2 50	x	¾ 20	2.50 * d 63.5	9.00 228.6	2.50 63.5	—
		1 25	2.50 * d 63.5	9.00 228.6	2.50 63.5	6.50 165.1
		1 ¼ 32	2.50 * d 63.5	9.00 228.6	2.50 63.5	6.50 165.1
		1 ½ 40	2.50 * d 63.5	9.00 228.6	2.50 63.5	6.50 165.1
2 ½ 65	x	1 25	2.50 63.5	9.50 241.3	+	7.00 177.8
		1 ¼ 32	2.50 * d 63.5	9.50 241.3	2.50 63.5	7.00 177.8
		1 ½ 40	2.50 * d 63.5	9.50 241.3	2.50 63.5	7.00 177.8
		2 50	2.50 d 63.5	9.50 241.3	3.00 76.2	7.00 177.8
3 80	x	1 25	2.50 * d 63.5	9.50 241.3	2.50 63.5	8.00 203.2
		1 ¼ 32	+	+	—	8.00 203.2
		1 ½ 40	2.50 * d 63.5	9.50 241.3	2.50 63.5	8.00 203.2
		2 50	2.50 * d 63.5	3.50 d 88.9	2.50 63.5	8.00 203.2
		2 ½ 65	2.50 * d 63.5	3.50 d 88.9	2.50 63.5	8.00 203.2
		76.1	2.50 d 63.5	—	—	—
3 ½ 90	x	3 80	2.50 d 63.5	9.50 241.3	—	8.00 203.2

Refer to notes on page 187.

STANDARD FITTINGS

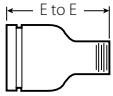


No. 50

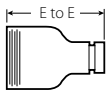
No. 51

No. 52

No. 53



No. 54



No. 55

Size			E to E – inches/mm			
inches/mm			No. 50	No. 51 @	No. 52	No. 53, 54, and 55
4 100	x	1 25	3.00 * d 76.2	10.00 254.0	3.00 76.2	9.00 228.6
		1 ¼ 32	+	—	—	9.00 228.6
		1 ½ 40	10.00 254.0	10.00 254.0	+	9.00 228.6
		2 50	3.00 * d 76.2	4.00 d 101.6	3.00 76.2	9.00 228.6
		2 ½ 65	3.00 * d 76.2	4.00 d 101.6	3.00 76.2	9.00 228.6
		3 80	3.00 * d 76.2	4.00 d 101.6	3.00 76.2	9.00 228.6
		3 ½ 90	3.00 d 76.2	10.00 254.0	—	9.00 228.6
5 125	x	2 50	4.00 101.6	11.00 279.4	—	11.00 279.4
		2 ½ 65	11.00 279.4	11.00 279.4	—	—
		3 80	4.00 d 101.6	11.00 279.4	—	11.00 279.4
		4 100	3.50 d 88.9	5.00 d 127.0	+	11.00 279.4
6 150	x	1 25	4.00 * d 101.6	11.50 292.1	4.00 101.6	12.00 304.8
		1 ¼ 32	—	—	—	12.00 304.8
		1 ½ 40	+	+	—	12.00 304.8
		2 50	4.00 * d 101.6	11.50 292.1	4.00 101.6	12.00 304.8
		2 ½ 65	4.00 * d 101.6	11.50 292.1	4.00 101.6	12.00 304.8
		3 80	4.00 * d 101.6	5.50 d 139.7	4.00 101.6	12.00 304.8
		3 ½ 90	—	—	—	12.00 304.8
		4 100	4.00 d 101.6	5.50 d 139.7	+	12.00 304.8
		4 ½ 120	—	—	—	12.00 304.8
		5 125	4.00 d 101.6	5.50 d 139.7	+	12.00 304.8

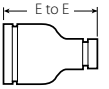
Refer to notes on page 187.

STANDARD FITTINGS

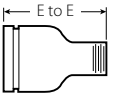
No. 50

No. 51

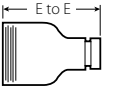
No. 52



No. 53



No. 54



No. 55

Size			E to E – inches/mm			
inches/mm			No. 50	No. 51 @	No. 52	No. 53, 54, and 55
8 200	x	2 50	—	—	16.00 406.4	—
		2½ 65	16.00 * 406.4	12.00 304.8	16.00 406.4	—
		3 80	5.00 d 127.0	12.00 304.8	—	—
		4 100	5.00 d 127.0	12.00 304.8	—	—
		5 125	5.00 d 127.0	12.00 304.8	—	—
		6 150	5.00 d 127.0	6.00 d 152.4	—	—
10 250	x	4 100	6.00 d 152.4	13.00 330.2	—	+
		6 150	6.00 d 152.4	13.00 330.2	—	—
		8 200	6.00 d 152.4	7.00 d 177.8	—	—
12 300	x	4 100	+	14.00 355.6	—	—
		6 150	7.00 d 177.8	14.00 355.6	—	—
		8 200	7.00 d 177.8	14.00 355.6	—	—
		10 250	7.00 d 177.8	14.00 355.6	—	—
14 350	x	6 150	13.00 330.2	13.00 330.2	—	—
		8 200	13.00 330.2	13.00 330.2	—	—
		10 250	13.00 330.2	13.00 330.2	—	—
		12 300	13.00 330.2	13.00 330.2	—	—
16 400	x	8 200	14.00 355.6	14.00 355.6	—	—
		10 250	14.00 355.6	14.00 355.6	—	—
		12 300	14.00 355.6	14.00 355.6	—	—
		14 350	14.00 355.6	14.00 355.6	—	—

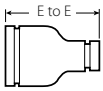
Refer to notes on page 187.

STANDARD FITTINGS

No. 50

No. 51

No. 52



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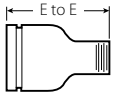

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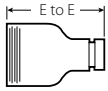


No. 55

Size			E to E – inches/mm			
inches/mm			No. 50	No. 51 @	No. 52	No. 53, 54, and 55
18 450	x	10 250	15.00 381.0	15.00 381.0	—	—
		12 300	15.00 381.0	15.00 381.0	—	—
		14 350	15.00 381.0	15.00 381.0	—	—
		16 400	15.00 381.0	15.00 381.0	—	—
20 500	x	10 250	20.00 508.0	20.00 508.0	—	—
		12 300	20.00 508.0	20.00 508.0	—	—
		14 350	20.00 508.0	20.00 508.0	—	—
		16 400	20.00 508.0	20.00 508.0	—	—
		18 450	20.00 508.0	20.00 508.0	—	—
24 600	x	10 250	20.00 508.0	20.00 508.0	—	—
		12 300	20.00 508.0	20.00 508.0	—	—
		14 350	20.00 508.0	20.00 508.0	—	—
		16 400	20.00 508.0	20.00 508.0	—	—
		18 450	20.00 508.0	20.00 508.0	—	—
		20 500	20.00 508.0	20.00 508.0	—	—

(d) Ductile iron

+ Contact Victaulic for details

* Available with male threaded small end No. 52

@ Steel eccentric reducers are available through 30 inches/750 mm. Contact Victaulic for dimensions.

No. 52 Threaded Reducers are supplied NPT and are available with British Standard Pipe Threads (BSPT). For British Standard Threads, specify "BSPT" clearly on order.

No. 80 Female Threaded Adapter

(Ductile iron, except where noted)

Size		E to E
Nominal Size inches/mm	Actual Outside Diameter inches/mm	inches/mm
¾ 20	1.050 26.9	2.00 50.8
1 25	1.315 33.7	2.06 52.3
1 ¼ (s) 32	1.660 42.4	2.31 58.7
1 ½ (s) 40	1.900 48.3	2.31 58.7
2 50	2.375 60.3	2.50 63.5
2 ½ 65	2.875 73.0	2.75 69.9
3 80	3.500 88.9	2.75 69.9
4 100	4.500 114.3	3.25 82.6

s = steel

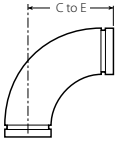
No. 80 Female Threaded Adapters are supplied NPT and are available with British Standard Pipe Threads (BSPT). For British Standard Threads, specify “BSPT” clearly on order.

STANDARD FITTINGS

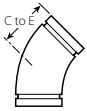
No. 100 – 90° Long Radius Elbow 1½ D
No. 110 – 45° Long Radius Elbow 1½ D

(Ductile iron, except where noted)

Size		No. 100 – 90°	No. 110 – 45°
Nominal Size inches/mm	Actual Outside Diameter inches/mm	C to E inches/ mm	C to E inches/ mm
2 50	2.375 60.3	4.38 111.3	2.75 69.9
2½ 65	2.875 73.0	5.00 127.0	3.00 76.2
3 80	3.500 88.9	5.88 149.4	3.38 85.9
4 100	4.500 114.3	7.50 190.5	4.00 101.6
5 125	5.563 141.3	+	+
165.1 mm	6.500 165.1	10.75 273.1	5.50 139.7
6 150	6.625 168.3	10.75 273.1	5.50 139.7
8 200	8.625 219.1	14.25 362.0	7.25 184.2
10 250	10.750 273.0	15.00 381.0	6.25 158.8
12 300	12.750 323.9	18.00 457.2	7.50 190.5
14 350	14.000 355.6	21.00 s 533.4	8.75 s 222.3
16 400	16.000 406.4	24.00 s 609.6	10.00 s 254.0
18 450	18.000 457.0	27.00 s 685.8	11.25 s 285.8
20 500	20.000 508.0	30.00 s 762.0	12.50 s 317.5
24 600	24.000 610.0	36.00 s 914.4	15.00 s 381.0



No. 100



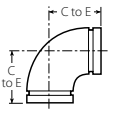
No. 110

(s) Steel.

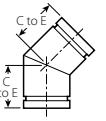
NOTE: Fittings in sizes 26 – 48inches/650 – 1200mm are available roll grooved for installation with Style 770 Large Diameter Couplings. Contact Victaulic for details.

EXTRA HEAVY “ES” ENDSEAL FITTINGS

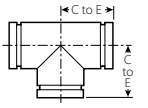
No. 62 – ES 90° Elbow
No. 63 – ES 45° Elbow
No. 64 – ES Tee
No. 35 – ES Cross



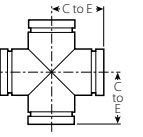
90° Elbow



45° Elbow



Tee



Cross

Size		No. 62 – ES 90° Elbow	* No. 63 – ES 45° Elbow	* No. 64 – ES Tee	* No. 35 – ES Cross
Nominal Size inches/ mm	Actual Outside Dia. inches/ mm	C to E inches/ mm	C to E inches/ mm	C to E inches/ mm	C to E inches/ mm
2 50	2.375 60.3	3.25 82.6	2.00 50.8	3.25 82.6	3.25 82.6
2½ 65	2.875 73.0	3.75 95.3	2.25 57.2	3.75 95.3	3.75 95.3
3 80	3.500 88.9	4.25 108.0	2.50 63.5	4.25 108.0	4.25 108.0
4 100	4.500 114.3	5.00 127.0	3.00 76.2	5.00 127.0	5.00 127.0
6 † 150	6.625 168.3	6.50 165.1	3.50 88.9	6.50 165.1	6.50 165.1

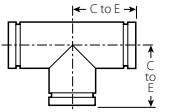
* Steel fabricated – cast full flow

† For sizes above 6 inches/150 mm, contact Victaulic.

Steel, full flow elbows are available with longer center-to-end dimensions. Contact Victaulic for details.

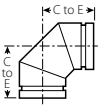
No. 22 Header Tee

SIZE Mated C to E		C to E
Nominal Size inches/mm	Actual Outside Diameter inches/mm	inches/mm
2 – 3 50 – 80	2.375 – 3.500 60.3 – 88.9	4.25 108.0
2 – 4 50 – 100	2.375 – 4.500 60.3 – 114.3	5.00 127.0

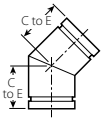


FABRICATED STEEL FITTINGS

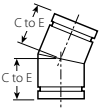
90° Elbow
45° Elbow
22½° Elbow
11¼° Elbow



90° Elbow



45° Elbow



22½° Elbow

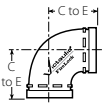
11¼° Elbow

Size		90° Elbow	45° Elbow	22½° Elbow	11¼° Elbow
Nominal Size inches/ mm	Actual Outside Dia. inches/ mm	C to E inches/ mm	C to E inches/ mm	C to E inches/ mm	C to E inches/ mm
¾ 20	1.050 26.9	2.25* 57.2	1.50* 38.1	1.63 41.4	1.38 35.1
1 25	1.315 33.7	2.25* 57.2	1.75* 44.5	1.63 41.4	1.38 35.1
1¼ 32	1.660 42.4	2.75* 69.9	1.75* 44.5	1.75 44.5	1.38 35.1
1½ 40	1.900 48.3	2.75* 69.9	1.75* 44.5	1.75 44.5	1.38 35.1
2 50	2.375 60.3	3.25* 82.6	2.00* 50.8	1.88 47.8	1.38* 35.1
2½ 65	2.875 73.0	3.75* 95.3	2.25* 57.2	2.00* 50.8	1.50 38.1
3 80	3.500 88.9	4.25* 108.0	2.50* 63.5	2.25 57.2	1.50* 38.1
3½ 90	4.000 101.6	4.50* 114.3	2.75* 69.9	2.50 63.5	1.75 44.5
4 100	4.500 114.3	5.00* 127.0	3.00* 76.2	2.88 73.2	1.75* 44.5
5 125	5.563 141.3	5.50* 139.7	3.25* 82.6	2.88 73.2	2.00 50.8
6 150	6.625 168.3	6.50* 165.1	3.50* 88.9	3.13 79.5	2.00* 50.8
8 200	8.625 219.1	7.75* 196.9	4.25* 108.0	3.88 98.6	2.00 50.8
10 250	10.750 273.0	9.00* 228.6	4.75* 120.7	4.38 111.3	2.13 54.1
12 300	12.750 323.9	10.00* 254.0	5.25* 133.4	4.88 124.0	2.25 57.2
14 350	14.000 355.6	11.00* 279.4	6.00* 152.4	5.00 127.0	3.50 88.9
16 400	16.000 406.4	12.00* 304.8	7.25* 184.2	5.00 127.0	4.00 101.6
18 450	18.000 457.0	15.50 393.7	8.00 203.2	5.50 139.7	4.50 114.3
20 500	20.000 508.0	17.25 438.2	9.00 228.6	6.00 152.4	5.00 127.0
24 600	24.000 610.0	20.00 508.0	11.00 279.4	7.00 177.8	6.00 152.4

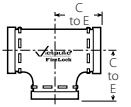
* Available in Victaulic full-flow cast design

FIRELOCK FIRE PROTECTION FITTINGS

No. 001 90° Elbow
No. 002 Straight Tee
No. 003 45° Elbow
No. 006 Cap



No. 001



No. 002

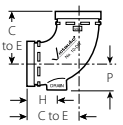
No. 003

No. 006

Size		No. 001 90° Elbow	No. 002 Straight Tee	No. 003 45° Elbow	No. 006 Cap
Nominal Size inches/mm	Actual Outside Dia. inches/mm	C to E inches/ mm	C to E inches/ mm	C to E inches/ mm	Thickness "T" inches/ mm
1 ¼ 32	1.660 42.4	2.75 69.9	2.75 69.9	1.75 44.5	0.82 20.8
1 ½ 40	1.900 48.3	2.75 69.9	2.75 69.9	1.75 44.5	0.82 20.8
2 50	2.375 60.3	2.75 69.9	2.75 69.9	2.00 50.8	0.88 22.4
2 ½ 65	2.875 73.0	3.00 76.2	3.00 76.2	2.25 57.2	0.88 22.4
76.1 mm	3.000 76.1	3.00 76.2	—	2.25 57.2	—
3 80	3.500 88.9	3.38 85.9	3.38 85.9	2.50 63.5	0.88 22.4
4 100	4.500 114.3	4.00 101.6	4.00 101.6	3.00 76.2	1.00 25.4
5 125	5.563 141.3	4.88 124.0	4.88 124.0	3.25 82.6	1.00 25.4
6 150	6.625 168.3	5.50 139.7	5.50 139.7	3.50 88.9	1.00 25.4
8 200	8.625 219.1	6.81 173.0	6.94 176.3	4.25 108.0	1.13 28.7

No. 10-DR Drain Elbow

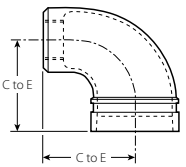
Size		Dimensions inches/mm		
Nominal Size inches/mm	Actual Outside Diameter inches/mm	C to E	H	P
2½ 65	2.875 73.0	3.75 95.3	2.75 69.9	1.68 42.7
3 80	3.500 88.9	4.25 108.0	2.75 69.9	2.10 53.3
4 100	4.500 114.3	5.00 127.0	2.75 69.9	2.60 66.0
6 150	6.625 168.3	6.50 165.1	2.75 69.9	3.65 92.7



NOTE: The drain is drilled and tapped for a 1-inch/25-mm NPT outlet.

No. 67 Vic®-End II End-of-Run Fitting

Size			C to E	Equivalent
inches/mm			inches/mm	feet/meters of Pipe
1 ¼ 32	x	½ NPT 15 NPT	2.38 60.5	2.8 0.9
		¾ NPT 20 NPT	2.38 60.5	2.8 0.9
		1 NPT 25 NPT	2.38 60.5	2.8 0.9
1 ½ 40	x	½ NPT 15 NPT	2.50 63.5	2.9 0.9
		¾ NPT 20 NPT	2.50 63.5	2.9 0.9
		1 NPT 25 NPT	2.50 63.5	2.9 0.9
2 50	x	½ NPT 15 NPT	2.75 69.9	4.0 1.2
		¾ NPT 20 NPT	2.75 69.9	4.0 1.2
		1 NPT 25 NPT	2.75 69.9	4.0 1.2
2 ½ 65	x	½ NPT 15 NPT	3.00 76.2	5.7 1.7
		¾ NPT 20 NPT	3.00 76.2	5.7 1.7
		1 NPT 25 NPT	3.00 76.2	5.7 1.7

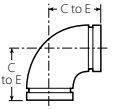


STAINLESS STEEL FITTINGS

For stainless steel fitting product data, refer to submittal
17.04, 17.10, 17.15, or 17.16 in the G-100 or on the website www.victaulic.com

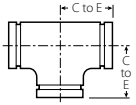
ALUMINUM FITTINGS

No. 10-A 90° Elbow
No. 11-A 45° Elbow
No. 20-A Tee
No. 60-A Cap



No. 10-A

No. 11-A



No. 20-A

No. 60-A

Size		No. 10 – A 90° Elbow	No. 11 – A 45° Elbow	No. 20 – A Tee	No. 60 – A Cap †
Nominal Size inches/ mm	Actual Outside Dia. inches/ mm	C to E inches/ mm	C to E inches/ mm	C to E inches/ mm	Thickness "T" inches/ mm
1 25	1.315 33.7	2.25 57.2	1.75 44.5	2.25 57.2	0.88 22.4
1 ½ 40	1.900 48.3	2.75 69.9	1.75 44.5	2.75 69.9	0.88 22.4
2 50	2.375 60.3	3.25 82.6	2.00 50.8	3.25 82.6	0.88 22.4
2 ½ 65	2.875 73.0	3.75 95.3	2.25 57.2	3.75 95.3	0.88 22.4
3 80	3.500 88.9	4.25 108.0	2.50 63.5	4.25 108.0	0.88 22.4
4 100	4.500 114.3	5.00 127.0	3.00 76.2	5.00 127.0	1.00 25.4
5 125	5.563 141.3	5.50 139.7	3.25 82.6	5.50 139.7	1.00 25.4
6 150	6.625 168.3	6.50 165.1	3.50 88.9	6.50 165.1	1.00 25.4
8 200	8.625 219.1	7.75 196.9	4.25 108.0	7.75 196.9	1.19 30.2

† Cap does not extend beyond coupling when assembled.

ALUMINUM FITTINGS

No. 40-A Grooved X Threaded Adapter Nipple
No. 42-A Grooved X Beveled Adapter Nipple
No. 43-A Grooved X Grooved Adapter Nipple

Nipple Size *		E to E †
Nominal Size inches/mm	Actual Outside Dia. inches/mm	inches/mm
1 25	1.315 33.7	3.00 76.2
1 ½ 40	1.900 48.3	4.00 101.6
2 50	2.375 60.3	4.00 101.6
2½ 65	2.875 73.0	4.00 101.6
3 80	3.500 88.9	4.00 101.6
4 100	4.500 114.3	6.00 152.4
5 125	5.563 141.3	6.00 152.4
6 150	6.625 168.3	6.00 152.4
8 200	8.625 219.1	6.00 152.4

* Made of standard-weight aluminum pipe.

† Other lengths available. Contact Victaulic for details.

No. 40-A Grooved X Threaded Adapter Nipples are supplied NPT and are available with British Standard Pipe Threads (BSPT). For British Standard Threads, specify “BSPT” clearly on order.

No. 40-A
Grooved X Threaded

No. 42-A
Grooved X Beveled

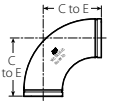
No. 43-A
Grooved X Grooved

No. 50-A Reducer

Size			E to E
inches/mm			inches/mm
1 ½ 40	x	1 25	2.50 63.5
2 50	x	1 25	2.50 63.5
		1 ½ 40	2.50 63.5
3 80	x	1 25	2.50 63.5
		2 50	2.50 63.5
		2 ½ 65	2.50 63.5
4 100	x	2 50	3.00 76.2
		2 ½ 65	3.00 76.2
		3 80	3.00 76.2
6 150	x	3 80	4.00 101.6
		4 100	4.00 101.6
8 200	x	4 100	5.00 127.0
		6 150	5.00 127.0

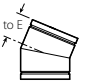
FITTINGS FOR THE AGS SYSTEM

No. W10 - 90° Elbow
No. W11 - 45° Elbow
No. W12 – 22½° Elbow
No. W13 – 11¼° Elbow
No. W20 – Tee
No. W35 - Cross



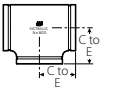
No. W10 – 90° Elbow

No. W11 – 45° Elbow

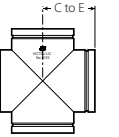


No. W12 – 22½° Elbow

No. W13 – 11¼° Elbow



No. W20 – Tee



No. W35 – Cross

Size		No. W10 # 90° Elbow (D.I.)	No. W11 # 45° Elbow (D.I.)	No. W12 22½° Elbow (sw)	No. W13 11¼° Elbow (sw)	No. W20 Tee (D.I.)	No. W35 Cross (sw)
Nominal Size inches/ mm	Actual Outside Diameter inches mm	C to E inches/ mm	C to E inches/ mm	C to E inches/ mm	C to E inches/ mm	C to E inches/ mm	C to E inches/ mm
14 350	14.000 355.6	14.00 355.6	5.80 147.3	5.00 127.0	3.50 88.9	11.00 279.4	11.00 279.4
16 400	16.000 406.4	16.00 406.4	6.63 168.4	5.00 127.0	4.00 101.6	12.00 304.8	12.00 304.8
18 450	18.000 457.2	18.00 457.2	7.46 189.5	5.50 139.7	4.50 114.3	13.50 342.9	13.50 342.9
20 500	20.000 508.0	20.00 508.0	8.28 210.3	6.00 152.4	5.00 127.0	15.00 381.0	15.00 381.0
24 550	24.000 610.0	24.00 609.6	9.94 252.5	7.00 177.8	6.00 152.4	17.00 431.8	17.00 431.8

For the United States, 14 – 24-inch/350 – 550-mm elbows (90° and 45°) are 1½ D long radius, forged steel elbows (No. 100 and No. 110). Refer to page 189.

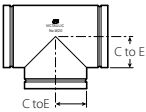
(sw) Segmentally welded steel

(D.I.) Ductile iron

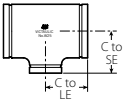
No. W20 – Tee
No. W25 – Reducing Tee

(Segmentally welded steel)

Size						No. W20 C to E	No. W25 inches/mm	
inches/Actual Outside Size mm						inches/ mm	C to LE	C to SE
14 355.6	x	14 355.6	x	6 168.3		—	11.00 279.4	9.38 238.3
				8 219.1		—	11.00 279.4	9.75 247.7
				10 273.0		—	11.00 279.4	10.12 257.0
				12 323.9		—	11.00 279.4	10.62 269.7
				14 355.6		11.00 279.4	—	—
16 406.4	x	16 406.4	x	6 168.3		—	12.00 304.8	10.38 263.7
				8 219.1		—	12.00 304.8	10.75 273.1
				10 273.0		—	12.00 304.8	11.12 282.4
				12 323.9		—	12.00 304.8	11.62 295.1
				14 355.6		—	12.00 304.8	12.00 304.8
				16 406.4		12.00 304.8	—	—
18 457.0	x	18 457.0	x	8 219.1		—	13.50 342.9	11.75 298.5
				10 273.0		—	13.50 342.9	12.12 307.8
				12 323.9		—	13.50 342.9	12.62 320.5
				14 355.6		—	13.50 342.9	13.00 330.2
				16 406.4		—	13.50 342.9	13.00 330.2
18 457.0	x	18 457.0	x	18 457.0		13.50 342.9	—	—
20 508.0	x	20 508.0	x	8 219.1		—	15.00 381.0	12.75 323.9
				10 273.0		—	15.00 381.0	13.12 333.2
				12 323.9		—	15.00 381.0	13.62 345.9
				14 355.6		—	15.00 381.0	14.00 355.6
				16 406.4		—	15.00 381.0	14.00 355.6
				18 457.0		—	15.00 381.0	14.50 368.3
				20 508.0		15.00 381.0	—	—



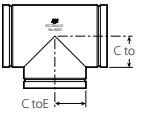
No. W20



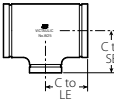
No. W25

FITTINGS FOR THE AGS SYSTEM

Size				No. W20 C to E	No. W25 inches/mm	
inches/Actual Outside Size mm				inches/ mm	C to LE	C to SE
24 610.0	x	24 610.0	x 8 219.1	—	17.00 431.8	14.75 374.7
			10 273.0	—	17.00 431.8	15.12 384.0
			12 323.9	—	17.00 431.8	15.62 396.7
			14 355.6	—	17.00 431.8	16.00 406.4
			16 406.4	—	17.00 431.8	16.00 406.4
			18 457.0	—	17.00 431.8	16.50 419.1
			20 508.0	—	17.00 431.8	17.00 431.8
			24 610.0	17.00 431.8	—	—



No. W20



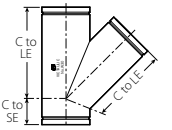
No. W25

Outlets in sizes 12 inches/323.9 mm and smaller will be provided with standard Victaulic roll or cut grooves that are suitable for use with Victaulic grooved pipe couplings in that size range.

No. W30 - 45º Lateral

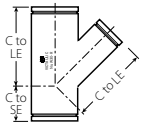
(Segmentally welded steel)

Size		Dimensions – inches/mm	
Nominal Size inches/mm	Actual Outside Diameter inches/mm	C to LE	C to SE
14 350	14.000 355.6	26.50 673.1	7.50 190.5
16 400	16.000 406.4	29.00 736.6	8.00 203.2
18 450	18.000 457.2	32.00 812.8	8.50 215.9
20 500	20.000 508.0	35.00 889.0	9.00 228.6
24 550	24.000 610.0	40.00 1016.0	10.00 254.0



No. W30-R – Reducing 45° Lateral

(Segmentally welded steel)



Size					C to LE	C to SE
inches/Actual Outside Size mm					inches/ mm	inches/ mm
14 355.6	x	14 355.6	x	4 114.3	26.50 673.1	7.50 190.5
				6 168.3	26.50 673.1	7.50 190.5
				8 219.1	26.50 673.1	7.50 190.5
				10 273.0	26.50 673.1	7.50 190.5
				12 323.9	26.50 673.1	7.50 190.5
16 406.4	x	16 406.4	x	6 168.3	29.00 736.6	8.00 203.2
				8 219.1	29.00 736.6	8.00 203.2
				10 273.0	29.00 736.6	8.00 203.2
				12 323.9	29.00 736.6	8.00 203.2
				14 355.6	29.00 736.6	8.00 203.2
18 457.0	x	18 457.0	x	6 168.3	32.00 812.8	8.50 215.9
				8 219.1	32.00 812.8	8.50 215.9
				12 323.9	32.00 812.8	8.50 215.9
				14 355.6	32.00 812.8	8.50 215.9
				16 406.4	32.00 812.8	8.50 215.9
20 508.0	x	20 508.0	x	12 323.9	35.00 889.0	9.00 228.6
				14 355.6	35.00 889.0	9.00 228.6
				16 406.4	35.00 889.0	9.00 228.6
24 610.0	x	24 610.0	x	16 406.4	40.00 1016.0	10.00 254.0
				20 508.0	40.00 1016.0	10.00 254.0

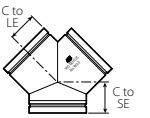
Outlets in sizes 12 inches/323.9 mm and smaller will be provided with standard Victaulic roll or cut grooves that are suitable for use with Victaulic grooved pipe couplings in that size range.

FITTINGS FOR THE AGS SYSTEM

No. W33 – True Wye

(Segmentally welded steel)

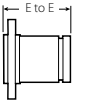
Size		Dimensions – inches/millimeters	
Nominal Size inches/mm	Actual Outside Diameter inches/mm	C to LE	C to SE
14 350	14.000 355.6	11.00 279.4	7.50 190.5
16 400	16.000 406.4	12.00 304.8	8.00 203.2
18 450	18.000 457.2	13.50 342.9	8.50 215.9
20 500	20.000 508.0	15.00 381.0	9.00 228.6
24 550	24.000 610.0	17.00 431.8	10.00 254.0



No. W45R – ANSI 150 Flanged Adapter Nipple

Raised Face (Steel)

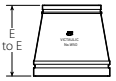
Size		Length E to E
Nominal Size inches/mm	Actual Outside Diameter inches/mm	inches/mm
14 350	14.000 355.6	8.00 203.2
16 400	16.000 406.4	8.00 203.2
18 450	18.000 457.2	8.00 203.2
20 500	20.000 508.0	8.00 203.2
24 550	24.000 610.0	8.00 203.2



FITTINGS FOR THE AGS SYSTEM

No. W50 – Concentric Reducer
No. W51 – Eccentric Reducer
(Steel and Ductile Iron)

Size			No. W50	No. W51
inches/ Actual Outside Size/mm			E to E inches/mm	E to E inches/ mm
14 355.6	x	10 273.0	13.00 330.2	13.00 330.2
		12 323.9	13.00 330.2	13.00 330.2
16 406.4	x	12 323.9	14.00 355.6	14.00 355.6
		14 355.6	14.00 355.6	14.00 355.6
18 457.2	x	14 355.6	15.00 381.0	15.00 381.0
		16 406.4	15.00 381.0	15.00 381.0
20 508.0	x	16 406.4	20.00 508.0	20.00 508.0
		18 457.2	20.00 508.0	20.00 508.0
24 610.0	x	18 457.2	20.00 508.0	20.00 508.0
		20 508.0	20.00 508.0	20.00 508.0



No. W50

No. W51

No. W60 – End Cap
No. W42 – Adapter Nipple
No. W43 – Adapter Nipple
No. W49 – Adapter Nipple
(Steel)

Size		No. W60 End Cap	No. W42, W43, W49 Nipple
Nominal Size inches/mm	Actual Outside Diameter inches/mm	Thickness "T" inches/ mm	E to E inches/mm
14 350	14.000 355.6	6.50 165.1	8.00 203.2
16 400	16.000 406.4	7.00 177.8	8.00 203.2
18 450	18.000 457.2	8.00 203.2	8.00 203.2
20 500	20.000 508.0	9.00 228.6	8.00 203.2
24 550	24.000 610.0	10.50 266.7	8.00 203.2

No. W60

No. W42 AGS Grv. X Bev.

No. W43 AGS Grv. X AGS Grv.

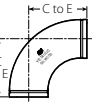
No. W49 AGS Grv. X C606 Grv.

FITTINGS FOR THE AGS SYSTEM

No. W100 – 1½ D Long Radius Elbow
No. W110 – 1½ D Long Radius Elbow

(Steel)

Size		No. W100 – 90	No. W110 – 45
Nominal Size inches/mm	Actual Outside Diameter inches/mm	C to E inches/mm	C to E inches/mm
14 350	14.000 355.6	21.00 533.4	8.75 222.3
16 400	16.000 406.4	24.00 609.6	10.00 254.0
18 450	18.000 457.2	27.00 685.8	11.25 285.8
20 500	20.000 508.0	30.00 762.0	12.50 317.5
24 550	24.000 610.0	36.00 914.4	15.00 381.0



No. W100

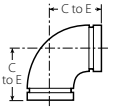
No. W110

FITTINGS FOR JIS PIPE

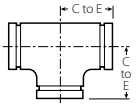
No. 10 – JIS 90 Elbow
No. 11 – JIS 45 Elbow
No. 20 – JIS Tee

Size mm/inches		No. 10 90° Elbow	No. 11 45° Elbow	No. 20 Tee
Nominal Size	JIS OD	C to E mm/ inches	C to E mm/ inches	C to E mm/ inches
200A 8	216.3 8.515	197 7.75	108 4.25	197 7.75
250A 10	267.4 10.528	229 9.00	121 4.75	229 9.00
300A 12	318.5 12.539	254 10.00	133 5.25	254 10.00

Fittings made to US standard sizes are available from 200A – 600A, which are compatible with JIS standards. Contact Victaulic for details.

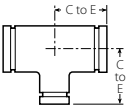


No. 10 **No. 11**



No. 20

No. 25 – JIS Reducing Tee



Size mm/inches									C to E Run	C to E Branch
Nominal Size					JIS OD				mm/ inches	mm/ inches
200A 8	x	200A 8	x	165 6½	216.3 8.515	x	216.3 8.515	x	165.1 6.500	198.1 7.8	198.1 7.8
250A 10	x	250A 10	x	200A 8	267.4 10.528	x	267.4 10.528	x	216.3 8.515	228.6 9.0	228.6 9.0
300A 12	x	300A 12	x	250A 10	318.5 12.539	x	318.5 12.539	x	267.4 10.528	254.0 10.0	254.0 10.0

Fittings made to US standard sizes are available from 200A – 600A, which are compatible with JIS standards. Contact Victaulic for details.

No. 50 – JIS Concentric Reducer

Size mm/inches							E to E
Nominal Size				JIS OD			mm/ inches
200A 8	x	165 6½		216.3 8.515	x	165.1 6.500	127.0 5.00
250A 10	x	200A 8		267.4 10.528	x	216.3 8.515	152.4 6.00
300A 12	x	250A 10		318.5 12.539	x	267.4 110.528	177.8 7.00

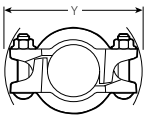
Fittings made to US standard sizes are available from 200A – 600A, which are compatible with JIS standards. Contact Victaulic for details.

STANDARD GROOVED PIPE COUPLINGS

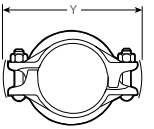
NOTICE

- **The "Y" dimension is the maximum dimension across the coupling. Bolt pads can be positioned in any orientation to provide adequate clearance if the orientation shown causes interference with other system components.**

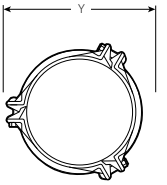
Style 005 FireLock Rigid Coupling
Style 07 Zero-Flex Rigid Coupling
Style HP-70 Rigid Coupling
Style HP-70ES Rigid Coupling



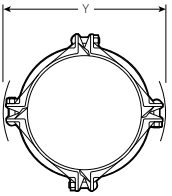
Style 005



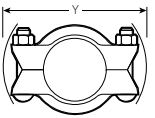
Style 07
1 – 12"/25 – 300 mm



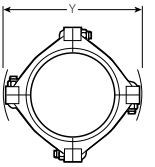
Style 07
14 – 18"/350 – 400 mm



Style 07
20 – 24"/500 – 600 mm



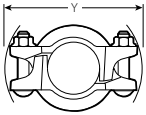
Style HP-70
2 – 12"/50 – 300 mm



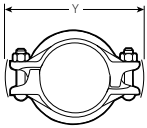
Style HP-70
14 – 16"/350 – 400 mm

Size		"Y" Dimension inches/mm		
Nominal Size inches/mm	Actual Outside Diameter inches/mm	Style 005	Style 07	Style HP – 70 and HP – 70ES
1 25	1.315 33.7	—	4.22 107.2	—
1 ¼ 32	1.660 42.4	4.50 114.3	4.62 117.3	—
1 ½ 40	1.900 48.3	4.75 120.7	5.81 147.6	—
2 50	2.375 60.3	5.25 133.4	5.78 146.8	6.68 169.7
2 ½ 65	2.875 73.0	5.75 146.1	6.38 162.1	7.13 181.1
76.1 mm	3.000 76.1	5.75 146.1	6.61 167.9	—
3 80	3.500 88.9	6.13 155.7	6.81 173.0	7.75 196.9
4 100	4.500 114.3	7.25 184.2	8.21 208.5	9.63 244.6

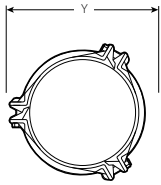
STANDARD GROOVED PIPE COUPLINGS



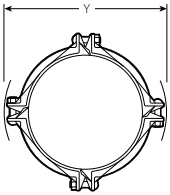
Style 005



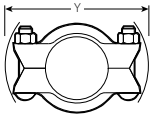
Style 07
1 – 12"/25 – 300 mm



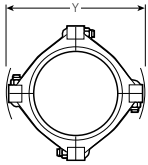
Style 07
14 – 18"/350 – 400 mm



Style 07
20 – 24"/500 – 600 mm



Style HP-70
2 – 12"/50 – 300 mm



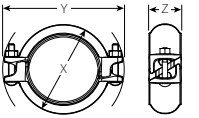
Style HP-70
14 – 16"/350 – 400 mm

Size		"Y" Dimension inches/mm		
Nominal Size inches/mm	Actual Outside Diameter inches/mm	Style 005	Style 07	Style HP – 70 and HP – 70ES
108.0 mm	4.250 108.0	7.25 184.2	7.98 202.7	—
5 125	5.563 141.3	9.00 228.6	9.98 251.2	—
133.0 mm	5.250 133.0	9.00 228.6	9.60 243.8	—
139.7 mm	5.500 139.7	9.00 228.6	9.82 249.4	—
6 150	6.625 168.3	10.00 254.0	10.83 275.1	12.68 322.1
159.0 mm	6.250 159.0	10.00 254.0	10.54 267.7	—
165.1 mm	6.500 165.1	10.00 254.0	10.84 275.3	—
8 200	8.625 219.1	13.13 333.5	13.74 349.0	15.00 381.0
10 250	10.750 273.0	—	16.98 431.3	17.25 438.2
12 300	12.750 323.9	—	18.88 479.6	19.13 485.9
14 350	14.000 355.6	—	19.89 505.2	22.00 558.8
16 400	16.000 406.4	—	21.84 554.7	24.13 612.9
18 450	18.000 457.0	—	23.89 606.8	—
20 500	20.000 508.0	—	27.47 697.7	—
24 600	24.000 610.0	—	31.61 802.9	—

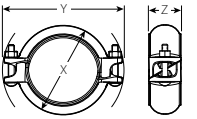
STANDARD GROOVED PIPE COUPLINGS

Style 009/009V FireLock EZ™ Rigid Coupling

Pipe Head		Dimensions – inches/mm			
Nominal Size inches/mm	Actual Outside Diameter inches/mm	Pre-Assembled (Stab-in-Condition)		Joint Assembled	
		X	Y	X	Y
1 ¼ 32	1.660 42.4	3.13 79.5	4.93 125.2	2.86 72.6	4.83 122.7
1 ½ 40	1.900 48.3	3.38 85.9	5.16 131.1	3.11 79.0	5.07 128.8
2 50	2.375 60.3	3.88 98.6	5.81 147.6	3.59 91.2	5.68 144.3
2½ 65	2.875 73.0	4.38 111.3	6.21 157.7	4.08 103.6	6.10 154.9
3 80	3.500 88.9	5.06 128.5	6.68 169.7	4.73 120.1	6.43 163.3
4 100	4.500 114.3	6.46 164.1	8.64 219.5	6.00 152.4	8.34 211.8



Style 009
Pre-assembled
(Stab in condition)

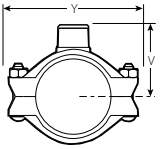


Style 009V Joint Assembled

STANDARD GROOVED PIPE COUPLINGS

Style 72 Outlet Coupling

Size Run x Reducing Outlet			Dimensions – inches/millimeters	
inches/mm			V §	Y
1 ½ 40	x	½ 15	2.63 66.8	4.50 114.3
		¾ 20	2.63 66.8	4.50 114.3
		1 25	2.63 66.8	4.50 114.3
2 50	x	½ 15	3.03 77.0	5.00 127.0
		¾ 20	3.03 77.0	5.00 127.0
		1 25	3.03 77.0	5.00 127.0
2 ½ 65	x	½ 15	3.13 79.5	6.00 152.4
		¾ 20	3.13 79.5	6.00 152.4
		1 25	3.13 79.5	6.00 152.4
		1 ¼ 32	3.69 93.7	6.88 174.8
		1 ½ 40	3.69 93.7	6.88 174.8
3 80	x	¾ 20	3.31 84.1	7.00 177.8
		1 25	4.75 120.7	8.00 203.2
		1 ¼ 32	4.25 120.7	8.00 203.2
		1 ½ 40	4.25 108.0	8.00 203.2
4 100	x	¾ 20	3.81 96.8	8.38 212.9
		1 25	3.81 96.8	8.38 212.9
		1 ½ 40	4.59 116.6	9.00 228.6
		2 50	4.59 116.6	9.00 228.6
6 150	x	1 25	6.88 174.8	12.00 304.8
		1 ½ 40	6.88 174.8	12.00 304.8
		2 50	6.06 153.9	12.00 304.8



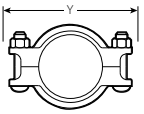
Style 72 with Female Threaded Outlet

† Center of run to end of fittings

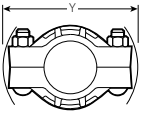
The No. 60 Cap is not suitable for use in vacuum services with Style 72 Outlet Couplings. For this type of service, No. 61 Bull Plugs should be used.

STANDARD GROOVED PIPE COUPLINGS

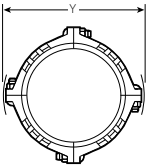
Style 75 Coupling
Style 77 Standard Flexible Coupling
Style 77A Flexible Aluminum Coupling
Style 77S Flexible Stainless Steel Coupling



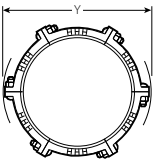
Style 75
1 – 8"/25 – 200 mm



Style 77
¾ – 12"/20 – 300 mm



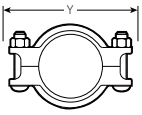
Style 77
14 – 22"/350 – 550 mm



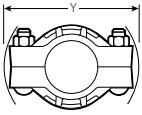
Style 77
24"/600 mm

Size		"Y" Dimension – inches/mm			
Nominal Size inches/mm	Actual Outside Diameter inches/mm	Style 75	Style 77	Style 77A	Style 77S
¾ 20	1.050 26.9	—	4.00 101.6	—	3.89 98.8
1 25	1.315 33.7	4.27 108.5	4.12 104.6	4.12 104.6	4.50 114.3
1 ¼ 32	1.660 42.4	4.61 117.1	5.00 127.0	4.91 124.7	4.79 121.7
1 ½ 40	1.900 48.3	4.82 122.4	5.38 136.7	5.23 132.8	4.80 121.9
2 50	2.375 60.3	5.22 132.6	5.88 149.4	5.77 146.6	5.33 135.4
2 ½ 65	2.875 73.0	5.68 144.3	6.50 165.1	6.38 162.1	5.79 147.1
76.1 mm	3.000 76.1	5.90 149.9	6.63 168.4	—	—
3 80	3.500 88.9	7.00 177.8	7.13 181.1	7.04 178.8	6.99 177.5
3 ½ 90	4.000 101.6	7.50 190.5	8.25 209.6	—	—
4 100	4.500 114.3	8.03 204.0	8.88 255.6	8.78 223.0	8.20 208.3
108.0 mm	4.250 108.0	7.79 197.9	8.63 219.2	—	—
4 ½ 120	5.000 127.0	9.43 239.5	—	—	—
5 125	5.563 141.3	10.07 255.8	10.65 270.5	10.47 265.9	—
133.0 mm	5.250 133.0	9.37 238.0	10.38 263.7	—	—
139.7 mm	5.500 139.7	9.59 243.6	10.65 270.5	—	—
152.4 mm	6.000 152.4	10.48 266.2	—	—	—
6 150	6.625 168.3	11.07 281.2	11.88 301.8	11.77 299.0	11.06 280.9
159.0 mm	6.250 159.0	10.49 266.4	11.50 292.1	—	—

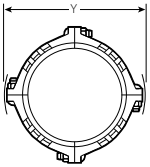
STANDARD GROOVED PIPE COUPLINGS



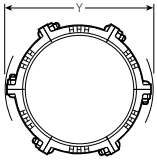
Style 75
1 – 8"/25
– 200 mm



Style 77
¾ – 12"/20
– 300 mm



Style 77
14 – 22"/350
– 550 mm



Style 77
24"/600 mm

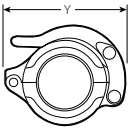
Size		"Y" Dimension – inches/mm			
NominalSize inches/mm	Actual Outside Diameter inches/mm	Style 75	Style 77	Style 77A	Style 77S
165.1 mm	6.500 165.1	10.66 270.8	11.63 295.4	—	—
203.2 mm*	8.000 203.2	13.33 338.6	—	—	—
8 200	8.625 219.1	13.97 354.8	14.75 374.7	14.73 374.1	14.74 374.4
254.0 mm*	10.000 254.0	15.81 401.6	—	—	—
10 250	10.750 273.0	—	17.13 435.1	—	17.33 440.2
304.8 mm*	12.000 304.8	17.69 449.3	—	—	—
12 300	12.750 323.9	—	19.25 489.0	19.15 486.4	19.15 486.4
14 350	14.000 355.6	—	19.88 505.0	—	20.44 519.2
15 375	15.000 381.0	—	21.63 594.4	—	—
16 400	16.000 406.4	—	22.13 562.1	—	22.52 572.0
18 450	18.000 457.0	—	24.50 622.3	—	24.62 625.3
20 500	20.000 508.0	—	27.25 692.2	—	—
22 550	22.000 559.0	—	29.50 749.3	—	—
24 600	24.000 610.0	—	31.25 793.8	—	—

*Style 74 Couplings

STANDARD GROOVED PIPE COUPLINGS

Style 78 Snap-Joint Coupling
Style 78A Snap-Joint Aluminum Coupling

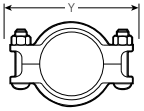
Size		"Y" Dimension inches/mm	
Nominal Size inches/mm	Actual Outside Diameter inches/mm	Style 78	Style 78A
1 25	1.315 33.7	3.25 82.6	—
1 ¼ 32	1.660 42.4	3.75 95.3	—
1 ½ 40	1.900 48.3	4.50 114.3	—
2 50	2.375 60.3	4.75 120.7	4.88 124.0
2 ½ 65	2.875 73.0	5.88 149.4	—
3 80	3.500 88.9	6.25 158.8	—
4 100	4.500 114.3	7.75 196.9	—
5 125	5.563 141.3	9.50 241.3	—
6 150	6.625 168.3	10.63 270.0	—
8 200	8.625 219.1	13.00 330.2	—
10 250	10.750 273.0	—	15.60 396.2



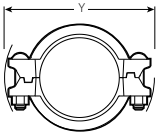
* Refer to the instructions on page 88 and 89 for locking handle clearance dimensions.

STANDARD GROOVED PIPE COUPLINGS

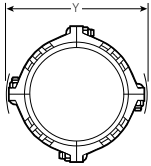
Style 89 Rigid Coupling for Stainless Steel Pipe
Style 475 Lightweight, Flexible Stainless Steel Coupling
Style 489 Rigid, Stainless Steel Coupling



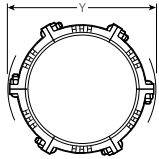
Style 89



Style 475



Style 489
1½ – 4"/40 – 100 mm



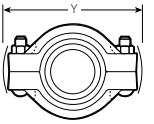
Style 489
6 – 12"/ 150 – 300 mm/ 165.1 – 318.5 mm JIS

Size		"Y" Dimension – inches/mm		
Nominal Size inches/mm	Actual Outside Diameter inches/mm	Style 89	Style 475	Style 489
1 25	1.315 33.7	—	4.36 110.7	—
1¼ 32	1.660 42.4	—	4.67 118.6	—
1½ 40	1.900 48.3	—	4.74 120.4	4.42 112.3
2 50	2.375 60.3	6.68 169.7	5.03 127.8	5.19 131.8
2½ 65	2.875 73.0	7.13 181.1	5.59 142.0	5.62 142.7
76.1 mm	3.000 76.1	—	5.73 145.5	5.72 145.3
3 80	3.500 88.9	7.75 196.9	6.67 169.4	6.78 172.2
4 100	4.500 114.3	9.63 244.6	7.96 202.2	7.90 200.7
139.7 mm	5.500 139.7	—	8.97 227.8	11.13 282.7
165.1 mm	6.500 165.1	11.13 282.7	10.53 267.5	12.68 322.1
6 150	6.625 168.3	12.68 322.1	—	12.68 322.1
216.3 mm	8.500 216.3	13.65 346.7	—	15.00 381.0
8 200	8.625 219.1	15.00 381.0	—	15.00 381.0
267.4 mm	10.500 267.4	15.81 401.6	—	17.25 438.2
10 250	10.750 273.0	17.25 438.2	—	17.25 438.2
318.5 mm	12.500 318.5	17.81 452.4	—	19.13 485.9
12 300	12.750 323.9	19.13 485.9	—	19.13 485.9

STANDARD GROOVED PIPE COUPLINGS

Style 750 Reducing Coupling

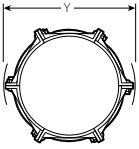
Size			"Y" Dimension
inches/mm			inches/mm
2 50	x	1 25	5.25 133.4
		1½ 40	5.25 133.4
2½ 65	x	2 50	6.00 152.4
76.1 mm	x	2 50	6.00 152.4
3 80	x	2 50	7.13 181.1
		2½ 65	7.13 181.1
		76.1 mm	7.13 181.1
4 100	x	2 50	8.88 225.6
		2½ 65	8.88 225.6
		3 80	8.88 225.6
4½ 120	x	76.1 mm	8.88 225.6
5 125	x	4 120	10.63 270.0
6 150	x	4 120	11.88 301.8
		5 125	11.88 301.8
165.1 mm	x	4 100	11.38 289.1
8 200	x	6 150	14.75 374.7



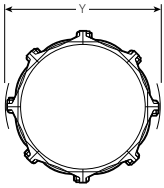
The No. 60 Cap is not suitable for use in vacuum services with Style 750 Reducing Couplings. For this type of service, No. 61 Bull Plugs should be used.

STANDARD GROOVED PIPE COUPLINGS

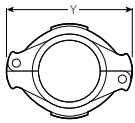
Style 770 Large Diameter Coupling
Style 775 Coupling for Plastic Pipe
Style 791 Vic-Boltless Coupling*



Style 770
26 – 36"/650 – 900 mm



Style 770
42"/1050 mm



Style 791

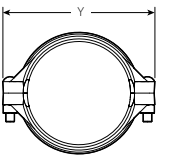
Size		"Y" Dimension – inches/mm	
Nominal Size inches/mm	Actual Outside Diameter inches/mm	Style 770	Style 791*
2 50	2.375 60.3	—	4.75 120.7
2½ 65	2.875 73.0	—	5.53 140.5
3 80	3.500 88.9	—	6.20 157.5
4 100	4.500 114.3	—	7.67 194.8
6 150	6.625 168.3	—	10.17 258.3
8 200	8.625 219.1	—	12.48 317.0
10 250	10.750 273.0	—	—
12 300	12.750 323.9	—	—
26 650	26.000 660.4	34.25 870.0	—
28 700	28.000 711.0	36.33 922.8	—
30 750	30.000 762.0	38.32 973.3	—
32 800	32.000 813.0	40.43 1026.9	—
36 900	36.000 914.0	44.33 1126.0	—
42 1050	42.000 1067.0	51.56 1309.6	—

* Refer to the instructions on page 96 for Style 792 Assembly Tool clearance dimensions.

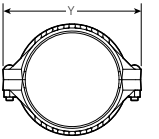
GROOVED PIPE COUPLINGS FOR THE AGS SYSTEM

Style W07 AGS Rigid Coupling
Style W77 AGS Flexible Coupling

Size		"Y" Dimension inches/millimeters	
Nominal Size inches/mm	Actual Outside Diameter inches/mm	Style W07	Style W77
14 350	14.000 355.6	20.59 523.0	20.59 523.0
16 400	16.000 406.4	23.51 597.2	23.51 597.2
18 450	18.000 457.2	25.53 648.5	25.46 646.7
20 500	20.000 508.0	27.13 689.1	27.13 689.1
24 550	24.000 610.0	32.31 820.7	32.31 820.7



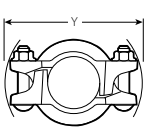
Style W07



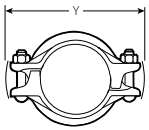
Style W77

GROOVED PIPE COUPLINGS FOR JIS PIPE

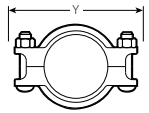
Style 005 FireLock Rigid Coupling
Style 07 Zero-Flex Rigid Coupling
Style 75 Coupling
Style 77 Standard Flexible Coupling



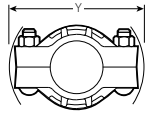
Style 005



Style 07



Style 75



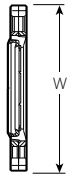
Style 77

Size – mm/inches		"Y" Dimension – mm/inches			
Nominal Size	JIS OD	Style 005	Style 07	Style 75	Style 77
200A 8	216.3 8.515	337 13.25	346 13.62	349 13.75	374 14.72
250A 10	267.4 10.528	—	431 16.97	—	433 17.05
300A 12	318.5 12.539	—	480 18.90	—	486 19.13

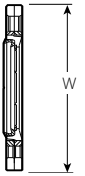
Couplings made to US standard sizes are available from 200A – 600A, which are compatible with JIS standards. Contact Victaulic for details.

STANDARD VIC-FLANGE ADAPTERS

Style 441 Stainless Steel Vic-Flange Adapter
Style 741 Vic-Flange Adapter
Style 743 Vic-Flange Adapter
Style 744 FireLock Flange Adapter

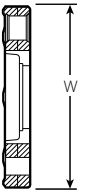


Style 441



Style 741
2 – 12"/58 – 300 mm

Style 741
14 – 24"/350 – 600 mm



Style 743

Style 744

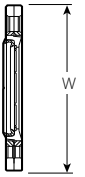
Size		"W" Dimension inches/mm			
Nominal Size inches/mm	Actual Outside Diameter inches/mm	Style 441	Style 741	Style 743	Style 744
2 50	2.375 60.3	6.84 173.7	6.75 171.5	6.50 165.1	6.75 171.5
2½ 65	2.875 73.0	7.72 196.1	7.88 200.2	7.50 190.5	7.88 200.2
76.1 mm	3.000 76.1	—	8.20 208.3	—	—
3 80	3.500 88.9	8.22 208.8	8.44 214.4	8.25 209.6	8.44 214.4
4 100	4.500 114.3	9.72 246.9	9.94 252.5	10.00 254.0	9.94 252.5
139.7 mm	5.500 139.7	—	10.78 273.8	—	—
5 125	5.563 141.3	—	11.00 279.4	11.00 279.4	11.00 279.4
6 150	6.625 168.3	11.78 299.2	12.00 304.8	12.50 317.5	12.50 304.8
165.1 mm	6.500 165.1	—	+	—	—
8 200	8.625 219.1	—	14.63 371.6	15.00 381.0	14.63 371.6
10 250	10.750 273.0	—	17.19 436.6	17.50 444.5	—
12 300	12.750 323.9	—	20.25 514.4	20.50 520.7	—
14 350	14.000 355.6	—	24.50 622.3	—	—
16 400	16.000 406.4	—	27.12 688.8	—	—
18 450	18.000 457.0	—	29.00 736.6	—	—
20 500	20.000 508.0	—	31.50 800.1	—	—
24 600	24.000 610.0	—	36.00 914.4	—	—

+ "W" dimension does not apply

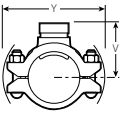
VIC-FLANGE ADAPTER FOR THE AGS SYSTEM

Style W741 AGS Vic-Flange Adapter

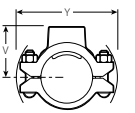
Size		"W" Dimension
Nominal Size inches/mm	Actual Outside Diameter inches/mm	inches/mm
14 350	14.000 355.6	24.50 622.3
16 400	16.000 406.4	27.12 688.8
18 450	18.000 457.0	29.00 736.6
20 500	20.000 508.0	31.50 800.1
24 600	24.000 610.0	36.00 914.4



Style 920 and Style 920N Mechanical-T Bolted Branch Outlets



Style 920 and 920N with Grooved Outlet

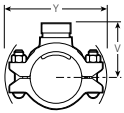


Style 920 and 920N with Female Threaded Outlet

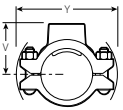
Size			Style No.	Dimension – inches/mm			
Run Nominal inches/mm	X	Branch	920 or 920N	T** Takeout	Fem. Thd. V ‡ #	Grv. V ‡	Y
2 50	x	½ (a) 15	920N	2.00 50.8	2.53 64.3	—	5.35 135.9
		¾ (a) 20	920N	1.97 50.0	2.53 64.3	—	5.35 135.9
		1 (a) 25	920N	1.85 47.0	2.53 64.3	—	5.35 135.9
		1 ¼ (a) 32	920N	2.05 52.1	2.75 69.9	3.00 76.2	5.35 135.9
		1 ½ (a) 40	920N	2.03 51.6	2.75 69.9	3.12 79.2	5.35 135.9
2 ½ 65	x	½ (a) 15	920N	2.21 56.1	2.74 69.6	—	5.64 143.3
		¾ (a) 20	920N	2.18 55.4	2.74 69.6	—	5.64 143.3
		1 (a) 25	920N	2.06 52.3	2.74 69.6	—	5.64 143.3
		1 ¼ † (a) 32	920N	2.30 58.4	3.00 76.2	3.25 82.6	6.29 159.8
		1 ½ † (a) 40	920N	2.28 57.9	3.00 76.2	3.25 82.6	6.26 159.8
76.1 mm	x	½ (a) 15	920	2.22 56.4	2.75 69.9	—	6.46 164.1
		¾ (a) 20	920	2.19 55.6	2.75 69.9	—	6.46 164.1
		1 (a) 25	920	2.07 52.6	2.75 69.9	—	6.46 164.1
		1 ¼ † (a) 32	920N	2.30 58.4	3.50 88.9	3.50 88.9	6.29 159.8
		1 ½ (a) 40	920N	2.28 57.9	3.50 88.9	—	6.29 159.8
3 80	x	½ (a) 15	920N	2.52 64.0	3.05 77.5	—	6.15 156.2
		¾ (a) 20	920N	2.49 63.2	3.05 77.5	—	6.15 156.2
		1 (a) 25	920N	2.38 60.5	3.06 77.7	—	6.15 156.2
		1 ¼ † (a) 32 (b)	920N	2.55 64.8	3.25 82.6	3.56 90.4	6.15 156.2
		1 ½ † (a) 40 (b)	920N	2.78 70.6	3.50 88.9	3.56 90.4	6.15 156.2
		2 (a) 50	920N	2.75 69.9	3.50 8.9	3.56 90.4	6.75 171.5

See notes on page 223.

Style 920 and Style 920N Mechanical-T Bolted Branch Outlets



Style 920 and 920N with Grooved Outlet

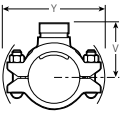


Style 920 and 920N with Female Threaded Outlet

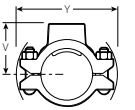
Size			Style No.	Dimension – inches/mm			
Run Nominal inches/mm	X	Branch	920 or 920N	T** Takeout	Fem. Thd. V ‡ #	Grv. V ‡	Y
3 ½ 90	x	2 50	920N	—	—	3.75 95.3	6.72 170.7
4 100	x	½ (a) 15	920N	3.03 77.0	3.56 90.4	—	7.01 178.1
		¾ (a) 20	920N	3.00 76.2	3.56 90.4	—	7.01 178.1
		1 (a) 25	920N	2.88 73.2	3.56 90.4	—	7.01 178.1
		1 ¼ † (a) 32 (b)	920N	3.08 78.2	3.78 96.0	4.00 101.6	7.01 178.1
		1 ½ † (a) 40 (b)	920N	3.28 83.3	4.00 101.6	4.00 101.6	7.01 178.1
		2 † (a) 50	920N	3.25 82.6	4.00 101.6	4.00 101.6	7.01 178.1
		2 ½ † (a) 65	920	2.88 73.2	4.00 101.6	4.00 101.6	7.34 186.4
		76.1 mm	920	—	—	4.00 101.6	7.34 186.4
		3 † (a) 80	920	3.31 84.1	4.50 114.3	4.12 104.6	7.73 196.3
108.0 mm	x	1 ¼ (a) 32	920N	3.08 78.2	3.78 96.0	—	7.64 194.1
		1 ½ (a) 40	920N	3.28 88.3	4.00 101.6	—	7.64 194.1
		2 (a) 50	920N	3.25 82.6	4.00 101.6	—	7.64 194.1
		76.1 mm	920	2.88 73.2	4.00 101.6	4.00 101.6	7.64 194.1
		3 (a) 80	920	3.31 84.1	4.50 114.3	—	7.63 193.8
5 125	x	1 ½ † (a) 40	920	4.03 102.4	4.75 120.7	4.75 120.7	9.70 246.4
		2 † (a) 50	920	4.00 101.6	4.75 120.7	4.75 120.7	9.70 246.4
		2 ½ † (a) 65	920	3.63 92.2	4.75 120.7	4.75 120.7	9.70 246.4
		3 † (a) 80	920	3.81 96.8	5.00 127.0	4.63 117.6	9.70 246.4
133.0 mm	x	2 50	920N	3.75 95.3	4.50 114.3	—	8.00 203.2
		3 80	920	3.81 96.8	5.00 127.0	—	9.46 240.3

See notes on page 223.

Style 920 and Style 920N Mechanical-T Bolted Branch Outlets



Style 920 and 920N with Grooved Outlet

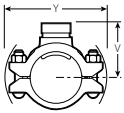


Style 920 and 920N with Female Threded Outlet

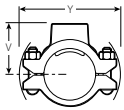
Size			Style No.	Dimension – inches/mm			
Run Nominal inches/mm	X	Branch inches/mm	920 or 920N	T** Takeout	Fem. Thd. V ‡ #	Grv. V ‡	Y
139.7 mm	x	1 ½ † 40	920N	3.78 96.0	4.50 114.3	—	8.23 209.0
		2 † 50	920N	3.75 95.3	4.50 114.3	—	8.23 209.0
139.7 mm		76.1 mm (a) (b)	920	3.63 92.2	4.75 120.7	—	9.85 250.2
		76.1 mm	920	—	—	4.63 117.6	9.70 246.4
		3 80	920	3.81 96.8	5.00 127.0	4.63 117.6	9.85 250.2
6 150	x	1 ¼ 32 (b)	920N	4.63 112.5	5.13 130.3	—	9.15 232.4
		1 ½ † (a) 40 (b)	920N	4.40 111.8	5.12 130.0	5.13 130.3	9.15 232.4
		2 † (a) 50	920N	4.38 111.3	5.13 130.3	5.13 130.3	9.15 232.4
		2 ½ † (a) 65	920	4.01 101.9	5.13 130.3	5.12 130.0	10.51 267.0
		76.1 mm (a) (b)	920	—	—	5.21 132.3	10.51 267.0
		3 † (a) 80	920	4.31 109.5	5.50 139.7	5.13 130.3	10.51 267.0
		4 † (a) 100	920	3.81 96.8	5.75 146.1	5.38 136.7	10.51 267.0
159.0 mm	x	1 ¼ 32	920N	4.43 112.5	5.13 130.3	—	9.40 238.8
		1 ½ (a) 40	920N	4.41 112.0	5.13 130.3	—	9.40 238.8
		2 (a) 50	920N	4.38 111.3	5.13 130.3	—	9.40 238.8
		76.1 mm	920	4.38 111.3	5.50 139.7	5.13 130.3	9.40 238.8
		3 80	920	4.31 109.5	5.50 139.7	5.13 130.3	9.40 238.8
		108.0 mm	920	—	—	5.38 136.7	9.40 238.8
		4 100	920	3.81 96.8	5.75 146.1	—	9.40 238.8

See notes on page 223.

Style 920 and Style 920N Mechanical-T Bolted Branch Outlets



Style 920 and 920N with Grooved Outlet



Style 920 and 920N with Female Threaded Outlet

Size			Style No.	Dimension – inches/mm			
Run Nominal inches/mm	X	Branch	920 or 920N	T** Takeout	Fem. Thd. V ‡ #	Grv. V ‡	Y
165.1 mm	x	1 25	920	3.88 98.6	4.56 115.8	—	9.34 237.2
		1 ¼ 32	920	4.43 112.5	5.13 130.3	—	9.34 237.2
		1 ½ † (a) 40	920	4.41 112.0	5.13 130.3	—	9.34 237.2
		2 † (a) 50	920	4.38 111.3	5.13 130.3	—	9.34 237.2
		2 ½ † 65	920	4.01 101.9	5.13 130.3	—	10.51 267.0
		76.1 mm (a) (b)	920	4.01 101.9	5.13 130.3	5.21 132.3	10.51 267.0
		3 † (a) 80	920	4.31 109.5	5.50 139.7	5.13 130.3	10.51 267.0
		4 † (a) 100	920	3.81 96.8	5.75 146.1	5.38 136.7	10.51 267.0
168.3 mm	x	42.4 mm	920N	4.43 112.5	5.13 103.3	—	9.15 232.4
8 200	x	2 (a) 50	920	5.44 138.2	6.19 157.2	—	12.42 315.5
		2 ½ † (a) 65	920	5.07 128.8	6.19 157.2	6.19 157.2	12.42 315.5
		3 † (a) 80	920	5.31 134.9	6.50 165.1	6.50 165.1	12.42 315.5
		4 † (a) 100	920	4.81 122.2	6.75 171.5	6.38 162.1	12.42 315.5

** Center of run engaged pipe end for female threaded outlets only (dimensions are approximate)

† Available with grooved outlet or female threaded outlet

‡ Center of run to end of fitting

Female threaded outlets are available to NPT and BSPT specifications

(a) British Standard female pipe threaded outlet is available

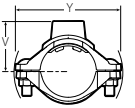
(b) For 76.1-mm threaded outlets, specify 2½-inch BSPT

NOTE: Style 920 and Style 920N housings cannot be mated to each other to achieve cross connections.

HOLE-CUT PRODUCTS

Style 922 FireLock Outlet-T

Size inches/mm			"Y" Dimension	"V" Dimension
Run X Branch FPT †			inches/mm	inches/mm
1 ¼ 32	x	½ 15	3.87 98.3	1.83 46.5
		¾ 20	3.87 98.3	1.83 46.5
		1 25	3.87 98.3	2.18 55.4
1 ½ 40	x	½ 15	4.08 103.6	1.95 49.5
		¾ 20	4.08 103.6	1.95 49.5
		1 25	4.08 103.6	2.30 58.4
2 50	x	½ 15	4.60 116.8	2.19 55.6
		¾ 20	4.60 116.8	2.19 55.6
		1 25	4.60 116.8	2.54 64.5
2½ 65	x	½ 15	5.40 137.2	2.44 62.0
		¾ 20	5.40 137.2	2.44 62.0
		1 25	5.40 137.2	2.79 70.9
76.1 mm	x	½ 15	5.50 139.7	2.44 62.0
		¾ 20	5.50 139.7	2.44 62.0
		1 25	5.50 139.7	2.79 70.9

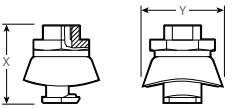


† Victaulic female threaded products are designed to accommodate standard NPT or BSPT (optional) male pipe threads only. Use of male threaded products with special features, such as probes, dry pendent sprinkler heads, etc., should be verified as suitable for use with this Victaulic product. Failure to verify suitability in advance may result in assembly problems or leakage.

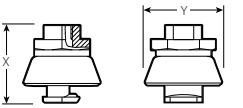
Style 923 Vic-Let Strapless Outlet

Size inches/mm			"Y" ‡ Dimension	"X" Dimension
Run X Branch			inches/mm	inches/mm
4 – 8	x	½ 15	3.09 78.5	3.00 76.2
		¾ 20	3.09 78.5	3.00 76.2
10 and Larger	x	½ 15	3.00 76.2	3.00 76.2
		¾ 20	3.00 76.2	3.00 76.2

‡ Width of collar as supplied. The width will change due to deformation of the collar during assembly.

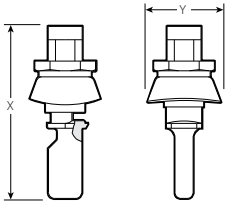


4 – 8" IPS

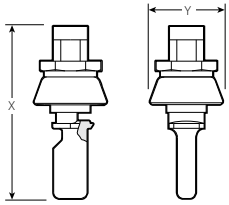


10" IPS and larger

Style 924 Vic-O-Well Strapless Thermometer Outlet



4 – 8" sizes



4 – 8" sizes

Size inches/mm	"Y" † Dimension	"X" Dimension
Run X Branch	inches/mm	inches/mm
4 – 8 for 6-inch Stem ‡ 100 – 200 for 150-mm Stem	3.09 78.5	7.09 180.1
10 and Larger for 6-inch Stem ‡ 250 and Larger for 150-mm Stem	3.09 78.5	7.09 180.1

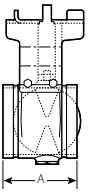
† Width of collar as supplied. The width will change due to deformation of the collar during assembly.

‡ 1¼-inch Outlet – 1¼-NEF18 – 2B

STANDARD GROOVED PIPE VALVES

Vic-300 Butterfly Valve

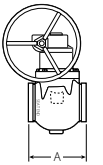
Size		"A" End-to-End Dimension
Nominal Size inches/mm	Actual Outside Diameter inches/mm	inches/mm
2 50	2.375 60.3	3.21 81.5
2½ 65	2.875 73.0	3.77 95.8
76.1 mm	3.000 76.1	3.77 95.8
3 80	3.500 88.9	3.77 95.8
4 100	4.500 114.3	4.63 117.6
5 125	5.563 141.3	5.88 149.4
139.7 mm	5.500 139.7	5.88 149.4
6 150	6.625 168.3	5.88 149.4
165.1 mm	6.500 165.1	5.88 149.4
8 200	8.625 219.1	5.33 135.4
10 250	10.750 273.0	6.40 162.6
12 300	12.750 323.9	6.50 165.1



Refer to Victaulic publication 08.02 for gear operator, two-position handle, and lever lock handle dimensions.

Series 377 Vic-Plug Balancing Valve

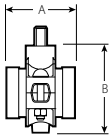
Size		"A" End-to-End Dimension
Nominal Size inches/mm	Actual Outside Diameter inches/mm	inches/mm
14 350	14.000 355.6	17.00 431.8
16 400	16.000 406.4	17.75 450.9
18 450	18.000 457.0	21.50 546.1



STANDARD GROOVED PIPE VALVES

Series 700 Butterfly Valves

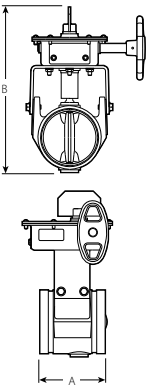
Size		"A" End-to-End Dimension	"B" Height inches/mm *	
Nominal Size inches/mm	Actual Outside Diameter inches/mm	inches/ mm	Standard Profile	Low Profile
1 ½ 40	1.900 48.3	3.38 85.9	4.45 113.0	3.57 90.7
2 50	2.375 60.3	3.19 81.0	4.97 126.2	4.09 103.9
2½ 65	2.875 73.0	3.81 96.8	6.19 157.2	5.19 131.8
3 80	3.500 88.9	3.81 96.8	6.75 171.5	5.75 146.1
4 100	4.500 114.3	4.56 115.8	8.19 208.0	7.38 187.5
5 125	5.563 141.3	5.81 147.6	9.34 237.2	8.84 224.5
6 150	6.625 168.3	5.81 147.6	10.38 263.7	9.88 251.0
165.1 mm	6.500 165.1	5.81 147.6	10.38 263.7	9.88 251.0



* Dimensions are for a bare valve. Refer to Victaulic publication 08.05 for gear operator, two-position handle, and lever lock handle dimensions.

Series 705W FireLock Butterfly Valve
Series 708W Fire Protection Butterfly Valve

Size		"A" End-to-End Dimension	"B" Overall Height Dimension
Nominal Size inches/mm	Actual Outside Diameter inches/mm	inches/mm	inches/mm
2½ 65	2.875 73.0	3.77 95.8	9.80 248.9
76.1 mm	3.000 76.1	3.77 95.8	9.80 248.9
3 80	3.500 88.9	3.77 95.8	10.48 266.2
4 100	4.500 114.3	4.63 117.6	11.89 302.0
139.7 mm ‡	5.500 139.7	5.88 149.4	12.82 325.6
5 125	5.563 141.3	5.88 149.4	12.82 325.6
165.1 mm	6.500 165.1	5.88 149.4	13.74 349.0
6 150	6.625 168.3	5.88 149.4	13.74 349.0
8 200	8.625 219.1	5.33 135.4	16.92 429.8
10 250	10.750 273.0	6.40 162.6	19.14 486.2
12 300	12.750 323.9	6.50 165.1	21.54 547.1

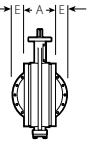


‡ The Series 708W is not available in size 139.7 mm.

STANDARD GROOVED PIPE VALVES

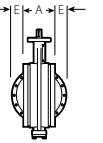
Series 706 Butterfly Valve

Size		"A" End-to-End Dimension	"E" Dimension
Nominal Size inches/mm	Actual Outside Diameter inches/mm	inches/mm	inches/mm
14 350	14.000 355.6	7.00 177.8	2.66 67.6
16 400	16.000 406.4	7.00 177.8	3.66 93.0
18 450	18.000 457.0	8.00 203.2	4.15 105.4
20 500	20.000 508.0	8.50 215.9	4.93 125.2
24 600	24.000 610.0	10.00 254.0	6.18 157.0



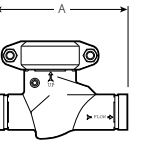
Series 709 Butterfly Valve

Size		"A" End-to-End Dimension	"E" Dimension
Nominal Size inches/mm	Actual Outside Diameter inches/mm	inches/mm	inches/mm
14 350	14.000 355.6	7.00 177.8	2.66 67.6
16 400	16.000 406.4	7.00 177.8	3.66 93.0
18 450	18.000 457.0	8.00 203.2	4.15 105.4
20 500	20.000 508.0	8.50 215.9	4.93 125.2
24 600	24.000 610.0	10.00 254.0	6.18 157.0



Series 712 Swinger Swing Check Valve
Series 712S Swinger Swing Check Valve
Series 713 Swinger Swing Check Valve

Size		"A" End-to-End Dimension
Nominal Size inches/mm	Actual Outside Diameter inches/mm	inches/mm
2 § 50	2.375 60.3	9.00 228.6
2½ ‡ 65	2.875 73.0	9.25 235.0
3 ‡ 80	3.500 88.9	10.75 273.1
4 ‡ 100	4.500 114.3	12.00 304.8



§ The Series 712S is available only in the 2-inch/50-mm size.

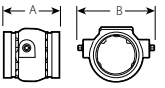
‡ The Series 713 Swinger Swing Check Valve is not available in 2½ – 4-inch/65 – 100-mm sizes.

Series 716 Vic-Check Valve
Series 717 FireLock Check Valve
Series 717R FireLock Check Valve
Series 779 Venturi Check Valve

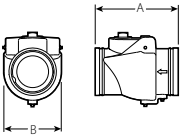
Size		"A" End-to-End Dimension	"B" Overall Width Dimension
Nominal Size inches/mm	Actual Outside Diameter inches/mm	inches/mm	inches/mm
2½ * 65	2.875 73.0	3.88 98.6	4.25 108.0
76.1 mm *	3.000 76.1	3.88 98.6	4.25 108.0
3 * 80	3.500 88.9	4.25 108.0	5.06 128.5
4 100	4.500 114.3	9.63 244.6	6.00 152.4
5 125	5.563 141.3	10.50 266.7	6.80 172.7
139.7 mm	5.500 139.7	10.50 266.7	6.80 172.7
6 150	6.625 168.3	11.50 292.1	8.00 203.2
165.1 mm	6.500 165.1	11.50 292.1	8.00 203.2
8 200	8.625 219.1	14.00 355.6	9.88 251.0
10 * 250	10.750 273.0	17.00 431.8	12.00 304.8
12 * 300	12.750 323.9	19.50 495.3	14.00 355.6
14 ‡ 350	14.000 355.6	20.25 514.4	14.52 368.8

‡ The Series 717/717R FireLock Check Valve and Series 779 Venturi Check Valve are not available in the 14-inch/350-mm size.

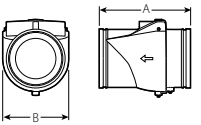
* The Series 717R FireLock Check Valve is not available in these sizes.



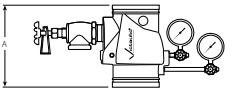
Typical 2½ – 3"



Typical 4 – 8"

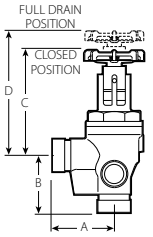


Typical 10 – 14"

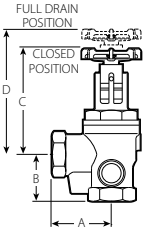


STANDARD GROOVED PIPE VALVES

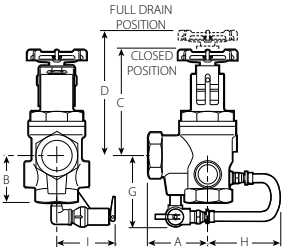
Style 720 TestMaster™ II Alarm Test Module



Style 720 Grooved Ends



Style 720 Threaded Ends



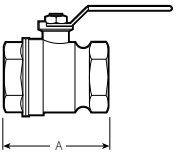
Style 720 with Pressure Relief Valve

Size		Dimensions – inches/mm						
Nominal Size inches/mm	Actual Outside Diameter inches/mm	A	B	C	D	G	H	I
STYLE 720 GROOVED ENDS								
1 ¼ 32	1.660 42.4	3.15 80.0	2.90 73.7	5.47 138.9	6.43 163.3	—	—	—
1 ½ 40	1.900 48.3	3.65 92.7	3.06 77.7	5.47 138.9	6.51 165.4	—	—	—
2 50	2.375 60.3	3.65 92.7	3.06 77.7	5.47 138.9	6.51 165.4	—	—	—
STYLE 720 THREADED ENDS								
1 25	1.315 33.4	3.00 76.2	2.38 60.5	5.47 138.9	6.43 163.3	—	—	—
1 ¼ 32	1.660 42.2	3.00 76.2	2.38 60.5	5.47 138.9	6.43 163.3	—	—	—
1 ½ 40	1.900 48.3	3.63 92.2	2.38 60.5	5.47 138.9	6.51 165.4	—	—	—
2 50	2.375 60.3	3.63 92.2	2.38 60.5	5.47 138.9	6.51 165.4	—	—	—
STYLE 720 WITH PRESSURE RELIEF VALVE								
1 25	1.315 33.4	3.00 76.2	2.38 60.5	5.47 138.9	6.43 163.3	3.90 99.1	4.95 125.7	4.00 101.6
1 ¼ 32	1.660 42.2	3.00 76.2	2.38 60.5	5.47 138.9	6.43 163.3	3.90 99.1	4.95 125.7	4.00 101.6
1 ½ 40	1.900 48.3	3.63 92.2	2.38 60.5	5.47 138.9	6.51 165.4	4.09 103.9	4.95 125.7	4.00 101.6
2 50	2.375 60.3	3.63 92.2	2.38 60.5	5.47 138.9	6.51 165.4	4.09 103.9	4.95 125.7	4.00 101.6

STANDARD GROOVED PIPE VALVES

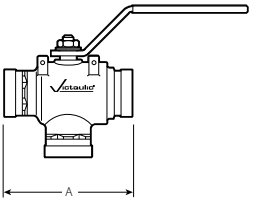
Series 722 Threaded Brass Body Ball Valve

Size		"A" End-to-End Dimension
Nominal Size inches/mm	Actual Outside Diameter inches/mm	inches/mm
¼ 8	0.540 13.7	1.54 39.1
⅜ 10	0.675 17.2	1.77 45.0
½ 15	0.840 21.3	2.13 54.1
¾ 20	1.050 26.9	2.44 62.0
1 25	1.315 33.4	2.95 74.9
1 ¼ 32	1.660 42.2	3.31 84.1
1 ½ 40	1.900 48.3	3.66 93.0
2 50	2.375 60.3	4.21 106.9



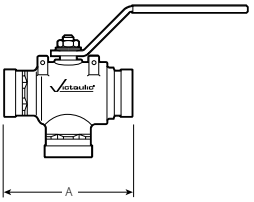
Series 723 Three-Port Diverter Valve

Size		"A" End-to-End Dimension
Nominal Size inches/ mm	Actual Outside Diameter inches/mm	inches/mm
2 50	2.375 60.3	6.50 165.1



Series 723S Stainless Steel Three-Port Diverter Valve

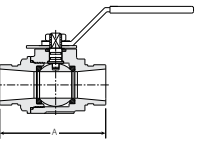
Size		"A" End-to-End Dimension
Nominal Size inches/mm	Actual Outside Diameter inches/mm	inches/mm
2 50	2.375 60.3	6.86 174.2



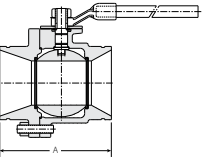
STANDARD GROOVED PIPE VALVES

Series 726 Vic-Ball Valve

Size		"A" End-to-End Dimension
Nominal Size inches/mm	Actual Outside Diameter inches/mm	inches/mm
1 ½ 40	1.900 48.3	5.12 130.0
2 50	2.375 60.3	5.50 139.7
2 ½ 65	2.875 73.0	6.25 158.8
3 80	3.500 88.9	6.56 166.6
4 100	4.500 114.3	8.25 209.6
6 150	6.625 168.3	10.10 256.5

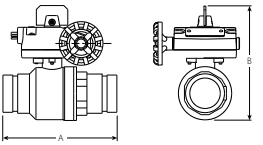


1 ½" – 3" Sizes

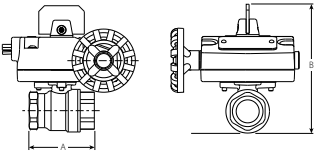


4 – 6" Sizes

Series 728 FireLock Ball Valve



Grooved X Grooved



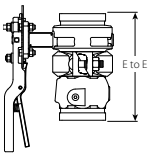
Threaded X Threaded

Size			"A" End-to-End Dimension	"B" Overall Height
inches/mm			inches/mm	inches/mm
1 Thd. 25 Thd.	x	Thd. Thd.	2.84 72.1	5.61 142.5
1 ¼ Thd. 32 Thd.	x	Thd. Thd.	3.31 84.1	6.04 153.4
1 ½ Thd. 40 Thd.	x	Thd. Thd.	3.66 93.0	6.42 163.1
2 Thd. 50 Thd.	x	Thd. Thd.	4.33 110.0	7.15 181.6
1 ¼ Grv. 32 Grv.	x	Grv. Grv.	7.25 184.2	6.25 158.8
1 ½ Grv. 40 Grv.	x	Grv. Grv.	7.25 184.2	6.75 171.5
2 Grv. 50 Grv.	x	Grv. Grv.	7.25 184.2	7.50 190.5

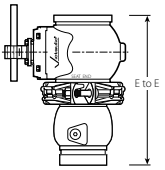
STANDARD GROOVED PIPE VALVES

Triple Service Valve Assemblies

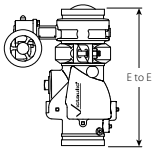
Size		End-to-End Dimension inches/mm	
Nominal Size inches/mm	Actual Outside Diameter inches/mm	Butterfly/ Check Valve Combination	Plug/Check Valve Combination
2½ 65	2.875 73.0	7.75 196.9	—
3 80	3.500 88.9	8.12 206.2	12.25 311.2
4 100	4.500 114.3	14.38 365.3	18.62 472.9
5 125	5.563 141.3	16.50 419.1	—
6 150	6.625 168.3	17.50 444.5	22.00 558.8
8 200	8.625 219.1	19.50 495.3	25.50 647.7
10 250	10.750 273.0	23.50 596.9	30.00 762.0
12 300	12.750 323.9	26.12 663.4	33.50 850.9
14 350	14.000 355.6	27.38 695.5	37.25 946.2



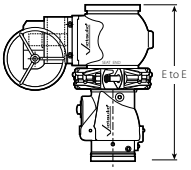
2½ – 3" Typical with Vic-300 Lever Operator Butterfly and Series 716 Vic-Check Valves



3" Typical Series 377 Vic-Plug with manual handle, Series 716 Vic-Check Valve, and Series 307 Coupling



4 – 14" Typical with Vic-300 Gear Operator Butterfly and Series 779 Vic-Check Valves

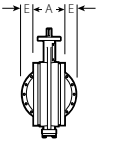


4 – 14" Typical Series 377 Vic-Plug with Gear Operator, Series 779 Vic-Check Valve, and Series 307 Coupling

GROOVED PIPE VALVES FOR THE AGS SYSTEM

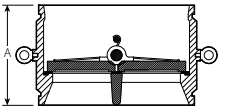
Series W706 AGS Butterfly Valve
Series W709 AGS Butterfly Valve

Size		"A" End-to-End Dimension	"E" Dimension
Nominal Size inches/mm	Actual Outside Diameter inches/mm	inches/mm	inches/mm
14 350	14.000 355.6	10.00 254.0	1.16 29.5
16 400	16.000 406.4	10.50 266.7	1.90 48.3
18 450	18.000 457.2	11.00 279.4	2.64 67.1
20 500	20.000 508.0	11.50 292.1	3.42 86.9
24 550	24.000 610.0	12.00 304.8	5.17 131.3



Series W715 AGS Dual-Disc Vic-Check® Valve

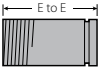
Size		"A" End-to-End Dimension
Nominal Size inches/mm	Actual Outside Diameter inches/mm	inches/mm
14 350	14.000 355.6	10.75 273.1
16 400	16.000 406.4	12.00 304.8
18 450	18.000 457.2	14.25 362.0
20 500	20.000 508.0	14.50 368.3
24 550	24.000 610.0	15.50 393.7



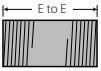
STANDARD GROOVED PIPE ACCESSORIES

Style 47-GT Grooved x Threaded Dielectric Waterway
Style 47-TT Threaded x Threaded Dielectric Waterway

Size		End-to-End Dimension
Nominal Size inches/mm	Actual Outside Diameter inches/mm	inches/mm
Grooved X Threaded		
1 25	1.315 33.7	4.00 101.6
1 ¼ 32	1.660 42.4	4.00 101.6
1 ½ 40	1.900 48.3	4.00 101.6
2 50	2.375 60.3	4.00 101.6
2 ½ 65	2.875 73.0	6.00 152.4
3 80	3.500 88.9	6.00 152.4
3 ½ 90	4.000 101.6	6.00 152.4
4 100	4.500 114.3	6.00 152.4
Threaded X Threaded		
½ 15	0.840 16.7	3.00 76.2
¾ 20	1.050 26.9	3.00 76.2
1 25	1.315 33.4	4.00 101.6
1 ¼ 32	1.660 42.2	4.00 101.6
1 ½ 40	1.900 48.3	4.00 101.6
2 50	2.375 60.3	4.00 101.6
2 ½ 65	2.875 73.0	6.00 152.4
3 80	3.500 88.9	6.00 152.4
3 ½ 90	4.000 101.6	6.00 152.4
4 100	4.500 114.3	6.00 152.4



Style 47-GT
Grooved X Threaded



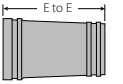
Style 47-TT
Threaded X Threaded

STANDARD GROOVED PIPE ACCESSORIES

Style 47-GG Grooved x Grooved Dielectric Waterway

(Grooved-End Steel to Grooved Copper Transition)

Size			End-to-End Dimension
Nominal Size inches/mm	Actual Outside Diameter inches/mm		
	Steel (IPS)	Copper (CTS)	inches/mm
2 50	2.375 60.3	2.125 54.0	4.19 106.4
2½ 65	2.875 73.0	2.625 66.7	6.19 157.2
3 80	3.500 88.9	3.125 79.4	6.19 157.2
4 100	4.500 114.3	4.125 104.8	6.19 157.2
5 125	5.563 141.3	5.125 130.2	6.19 157.2
6 150	6.625 168.3	6.125 155.6	6.19 157.2
8 200	8.625 219.1	8.125 206.4	6.19 157.2

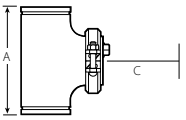


Style 47-GG Grooved X Grooved

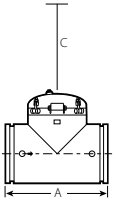
STANDARD GROOVED PIPE ACCESSORIES

Series 730 Vic-Strainer – Tee Type

Size		"A" End-to-End Dimension	"C" Basket Clearance Dimension
Nominal Size inches/mm	Actual Outside Diameter inches/mm	inches/mm	inches/mm
1 ½ 40	1.900 48.3	5.50 139.7	4.00 102
2 50	2.375 60.3	6.50 165.1	5.00 127
2½ 65	2.875 73.0	7.50 190.5	5.00 127
3 80	3.500 88.9	8.50 215.9	6.00 152
4 100	4.500 114.3	10.00 254.0	7.00 178
5 125	5.563 141.3	11.00 279.4	8.00 203
6 150	6.625 168.3	13.00 330.2	10.00 254
8 200	8.625 219.1	15.50 393.7	12.00 305
10 250	10.750 273.0	18.00 457.2	14.00 356
12 300	12.750 323.9	20.00 508.0	16.00 406
14 350	14.000 355.6	22.00 558.8	22.00 559
16 400	16.000 406.4	24.00 609.6	23.00 584
18 450	18.000 457.0	31.00 787.4	29.00 737
20 500	20.000 508.0	34.50 876.3	32.00 813
24 600	24.000 610.0	40.00 1016.0	37.00 940
30 750	30.000 762.0	50.00 1270.0	44.00 1118



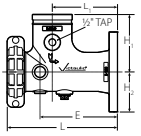
Typical 1½ – 12"/40 – 300 mm Sizes



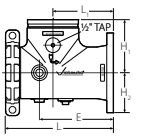
Typical 14 – 30"/350 – 750 mm Sizes

STANDARD GROOVED PIPE ACCESSORIES

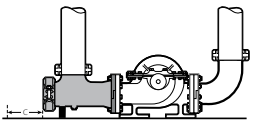
Series 731-G Suction Diffuser with ANSI Class 150 Flange



3 – 6"/
80 – 150 mm Sizes



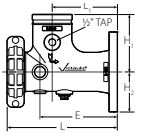
8 – 16"/
200 – 400 mm Sizes



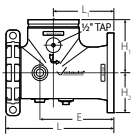
Size inches/mm			Dimensions – inches/mm					
System Side Grooved	X	Pump Side Flanged ANSI Class 150*	"L"	"L1"	"H1"	"H2"	"E"	"C" Minimum Basket Clearance inches/mm †
3 80	x	2 50	10.63 270.0	6.30 160.0	5.51 140.0	3.00 76.2	7.48 190.0	9.00 230
		2½ 65	10.63 270.0	6.30 160.0	5.51 140.0	3.50 88.9	7.48 190.0	9.00 230
		3 80	10.63 270.0	6.30 160.0	5.51 140.0	3.74 95.0	7.48 190.0	9.00 230
4 100	x	2½ 65	12.48 317.0	7.36 186.9	6.50 165.1	3.50 88.9	8.74 222.0	11.00 279
		3 80	12.48 317.0	7.36 186.9	6.50 165.1	3.74 95.0	8.74 222.0	11.00 279
		4 100	12.48 317.0	7.36 186.9	6.50 165.1	4.50 114.3	8.74 222.0	11.00 279
5 125	x	3 80	14.29 363.0	8.39 213.1	7.52 191.0	4.51 114.6	9.84 249.9	12.00 305
		4 100	14.29 363.0	8.39 213.1	7.52 191.0	4.51 114.6	9.84 249.9	12.00 305
		5 125	14.29 363.0	8.39 213.1	7.52 191.0	4.92 125.0	9.84 249.9	12.00 305
6 150	x	4 100	15.51 394.0	9.02 229.1	7.99 202.9	4.51 114.6	10.98 278.9	13.00 330
		5 125	15.51 394.0	9.02 229.1	7.99 202.9	4.92 125.0	10.98 278.9	13.00 330
		6 150	15.51 349.0	9.02 229.1	7.99 202.9	5.49 139.4	10.98 278.9	13.00 330
8 200	x	5 125	18.27 464.1	10.24 260.1	9.02 229.1	5.00 127.0	12.52 318.0	15.00 381
		6 150	18.27 464.1	10.24 260.1	9.02 229.1	5.49 139.4	12.52 318.0	15.00 381
		8 200	18.27 464.1	10.24 260.1	9.02 229.1	6.75 171.5	12.52 318.0	15.00 381
10 250	x	6 150	22.11 561.6	12.40 315.0	10.98 278.9	5.50 139.7	15.55 395.0	18.00 457
		8 200	22.11 561.6	12.40 315.0	10.98 278.9	6.75 171.5	15.55 395.0	18.00 457
		10 250	22.11 561.6	12.40 315.0	10.98 278.9	7.99 202.9	15.55 395.0	18.00 457

Refer to notes on the following page.

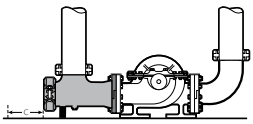
STANDARD GROOVED PIPE ACCESSORIES



3 – 6"/
80 – 150 mm Sizes



8 – 16"/
200 – 400 mm Sizes



Size inches/mm			Dimensions – inches/mm					
System Side Grooved	X	Pump Side Flanged ANSI Class 150*	"L"	"L1"	"H1"	"H2"	"E"	"C" Minimum Basket Clearance inches/mm †
12 300	x	8 200	26.30 668.0	15.43 391.9	13.19 335.0	6.75 171.5	18.58 471.9	21.00 533
		10 250	26.30 668.0	15.43 391.9	13.19 335.0	7.99 202.9	18.58 471.9	21.00 533
		12 300	26.30 668.0	15.43 391.9	13.19 355.0	9.70 246.4	18.58 471.9	21.00 533
14 350	x	10 250	28.62 726.9	16.14 410.0	14.37 365.0	7.99 202.9	21.25 539.8	23.00 584
		12 300	28.62 726.9	16.14 410.0	14.37 365.0	9.50 241.3	21.25 539.8	23.00 584
		14 350	28.62 726.9	16.14 410.0	14.37 365.0	10.50 266.7	21.25 539.8	23.00 584
16 400	x	12 300	33.03 839.0	19.57 497.1	15.87 403.1	9.50 241.3	25.16 639.1	27.00 686
		14 350	33.03 839.0	19.57 497.1	15.87 403.1	10.50 266.7	25.16 639.1	27.00 686
		16 400	33.03 839.0	19.57 497.1	15.87 403.1	11.75 298.5	25.16 639.1	27.00 686

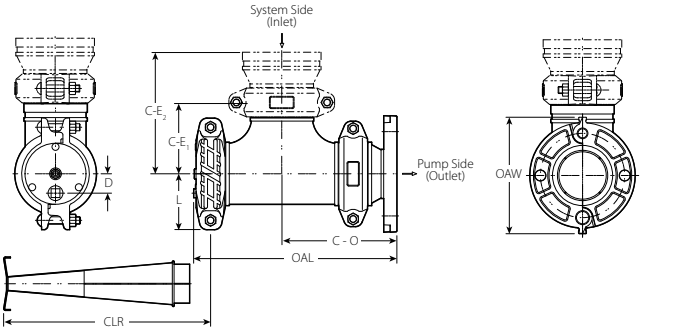
* For DIN and JIS dimensions, refer to Victaulic publication 09.14.

† The recommended clearances are equal to the minimum clearance, plus 2 inches/51 mm.

STANDARD GROOVED PIPE ACCESSORIES

Series 731-I Suction Diffuser

(Available Only in Europe)



Size			Dimensions millimeters/inches							
System Side (Inlet) mm/inches	X	Pump Side (Outlet)	C-E1	C-E2 ‡	CLR	C-O	D	L	OAL	OAW
76.1	x	60.3 2	—	173 681	305 12.0	173 6.81	26 1.01	84 3.32	311 12.25	171 6.75
88.9 3	x	60.3 2	108 4.25	—	3.05 12.0	173 6.81	26 1.01	84 3.32	311 12.25	171 6.75
		76.1	108 4.25	—	305 12.0	173 6.81	26 1.01	84 3.32	311 12.25	208 8.20
		88.9 3	—	207 8.13	356 14.0	207 8.13	34 1.34	101 3.97	368 14.50	211 8.29
114.3 4	x	60.3 2	—	186 7.31	305 12.0	173 6.81	26 1.01	84 3.32	311 12.25	171 6.75
		73 2½	—	186 7.31	305 12.0	173 6.81	26 1.01	84 3.32	311 12.25	200 7.87
		76.1	—	186 7.31	305 12.0	173 6.81	26 1.01	84 3.32	311 12.25	208 8.20
		88.9 3	127 5.00	—	356 14.0	207 8.13	34 1.34	101 3.97	368 14.50	211 8.29
		114.3 4	—	232 9.13	406 16.0	232 9.13	48 1.87	121 4.75	406 16.00	251 9.87
139.7	x	76.1	—	224 8.81	305 12.0	173 6.81	26 1.01	84 3.32	311 12.25	208 8.20
		88.9 3	—	245 9.63	356 14.0	207 8.13	34 1.34	101 3.97	368 14.50	211 8.29
		114.3 4	140 5.50	—	406 16.0	232 9.13	48 1.87	120 4.71	406 16.00	251 9.87
		139.7	—	270 10.63	457 18.0	257 10.13	60 2.36	133 5.25	457 18.00	274 10.78
141.3 5	x	73 2½	—	211 8.31	305 12.0	173 6.81	26 1.01	84 3.32	311 12.25	200 7.87
		88.9 3	—	219 8.63	356 14.0	207 8.13	34 1.34	101 3.97	368 14.50	211 8.29
		114.3 4	140 5.50	—	406 16.0	232 9.13	48 1.87	121 4.57	406 16.0	251 9.87
		141.3 5	—	270 10.63	475 18.0	270 10.63	60 2.36	133 5.25	470 18.50	277 10.90

Series 731-I Suction Diffuser

(Available Only in Europe)

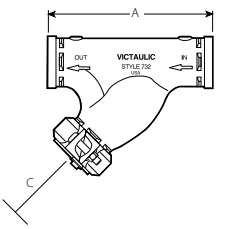
Size			Dimensions millimeters/inches							
System Side (Inlet) mm/inches	X	Pump Side (Outlet) mm/inches	C-E1	C-E2 ‡	CLR	C-O	D	L	OAL	OAW
168.3 6	x	88.9 3	—	232 9.13	356 14.0	207 8.13	34 1.34	101 3.97	368 14.50	211 8.29
		114.3 4	—	245 9.63	406 16.0	232 9.13	48 1.87	121 4.75	406 16.00	251 9.87
		139.7	165 6.50	—	475 18.0	270 10.63	60 2.36	133 5.25	470 18.50	274 10.78
		141.3 5	165 6.50	—	475 18.0	270 10.63	60 2.36	133 5.25	470 18.50	277 10.90
		168.3 6	—	327 12.88	559 22.0	327 12.88	83 3.27	168 6.60	565 22.25	302 11.90
219.1 8	x	114.3 4	—	270 10.63	406 16.0	232 9.13	48 1.87	146 5.75	406 16.00	251 9.87
		139.7	—	295 11.63	475 18.0	257 10.13	60 2.36	133 5.25	457 18.00	274 10.78
219.1 8	x	141.3 5	—	295 11.63	457 18.0	270 10.63	60 2.36	133 5.25	470 18.50	277 10.90
		168.3 6	197 7.75	—	559 22.0	327 12.88	83 3.27	168 6.60	565 22.25	302 11.90
		219.1 8	—	384 15.13	635 25.0	384 15.13	107 4.23	202 7.96	656 25.81	368 14.50
273.0 10	x	168.3 6	—	353 13.88	559 22.0	327 12.88	83 3.27	168 6.60	565 22.25	302 11.90
		219.1 8	229 9.00	—	635 25.0	384 15.13	107 4.23	202 7.96	656 25.81	368 14.50
		237.0 10	—	435 17.13	711 28.0	435 17.13	135 5.32	227 8.93	737 29.00	432 17.00
323.9 12	x	219.1 8	—	410 16.13	635 25.0	384 15.13	107 4.23	202 7.96	656 25.81	368 14.50
		273.0 10	254 10.00	—	711 28.0	435 17.13	135 5.32	227 8.93	737 29.00	432 17.00
		323.9 12	—	765 30.13	889 35.0	613 24.13	152 5.98	248 9.77	946 37.25	508 20.00
355.6 14	x	273.0 10	—	740 29.13	711 28.0	435 17.13	135 5.32	227 8.93	737 29.00	432 17.00
		323.9 12	279 11.00	—	889 35.0	613 24.13	152 5.98	248 9.77	946 37.25	508 20.00
		355.6 14	—	816 32.13	991 39.0	664 26.13	177 6.98	275 10.81	1030 40.56	622 24.50

‡ Dimension applies only when the coupling and reducer are used on the inlet of the system side.

STANDARD GROOVED PIPE ACCESSORIES

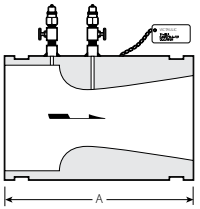
Series 732 Vic-Strainer – Wye Type

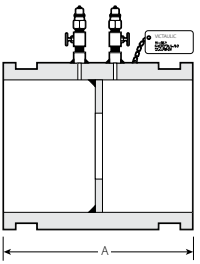
Size		"A" End-to-End Dimension	"C" Basket Clearance Dimension
Nominal Size inches/mm	Actual Outside Diameter inches/mm	inches/mm	inches/mm
2 50	2.375 60.3	9.75 247.7	8.00 203
2½ 65	2.875 73.0	10.75 273.1	9.00 229
3 80	3.500 88.9	11.75 298.5	10.00 254
4 100	4.500 114.3	14.25 362.0	12.00 305
139.7 mm	5.500 139.7	16.50 419.1	14.00 356
5 125	5.563 141.3	16.50 419.1	14.00 356
6 150	6.625 168.3	18.50 469.9	16.00 406
8 200	8.625 219.1	24.00 609.6	20.00 508
10 250	10.750 273.0	27.00 685.8	24.00 610
12 300	12.750 323.9	30.00 762.0	28.00 711



Style 733 Venturi Flow Metering Sensor
Style 734 Orifice/Indicator Flow Metering System

Size		"A" End-to-End Dimension inches/ mm	
Nominal Size inches/mm	Actual Outside Diameter inches/mm	Style 733	Style 734
2½ 65	2.875 73.0	—	3.50 88.9
2½L 65	2.875 73.0	4.63 117.6	—
2½H 65	2.875 73.0	4.00 101.6	—
3 80	3.500 88.9	—	3.50 88.9
3L 80	3.500 88.9	5.25 133.4	—
3H 80	3.500 88.9	4.25 108.0	—
4 100	4.500 114.3	—	3.63 92.2
4L 100	4.500 114.3	5.88 149.4	—
4H 100	4.500 114.3	5.38 136.7	—
5 125	5.563 141.3	5.00 127.0	4.25 108.0
6 150	6.625 168.3	6.00 152.4	4.25 108.0
8 200	8.625 219.1	7.00 177.8	4.75 120.7
10 250	10.750 273.0	8.00 203.2	5.00 127.0
12 300	12.750 323.9	12.00 304.8	5.00 127.0
14 350	14.000 355.6	14.00 355.6	5.38 136.7
16 400	16.000 406.4	26.00 660.4	5.38 136.7
18 450	18.000 457.0	29.00 736.6	5.50 139.7
20 500	20.000 508.0	32.00 812.8	6.19 157.2
24 600	24.000 610.0	39.00 990.6	7.19 182.6
30 750	30.000 762.0	48.00 1219.2	—





NOTE: "L" and "H" sizes apply to Style 733 Venturi Flow Metering Sensors.

Style 733 Threaded Venturi
Style 734 XT-M/F Threaded Orifice/Indicator
Style 734 XF-F/F Threaded Orifice/Indicator
Style 734 XS-M/F Sweated Orifice/Indicator

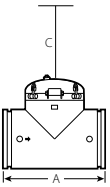
Size		Style 733 Threaded Venturi	Style 734 XT-M/F Threaded Orifice/ Indicator	Styel 734 XF-F/F Threaded Orifice/ Indicator	Style 734 XS-M/F Sweated Orifice/ Indicator
Nominal Size inches/mm	Actual Outside Diameter inches/mm	End-to-End Dimension – inches/mm			
½ 15	0.840 21.3	2.75 69.9	1.50 38.1	1.50 38.1	1.50 38.1
¾ 20	1.050 26.9	3.00 76.2	1.50 38.1	1.50 38.1	1.50 38.1
1 25	1.315 33.7	3.75 95.3	1.88 47.8	1.88 47.8	1.88 47.8
1 ¼ 32	1.660 42.4	4.00 * 101.6	2.75 69.9	2.75 69.9	—
1 ½ 40	1.900 48.3	4.25 * 108.0	2.75 69.9	2.75 69.9	—
2 50	2.375 60.3	5.00 * 127.0	3.25 82.6	3.25 82.6	—

* “L” size shown. “H” size 1¼ inches/32 mm = 3¾ inches/95.3 mm; 1½ and 2 inches/40 and 50 mm = 4¼ inches/108.0 mm.

GROOVED PIPE ACCESSORIES FOR THE AGS SYSTEM

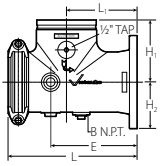
Series W730 AGS Vic-Strainer®

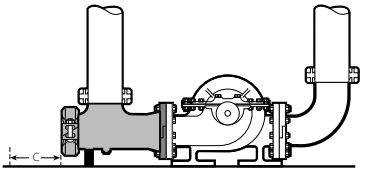
Size		"A" End-to-End Dimension	"C" Basket Clearance Dimension
Nominal Size inches/mm	Actual Outside Diameter inches/mm	inches/mm	inches/mm
14 350	14.000 355.6	22.00 558.8	22.00 558.8
16 400	16.000 406.4	24.00 609.6	23.00 584.2
18 450	18.000 457.2	31.00 787.4	29.00 736.6
20 500	20.000 508.0	34.50 876.3	32.00 812.8
24 550	24.000 610.0	40.00 1016.0	37.00 939.8



GROOVED PIPE ACCESSORIES FOR THE AGS SYSTEM

Series W731-G AGS Suction Diffuser with ANSI Class 150 Flange





Size Inches/mm			Dimensions – inches/mm					
System Side Grooved	X	Pump Side Flanged ANSI Class 150*	"L"	"L1"	"H1"	"H2"	"E"	"C" Minimum Basket Clearance inches/mm †
14 355.6	x	10 273.0	28.62 726.9	16.14 410.0	14.37 365.0	7.99 202.9	21.25 539.8	23.00 584.2
		12 323.9	28.62 726.9	16.14 410.0	14.37 365.0	9.50 241.3	21.25 539.8	23.00 584.2
		14 355.6	28.62 726.9	16.14 410.0	14.37 365.0	10.50 266.7	21.25 539.8	23.00 584.2
16 406.4	x	12 323.9	34.25 870.0	19.57 497.1	15.87 403.1	9.50 241.3	25.16 639.1	27.00 685.8
		14 355.6	34.25 870.0	19.57 497.1	15.87 403.1	10.50 266.7	25.16 639.1	27.00 685.8
		16 406.4	34.25 870.0	19.57 497.1	15.87 403.1	11.75 298.5	25.16 639.1	27.00 685.8
18 457.0	x	12 323.9	39.60 1005.8	18.70 475.0	17.25 438.2	9.50 241.3	27.60 701.0	29.00 736.6
		14 355.6	39.60 1005.8	18.70 475.0	17.25 438.2	10.50 266.7	27.60 701.0	29.00 736.6
		16 406.4	39.60 1005.8	18.70 475.0	17.25 438.2	11.75 298.5	27.60 701.0	29.00 736.6
		18 457.0	39.60 1005.8	18.70 475.0	17.25 438.2	12.50 317.5	27.60 701.0	29.00 736.6
20 508.0	x	20 508.0	45.00 1143.0	21.00 533.4	16.30 414.0	11.90 302.3	27.90 708.7	32.00 812.8
24 610.0	x	24 610.0	47.00 1193.8	26.50 673.1	18.70 475.0	13.80 350.5	35.00 889.0	39.00 990.6

* For DIN and JIS dimensions, refer to Victaulic publication 20.10.

† The recommended clearances are equal to the minimum clearance, plus 2 inches/51 mm.

Helpful Information

ENGLISH AND METRIC CONVERSION CHART

Convert US to Metric				Convert Metric to US		
25.4	X	inches (in)	=	millimeters (mm)	X	0.03937
0.3048	X	feet (ft)	=	meter (m)	X	3.281
0.4536	X	pounds (lbs)	=	kilograms (kg)	X	2.205
28.35	X	ounces (oz)	=	grams (g)	X	0.03527
6.894	X	pressure (psi)	=	kilopascals (kPa)	X	0.145
.069	X	pressure	=	Bar	X	14.5
4.45	X	end load (lbs)	=	Newtons (N)	X	0.2248
1.356	X	torque (ft-lbs)	=	Newton meters (N•m)	X	0.738
F – 32 ÷ 1.8		temperature (°F)	=	Celsius (°C)		C ÷ 17.78 X 1.8
745.7	X	horsepower (hp)	=	watts (W)	X	1.341 X 10^{-3}
3.785	X	gallons per minute (gpm)	=	liters per minute (l/m)	X	0.2642
3.7865	X	10^{-3} gallons per minute (gpm)	=	cubic meters per minute (m^3/m)	X	264.2

ANSI COMMERCIAL PIPE SIZES

Size		Nominal Wall – inches/mm						Thickness – inches/mm								
Nominal Size inches/mm	Actual Outside Diameter inches/mm	Sch. 5S	Sch. 10S	Sch. 10	Sch. 20	Sch. 30	Std.	Sch. 40	Sch. 60	Extra Heavy	Sch. 80	Sch. 100	Sch. 120	Sch. 140	Sch. 160	XX Heavy
⅛ 4	0.405 10.3	—	0.049 1.2	—	—	—	0.068 1.7	0.068 1.7	—	0.095 2.4	0.095 2.4	—	—	—	—	—
¼ 8	0.540 13.7	—	0.065 1.7	—	—	—	0.088 2.2	0.088 2.2	—	0.119 3.0	0.119 3.0	—	—	—	—	—
⅜ 10	0.675 17.1	—	0.065 1.7	—	—	—	0.091 2.3	0.091 2.3	—	0.126 3.2	0.126 3.2	—	—	—	—	—
½ 15	0.840 21.3	0.065 1.7	0.083 2.1	—	—	—	0.109 2.8	0.109 2.8	—	0.147 3.7	0.147 3.7	—	—	—	0.188 4.8	0.294 7.5
¾ 20	1.050 26.9	0.065 1.7	0.083 2.1	—	—	—	0.113 2.9	0.113 2.9	—	0.154 3.9	0.154 3.9	—	—	—	0.219 5.6	0.308 7.8
1 25	1.315 33.7	0.065 1.7	0.109 2.8	—	—	—	0.133 3.4	0.133 3.4	—	0.179 4.5	0.179 4.5	—	—	—	0.250 6.4	0.358 9.1
1 ¼ 32	1.660 42.4	0.065 1.7	0.109 2.8	—	—	—	0.140 3.6	0.140 3.6	—	0.191 4.9	0.191 4.9	—	—	—	0.250 6.4	0.382 9.7
1 ½ 40	1.900 48.3	0.065 1.7	0.109 2.8	—	—	—	0.145 3.7	0.145 3.7	—	0.200 5.1	0.200 5.1	—	—	—	0.281 7.1	0.400 10.2
2 50	2.375 60.3	0.065 1.7	0.109 2.8	—	—	—	0.154 3.9	0.154 3.9	—	0.218 5.5	0.218 5.5	—	—	—	0.344 8.7	0.436 11.1
2 ½ 65	2.875 73.0	0.083 2.1	0.120 3.0	—	—	—	0.203 5.2	0.203 5.2	—	0.276 7.0	0.276 7.0	—	—	—	0.375 9.5	0.552 14.0
3 80	3.500 88.9	0.083 2.1	0.120 3.0	—	—	—	0.216 5.5	0.216 5.5	—	0.300 7.6	0.300 7.6	—	—	—	0.438 11.1	0.600 15.2
3 ½ 90	4.000 101.6	0.083 2.1	0.120 3.0	—	—	—	0.226 5.7	0.226 5.7	—	0.318 8.1	0.318 8.1	—	—	—	—	—

ANSI COMMERCIAL PIPE SIZES

Size		Nominal Wall – inches/mm					Thickness – inches/mm							
Nominal Size inches/mm	Actual Outside Diameter inches/mm	Sch. 5S	Sch. 10S	Sch. 10	Sch. 20	Sch. 30	Std.	Sch. 40	Sch. 60	Extra Heavy	Sch. 80	Sch. 100	Sch. 120	Sch. 140	Sch. 160	XX Heavy
4 100	4.500 114.3	0.083 2.1	0.120 3.0	—	—	—	0.237 6.0	0.237 6.0	—	0.337 8.6	0.337 8.6	—	0.438 11.1	—	0.531 13.5	0.674 17.1
5 125	5.563 141.3	0.109 2.8	0.134 3.4	—	—	—	0.258 6.6	0.258 6.6	—	0.375 9.5	0.375 9.5	—	0.500 12.7	—	0.625 15.9	0.750 19.1
6 150	6.625 168.3	0.109 2.8	0.134 3.4	—	—	—	0.280 7.1	0.280 7.1	—	0.432 11.0	0.432 11.0	—	0.562 14.3	—	0.719 18.3	0.864 21.9
8 200	8.625 219.1	0.109 2.8	0.148 3.8	—	0.250 6.4	0.277 7.0	0.322 8.2	0.322 8.2	0.406 10.3	0.500 12.7	0.500 12.7	0.594 15.1	0.719 18.3	0.812 20.6	0.906 23.0	0.875 22.2
10 250	10.750 273.0	0.134 3.4	0.165 4.2	—	0.250 6.4	0.307 7.8	0.365 9.3	0.365 9.3	0.500 12.7	0.500 12.7	0.594 15.1	0.719 18.3	0.844 21.4	1.000 25.4	1.125 28.6	1.000 25.4
12 300	12.750 323.9	0.156 4.0	0.180 4.6	—	0.250 6.4	0.330 8.4	0.375 9.5	0.406 10.3	0.562 14.3	0.500 12.7	0.688 17.5	0.844 21.4	1.000 25.4	1.125 28.6	1.312 33.3	1.000 25.4
14 OD	14.000 355.6	0.156 4.0	0.188 4.8	0.250 6.4	0.312 7.9	0.375 9.5	0.375 9.5	0.438 11.1	0.594 15.1	0.500 12.7	0.688 17.5	0.938 23.8	1.094 27.8	1.250 31.8	1.406 35.7	—
16 OD	16.000 406.4	0.165 4.2	0.188 4.8	0.250 6.4	0.312 7.9	0.375 9.5	0.375 9.5	0.500 12.7	0.656 16.7	0.500 12.7	0.750 19.1	1.031 26.2	1.219 31.0	1.438 36.5	1.594 40.5	—
18 OD	18.000 457.0	0.165 4.2	0.188 4.8	0.250 6.4	0.312 7.9	0.438 11.1	0.375 9.5	0.562 14.3	0.750 19.1	0.500 12.7	0.844 21.4	1.156 29.4	1.375 34.9	1.562 39.7	1.781 45.2	—
20 OD	20.000 508.0	0.188 4.8	0.218 5.5	0.250 6.4	0.375 9.5	0.500 12.7	0.375 9.5	0.594 15.1	0.812 20.6	0.500 12.7	0.938 23.8	1.281 32.5	1.500 38.1	1.750 44.5	1.969 50.0	—
22 OD	22.000 559.0	0.188 4.8	0.218 5.5	0.250 6.4	0.375 9.5	0.500 12.7	0.375 9.5	—	0.875 22.2	0.500 12.7	1.031 26.2	1.375 34.9	1.625 41.3	1.875 47.6	2.125 54.0	—
24 OD	24.000 610.0	0.218 5.5	0.250 6.4	0.250 6.4	0.375 9.5	0.562 14.3	0.375 9.5	0.688 17.5	0.969 24.6	0.500 12.7	1.125 28.6	1.531 38.9	1.812 46.0	2.062 52.4	2.344 59.5	—

ANSI COMMERCIAL PIPE SIZES

Size		Nominal Wall – inches/mm						Thickness – inches/mm							
Nominal Size inches/mm	Actual Outside Diameter inches/mm	Sch. 5S	Sch. 10S	Sch. 10	Sch. 20	Sch. 30	Std.	Sch. 40	Sch. 60	Extra Heavy	Sch. 80	Sch. 100	Sch. 120	Sch. 140	Sch. 160	XX Heavy
26 OD	26.000 660.4	—	—	0.312 7.9	0.500 12.7	—	0.375 9.5	—	—	0.500 12.7	1.218 30.9	—	—	—	—	—
28 OD	28.000 711.0	—	—	0.312 7.9	0.500 12.7	0.625 15.9	0.375 9.5	—	—	0.500 12.7	—	—	—	—	—	—
30 OD	30.000 762.0	0.250 6.4	0.312 7.9	0.312 7.9	0.500 12.7	0.625 15.9	0.375 9.5	—	—	0.500 12.7	—	—	—	—	—	—
32 OD	32.000 813.0	—	—	0.312 7.9	0.500 12.7	0.625 15.9	0.375 9.5	0.688 17.5	—	0.500 12.7	—	—	—	—	—	—
34 OD	34.000 863.6	—	—	0.312 7.9	0.500 12.7	0.625 15.9	0.375 9.5	0.688 17.5	—	0.500 12.7	—	—	—	—	—	—
36 OD	36.000 914.0	—	—	0.312 7.9	0.500 12.7	0.625 15.9	0.375 9.5	0.750 19.1	—	0.500 12.7	—	—	—	—	—	—
42 OD	42.000 1067.0	—	—	—	0.375 9.5	—	—	—	—	0.500 12.7	—	—	—	—	—	—

DECIMAL EQUIVALENTS OF FRACTIONS

Fraction in inches	Decimal Equivalent inches	Decimal Equivalent millimeters
1/64	0.016	0.397
1/32	0.031	0.794
3/64	0.047	1.191
1/16	0.063	1.588
5/64	0.781	1.984
3/32	0.094	2.381
7/64	0.109	2.778
1/8	0.125	3.175
9/64	0.141	3.572
5/32	0.156	3.969
11/64	0.172	4.366
3/16	0.188	4.763
13/64	0.203	5.159
7/32	0.219	5.556
15/64	0.234	5.953
1/4	0.250	6.350
17/64	0.266	6.747
9/32	0.281	7.144
19/64	0.297	7.541
5/16	0.313	7.938
21/64	0.328	8.334
1/3	0.333	8.467
11/32	0.344	8.731
23/64	0.359	9.128
3/8	0.375	9.525
25/64	0.391	9.922
13/32	0.406	10.319
27/64	0.422	10.716
7/16	0.438	11.113
29/64	0.453	11.509
15/32	0.469	11.906
1/2	0.500	12.700

Fraction in inches	Decimal Equivalent inches	Decimal Equivalent millimeters
33/64	0.516	13.097
17/32	0.531	13.494
35/64	0.547	13.891
9/16	0.563	14.288
37/64	0.578	14.684
19/32	0.594	15.081
39/64	0.609	15.478
5/8	0.625	15.875
41/64	0.641	16.272
21/32	0.656	16.669
43/64	0.672	17.066
11/16	0.688	17.463
45/64	0.703	17.859
23/32	0.719	18.256
47/64	0.734	18.653
3/4	0.750	19.050
49/64	0.766	19.447
25/32	0.781	19.844
51/64	0.797	20.241
13/16	0.813	20.638
53/64	0.828	21.034
27/32	0.844	21.431
55/64	0.859	21.828
7/8	0.875	22.225
57/64	0.891	22.622
29/32	0.906	23.019
59/64	0.922	23.416
15/16	0.938	23.813
61/64	0.953	24.209
31/32	0.969	24.606
63/64	0.984	25.003
1	1.000	25.400

MINUTES CONVERTED TO DECIMALS OF A DEGREE

Min.	Deg.
1	.0166
2	.0333
3	.0500
4	.0666
5	.0833
6	.1000
7	.1166
8	.1333
9	.1500
10	.1666
11	.1833
12	.2000
13	.2166
14	.2333
15	.2500

Min.	Deg.
16	.2666
17	.2833
18	.3000
19	.3166
20	.3333
21	.3500
22	.3666
23	.3833
24	.4000
25	.4166
31	.5166
32	.5333
33	.5500
34	.5666
35	.5833

Min.	Deg.
26	.4333
27	.4500
28	.4666
29	.4833
30	.5000
41	.6833
42	.7000
43	.7166
44	.7333
45	.7500
46	.7666
47	.7833
48	.8000
49	.8166
50	.8333

Min.	Deg.
36	.6000
37	.6166
38	.6333
39	.6500
40	.6666
51	.8500
52	.8666
53	.8833
54	.9000
55	.9166
56	.9333
57	.9500
58	.9666
59	.9833
60	1.0000

WATER PRESSURE TO FEET-OF-HEAD

Pounds Per Square Inch	Feet of Head
1	2.31
2	4.62
3	6.93
4	9.24
5	11.54
6	13.85
7	16.16
8	18.47
9	20.78
10	23.09
15	34.63
20	46.18
25	57.72
30	69.27
40	92.36
50	115.45
60	138.54
70	161.63
80	184.72
90	207.81

Pounds Per Square Inch	Feet of Head
100	230.90
110	253.93
120	277.07
130	300.16
140	323.25
150	346.34
160	369.43
170	392.52
180	415.61
200	461.78
250	577.24
300	692.69
350	808.13
400	922.58
500	1154.48
600	1385.39
700	1616.30
800	1847.20
900	2078.10
1000	2309.00

FEET-OF-HEAD OF WATER TO PRESSURE

Feet of Head	Pounds Per Square Inch
1	0.43
2	0.87
3	1.30
4	1.73
5	2.17
6	2.60
7	3.03
8	3.46
9	3.90
10	4.33
15	6.50
20	8.66
25	10.83
30	12.99
40	17.32
50	21.65
60	25.99
70	30.32
80	34.65
90	39.98

Feet of Head	Pounds Per Square Inch
100	43.31
110	47.64
120	51.97
130	56.30
140	60.63
150	64.96
160	69.29
170	76.63
180	77.96
200	86.62
250	108.27
300	129.93
350	151.58
400	173.24
500	216.55
600	259.85
700	303.16
800	346.47
900	389.78
1000	433.00

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