

JCM Industries, Inc.

Fittings & Fabrications for Repair - Connection - Branching All Types and Sizes of Pipe

JCM Industries, Inc.

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www.jcmindustries.com

JCM FLANGED COUPLING ADAPTERS

JCM Flange Coupling Adapters employ the mechanical compression joint principle to join a plain end piece of pipe to a flanged fitting. This stress receiving flexible joint eliminates precise cutting and fitting in the field while providing for deflection, limited expansion-contraction, pipe settlement and a quick easy means of disassembling the system for maintenance.



Flanged Adapters offer several advantages in a piping system:

- No beveling, costly threading, exact pipe alignment or fitting is required
- Make assembly/disassembly of flanged pipe apurtances fast.
- Quick, simple to install
- Gaskets absorb vibration and pipe movement
- Permits Imited expansion/contraction
- Simple, rugged and serviceable
- Available size on size and reducing designs
- Available in ductile iron, fabraicated steel and stainless steel materials
- Meets AWWA Standard C219 Bolted Sleeve-Type Couplings for Plain-End Pipe





Call Toll Free: 800-527-8482

Fax Toll Free: 800-874-9524

Email: sales@jcmindustries.com

JCM 301 Flanged Coupling Adapters

The Quick, Simple, Economical way to join flanged fittings, valves and meters to plain end pipe.

The JCM 301 Flanged Coupling Adapter combines a flange with a ductile iron flexible coupling to provide a compact adapter fitting to connect plain end pipe to flanged fittings, meters, valves and equipment. The JCM 301 can be used to make on-site flanged spools and, when used with the optional set screws, eliminates the need for extra tie rods or harnessing assemblies on flanged equipment.

Ductile Iron body and flange and corrosion resistant high strength alloy bolts provide high strength and corrosion resistance to installations.

Laying length provides extra margin of safety for field cutting of pipe, yet is short enough for close quarter installations.

Full bolting to compression flange provides proper gasket compression. Many adapters use half the number of the standard flange.

Special flange gasket provides extra sealing capability on new and old flanged fittings and equipment. The wide molded gasket has a special lip which increases its sealing pressure with increases in line pressure.

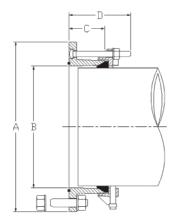
Optional retainer set screws anchor the adapter on steel, cast iron and ductile iron pipe eliminating the need for tie rods, thrust blocks and additional joint restraint. Retainer set screws are not exposed to the line contents and do not require drilling of pipe.

Special flange design provides extra versatility which makes it an excellent means for installing wafer type valves, fittings and equipment.

Special wide range gaskets, which are interchangeable with JCM Ductile Iron Couplings, provide extra field versatility necessary on installations involving deflection, oversize pipe, out-of-round and uneven pipe ends.

JCM 301 Flanged Coupling Adapter Dimensions





Nominal Size	А	В	С	D
3	8-1/8	4-1/4	3	5-1/2
4	9-1/8	5-1/4	3	5-1/2
6	11-1/8	7-5/16	3-1/2	5-1/2
8	13-1/2	9-9/16	3-1/2	5-1/2
10	16-1/4	11-9/16	4	7
12	19	13-5/8	4	7

JCM 301 Flanged Coupling Adapters



301 Standard Flanged Coupling Adapter

301 Standard Flexible Flanged Coupling Adapter

The JCM 301 FCA provides a quick simple means of joining flanged fittings to plain end pipe. The 301 will absorb vibration, accommodate pipe deflection and expansion, provide for easy equipment removal and re-installation, and eliminate the need for exact measurements.



301 Restrained Flanged Coupling Adapter Applications especially advantageous for using JCM FCA's

Valve insertions

Equipment connections and offset adjustment

Converting flanged fittings to mechanical joint or push on type Dampening vibration

Providing for field fitting of flanged spool pieces

301 FLANGED COUPLING ADAPTERS

NOM PIPE SIZE (IN)	PIPE O.D. RANGE (IN)	CATALOG NUMBER	QTY OPTIONAL SET SCREWS	APPR WT EACH (LBS)
3	3.50	301-0350	4	17
	3.80 - 4.17	301-0396	4	17
4	4.00	301-0400	N/A	22
	4.50	301-0450	4	22
	4.80 - 5.10	301-0480	4	22
6	6.00	301-0600	N/A	37
	6.63	301-0663	8	37
	6.90 - 7.20	301-0690	8	37
8	8.00	301-0800	N/A	44
	8.63	301-0863	8	44
	9.05 - 9.40	301-0905	8	44
10	10.75	301-1075	12	67
	11.10 - 11.40	301-1110	12	67
12	12.75	301-1275	12	94
	13.20 - 13.50	301-1320	12	94

^{*}Set Screws are not for use on Asbestos Cement, HDPE or PVC pipe.

Add (R) to end of Catalog Number to indicate optional set screws.

Note: Applications in which pipe may move out of the coupling, proper anchorage of the pipe must be provided.

MATERIAL SPECIFICATIONS - JCM 301 FLANGED COUPLING ADAPTER

Sleeve & Flange: Ductile Iron ASTM A536

Gaskets: Styrene-Butadiene Rubber (SBR) has good physical properties. Compounded for use with water, salt

solutions, mild acids and bases; has excellent abrasion resistance. Per ASTM D2000 Standard, temperature range from -40° to 150°F (-40° to 65°C) constant, maximum intermittent 180°F (82°C). For applications on high temperatures or chemical pipelines, contact JCM Industries Technical Services. Not recommended for

use on oil, ozone or weather resistant applications.

Bolts: Corrosion resistant, high strength low alloy bolts and nuts ASTM A242 (AWWA C111, ANSI 21.11) per A563

or equal. Optional Stainless Steel 18-8 Type 304.

Finish: Heavy coating of corrosion resistant metal primer. Optional fusion applied epoxy coating.

Restraint Set Pins: AISI Type 1022 Carbon Steel

JCM Industries flanged adapters meet or exceed the ANSI/AWWA C-219 Standard as applicable.



JCM 303 Fabricated Flanged Coupling Adapters

The JCM 303 Fabricated Flanged Coupling Adapter provides a simple means of joining plain end pipe to flanged fittings, valves and equipment. Fabricated of carbon steel, these fittings are readily available in large or small sizes with a standard ANSI/AWWA Class D flange. Special or heavier flanges are available on request.

Flange: Standard 125# Class D - other flanges available upon request.



HOW TO ORDER

- 1. Determine pipe O.D. and flange size & type to be joined.
- 2. Order catalog Number indicating O.D. and flange size selected.

EXAMPLE: For 17.40 O.D. ductile iron pipe to be joined to 16" Class D flange.

order: 303-1740 x16

303 FLANGED COUPLING ADAPTERS

NOM PIPE SIZE (IN)	PIPE O.D. RANGE (IN)	NOMINAL FLANGE SIZE	CATALOG NUMBER	APPR WT EACH (LBS)
3	3.50	3	303-0350 X 3	19
3	3.96	3	303-0396 X 3	20
4	4.50	4 303-0450 X 4		25
4	4.80 - 5.00	4 303-0480 X 4		26
5	5.56	5 303-0556 X 5		32
6	6.63	6	303-0663 X 6	38
6	6.90 - 7.10	6	303-0690 X 6	40
8	8.63	8	303-0863 X 8	50
8	9.05 - 9.30	8	303-0905 X 8	52
10	10.75	10	303-1075 X 10	58
10	11.10 - 11.40	10	303-1110 X 10	61
12	12.75	12	303-1275 X 12	78
12	13.20 - 13.50	12	303-1320 X 12	84
14	14.00	14	303-1400 X 14	90
14	15.30	14	303-1530 X 14	110
14	15.65	14	303-1565 X 14	110
16	16.00	16	303-1600 X 16	113
16	17.40	16	303-1740 X 16	130
16	17.80	16	303-1780 X 16	137
18	18.00	18	303-1800 X 18	137
18	19.50	18	303-1950 X 18	144
18	19.92	18	303-1992 X 18	144
20	20.00	20	303-2000 X 20	158
20	21.60	20	303-2160 X 20	162
20	22.06	20	303-2206 X 20	162
24	24.00	24	303-2400 X 24	192
24	25.80	24	303-2580 X 24	220
24	26.32	24	303-2632 X 24	220
30	32.00	30	303-3200 X 30	442
36	38.30	36 303-3830 X 36		602
42	44.50	42	303-4450 X 42	771
48	50.80	48	303-5080 X 48	885

NOTE: Applications in which pipe may move out of the coupling, correct anchorage of the pipe must be provided. Epoxy coating and stainless steel bolts are available as an extra. Other sizes available upon request.



JCM 304 Fabricated Reducing Flanged Coupling Adapters

The JCM 304 Reducing Flanged Coupling Adapter is similar in construction to the JCM 303 FCA but has a reducer or increaser combination of coupling and flange.

FLANGES: Standard 125 Class D, other flanges available.



HOW TO ORDER

- 1. Determine pipe O.D. and flange 2. Order catalog Number indicating size & type to be joined.
 - O.D. and flange size selected.

EXAMPLE: For 17.40 O.D. ductile iron pipe to be joined to 14" Class D flange, order: 304-1740 x14

304 FABRICATED REDUCING FLANGED COUPLING ADAPTERS

NOM PIPE SIZE (IN)	PIPE O.D. RANGE (IN)	CATALOG NUMBER	(X) ADD FLANGE SIZE
4	4.50	304-0450	Х
4	4.80 - 5.00	304-0480	Х
5	5.56	304-0556	Х
6	6.63	304-0663	Х
6	6.90 - 7.10	304-0690	Х
8	8.63	304-0863	Х
8	9.05 - 9.30	304-0905	Х
10	10.75	304-1075	Х
10	11.10 - 11.40	304-1110	Х
12	12.75	304-1275	Х
12	13.20 - 13.50	304-1320	Х
14	14.00	304-1400	Х
14	15.30	304-1530	Х
14	15.65	304-1565	Х
16	16.00	304-1600	Х
16	17.40	304-1740	Х
16	17.80	304-1780	Х
18	18.00	304-1800	Х
18	19.50	304-1950	Х
18	19.92	304-1992	Х
20	20.00	304-2000	Х
20	21.60	304-2160	Х
20	22.06	304-2206	Х
24	24.00	304-2400	Х
24	25.80	304-2580	Х
24	26.32	304-2632	Х

STANDARD AVAILABLE FLANGE SIZES					
2					
3					
4					
6					
8					
10					
12					
14					
16					
18					
20					
24					
·					

NOTE: Applications in which pipe may move out of the coupling, correct anchorage of the pipe must be

Epoxy coating and stainless steel bolts are available as an extra.

Other sizes available upon request.



JCM 306 Fabricated Flanged Coupling Adapters

The JCM 306 Fabricated Flanged Coupling Adapter combines the versatile JCM Ductile Iron Coupling system with a fabricated flanged end to provide a fitting which allows for pipe misalignment, less critical pipe end preparation and ease of equipment installation and removal. The 306 FCAs are easily adapted from one type of pipe to another with the simple JCM Transition Gasket system. These FCAs simplify installations on larger A/C pipe and are available in the hard to find 10" and 12" sizes.



306 FLANGED COUPLING ADAPTERS

NOM	COUPLING	NOM	CATALOG NUMBER	OVERALL	APPR WT
PIPE SIZE	O.D. RANGE	FLANGE		LENGTH	EACH
(IN)	(IN)	SIZE		(IN)	(LBS)
3	3.50	3	306-0350 X 3	12	32
	3.80 - 4.17	3	306-0396 X 3	12	32
4	4.50	4	306-0450 X 4	12	42
	4.80 - 5.10	4	306-0480 X 4	12	42
6	6.63	6	306-0663 X 6	12	59
	6.90 - 7.20	6	306-0690 X 6	12	59
8	8.63	8	306-0863 X 8	12	86
	9.05 - 9.40	8	306-0905 X 8	12	86
10	10.75	10	306-1075 X 10	12	115
	11.10 - 11.40	10	306-1110 X 10	12	115
12	12.75	12	306-1275 X 12	12	163
	13.20 - 13.50	12	306-1320 X 12	12	163

NOTE: Applications in which pipe may move out of the coupling, proper anchorage of the pipe must be provided. Integral retainer set screws are available as an extra. Add (R) to end of catalog number. Price on application.

NOTE: Restraining set screws are not for use on Asbestos Cement, HDPE or PVC pipe.

Epoxy coating and stainless steel bolts available as an extra.

Larger sizes available upon request.

MATERIAL SPECIFICATIONS - JCM 306 & 307 FLANGED COUPLING ADAPTERS

Sleeve: Ductile Iron ASTM A536

Flange & Neck: Fabricated ASTM A285 Grade C Steel or equal with AWWA C207 Class D Flange, with ANSI 150lb. drilling.

Gaskets: Styrene-Butadiene Rubber (SBR) has good physical properties. Compounded for use with water, salt solutions, mild

acids and bases; has excellent abrasion resistance. Per ASTM D2000 Standard, temperature range from -40° to 150°F (-40° to 65°C) constant, maximum intermittent 180°F (82°C). For applications on high temperatures or chemical pipelines, contact JCM Industries Technical Services. Not recommended for use on oil, ozone or weather resistant

applications.

Bolts: Corrosion resistant, high strength low alloy bolts and nuts ASTM A242 (AWWA C111, ANSI 21.11) per A563 or equal.

Optional Stainless Steel 18-8 Type 304.

Finish: Heavy coating of corrosion resistant metal primer. Optional fusion applied epoxy coating.

JCM Industries flanged adapters meet or exceed the ANSI/AWWA C219 Standard as applicable.



JCM 307 Fabricated Reducing Flanged Coupling Adapters

The JCM 307 Reducing Fabricated Flanged Coupling Adapter combines the versatile JCM Ductile Iron Coupling system with an increaser or reducer fabricated flanged end to provide a fitting which allows for pipe misalignment, less critical pipe end preparation and ease of equipment installation and removal. The 307 FCAs are easily adapted from one type of pipe to another with the simple JCM Transition Gasket system. These FCAs simplify installations on larger A/C pipe and are available in the hard to find 10" and 12" sizes.



307 FLANGED REDUCING COUPLING ADAPTERS

NOM PIPE SIZE (IN)	COUPLING O.D. RANGE (IN)	CATALOG NUMBER	(X) ADD REQUIRED FLANGE SIZE	OVERALL LENGTH (IN)
3	3.50	307-0350	X	12
	3.80 - 4.17	307-0396	X	12
4	4.50	307-0450	X	12
	4.80 - 5.10	307-0480	X	12
6	6.63	307-0663	X	12
	6.90 - 7.20	307-0690	X	12
8	8.63	307-0863	X	12
	9.05 - 9.40	307-0905	X	12
10	10.75	307-1075	X	12
	11.10 - 11.40	307-1110	X	12
12	12.75	307-1275	X	12
	13.20 - 13.50	307-1320	X	12

NOTE: Applications in which pipe may move out of the coupling, proper anchorage of the pipe must be provided. Integral retainer set screws are available as an extra. Add (R) to end of catalog number.

NOTE: Restraining set screws are not for use on Asbestos Cement, HDPE or PVC pipe.

Epoxy coating and stainless steel bolts available.

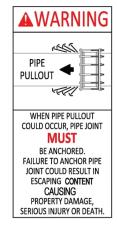
Larger sizes available upon request



Standard flanged coupling adapters to join plain end pipe to flanged fittings do not prevent pipe movement or restrain from pipe pullout. In applications in which pipe may move/pull out of the coupling, correct anchorage/restraint of the pipe must be provided.

For JCM Restrainer options, see JCM Series 600 Restrainer Systems. JCM can also fabricate restraint mechanisms on fabrications to accommodate third party restrainer options. Contact JCM Industries Inside Sales for information.

1-800-527-8482 or 903-832-2581 sales@jcmindustries.com www.jcmindustries.com



JCM 309 Dismantling Joints

Dismantling joints simplify installations and replacement of flanged fittings in retrofitting applications. JCM 309 Dismantling Joints provide the solution for adding, repairing or replacing flanged fittings within a flanged pipe system. Adjustable, slip joint design accommodates either wide gaps or close guarter installations and eliminates the need for precise measurements between flange connections. Available in sizes 2" (50mm) and larger, for ductile iron or flanged steel pipe systems.

MATERIAL SPECIFICATIONS - JCM 309 Dismantling Joint

Flanged Adapter Body: ASTM A36 or Ductile Iron ASTM A536

AISI C1012, ASME SA36, or Ductile Iron ASTM A536 Follower Flange:

Flange Extension: Schedule 40 Steel Pipe

> Bolts: Corrosion resistant, high strength low alloy ASTM A242, A193 B5,

B7. Optional A193 B8 304 stainless steel or 316 stainless

steel.

Finish: Heavy coat of corrosion resistant metal primer.

Optional Fusion Applied Epoxy per ANSI/AWWA C213 available.

Other coatings available.

Gasket: Nitrile - Specially compounded new rubber polymer for superior shelf

life and resistance to permanent set per ASTM Recommended for

water, salt solutions, mild acids, bases.

Standard Flange: ASME/ANSI B16.1 Class 125 Compatible Steel Ring Flange

Optional Flanges Available Upon Request:

ASME/ANSI B16.5 Class 150, 300

Weld Neck, Blind, Slip-on, Reducing, Threaded, Socket Weld, Lap Joint, Angle Face, Van Stone

Concentric and Eccentric Flanges

NOM PIPE		FLANGE	NOMINAL	OPEN	CLOSED BOLTS		CLOSED BOLTS RESTRAINT RODS/ STRAPS		APPROX		
SIZE* (IN)	NUMBER	CLASS D	(MID RANGE) (IN)	MAX (IN)	MIN (IN)	QTY	SIZE	QTY	SIZE	LENGTH	WT EA (LBS)
3	309-3	3	11.00	12.00	10.00	4	5/8 x 6-1/2	2	5/8	16	34
4	309-4	4	11.00	12.00	10.00	4	5/8 x 6-1/2	2	5/8	16	47
6	309-6	6	11.50	12.50	10.50	6	5/8 x 6-1/2	2	3/4	18	65
8	309-8	8	11.50	13.00	10.50	6	5/8 x 6-1/2	2	3/4	18	102
10	309-10	10	12.00	13.00	11.00	8	5/8 x 6-1/2	2	7/8	18	125
12	309-12	12	12.00	13.00	11.00	8	5/8 x 6-1/2	2	7/8	18	150
14	309-14	14	13.00	14.50	11.50	8	5/8 x 6-1/2	4	1	24	175
16	309-16	16	13.00	14.50	11.50	10	5/8 x 6-1/2	4	1	24	212
18	309-18	18	13.50	15.00	12.00	10	5/8 x 6-1/2	6	1-1/8	24	250
20	309-20	20	13.50	15.00	12.00	12	5/8 x 6-1/2	6	1-1/8	24	380
24	309-24	24	14.75	16.50	13.00	14	5/8 x 6-1/2	6	1-1/4	26	425
	-					-					

13.00

16

5/8 x 6-1/2

Sizes 14" and larger incorporate a strap restraint configuration. Other sizes available upon request.

16.50

14.75

Other flanges available upon request.

309-30

30

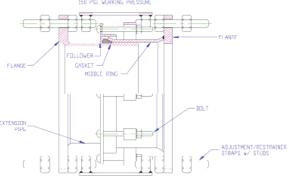
EXTENSION PIPE

309 Dismantling Joints are priced on application. Contact JCM Sales Team.

Dismantling joints do not provide for lateral pipe movement.

309 Dismantling Joints rated for 150PSI. Higher pressure ratings available, contact JCM Industries.





6

1-1/4

24





590

³⁰ *2 inch available, contact JCM Industries for information

JCM 362 Fabricated Stainless Steel Flanged Coupling Adapter



The JCM 362 Fabricated Stainless Steel Flanged Adapter provides an economical solution to join a plain end piece of pipe to a flanged fitting. Constructed of Carbon Steel End Ring with resilient Fusion Plastic Coating, a 304 Stainless Steel middle ring, flange and hardware. The JCM 362 is prepared for the harshest of elements or corrosive line content - or both!

For American Iron and Steel (AIS) Compliance, contact JCM Sales Team for price and availability. Adapter uses the popular and economical JCM G212 Transition Gasket System. Making transitions of the same nominal pipe size easy with just the change of gasket.

NOM PIPE SIZE (IN)	FROM OD RANGE (IN)	TO FLANGE (IN)	CATALOG NUMBER	NO OF BOLTS	EFFECTIVE LENGTH (IN)	BOLT SIZE	APPR WT EA (LBS)
4	4.50	4	362-0450	4	5.63	5/8	20
4	4.80 - 5.10	4	362-0480	4	5.63	5/8	20
6	6.63	6	362-0663	5	5.63	5/8	26
6	6.90 - 7.20	6	362-0690	5	5.63	5/8	26
8	8.63	8	362-0863	6	5.63	5/8	36
8	9.05 - 9.40	8	362-0905	6	5.63	5/8	36
10	10.75	10	362-1075	7	5.63	5/8	47
10	11.10 - 11.40	10	362-1110	7	5.63	5/8	47
12	12.75	12	362-1275	8	5.63	5/8	56
12	13.20 - 13.50	12	362-1320	8	5.63	5/8	56

JCM 362 Oversized Fabricated Stainless Steel Flanged Adapters

The JCM 362 Oversized Fabricated Stainless Steel Flanged Adapters provides an economical solution for joining old cast iron, larger classes of asbestos cement and other types of oversized pipe to flanged fittings. The 362 Oversized Fabricated Stainless Steel Flanged Adapter uses the popular and economical JCM G212 Transition Gasket System. Making transitions of the same nominal pipe size easy with just the change of gasket. For American Iron and Steel (AIS) Compliance, contact JCM Sales Team for price and availability.

NOM PIPE SIZE (IN)	FROM OD RANGE (IN)	TO FLANGE (IN)	CATALOG NUMBER	NO OF BOLTS	EFFECTIVE LENGTH (IN)	BOLT SIZE	APPR WT EA (LBS)
4	5.10 - 5.40	4	362-0535	4	5.63	5/8	20
6	7.20 - 7.55	6	362-0740	5	5.63	5/8	26
8	9.40 - 9.75	8	362-0960	6	5.63	5/8	36
10	11.60 - 12.05	10	362-1200	7	5.63	5/8	47
12	13.92 - 14.40	12	362-1420	8	5.63	5/8	56

Purchase orders for the JCM Industries, Inc 362 type FCA coupling signify an agreement between the manufacturer and customer that both parties agree to the JCM test procedure for meeting ANSI/AWWA C219 Standard for Bolted, Sleeve-Type Couplings for Plain-End Pipe. All couplings are pneumatically tested to a minimum of 25 PSI. Additional testing for certification purposes available upon request with additional charge.



JCM 4362 All 304 Stainless Steel FCA JCM 6362 All 316 Stainless Steel FCA

For All 304 Stainless Steel FCA - order Catalog Number Model 4362 For All 316 Stainless Steel FCA - order Catalog Number Model 6362



JCM 230 STAINLESS STEEL STIFFENERS FOR HDPE PIPE (6" width) JCM 231 LONG STAINLESS STEEL STIFFENERS FOR HDPE PIPE (12" width)

JCM Industries recommends fusion as the primary method to join plain end HDPE. Often, however, logistics of the job site, weather, site conditions and accessibility can eliminate the fusion process as an option and mechanical, bolted fittings are selected. When mechanical fittings are selected as the means to join plain end pipe, JCM recommends that internal stiffeners be used. The expansion/contraction of HDPE pipe requires that the sealing system maintain a seal throughout all cycles which the system will experience in its life. Proper gasket capture, pipe support and reinforcement are critical factors for long term reliability.

JCM Stainless Stiffeners offer:

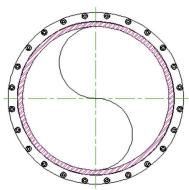
- Corrosion Resistance
- Rigid Reinforcement of Pipe Wall for Pipe Connections
- Accurate Pipe I.D. Sizing maintains proper Outside Diameter
- 1/8" Tapered Insert End provides easy installation
- Flared End or Tab Stop secures Stiffener to End of Pipe
- Positive Reinforcement without interference

JCM Stainless Steel Stiffeners perform two functions when installed. First, the stiffener brings the pipe "into round" so that fabricated/cast mechanical bolt-on product will fit correctly as designed on the full circumference of the pipe.

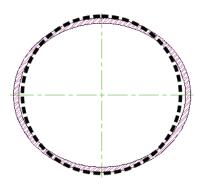
Secondly, it provides support to the pipe wall and prevents movement away from the pressure when gasketed bolted fittings are tightened. HDPE has a high coefficient of thermal expansion and contraction along with a low modulus of elasticity. This sensitivity to pressure and temperature causes HDPE to expand and contract more than traditional water and sewer piping materials.

The potential pipe expansion or contraction must be considered when assembling bolt-on fittings. HDPE will relax ("creep") at lower stress levels than other piping materials. The use of stiffeners in the interior of the pipe can prevent these types of issues. Along with the stiffeners, the use of restraint products suitable for HDPE should be factored into the application.

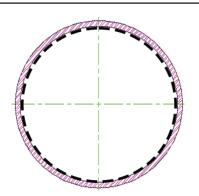
JCM 230 Stiffeners 6" in width JCM 231 Stiffeners 12" in width JCM 230/231 Stiffeners are available in 304 or 316 stainless steel



Mechanical bolted fittings are manufactured to certain "fit" tolerances. (i.e. round +/- XX)



The ends of HDPE can experience an "egging or necking down" and be out of round beyond mechanical fitting tolerances.



Installation of stiffeners brings pipe "into round" and provides a rigid support for mechanical fitting installation.