

F09 Quick Install Rigid Coupling Installation Instructions

WARNING AVERTISSEMENT

- **Always read this installation manual before installing any product. To view all pipe end preparation, groove dimension, bolt and nut, socket size, rubber gasket, hanger, and other technical information please refer to our general installation instructions and general catalog. To avoid serious personal injury, wear safety glasses, hard hat, and foot protection. Designers must know and understand all relevant building and/or piping standards, codes, and other specifications. It is the responsibility of the designer to select and/or specify the appropriate products for the intended use and service.**
Lisez toujours ce manuel d'installation avant d'installer un produit. Pour voir toutes les préparations d'extrémité de tuyau, la dimension de la rainure, le boulon et l'écrou, la taille de la douille, le joint en caoutchouc, le support et d'autres informations techniques, veuillez vous référer à nos instructions d'installation générales et à notre catalogue général. Pour éviter des blessures graves, portez des lunettes de sécurité, un casque et des chaussures de protection. Les concepteurs doivent connaître et comprendre toutes les normes, codes et autres spécifications de construction et/ou de tuyauterie pertinents. Il est de la responsabilité du concepteur de sélectionner et/ou de spécifier les produits appropriés pour l'utilisation et le service prévus.
- **The pipe groove dimensions must be in accordance with applicable Cut Groove or Roll Groove specifications. Please see #2 below under INSTRUCTIONS FOR THE INITIAL INSTALLATION OF F09 COUPLINGS for more details.**
Les dimensions de la rainure du tuyau doivent être conformes aux spécifications Cut Groove ou Roll Groove. Veuillez consulter le point 2 ci-dessous sous INSTRUCTIONS FOR THE INITIAL INSTALLATION OF F09 COUPLINGS pour plus de détails.
- **Always refer to the maximum pressure rating and range of service temperatures allowed for the F09 and ensure that they are used within these limitations.**
Reportez-vous toujours à la pression nominale maximale et à la plage de températures de service autorisées pour le F09 et assurez-vous qu'elles sont utilisées dans ces limites.
- **Always depressurize and drain the piping system before attempting disassembly, adjustment, or removal of any piping component. Failure to do so may result in serious personal injury.**
Toujours dépressuriser et vidanger le système de tuyauterie avant de tenter le démontage, le réglage ou le retrait de tout composant de tuyauterie. Le non-respect de cette consigne peut entraîner des blessures graves.
- **Torque values are supplied as a guideline and may be used when setting the torque on power impact wrenches. Always refer to the power impact wrench manufacturer's instructions for settings. Exceeding the suggested torque values may cause damage to the coupling and/or result in pipe-joint failure.**
Les valeurs de couple sont fournies à titre indicatif et peuvent être utilisées lors du réglage du couple sur les clés à chocs électriques. Reportez-vous toujours aux instructions du fabricant de la clé à chocs électrique pour les réglages. Le dépassement des valeurs de couple suggérées peut endommager le raccord et/ou entraîner une défaillance du joint de tuyau.
- **If couplings are accidentally dropped during the installation process, the support barrier ring may be crooked; please be cautious when installing.**
Si les accouplements tombent accidentellement pendant le processus d'installation, l'anneau de barrière de support peut être tordu ; soyez prudents lors de l'installation.

All information and data contained herein supersedes all previous published data. Shurjoint reserves the right to change product designs and/or specifications without notice and/or obligation.

Toutes les informations et données contenues dans ce document remplacent toutes les données publiées antérieurement. Shurjoint se réserve le droit de modifier la conception et/ou les spécifications des produits sans préavis et/ou obligation.

INSTRUCTIONS FOR THE INITIAL INSTALLATION OF F09 COUPLINGS



1. **DO NOT DISASSEMBLE:** F09 Quick Install Rigid Couplings are a "Quick Install Coupling" (QIC). They should not be disassembled prior to installation. The Quick Install Coupling is designed to allow the installer to directly place the coupling onto the grooved pipe end or fitting. *The housings are held open by a support barrier ring (304 SS component). The ring sits between the rubber gasket and the ductile iron housings and is not to be tampered with during installation.*



2. INSPECT PIPE ENDS: The exterior surface of the pipe ends must be free from any indentations, projections, roll marks or other harmful surface defects such as loose paint, scale, dirt, chips, grease, and rust.

The pipe ends' outside diameter ("OD"), groove dimensions, and maximum allowable flare diameter must be within the tolerances stated in the [Shurjoint General Catalog, pages 187 – 190](#), following AWWA C606-15, UL 213, and ISO/FDIS 6182-12. These are also published in the [Shurjoint Grooved, Plain End, and Hole-Cut Piping Instruction Manual \(pages 8 – 29\)](#). We have included pipe end dimensions relevant to the F09 further below.



3. CHECK GASKET: Verify the gasket supplied is correct for the intended service. Gasket material is identified by a single or multi-stripe color code located on the sealing lip. The standard E2-A gasket is identified by one violet stripe.

CAUTION ATTENTION

- The Shurjoint F09 Quick Install Rigid Coupling is supplied with a pre-lubricated, powder lube gasket. In applications with the following conditions, a thin coat of Shurjoint lubricant should be applied to the gasket lips to aid in coupling installation. Only apply a thin coat; do not apply an excessive lubricant amount to the gasket sealing area. Other compatible lubricants may be used so long as they are not harmful to the gasket and are suitable for the intended application. The gasket does not need to be removed for lubrication.

Le raccord rigide à installation rapide Shurjoint F09 est fourni avec un joint de lubrification en poudre prélubrifié. Dans les applications présentant les conditions suivantes, une fine couche de lubrifiant Shurjoint doit être appliquée sur les lèvres du joint pour faciliter l'installation de l'accouplement. NE PAS utiliser de lubrifiant excessif sur les lèvres d'étanchéité du joint. D'autres lubrifiants compatibles peuvent être utilisés tant qu'ils ne sont pas nocifs pour le joint et adaptés à l'application prévue. Le joint n'a pas besoin d'être retiré pour la lubrification.

Failure to use a compatible lubricant for EPDM rubber materials may cause gasket damage, resulting in joint leakage and property damage.

La non-utilisation d'un lubrifiant compatible avec les matériaux en caoutchouc EPDM peut endommager le joint, entraînant des fuites au niveau du joint et des dommages matériels.

CONDITIONS REQUIRING LUBRICATION / CONDITIONS NECESSITANT UNE LUBRIFICATION

Apply a thin coat of a compatible lubricant to the gasket sealing lips when installing in applications where any of the following occur:

Appliquez une fine couche d'un lubrifiant compatible sur les lèvres d'étanchéité du joint lors de l'installation dans des applications où l'un des cas suivants se produit :

- installation or working temperature is below 0°F/-18°C / *la température d'installation ou de fonctionnement est inférieure à 0°F/-18°C*
- The gasket has been exposed to liquids before installation / *Le joint a été exposé à des liquides avant l'installation*
- The application is a dry pipe system / *L'application est un système de conduite sèche*
- The systems' post installation test uses air media to test instead of water media / *Le test post-installation des systèmes utilise un média d'air pour tester au lieu d'un média d'eau*

WARNING AVERTISSEMENT

- Once engaging the Shurjoint F09 coupling onto pipe ends, immediately install the coupling by tightening the bolts and nuts to close the coupling over the pipe until the bolt pads make metal to metal contact / *Une fois l'accouplement Shurjoint F09 engagé sur les extrémités du tuyau, installez immédiatement l'accouplement en serrant les boulons et les écrous pour fermer l'accouplement sur le tuyau jusqu'à ce que les coussinets des boulons entrent en contact métal sur métal*
- Keep hands away from coupling openings during tightening. / *Gardez les mains éloignées des ouvertures d'accouplement pendant le serrage.*



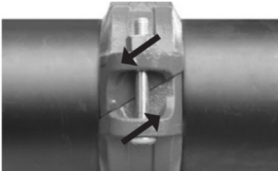
4. **INSTALL COUPLING:** Install the coupling on to the grooved pipe end or fitting. Align the center axis of the gasket with the grooved fitting and apply even pressure on the coupling until the gasket is seated onto the pipe/ fitting. Install the other mating pipe end into the coupling. The gasket is designed with a center leg that will stop the coupling when fully seated onto the pipe/fitting. Visually check to make sure the coupling keys are aligned with the grooves in the pipes/fittings. To ensure the gasket lip is seated in the right location, its recommended to rotate the coupling slightly over the pipe/fitting. Use deep-well sockets with impact tools or standard socket wrenches when tightening the bolt and nut to reach into metal-to-metal contact at the bolt pad areas. Refer to max bolt torque information stated in the Shurjoint general catalog and installation instructions.

WARNING
AVERTISSEMENT

- **Tighten nuts alternately and equally maintaining nearly equal bolt pad gaps until the bolt pads meet and make metal-to-metal contact. / Serrez les écrous alternativement et de manière égale en maintenant des espaces entre les patins de boulons presque égaux jusqu'à ce que les patins de boulons se rencontrent et entrent en contact métal sur métal.**
- **Failure to tighten nuts alternately and equally as stated above can cause increased loading of the ductile iron coupling housings, which can result in the following. All of the below can lead to joint failure, leakage, injury, and/or property damage. / Le fait de ne pas serrer les écrous alternativement et de manière égale comme indiqué ci-dessus peut entraîner une augmentation de la charge des boîtiers d'accouplement en fonte ductile, ce qui peut avoir les conséquences suivantes. Tous les éléments ci-dessous peuvent entraîner une défaillance du joint, des fuites, des blessures et/ou des dommages matériels.**
 - **Excessive bolt torque required to assemble the joint / Couple de boulon excessif requis pour assembler le joint**
 - **Compromised housing bolt pads / Coussinets de boulons de logement compromis**
 - **Compromised bolt integrity possibly due to over torquing / Intégrité du boulon compromise, probablement en raison d'un serrage excessif**

Do not continue to tighten the nuts after the visual, metal-to-metal bolt pad inspection requirement is achieved.

Ne pas continuer à serrer les écrous une fois que l'exigence d'inspection visuelle de la plaquette de boulon métal sur métal a été satisfaite.



5. **TIGHTEN NUTS:** Tighten the nuts evenly and alternating sides maintaining nearly equal bolt pad gaps until metal-to-metal contact occurs at the angled bolt pads.. Ensure that the oval neck of each bolt seats properly in the bolt holes prior to and after installation. As the coupling bolts are tightened, the angled bolt pads slide in opposite directions causing the coupling keys to tightly grip the pipe, while at the same time the pipe grooves are forced outward against the coupling keys. The bolt pads should always maintain metal-to-metal contact. The angled bolt pad ends should not have positive or negative offsets once reaching metal to metal contact. If you suspect that any hardware has been over-tightened by visible damage to any components, disassemble the Shurjoint F09 immediately and replace with a new F09 coupling.

WARNING
AVERTISSEMENT

- inspect each joint to ensure there is no pinching, binding, bolt pad gaps, bolt pad offsets, key misalignment with grooves, bolt misplacement or other unusual placement which could lead to failure. / *Inspectez visuellement chaque joint pour vous assurer qu'il n'y a pas de pincement, de grippage, d'espace entre les coussinets de boulons, de décalages de coussinets de boulons, de désalignement de la clé avec les rainures, de mauvais placement des boulons ou de tout autre placement inhabituel qui pourrait entraîner une défaillance.*
- Improperly assembled joints shall be disassembled and reassembled correctly before the system is filled, tested, or placed into service. / *Les joints mal assemblés doivent être corrigés avant que le système ne soit rempli, testé ou mis en service.*
- Any components that exhibit physical damage due to improper assembly shall be replaced before the system is filled, tested, or placed into service. / *Tous les composants qui présentent des dommages physiques dus à un assemblage incorrect doivent être remplacés avant que le système ne soit rempli, testé ou mis en service.*

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

Le non-respect de ces instructions peut entraîner une défaillance du joint, entraînant la mort ou des blessures graves et des dommages matériels.

BOLT & NUT INFORMATION

Nominal Pipe Size Inch/DN	Pipe OD In/mm	Nut Size UNC/ISO	Socket Size In/mm	Max. allowable torque
1-¼ - 4 DN32 - DN100	1.660 - 4.500 42.4 - 114.3	3/8 M10	11/16 17	30-45 Lbs-Ft 40-61 Nm



The F09 bolts are supplied with a torque resistant adhesive strategically placed to assist and provide the installer with touch feedback, while equally and alternately tightening the nuts.

The installer will be able to notice slight resistance when the nut makes contact with the adhesive, which will slow the speed at which the bolt pads will make metal-to-metal contact.

INSTRUCTIONS FOR REASSEMBLY OF F09 COUPLINGS

WARNING
AVERTISSEMENT

➤ **Always depressurize and drain the piping system before attempting disassembly, adjustment, or removal of any piping component. Failure to do so may result in serious personal injury. / Toujours dépressuriser et vidanger le système de tuyauterie avant de tenter le démontage, le réglage ou le retrait de tout composant de tuyauterie. Le non-respect de cette consigne peut entraîner des blessures graves.**

NOTICE

➤ **After initial disassembly, the gasket and housings can be assembled onto the mating component ends by following steps below. The support barrier ring should be removed and discarded.**

Follow these steps:

1. Verify that the system has been depressurized and drained completely.
2. Loosen the nuts of the coupling assembly to result in gaps between the F09 bolt pads. Once loosened enough so that the F09 keys can be removed over the pipe or fitting OD, remove the coupling from the mating components.
3. Remove the nuts, bolts, and gasket from the housings. *Also remove and discard the support barrier ring (304 SS ring component which holds open the housings prior to the initial install).* Inspect all components for any damage or wear. If any damage or wear is present, use a new Shurjoint-supplied coupling assembly.
4. Check mating component ends, as described on page 1.



5. Lubricate gasket: To help insert pipe smoothly and mount couplings smoothly without pinching, apply a thin layer of Shurjoint Lubricant to the sealing lips of the gasket and as well as to the exterior of the gasket. Other compatible lubricants may be used so long as they are not harmful to the gasket. Best piping practices call for a new gasket to be used during reassembly.



6. Install the gasket over one end of the pipe. The gasket center leg will be allowed to mate against the pipe end. Then bring the pipe ends together against the



7. Install the couplings halves over the gasket. *Do not attempt to reinstall the support barrier ring (304 SS ring component); please discard this component during reinstall.* For a "swing-over" installation, place one of the coupling halves around the bottom side of the gasket and swing over the other coupling half into position over the top side of the gasket. In tight areas where a swing-over is not possible, install the coupling halves one at a time. In both cases, make sure the coupling keys are engaged into the grooves.



8. Insert bolt & nut: Insert the bolts and nuts and apply the nut hand-tight. Make sure that the oval neck of the bolt engages into the bolt hole of the housing.



9. Tighten nuts: Tighten nuts alternately and equally until the bolt pads meet and make metal-to-metal contact. Tighten nuts by another one quarter to one half turn to make sure the bolts and nuts are snug and secure. The use of a torque wrench is not required

Pipe End Preparation

Check pipe O.D.

Check to ensure that the pipe to be prepared has the proper O.D. and wall thickness for the intended service.

While *Shurjoint* fittings are normally identified by the nominal size, always check the actual O.D. of the pipe and fittings to be connected, as in some markets it is customary to refer to different O.D. pipes with the same nominal size.

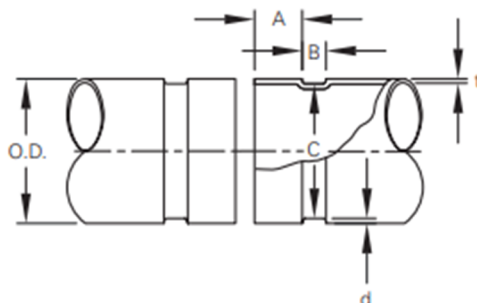
Sizes - Inches		Sizes - Millimeters	
Nominal Size	Actual Size	Nominal Size	Actual Size
1 ¼	1.660	32	42.2
1 ½	1.900	40	48.3
2	2.375	50	60.3
2 ½	2.875	65	73.0
76.1	3.000	76.1	76.1
3	3.500	80	88.9
4	4.500	100	114.3

Roll & Cut-Grooving Applications		
Pipe Materials	Roll Groove	Cut Groove
Carbon Steel Pipe	Sch 40, 10, ISO 4200 & MF, EF, FF	Sch 40 & ISO 4200

*For pressure ratings, listings, and approval information, check the applicable approval agency online listings to confirm which pipes are approved with the F09 coupling.

Groove Dimensions

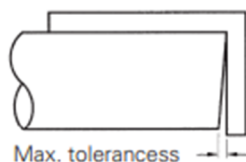
General Notes for Roll Groove Dimensions



Standard Roll Groove

Nominal Size: *Shurjoint* couplings and fittings are identified by the nominal IPS pipe size in inches or nominal outside diameter of pipe in millimeters

O.D.: Pipe ends must be square cut. The maximum allowable tolerances from square ends is 0.03" (0.8 mm) for sizes up to 3½", 0.045" (1.2 mm) for 4" thru 6" and 0.060" (1.6 mm) for sizes 8" and above.



Gasket Seating Surface ("A" Dimension): The exterior surface of the gasket seating area shall be free from any indentations, projections, roll marks or other harmful surface defects such as loose paint, scale, dirt, chips, grease and rust.

Groove Width ("B" Dimension): is to be measured between vertical flanks of the groove side walls, and is determined by the width of the upper roller as it is pressed into the pipe. Visually inspect the pipe groove to insure the groove has well defined edges for the coupling keys to engage properly. If they appear to be rounded with little or no vertical lip, they should be replaced as this could lead to reduced product performance or joint failure.

Groove Diameter (“C” Dimension): are given in the tables on the following page. These should be inspected for dimensional accuracy to insure proper product performance of the couplings, to the required systems pressures. The groove diameters are average values. The groove must be of uniform depth around the entire pipe circumference.

Minimum Wall Thickness (“t” Dimension): The “t” is the minimum allowable wall thickness that may be roll-grooved.

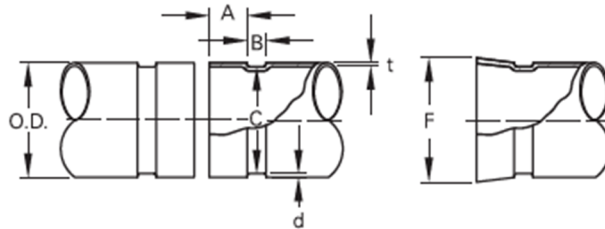
Groove Depth (“d” Dimension): The values listed in the Groove Specification tables are for reference only.

Flare Diameter (“F” Dimension): The pipe end that may flare when roll grooved shall measure within this limit when measured at the extreme end of the pipe.

Roll Grooving Dimensions for Sch. 40, 10, ISO 4200 & MF, EF, FF Pipe

Nominal Size in / mm	Pipe O.D.			A ±0.030 / ±0.76 in / mm	B ±0.030 / ±0.76 in / mm
	Basic in / mm	Tolerance			
		in / mm	in / mm		
1 ¼	1.660	+0.016	-0.016	0.625	0.281
32	42.2	+0.41	-0.41	15.88	7.14
1 ½	1.900	+0.019	-0.019	0.625	0.281
40	48.3	+0.48	-0.48	15.88	7.14
2	2.375	+0.024	-0.024	0.625	0.344
50	60.3	+0.61	-0.61	15.88	8.74
2 ½	2.875	+0.029	-0.029	0.625	0.344
65	73.0	+0.74	-0.74	15.88	8.74
76.1	3.000	+0.030	-0.030	0.625	0.344
	76.1	+0.76	-0.76	15.88	8.74
3	3.500	+0.035	-0.031	0.625	0.344
80	88.9	+0.89	-0.79	15.88	8.74
4	4.500	+0.040	-0.031	0.625	0.344
100	114.3	+1.02	-0.79	15.88	8.74

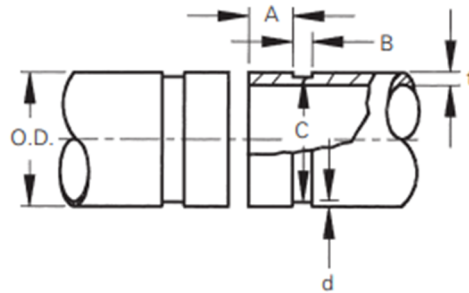
C +0.000 / +0.00 in / mm	T Min. Wall in / mm	d Groove Depth (ref.) in / mm	F Max. Allowed Flare Dia. in / mm	Nominal Size in / mm
1.535-0.015	0.065	0.063	1.77	1 ¼
38.99-0.38	1.65	1.60	44.96	32
1.775-0.015	0.065	0.063	2.01	1 ½
45.09-0.38	1.65	1.60	51.05	40
2.250-0.015	0.065	0.063	2.48	2
57.15-0.38	1.65	1.60	62.99	50
2.720-0.018	0.083	0.078	2.98	2 ½
69.09-0.46	2.11	1.98	75.69	65
2.844-0.018	0.090	0.075	3.10	76.1
72.24-0.46	2.30	1.93	78.74	
3.344-0.018	0.083	0.078	3.60	3
84.94-0.46	2.11	1.98	91.44	80
4.334-0.020	0.083	0.083	4.60	4
110.08-0.51	2.11	2.11	116.84	100



For applications requiring strict adherence to AWWA C606-15 only, roll groove to the below specifications.

Nominal Pipe Size	Pipe OD <i>in. / mm</i>		A	B	C Groove Diameter (+0.0)	
in.	in.		+0.015 -0.030	+0.030 -0.015	in.	
mm	mm		+0.38 -0.76	+0.76 -0.38	mm	
1¼	1.660	±0.016	0.625	0.281	1.535	-0.015
32	42.2	±0.41	15.88	7.14	39.0	-0.4
1½	1.900	±0.019	0.625	0.281	1.775	-0.015
40	48.3	±0.48	15.88	7.14	45.1	-0.4
2	2.375	±0.024	0.625	0.344	2.250	-0.015
50	60.3	±0.61	15.88	8.74	57.2	-0.4
2½	2.875	±0.029	0.625	0.344	2.720	-0.015
65	73.0	±0.74	15.88	8.74	69.1	-0.4
3	3.500	+0.035 -0.031	0.625	0.344	3.344	-0.015
80	88.9	+0.89 -0.79	15.88	8.74	84.9	-0.4
4	4.500	+0.045 -0.031	0.625	0.344	4.334	-0.015
100	114.3	+1.14 -0.79	15.88	8.74	110.1	-0.4

General Notes for Cut Groove Dimensions



Standard Cut Groove

Nominal Size: *Shurjoint* couplings and fittings are identified by the nominal IPS pipe size in inches or nominal outside diameter of pipe in millimeters.

O.D.: Pipe ends must be square cut. The Maximum allowable tolerances from square of end is 0.03" (0.8 mm) for sizes up to 3½", 0.045" (1.2 mm) for 4" 0.060" (1.6 mm)



Gasket Seating Surface ("A" Dimension): The exterior surface of the gasket seating area shall be free from any indentations, projections, roll marks or other harmful surface defects such as loose paint, scale, dirt, chips, grease and rust.

Groove Width ("B" Dimension): The groove width is to be measured between vertical flanks of the groove side walls.

Groove Diameter ("C" Dimension): The groove diameters are average values. The groove must be of uniform depth around the entire pipe circumference.

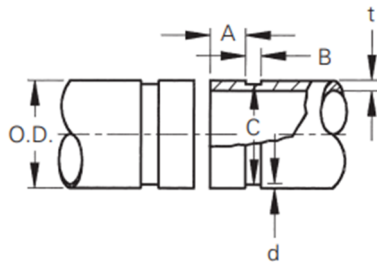
Minimum Wall Thickness ("t" Dimension): The "t" is the minimum allowable wall thickness that may be cut-grooved.

Groove Depth ("d" Dimension): The values listed in the Groove Specification tables are for reference only and a slightly deeper groove may be acceptable. However, a shallower groove is never acceptable as it may lead to joint failure.

Cut Grooving Dimensions for Sch 40 & ISO 4200

Nominal Size in / mm	Pipe O.D.			A ±0.031 / ±0.79 in / mm
	Basic in / mm	Tolerance		
		in / mm	in / mm	
1 ¼	1.660	+0.016	-0.016	0.625
32	42.2	+0.41	-0.41	15.88
1 ½	1.900	+0.019	-0.019	0.625
40	48.3	+0.48	-0.48	15.88
2	2.375	+0.024	-0.024	0.625
50	60.3	+0.61	-0.61	15.88
2 ½	2.875	+0.029	-0.029	0.625
65	73.0	+0.74	-0.74	15.88
76.1	3.000	+0.030	-0.030	0.625
	76.1	+0.76	-0.76	15.88
3	3.500	+0.035	-0.031	0.625
80	88.9	+0.89	-0.79	15.88
4	4.500	+0.045	-0.031	0.625
100	114.3	+1.14	-0.79	15.88

B ±0.031 / ±0.79 in / mm	C ±0.031 / ±0.79 in / mm	t Min. Wall in / mm	d Groove Depth (ref.) in / mm	Nominal Size in / mm
0.313	1.535-0.015	0.140	0.063	1 ¼
7.95	38.99-0.38	3.56	1.60	32
0.313	1.775-0.015	0.145	0.063	1 ½
7.95	45.09-0.38	3.68	1.60	40
0.313	2.250-0.015	0.154	0.063	2
7.95	57.15-0.38	3.91	1.60	50
0.313	2.720-0.018	0.188	0.078	2 ½
7.95	69.09-0.46	4.78	1.98	65
0.313	2.845-0.018	0.188	0.078	76.1
7.95	72.26-0.46	4.78	1.98	
0.313	3.344-0.018	0.188	0.078	3
7.95	84.94-0.46	4.78	1.98	80
0.375	4.334-0.020	0.203	0.083	4
9.53	110.08-0.51	5.16	2.11	100



For applications requiring strict adherence to AWWA C606-15 only, cut groove to the below specifications.

Nominal Pipe Size	Pipe OD <i>in. / mm</i>		A	B	C Groove Diameter (+0.0)	
in.	in.		+0.015 -0.030	+0.030 -0.015	in.	
mm	mm		+0.38 -0.76	+0.76 -0.38	mm	
1¼	1.660	±0.016	0.625	0.312	1.535	-0.015
32	42.2	±0.41	15.88	7.9	39.0	-0.4
1½	1.900	±0.019	0.625	0.312	1.775	-0.015
40	48.3	±0.48	15.88	7.9	45.1	-0.4
2	2.375	±0.024	0.625	0.312	2.250	-0.015
50	60.3	±0.61	15.88	7.9	57.2	-0.4
2½	2.875	±0.029	0.625	0.312	2.720	-0.015
65	73.0	±0.74	15.88	7.9	69.1	-0.4
3	3.500	+0.035 -0.031	0.625	0.312	3.344	-0.015
80	88.9	+0.89 -0.79	15.88	7.9	84.9	-0.4
4	4.500	+0.045 -0.031	0.625	0.375	4.334	-0.015
100	114.3	+1.14 -0.79	15.88	9.5	110.1	-0.4