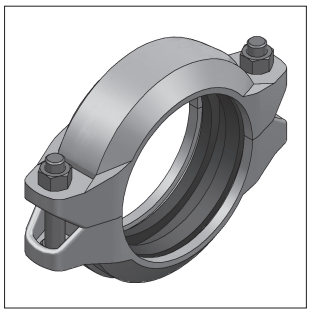
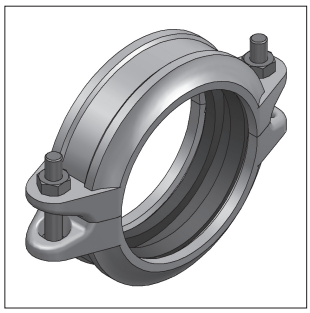
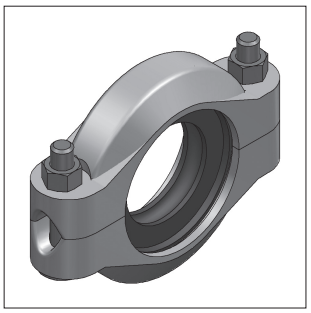
Couplok - products for Grooved Piping System



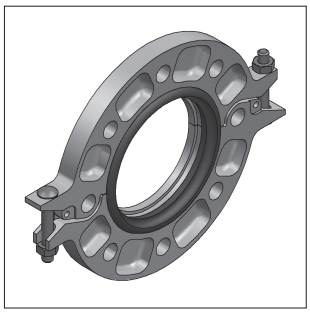
Flexible Coupling
Mod. 1N



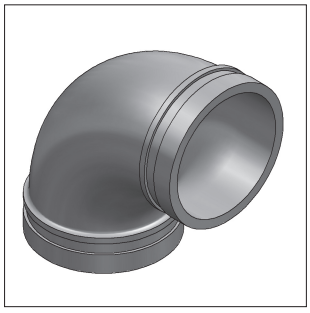
Rigid Coupling
Mod. 1GS



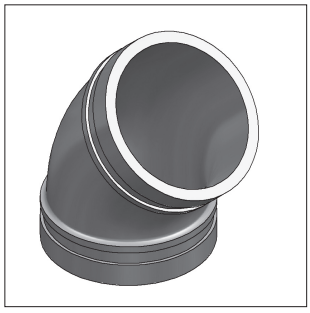
Reduced Flexible Coupling
Mod. 1NR



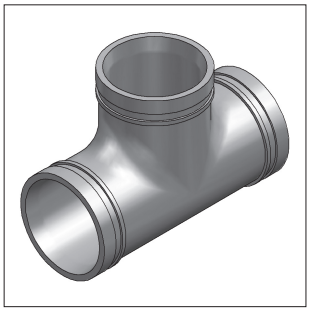
Flange Adapter
Mod. 321



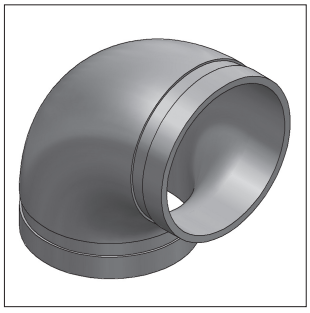
Elbow 90°
Mod. 90



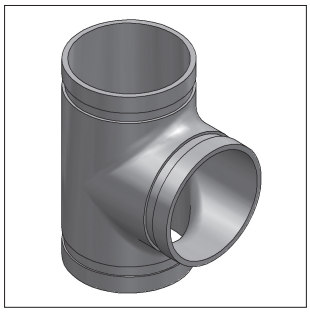
Elbow 45°
Mod. 120



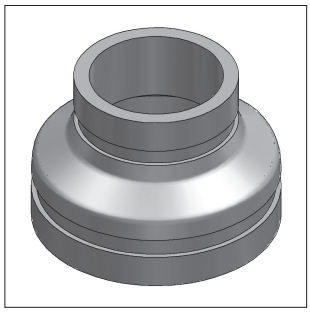
Equal Tee
Mod. 130



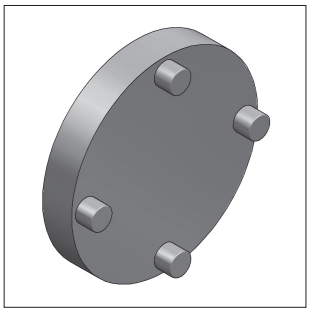
FireFit Elbow
Mod. 90S



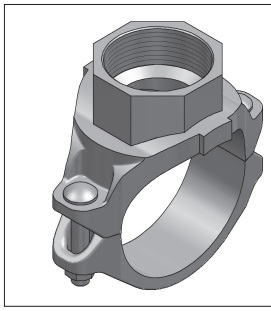
Firefit Tee
Mod. 130S



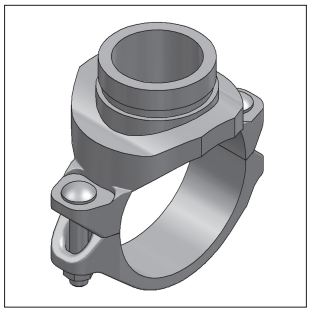
Concentric Reducer
Mod. 240



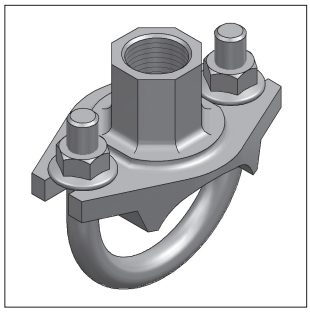
Blind cap
Mod. 300



Mechanical Tee Threaded
Mod. 3J



Mechanical Tee Grooved
Mod. 3G



Sprinkler Tee
Mod. 90

Easyflex Flexible Pipe

Agency Approvals

Products for Grooved Piping System

For Listing/Approval Details contact your MEFA Representative.

APPROVED
For Listing/Approval Details and Limitations contact MEFA Sales Representative.

Industry & government standards & approvals

ABS	American Bureau of Shipping
ANSI	American National Standards Institute
API	American Petroleum Institute: API Std. 5L, Sect. 7.5
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers: Power Piping, B 31.1; Chemical Plant and Petroleum Refinery Piping, B 31.3; Refrigeration Piping, B 31.5; Building Services Piping, B 31.9; Slurry Pipelines, B 31.11
ASTM	American Society of Testing and Materials: F 1476, F 1387
AWWA	American Water Works Association: C 606
BV	Bureau Veritas
CDF	California State Fire Marshal
COE	Corps of Engineers: CEGS 5000
CSA	Canadian Standards Association: B 242
DNV	Det Norske Veritas
	Hong Kong Fire Services Board
	New Zealand Insurance Council
	New Zealand Building Act. (1991)
FAA	Federal Aviation Administration: HVAC, Plumbing, Fire Protection
FHA	Federal Housing Administration
FM	Factory Mutual Engineering Corp.
GSA	General Service Administration:15000 Series
IAPMO	International Association of Plumbing & Mechanical Officials
LLOYD'S	Lloyd's Register of Shipping
LPC	Loss Prevention Council
MEA	Materials & Equipment Acceptance
MIL	Military Specifications: MILP-10388 Fittings; MIL-C-10387 Couplings; MIL-P-11087A(CE) Steel Pipe, Grooved MIL-I-45208 Inspection Procedure
NASA	National Aeronautics and Space Administration: 15000 Series
NAVFAC	Naval Facilities Engineering Command: NFGS 15000 Series
NFPA	National Fire Protection Association
NIH	National Institute of Health (Dept. of Health): 15000 Series
NSF	NSF International
NY-BSA	New York Board of Standards and Appeals
NYC	New York City
SBCCI	Southern Building Code Congress International: Standard Plumbing and Mechanical Code
TVA	Tennessee Valley Authority: Fire protection, storm drains
UL	Underwriter's Laboratories, Inc.
ULC	Underwriter's Laboratories of Canada
	Bureau of Marine Inspection: Salt and fresh water, oil transfer
	Bureau of Public Roads; Div. of Bridges: Drain lines and bridge crossings
	Canadian Coast Guard
	U.S. Coast Guard –Approves each vessel individually
USGBC	United States Green Building Council
VA	Veterans Affairs : 15000 Series
VdS	Verband der Sachversicherer e.V.

Introduction

Couplok – the engineered coupling

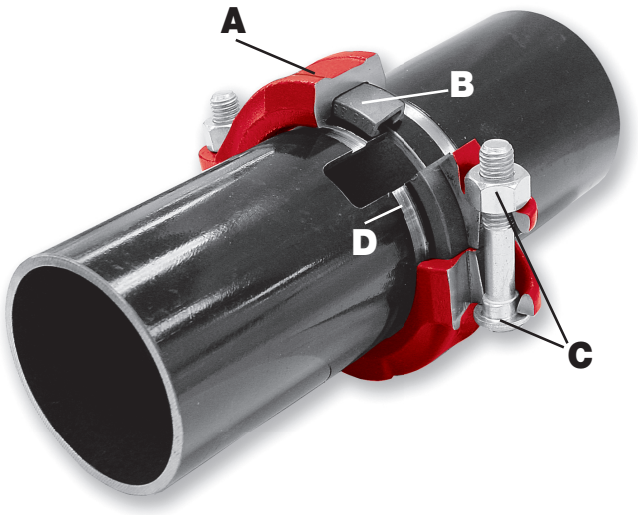
Housing (a) flexible or rigid

The Couplok Coupling housing is designed to self-center around the pipe. The housing encircles and retains the gasket against the application of internal system pressure or vacuum.

The housing key sections fit into and engage the pipe-end grooves around the entire pipe circumference, thus restraining the pipe ends from separation due to the application of internal pressure.

Flexible Couplings provide designed-in clearances between the housing key sections and the pipe grooves to permit both angular and longitudinal movement of the pipe. Rigid couplings grip the pipe and lock the joint into position.

All housings are coated with lead free paint for general service applications. The paint serves to provide protection against normal atmospheric corrosion. However, for couplings used in corrosive environments, hot-dip galvanizing, and stainless steel are available.

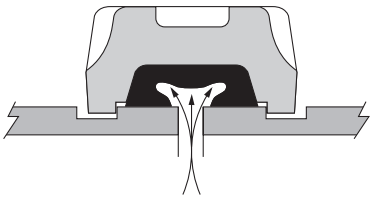


Gasket (b)

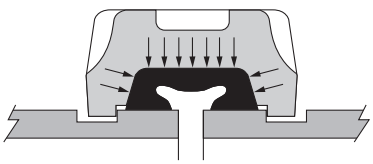
The unique single piece “C” style design of the gasket has been engineered to provide a pressure responsive, leak-tight seal in both pressure and vacuum applications without the aid of external forces. The “lips” of the gasket are molded so that upon installation onto the pipe ends they provide compression against the pipe surface to establish the leak-tight seal.

The gasket cavity functions as a “pressure reservoir”. Pressure within the pipe system is applied to the internal surfaces of the gasket which increases the sealing force and enhances the leak-tight seal. In vacuum systems, non-pressure-responsive seals tend to “lift off” the pipe, producing leak paths. However, the Couplok gasket reacts to the negative pressure (higher outside atmospheric pressure) as to improve the sealing capability of the gasket.

Gasket Reaction To Pressure



Gasket Reaction To Vacuum



Bolts and nuts (c)

Heat treated oval neck track head bolts serve to connect and secure the housing segments together. The oval neck design prevents turning of the bolt while tightening the hex nut with a single wrench. The bolt size and corresponding wrench (or socket) size for the hex nuts are shown in the chart below.

ANSI

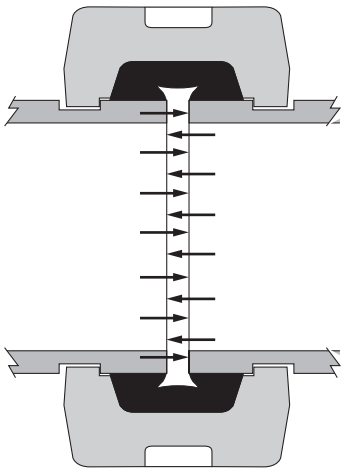
Bolt Size	$^{3}/_{8}$	$^{1}/_{2}$	$^{5}/_{8}$	$^{3}/_{4}$	$^{7}/_{8}$	1	$1^{1}/_{4}$
Wrench Size	$^{11}/_{16}$	$^{7}/_{8}$	$1^{1}/_{16}$	$1^{1}/_{4}$	$1^{7}/_{16}$	$1^{5}/_{8}$	2

METRIC

Bolt Size	M10	M12	M16	M20	M22
Wrench Size	17	19	24	30	34

Grooved pipe ends (d)

The ends of the pipe must have a groove in them which may be either cut grooved or roll grooved. The grooved pipe ends engage the coupling keys, thus, providing a self-restraining, mechanical joint capable of resisting the separation of the pipe ends due to the application of system pressure. The groove diameters must be dimensionally accurate to obtain the maximum benefit of the Couplok Coupling.



Introduction

The Couplok piping method

Couplok couplings and grooved-end fittings are widely used for joining pipe in a wide variety of piping systems. Couplok couplings for grooved-end pipe are designed to provide a self-centering joint which accommodates the application of pressure, vacuum and other external forces, while limiting the burdensome need for special supports, expansion joints, etc.

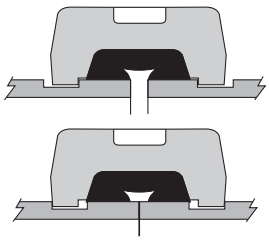
The Couplok piping method offers many mechanical design features which benefit the design engineer, the contractor, and the end user. Utilization of the functional characteristics of the Couplok coupling will aid in pipe system design and must be considered for proper installation, assembly and performance.

The design factors presented in the Couplok technical data section should always be referenced to when designing any grooved piping system to obtain the maximum benefit of the Couplok piping method.

Couplok features

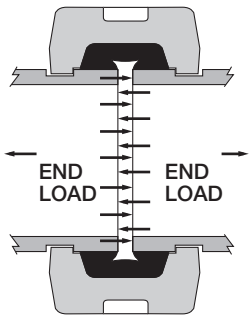
RIGIDITY OR FLEXIBILITY

Couplings are available where rigid connections are required. Couplings with flexible design allow for pipe expansion and contractions with temperature changes. The need for an expansion joint is minimized or eliminated.



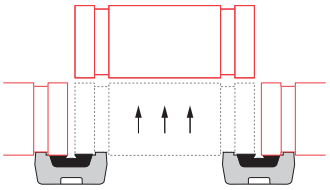
SELF RESTRAINED JOINT

The couplings engage the pipe around the entire circumference and restrain the pipe ends from separation due to pressure and other forces, up to the maximum coupling rated working pressure.



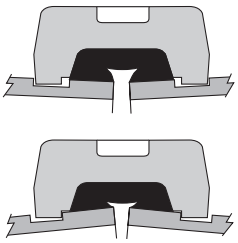
UNION AT EVERY JOINT

Couplok couplings can be disassembled easily permitting maintenance and servicing of the piping system. It will facilitate periodic rotation of pipe to distribute internal wear from slurries or other abrasive media.



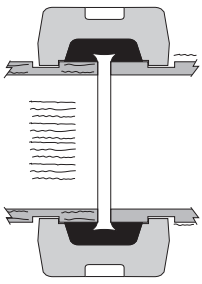
STRESS-FREE SYSTEM

Flexibility designed in the Couplok coupling absorbs and eliminates stress from settlement of buried pipe or those induced by seismic tremors.



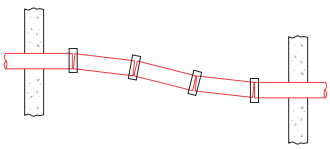
MINIMIZES NOISE & VIBRATION

The resilient elastomeric gasket and pre-designed gap of the Couplok coupling help isolate and absorb noise and vibration, this minimizes vibration transmission.

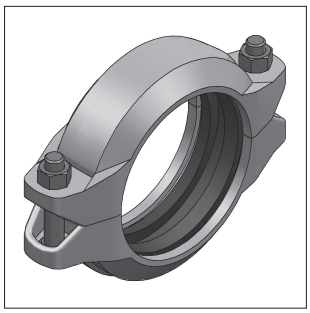


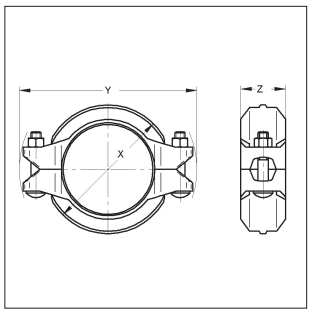
ACCOMMODATES MISALIGNMENT AND JOINT

The flexibility designed into the Couplok coupling will accommodate misalignments caused by imprecise location of pipe opening through walls and floors, will provide pitch for drainage piping systems and facilitate laying pipe on uneven terrain, thus permitting deflection in any direction.



Flexible Coupling Mod. 1N





FM UL

APPROVED
For Listing/Approval Details and Limitations contact MEFA Sales Representative.

Flexible Coupling

Material Specifications:

The Flexible Coupling is designed for applications where system flexibilty is desired.
The Flexible Special Coupling working pressure ratings up to 34,5 bar (500 psi).

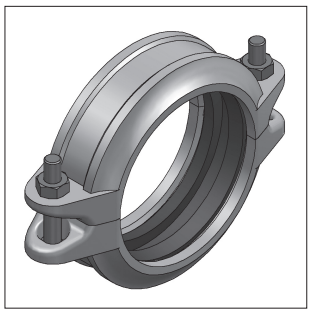
- **Housing:**
  Ductile Iron conforming to ASTM-A536, Grade 65-45-12
- **Coatings:**
  Rust inhibiting lead-free paint
  Color: Red (Standard), Hot Dipped Zinc Galvanized (Optional)
  (For other coating requirements contact your MEFA Representative)
- **Metric Bolts and Heavy Hex Nuts:**
  Stainless steel bolts and nuts are also available. Contact your MEFA Representative for more information.
- **Lubrication:**
  Standard MEFA
- **Gasket:**
  Grade "E" EPDM (Standard)
  Green color code • Properties as designated by ASTM D-2000
  Service Temperature Range: da -34°C a +110°C
  Recommended for water service, diluted acids, alkaline solutions, oil-free air and many chemical services.
  NOT FOR USE IN PETROLEUM APPLICATIONS.

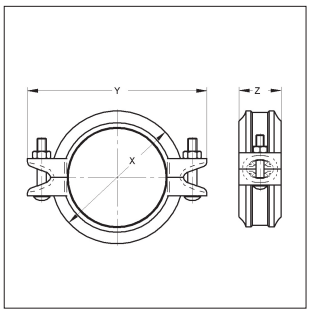
Flexible Coupling											Finishing			Painted	Galvanized
Nominal Size	O. D.	Max. Work. Pressure*	Max End* Load	Range* of Pipe End Separation	Deflection Per Coupling	Coupling Dimensions X	Y	Z	Bolt Dimensions Q.ty.	Size	Specified Torque Min.	Max.	Approx. Wt. Ea.	Code	Code
Inch.	mm	bar	kN	mm	Degrees	mm	mm	mm		mm	N-M		Kg		
1	33.7	34.5	3.0	0-3.2	2° 45'	60	108	44	2	M10 x 57	40	60	0.6	GFL033V	GFL033Z
1¼	42.4	34.5	4.8	0-3.2	2° 10'	70	111	44	2	M10 x 57	40	60	0.6	GFL042V	GFL042Z
1½	48.3	34.5	6.3	0-3.2	1° 54'	76	117	44	2	M10 x 57	40	60	0.7	GFL048V	GFL048Z
2	60.3	34.5	9.8	0-3.2	1° 31'	89	140	44	2	M10 x 57	40	60	0.8	GFL060V	GFL060Z
2½	73.0	34.5	14.4	0-3.2	1° 12'	102	146	44	2	M10 x 57	40	60	0.9	GFL073V	GFL073Z
3 O.D.	76.1	34.5	15.7	0-3.2	1° 12'	102	156	44	2	M10 x 57	110	150	1.0	GFL076V	GFL076Z
3	88.9	34.5	21.4	0-3.2	1° 02'	117	171	44	2	M12 x 70	110	150	1.3	GFL089V	GFL089Z
4	114.3	34.5	35.4	0-6.4	1° 36'	149	206	51	2	M12 x 70	110	150	2.1	GFL114V	GFL114Z
5½ O.D.	139.7	31.0	48.6	0-6.4	1° 19'	171	238	51	2	M16 x 85	135	175	2.7	GFL139V	GFL139Z
5	141.3	31.0	48.6	0-6.4	1° 19'	178	244	51	2	M16 x 85	135	175	2.8	GFL141V	GFL141Z
6½ O.D.	165.1	31.0	66.4	0-6.4	1° 05'	197	273	51	2	M16 x 85	135	175	3.2	GFL165V	GFL165Z
6	168.3	31.0	68.9	0-6.4	1° 05'	203	279	51	2	M16 x 85	135	175	3.7	GFL168V	GFL168Z
8	219.1	20.0	77.8	0-6.4	0° 50'	264	337	60	2	M20 x 110	175	245	6.4	GFL219V	GFL219Z
10	273.0	20.0	121.0	0-6.4	0° 40'	333	422	67	2	M20 x 110	245	300	10.5	GFL273V	GFL273Z
12	323.9	20.0	170.3	0-6.4	0° 34'	394	473	67	2	M24 x 140	245	300	13.5	GFL323V	GFL323Z

Not for use in copper systems.

* Based on standard wall steel pipe with cut grooves in accordance with Couplok specifications.

Rigid Coupling Mod. 1GS





FM UL

APPROVED
For Listing/Approval Details and Limitations contact MEFA Sales Representative.

Rigid Coupling

Material Specifications:

The Rigid Special Coupling is our standard coupling and is designed for rigid piping applications.

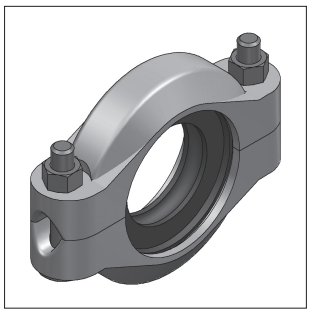
- **Housing**
  Ductile Iron conforming to ASTM-A536, Grade 65-45-12
- **Coatings:**
  Rust inhibiting lead-free paint, Color: Red (Standard),
  Hot Dipped Zinc Galvanized (Optional)
  (For other coating requirements contact your MEFA Representative)
- **Metric Bolts and Heavy Hex Nuts:**
  Stainless steel bolts and nuts are also available. Contact your Anvil Representative for more information.
- **Lubrication:**
  Standard MEFA
- **Gasket:**
  EPDM Grado "E"(Standard)
  Green color code • Properties as designated by ASTM D-2000
  Service Temperature Range: da -34°C a +110°C
  Recommended for water service, diluted acids, alkaline solutions, oil-free air and many chemical services.
  NOT FOR USE IN PETROLEUM APPLICATIONS.

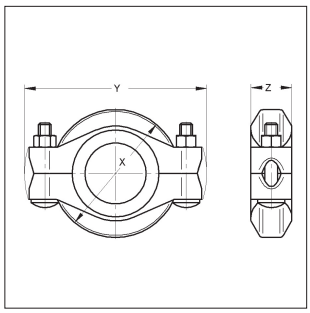
Rigid Coupling										Finishing			Painted	Galvanized
Nominal Size	O. D.	Max. Work. Pressure*	Max End* Load	Range* of Pipe End	Coupling Dimensions X	Y	Z	Bolt Dimensions n.	Size	Specified Torque Min.	Max.	Approx. Wt. Ea.	Code	Code
Inch.	mm	bar	kN	mm	mm	mm	mm		mm	N-M		Kg		
1	33.7	20.7	1.81	0-1.5	60	108	44	2	M10 x 50	40	60	0.6	GRL033V	GRL033Z
1¼	42.4	20.7	2.89	0-1.5	70	117	48	2	M10 x 50	40	60	0.7	GRL042V	GRL042Z
1½	48.3	20.7	3.78	0-1.5	71	124	48	2	M10 x 50	40	60	0.8	GRL048V	GRL048Z
2	60.3	20.7	5.91	0-1.5	89	137	51	2	M10 x 57	40	60	0.9	GRL060V	GRL060Z
2½	73.0	20.7	8.66	0-1.5	102	152	51	2	M10 x 63	40	60	0.9	GRL073V	GRL073Z
3 O.D.	76.1	20.7	9.41	0-1.5	105	156	48	2	M10 x 63	40	60	1.0	GRL076V	GRL076Z
3	88.9	20.7	12.84	0-3.2	121	168	51	2	M10 x 63	40	60	1.1	GRL089V	GRL089Z
4	114.3	20.7	21.22	0-3.2	149	197	54	2	M10 x 63	40	60	1.4	GRL114V	GRL114Z
5½ O.D.	139.7	20.7	31.70	0-3.2	171	235	51	2	M12 x 76	105	135	2.0	GRL139V	GRL139Z
5	141.3	20.7	32.44	0-3.2	176	230	52	2	M12 x 76	105	135	2.0	GRL141V	GRL141Z
6½ O.D.	165.1	20.7	44.28	0-3.2	207	264	54	2	M12 x 76	105	135	2.6	GRL165V	GRL165Z
6	168.3	20.7	46.00	0-3.2	210	264	54	2	M12 x 76	105	135	2.6	GRL168V	GRL168Z
8	219.1	20.7	77.97	0-3.2	267	337	64	2	M20 x 110	175	245	4.9	GRL219V	GRL219Z
10	273.1	20.7	121.12	0-3.2	331	425	67	2	M20 x 110	175	245	9.8	GRL273V	GRL273Z
12	323.9	20.7	170.38	0-3.2	391	489	67	2	M22 x 140	245	298	12.4	GRL323V	GRL323Z

Not for use in copper systems.

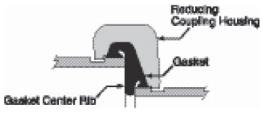
* Based on standard wall steel pipe with cut grooves in accordance with Couplok specifications.

Reduced Flexible Coupling





APPROVED
For Listing/Approval Details and Limitations contact MEFA Sales Representative.



Reduced Flexible Coupling

Material Specifications:

The Reduced Coupling makes it possible to directly connect two different pipe sizes, eliminating the need fortwo couplings and a reducing fitting. The specially designed reducing coupling gasket with a center rib assures proper posi-tioning of the gasket and prevents the smaller pipe from telescoping into the larger during assembly. Working pressure ratingsshown are for reference only and are based on schedule 40 pipe. For the latest UL/ULC Listed and FM approved pressureratings versus pipe schedule contact your MEFA Representative.

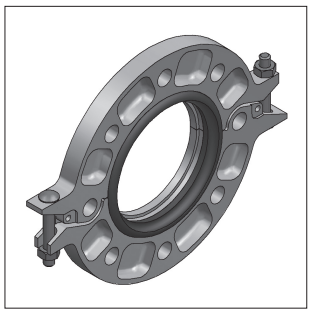
- **Housing:**
  Ductile Iron conforming to ASTM-A536, Grade 65-45-12
- **Coatings:**
  Rust inhibiting lead-free paint
  Color: Red (Standard), Hot Dipped Zinc Galvanized (Optional)
  (For other coating requirements contact your MEFA Representative)
- **Metric Bolts and Heavy Hex Nuts:**
  Stainless steel bolts and nuts are also available. Contact your MEFA Representative for more information.
- **Lubrication:**
  Standard MEFA
- **Gasket:**
  Grade "E" EPDM (Standard)
  Green color code • Properties as designated by ASTM D-2000
  Service Temperature Range: da -34°C a +110°C
  Recommended for water service, diluted acids, alkaline solutions, oil-free air and many chemical services.
  NOT FOR USE IN PETROLEUM APPLICATIONS.

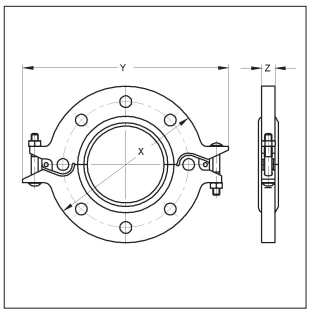
Reduced Flexible Coupling								Coupling Dimensions			Bolt Dimensions		Specified Torque		Finishing	Painted	Galvanized
Nominal Size	Larger Pipe O. D.	Smaller Pipe O. D.	Max.* Work. Pressure	Max. End* Load	Range* of Pipe End Separation	Deflection Per Coupling		X	Y	Z	n.	Size	Min.	Max.	Approx. Wt. Ea.	Code	Code
Inch.	mm	mm	bar	kN	mm	Degrees	mm	mm	mm	mm		mm	N-M		Kg		
2 x 1½	60.3	48.3	20.7	5.19	0-3.2	1° 53'	32.9	92	149	48	2	M10 x 55	40	60	0.9	GR060048V	GR060048Z
2½ x 2	73.0	60.3	20.7	8.67	0-3.2	1° 33'	27.0	108	162	48	2	M10 x 55	40	60	1.6	GR073060V	GR073060Z
3 O.D. x 2	76.1	60.3	20.7	9.41	0-3.2	1° 28'	26.2	108	162	48	2	M10 x 55	40	60	1.5	GR076060V	GR076060Z
3 x 2	88.9	60.3	20.7	12.84	0-3.2	1° 17'	22.4	124	181	48	2	M10 x 55	40	60	2.0	GR089060V	GR089060Z
3 x 2½	88.9	73.0	20.7	12.84	0-3.2	1° 17'	22.4	124	181	48	2	M10 x 55	40	60	1.9	GR089073V	GR089073Z
3 x 3 O.D.	88.9	76.1	20.7	12.84	0-3.2	1° 17'	22.4	124	181	48	2	M10 x 50	40	60	1.8	GR089076V	GR089076Z
4 x 2	114.3	60.3	20.7	21.22	0-4.8	2° 38'	45.9	159	225	51	2	M12 x 70	105	135	4.0	GR114060V	GR114060Z
4 x 2½	114.3	73.0	20.7	21.22	0–4.8	2° 38'	45.9	159	225	51	2	M12 x 70	105	135	3.6	GR114073V	GR114073Z
4 x 3	114.3	88.9	20.7	21.22	0-4.8	2° 38'	45.9	159	225	51	2	M12 x 70	105	135	3.0	GR114089V	GR114089Z
4 x 3 O.D.	114.3	76.1	20.7	21.22	0-4.8	2° 38'	45.9	159	225	51	2	M12 x 70	105	135	3.5	GR114076V	GR114076Z
5½ O.D. x 4	139.7	114.3	20.7	31.71	0-6.4	2° 55'	52.4	184	270	54	2	M16 x 85	135	175	5.2	GR139114V	GR139114Z
5 x 4	141.3	114.3	20.7	32.44	0-6.4	2° 50'	36.4	184	270	54	2	M16 x 85	135	175	5.2	GR141114V	GR141114Z
6½ O.D. x 4	165.1	114.3	20.7	44.28	0-6.4	2° 15'	39.3	210	295	54	2	M16 x 85	135	175	6.2	GR165114V	GR165114Z
6 x 4	168.3	114.3	20.7	46.00	0-6.4	1° 44'	30.2	210	295	54	2	M16 x 85	135	175	6.1	GR168114V	GR168114Z
8 x 6	219.1	168.3	20.7	77.97	0-6.4	1° 15'	21.8	267	365	57	2	M20 x 115	175	245	8.0	GR219168V	GR219168Z
8 x 6½ O.D	219.1	165.1	20.7	77.97	0-6.4	1° 15'	21.8	267	365	57	2	M20 x 115	175	245	8.3	GR219165V	GR219165Z

Not for use in copper systems.

* Based on standard wall steel pipe with cut grooves in accordance with Couplok specifications.

Flange Adapter Mod. 321





FM UL

APPROVED
For Listing/Approval Details and Limitations contact MEFA Sales Representative.

Flange Adapter

Material Specifications:

The Couplok Flange allows direct connection of Class 125 or Class 150 flanged components to a grooved pipingsystem.The two interlocking halves of the 2" thru 12" sizes of the Couplok Flange are hinged for ease of handling, and aredrawn together by a latch bolt which eases assembly on the pipe. Precision machined bolt holes, key and mating surfacesassure concentricity and flatness to provide exact fit-up with flanged, lug, and wafer styles of pipe system equipment. Aspecially designed gasket provides a leak-tight seal on both the pipe and the mating flange face.The 14" thru 24" sizes of the Couplok Flange are cast in four segments. Asleek profile gasket design allowsquick and easy assembly of the Couplok Flange onto the pipe. All Couplok Flanges have designed-in anti-rotation tangs which bite into and grip the sides of the pipe grooves toprovide a secure, rigid connection.The Couplok Flange requires the use of a steel adapter insert when used against rubber faced surfaces, wafer/lugdesign valves and serrated or irregular sealing surfaces. In copper systems a phenolic adapter insert is required, in placeof the steel adapter insert. (For other coating requirements contact your MEFA Representative)

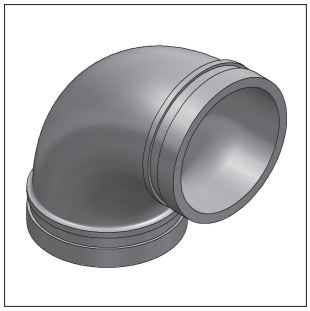
- **Housing**
  Ductile Iron conforming to ASTM-A536, Grade 65-45-12.
- **Coatings:**
  Rust inhibiting lead-free paint
  Color: Orange (standard), Red (optional)
  Hot Dipped Zinc Galvanized (optional)
  For other coating requirements contact your MEFA Representative.
- **Bolt Dimensions (2"-12") (14"-24"):**
  Heat treated, zinc electroplated, carbon steel oval-neck track boltsconforming to ASTM A-183 and zinc electroplated carbon steel heavyhex nuts conforming to ASTM A-563.
- **Lubrication:**
  Standard MEFA
- **Gasket:**
  EPDM Grado "E"(Standard)
  Green color code • NSF 61 Certified
  Service Temperature Range: da -34°C a +110°C
  Recommended for water service, diluted acids, alkaline solutions, oil-free air and many chemical services.
  NOT FOR USE IN PETROLEUM APPLICATIONS.

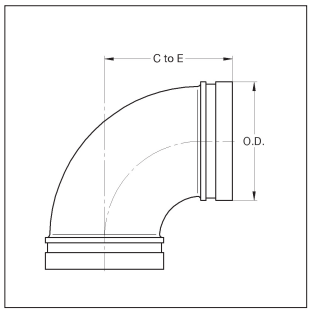
Flange Adapter																	Finishing		Painted	Galvanized
Nominal Size	Pipe O. D.	Max Working Pressure*	Max* End Load	Latch Dimensions			Range Dimensions			Sealing Surface		Mating Flange Bolts				Approx. Wt. Ea.	Code	Code
				Latch Bolt Size	Specified Torque Min.	Max	X	Y	Z	A Max.	B Min.	Mating Flange Bolts Q.ty	Size	Specified Torque Min.	Max.			
Inch.	mm	bar	kN	mm	N-M		mm	mm	mm	MM	mm		mm	N-M		Kg		
2	60.3	4.4	5.91	M10 x 70	40	60	159	213	19	60	87	4	M16 x 70	150	190	1.9	AF060PNV	AF060PNZ
2½	73.0	5.9	8.66	M10 x 70	40	60	178	241	19	73	102	-	M16 x 70	150	190	2.1	AF073ANSIV	AF073ANSIZ
3 O.D.	76.1	7.1	9.41	M10 x 70	40	60	184	248	19	76	105	4	M16 x 70	150	190	2.2	AF076PNV	AF076PNZ
3	88.9	9.6	12.84	M10 x 70	40	60	200	267	19	89	116	8	M16 x 70	150	190	2.7	AF089PNV	AF089PNZ
4	114.3	15.9	21.22	M10 x 70	40	60	229	292	19	114	141	8	M16 x 70	150	190	2.9	AF114PNV	AF114PNZ
5½ O.D.	139.7	31.3	31.70	M10 x 70	40	60	251	327	22	141	171	8	M16 x 75	300	340	7.1	AF139PNV	AF139PNZ
5	141.3	31.3	32.44	M10 x 70	40	60	254	318	22	141	171	-	-	300	340	4.0	AF141ANSIV	AF141ANSIZ
6	168.3	34.5	46.00	M10 x 70	40	60	279	356	22	168	198	8	M20 x 80	300	340	4.4	AF168PNV	AF168PNZ
8	219.1	58.4	77.97	M10 x 70	40	60	343	419	25	219	254	8 (12)	M20 x 80	300	340	7.1	AF219PNV	AF219PNZ
10	273.1	90.8	121.12	M10 x 70	40	60	406	483	25	273	308	12	M20 x 90	430	540	8.3	AF273PNV	AF273PNZ
12 (PN)	323.9	127.7	170.38	M10 x 70	40	60	460	540	25	324	359	12	M20 x 90	430	540	9.5	AF323PNV	AF323PNZ

Not for use in copper systems.

* Based on standard wall steel pipe with cut grooves in accordance with Couplok specifications.

Elbow 90° Mod. 90





FM UL
APPROVED
For Listing/Approval Details and Limitations contact MEFA Sales Representative.

Elbow 90°

Material Specifications:

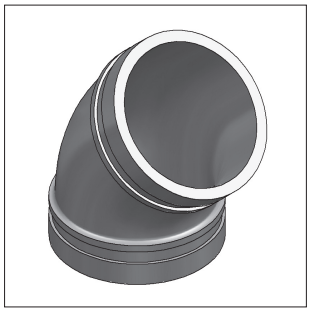
- **Cast Fittings:**
  Ductile Iron conforming to ASTM A-536, Grade 65-45-12
- **Coatings:**
  Rust inhibiting lead-free paint - Color: Red (Standard)
  Hot Dipped Zinc Galvanized conforming to ASTM A-153 (Optional)
  For other coating requirements contact your MEFA Representative.
- **Pressure:**
  As the coupling Mod. 1N

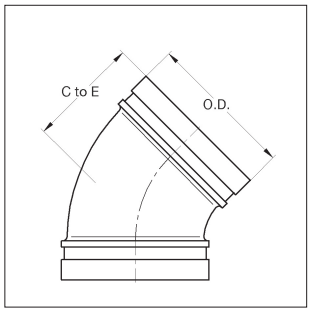
Elbow 90°				Painted	Galvanized
Nominal Size	O.D.	Center to End	Approx. Wt. Ea.	Code	Code
Inch.	mm	mm	Kg		
1	33.4	57	0.3	C90033V	C90033Z
1¼	42.2	70	0.4	C90042V	C90042Z
1½	48.3	70	0.5	C90048V	C90048Z
2	60.3	83	0.7	C90060V	C90060Z
2½	73.0	95	1.1	C90073V	C90073Z
3 O.D.	76.1	95	1.3	C90076V	C90076Z
3	88.9	108	1.9	C90089V	C90089Z

Sizes continue in next column

				Painted	Galvanized
Nominal Size	O.D.	Center to End	Approx. Wt. Ea.	Code	Code
Inch.	mm	mm	Kg		
4	114.3	127	3.0	C90114V	C90114Z
5½ O.D.	139.7	140	–	C90139V	C90139Z
5	141.3	140	5.4	C90141V	C90141Z
6½ O.D.	165.1	165	8.3	C90165V	C90165Z
6	168.3	165	7.9	C90168V	C90168Z
8	219.1	197	14.6	C90219V	C90219Z
10	273.1	229	24.5	C90273V	C90273Z
12	323.9	254	31.8	C90323V	C90323Z

Elbow 45° Mod. 120





FM UL
APPROVED
For Listing/Approval Details and Limitations contact MEFA Sales Representative.

Elbow 45°

Material Specifications:

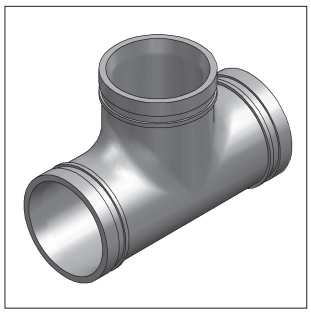
- **Cast Fittings:**
  Ductile Iron conforming to ASTM A-536
- **Coatings:**
  Rust inhibiting lead-free paint - Color: Red (Standard)
  Hot Dipped Zinc Galvanized conforming to ASTM A-153 (Optional)
  For other coating requirements contact your MEFA Representative.
- **Pressure:**
  As the coupling Mod. 1N

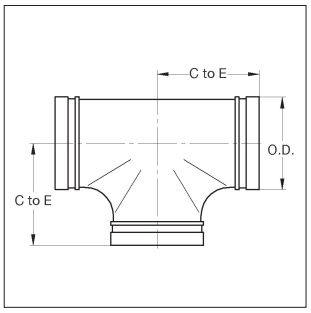
Elbow 45°				Painted	Galvanized
Nominal Size	O.D.	Center to End	Approx. Wt. Ea.	Code	Code
Inch.	mm	mm	Kg		
1	33.4	44	0.2	C45033V	C45033Z
1¼	42.2	44	0.3	C45042V	C45042Z
1½	48.3	44	0.4	C45048V	C45048Z
2	60.3	51	0.4	C45060V	C45060Z
2½	73.0	57	0.8	C45073V	C45073Z
3 O.D.	76.1	57	1.0	C45076V	C45076Z
3	88.9	64	1.1	C45089V	C45089Z

Sizes continue in next column

				Painted	Galvanized
Nominal Size	O.D.	Center to End	Approx. Wt. Ea.	Code	Code
Inch.	mm	mm	Kg		
4	114.3	76	2.2	C45114V	C45114Z
5½ O.D.	139.7	83	–	C45139V	C45139Z
5	141.3	83	5.2	C45141V	C45141Z
6½ O.D.	165.1	89	3.8	C45165V	C45165Z
6	168.3	89	5.2	C45168V	C45168Z
8	219.1	108	8.1	C45219V	C45219Z
10	273.1	121	13.6	C45273V	C45273Z
12	323.9	133	18.3	C45323V	C45323Z

Equal Tee Mod. 130





FM UL

APPROVED
For Listing/Approval Details and Limitations contact MEFA Sales Representative.

Tee

Material Specifications:

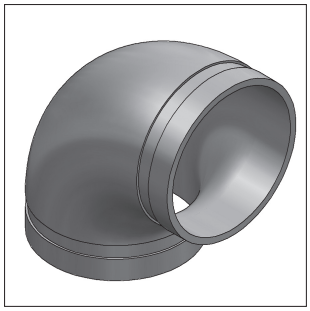
- **Cast Fittings:**
  Ductile Iron conforming to ASTM A-536, Grade 65-45-12
- **Coatings:**
  Rust inhibiting lead-free paint - Color: Red (Standard)
  Hot Dipped Zinc Galvanized conforming to ASTM A-153 (Optional)
  For other coating requirements contact your MEFA Representative.
- **Pressure:**
  As the coupling Mod. 1N

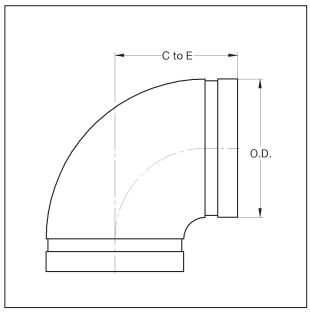
Equal Tee			Finishing	Painted	Galvanized
Nominal Size	O.D.	Center to End	Approx. Wt. Ea.	Code	Code
Inch.	mm	mm	Kg		
1	33.4	57	0.4	TU033V	TU033Z
1¼	42.2	69	0.7	TU042V	TU042Z
1½	48.3	69	0.7	TU048V	TU048Z
2	60.3	83	1.1	TU060V	TU060Z
2½	73.0	95	1.6	TU073V	TU073Z
3 O.D.	76.1	101	2.1	TU076V	TU076Z
3	88.9	108	2.9	TU089V	TU089Z
4	114.3	127	4.4	TU114V	TU114Z

Sizes continue in next column

			Finishing	Painted	Galvanized
Nominal Size	O.D.	Center to End	Approx. Wt. Ea.	Code	Code
Inch.	mm	mm	Kg		
5	141.3	140	8.1	TU141V	TU141Z
5½ O.D.	139.7	140	7.3	TU139V	TU139Z
6½ O.D.	165.1	165	11.1	TU165V	TU165Z
6	168.3	165	11.5	TU168V	TU168Z
8	219.1	197	19.1	TU219V	TU219Z
10	273.1	229	31.3	TU273V	TU273Z
12	323.9	254	41.3	TU323V	TU323Z

FireFit Elbow Mod. 90S





FM UL
APPROVED
For Listing/Approval Details and Limitations contact MEFA Sales Representative.

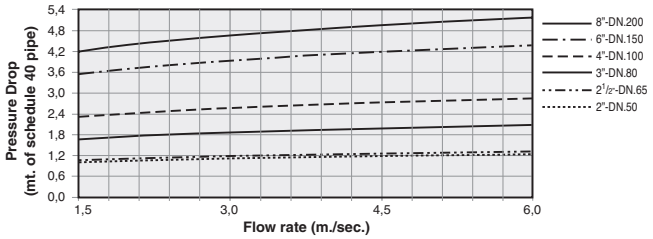
FireFit Elbow

Material Specifications:

The FireFit Elbow is a short pattern tee specifically designed for use in fire protection applications where economy is a factor. All products are UL & ULC listed as well as FM approved. Maximum working pressure is 300 psi

- **Cast Fittings:**
  Ductile Iron conforming to ASTM A-536.
- **Coatings:**
  Rust inhibiting lead-free paint - Color: Red (Standard)
  Hot Dipped Zinc Galvanized conforming to ASTM A-153 (Optional)
  For other coating requirements contact your MEFA Representative.

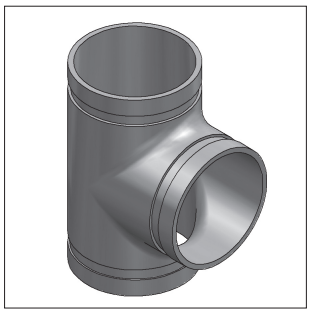
FireFit Elbow

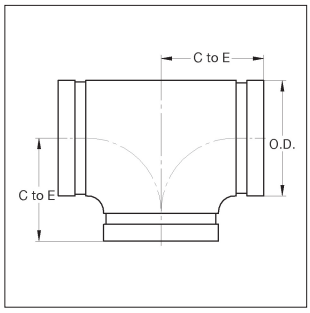


Couplok short pattern fittings exceed the headloss requirements of NFPA 13.
For FireFit Tee branch use 2½ the valves shown.
For FireFit Tee run use the valve shown.

FireFit Elbow			Finishing	Painted	Galvanized
Nominal Size	O.D.	Center to End	Approx. Wt. Ea.	Code	Code
Inch.	mm	mm	Kg		
2	60.3	70	1.3	C90F060V	C90F060Z
2½	73.0	76	2.1	C90F073V	C90F073Z
3	88.9	86	3.1	C90F089V	C90F089Z
4	114.3	102	4.9	C90F114V	C90F114Z
6	168.3	140	11.3	C90F168V	C90F168Z
8	219.1	175	19.1	C90F219V	C90F219Z

FireFit Tee Mod. 130S





FM UL
APPROVED
For Listing/Approval Details and Limitations contact MEFA Sales Representative.

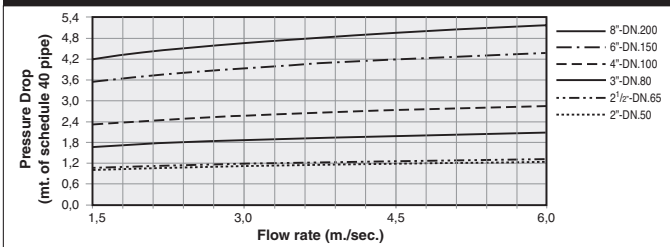
FireFit Tee

Material Specifications:

The FireFit Tee is a short pattern tee specifically designed for use in fire protection applications where economy is a factor. All products are UL & ULC listed as well as FM approved. Maximum working pressure is 300 psi

- **Cast Fittings:**
  Ductile Iron conforming to ASTM A-536.
- **Coatings:**
  Rust inhibiting lead-free paint - Color: Red (Standard)
  Hot Dipped Zinc Galvanized conforming to ASTM A-153 (Optional)
  For other coating requirements contact your MEFA Representative.

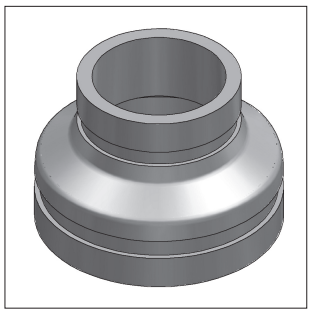
FireFit Tee

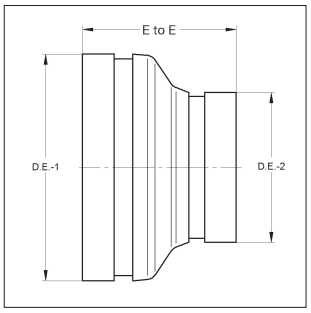


Couplok short pattern fittings exceed the headloss requirements of NFPA 13.
For FireFit Tee branch use 2½ the valves shown.
For FireFit Tee run use the valve shown.

Tee FireFit			Finishing	Painted	Galvanized
Nominal Size	O.D.	Center to End	Approx. Wt. Ea.	Code	Code
Inch.	mm	mm	Kg		
2	60.3	70	1.3	TUF060V	TUF060Z
2½	73.0	76	2.1	TUF073V	TUF073Z
3	88.9	86	3.1	TUF089V	TUF089Z
4	114.3	102	4.9	TUF114V	TUF114Z
6	168.3	140	11.3	TUF168V	TUF168Z
8	219.1	175	19.1	TUF219V	TUF219Z

Concentric Reducer Mod. 240





FM UL

APPROVED
For Listing/Approval Details and Limitations contact MEFA Sales Representative.

Concentric Reducer

Material Specifications:

- **Cast Fittings:**
  Ductile Iron conforming to ASTM A-536
  Malleable Iron conforming to ASTM A-47
- **Fabricated Fittings:**
  1-10" Carbon steel, Schedule 40, conforming to ASTM A-53, Grade B
  12" and above Carbon steel, Standard Wall, conforming to ASTM A-53, Grade B.
- **Coatings:**
  Rust inhibiting lead-free paint - Color: Red (Standard)
  Hot Dipped Zinc Galvanized conforming to ASTM A-153 (Optional)
  For other coating requirements contact your MEFA Representative.

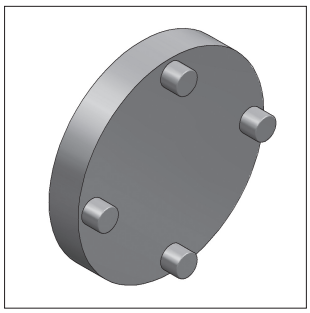
Concentric Reducer		Finishing	Painted	Galvanized
Nominal Size	End to End	Approx. Wt. Ea.	Code	Code
Inch.	mm	Kg		
1¼ x 1	64	0.3	RC042033V	RC042033Z
1½ x 1	64	0.3	RC048033V	RC048033Z
1½ x 1¼	64	0.3	RC048042V	RC048042Z
2 x 1	64	0.4	RC060033V	RC060033Z
2 x 1¼•	64	0.6	RC060042V	RC060042Z
2 x 1½•	64	0.6	RC060048V	RC060048Z
2½ x 1¼	64	0.5	RC076042V	RC076042Z
2½ x 1½	64	0.6	RC076048V	RC076048Z
2½ x 2•	64	0.7	RC076060V	RC076060Z
3 x 1	64	0.5	RC089033V	RC089033Z
3 x 1¼	64	0.6	RC089042V	RC089042Z
3 x 1½	64	0.6	RC089048V	RC089048Z
3 x 2•	64	0.6	RC089060V	RC089060Z
3 x 2½•	64	0.7	RC089076V	RC089076Z
3½ x 3	76	0.8	RC101089V	RC101089Z
4 x 1•	76	1.0	RC114033V	RC114033Z
4 x 1¼	76	1.0	RC114042V	RC114042Z
4 x 1½	76	1.0	RC114048V	RC114048Z
4 x 2•	76	1.1	RC114060V	RC114060Z
4 x 2½•	76	1.2	RC114076V	RC114076Z
4 x 3•	76	1.5	RC114089V	RC114089Z

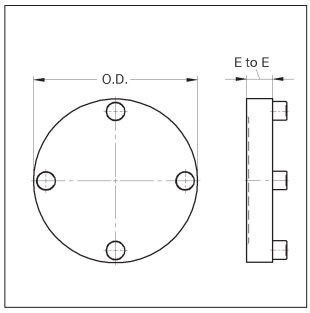
Sizes continue in next column

		Finishing	Painted	Galvanized
Nominal Size	End to End	Approx. Wt. Ea.	Code	Code
Inch.	mm	Kg		
4 x 3½•	76	1.6	RC114101V	RC114101Z
5 x 4•	89	2.0	RC139114V	RC139114Z
6 x 1	102	3.1	RC168033V	RC168033Z
6 x 1½	102	3.1	RC168048V	RC168048Z
6 x 2•	102	2.7	RC168060V	RC168060Z
6 x 3•	102	2.4	RC168089V	RC168089Z
6 x 4•	102	2.5	RC168114V	RC168114Z
6 x 5•	102	2.7	RC168139V	RC168139Z
8 x 3	127	5.5	RC219089V	RC219089Z
8 x 4•	127	4.1	RC219114V	RC219114Z
8 x 5	127	5.2	RC219139V	RC219139Z
8 x 6•	127	4.8	RC219168V	RC219168Z
10 x 4	152	9.1	RC273114V	RC273114Z
10 x 5	152	9.1	RC273139V	RC273139Z
10 x 6•	152	9.1	RC273168V	RC273168Z
10 x 8	152	10.8	RC273219V	RC273219Z
12 x 4	178	11.3	RC323114V	RC323114Z
12 x 6	178	13.2	RC323168V	RC323168Z
12 x 8	178	13.2	RC323219V	RC323219Z
12 x 10	178	14.7	RC323273V	RC323273Z

• - Cast malleable or ductile iron, all others are fabricated steel.
Other sizes available upon request.

Blind Cap Mod. 300





FM UL

APPROVED
For Listing/Approval Details and Limitations contact MEFA Sales Representative.

Blind Cap

Material Specifications:

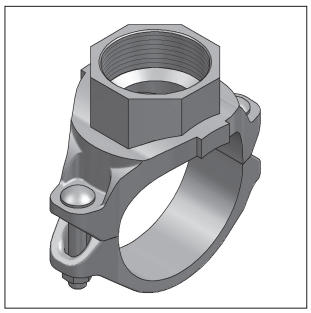
- **Cast Fittings:**
  Ductile Iron conforming to ASTM A-536
  Malleable Iron conforming to ASTM A-47
- **Coatings:**
  Rust inhibiting lead-free paint - Color: Red (Standard)
  Hot Dipped Zinc Galvanized conforming to ASTM A-153 (Optional)
  For other coating requirements contact your MEFA Representative.
- **Pressure:**
  Flexible coupling Mod. 1N

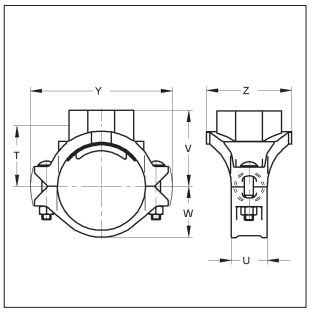
Blind Cap				Finishing	Painted	Galvanized
Nominal Size	O.D.	End to End	Approx. Wt. Ea.	Code	Code
Inch.	mm	mm	Kg		
1	33.4	32	0.1	FC033V	FC033Z
1¼	42.2	32	0.2	FC042V	FC042Z
1½	48.3	32	0.2	FC048V	FC048Z
2	60.3	25	0.2	FC060V	FC060Z
2½	73.0	25	0.3	FC073V	FC073Z
3 O.D.	76.1	25	0.4	FC076V	FC076Z
3	88.9	25	0.5	FC089V	FC089Z

Sizes continue in next column

			Finishing	Painted	Galvanized
Nominal Size	O.D.	End to End	Approx. Wt. Ea.	Code	Code
Inch.	mm	mm	Kg		
4	114.3	29	1.3	FC114V	FC114Z
5½ O.D.	139.7	29	1.8	FC139V	FC139Z
5	141.3	29	1.8	FC141V	FC141Z
6½ O.D.	165.1	29	2.7	FC165V	FC165Z
6	168.3	33	2.7	FC168V	FC168Z
8	219.1	38	5.7	FC219V	FC219Z
10	273.1	38	9.9	FC273V	FC273Z
12	323.9	38	15.3	FC323V	FC323Z

Mechanical Tee Threaded Mod. 3J





FM UL

APPROVED
For Listing/Approval Details and Limitations contact MEFA Sales Representative.

Mechanical Tee Threaded

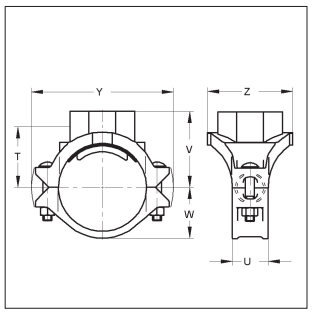
Material Specifications:

The Couplok Mechanical Tee provides a quick and easy outlet at any location along the pipe. A hole drilled or cut in the pipe to receive the locating collar of the is all that is required. The full, smooth outlet area provides for optimum flow characteristics. The housing is specially engineered to conform to the pipe O.D. and the gasket providing a leak tight reliable seal in both positive pressure and vacuum conditions. The maximum working pressure for all sizes is 500 PSI (34.5 bar) when assembled on standard wall steel pipe. The Couplok provides for a branch or cross connection in light wall or standard wall steel pipe.
The Couplok Mechanical Tee female pipe thread branch is available with NPT or ISO 7/1 connection and the Couplok Mechanical Tee has grooved-end branch connection. Couplok Mechanical Tee cross connections are available in various sizes allowing greater versatility in piping design.
NOTE: Variable End Configurations are Possible —
Thd x Thd and Gr. x Thd.
Sizes — 2" x 1/2" through 8" x 4"

- **Housing**
  Ductile Iron conforming to ASTM A536, Grade 65-45-12 or Malleable Iron conforming to ASTM A47, Grade 32510.
- **Coatings:**
  Rust inhibiting lead-free paint
  Color: Red (Standard)
  Hot Dipped Zinc Galvanized (Optional)
  For other coating requirements contact your MEFA Representative.
- **ANSI Bolts and Heavy Hex Nuts:**
  Heat treated, oval-neck track head bolts conforming to ASTM A183 Grade 2 with a minimum tensile strength of 110,000 psi and heavy hex nuts of carbon steel conforming to ASTM A563. Bolts and nuts are provided zinc electroplated as standard.
- **Stainless Steel Bolts and Nuts:**
  Stainless steel bolts and nuts are also available.
  For other coating requirements contact your MEFA Representative.
- **Lubrication:**
  Standard MEFA
- **Gasket:** Materials
  Properties as designated by ASTM D2000.
  Grade "E" EPDM (Standard)
  Green color code
  Service Temperature Range: -40°F to +230°F(-40°C to +110°C)
  Recommended for water service, diluted acids, alkaline solutions, oil-free air and many chemical services.
  NOT FOR USE IN PETROLEUM APPLICATIONS.

Clamp-t flow data (frictional resistance)

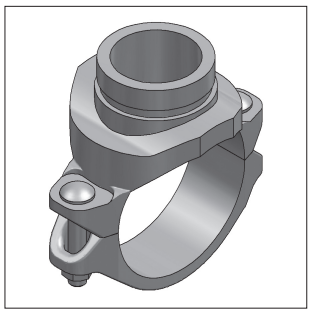
Branch Size Inches	Equiv. Pipe Length Feet
Inches	meters
1/2	0.3
3/4	0.6
1	0.6
1 1/4	0.8
1 1/2	1.2
2	1.1
2 1/2	3.8
3	2.6
4	2.4

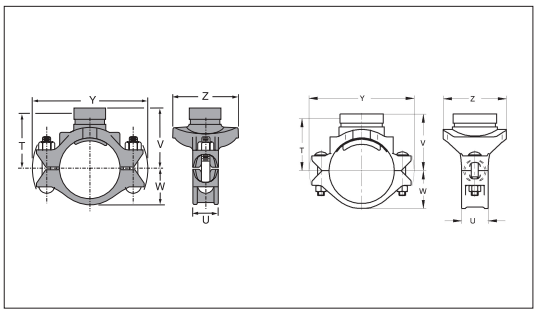


Mechanical Tee Threaded												Painted	Galvanized
Nominal Size	O.D.	Hole Dimensions		▼ Max. Working Pressure	Coupling Dimensions						Approx. Wt. Ea.	Code	Code
		Min. Diameter	Max. Diameter		T	U	V Thread	W	Y	Z			
Inch.	mm	mm	mm	bar	mm	mm	mm	mm	mm	mm	Kg		
2 x ½	60.3 x 21.3	38	39,6	20.7	56	14	67	12	140	76	1.0	DSF060021V	DSF060021Z
2 x ¾	60.3 x 26.7	38	39,6	20.7	52	14	67	38	140	76	1.0	DSF060026V	DSF060026Z
2 x 1	60.3 x 33.7	38	39,6	20.7	51	14	67	38	140	76	1.2	DSF060033V	DSF060033Z
2 x 1¼	60.3 x 42.4	45	46,6	20.7	55	14	73	38	140	89	1.2	DSF060042V	DSF060042Z
2 x 1½	60.3 x 48.3	45	46,6	20.7	55	14	73	38	178	89	1.1	DSF060048V	DSF060048Z
2½ x ½	73.0 x 21.3	38	39,6	20.7	62	14	73	44	140	76	1.4	DSF073021V	DSF073021Z
2½ x ¾	73.0 x 26.7	38	39,6	20.7	59	14	73	44	140	76	1.3	DSF073026V	DSF073026Z
2½ x 1	73.0 x 33.7	38	39,6	20.7	55	14	73	44	156	76	1.3	DSF073033V	DSF073033Z
2½ x 1¼	73.0 x 42.4	51	52,6	20.7	62	14	79	44	156	86	1.5	DSF073042V	DSF073042Z
2½ x 1½	73.0 x 48.3	51	52,6	20.7	62	14	79	44	156	86	1.5	DSF073048V	DSF073048Z
3 x ½	88.9 x 21.3	38	39,6	20.7	65	14	76	54	178	95	1.2	DSF089021V	DSF089021Z
3 x ¾	88.9 x 26.7	38	39,6	20.7	62	14	76	54	178	95	1.2	DSF089026V	DSF089026Z
3 x 1	88.9 x 33.7	38	39,6	20.7	59	14	76	54	178	95	1.2	DSF089033V	DSF089033Z
3 x 1¼	88.9 x 42.4	51	52,6	20.7	68	38	86	54	175	95	1.5	DSF089042V	DSF089042Z
3 x 1½	88.9 x 48.3	51	52,6	20.7	68	38	86	54	175	95	2.0	DSF089048V	DSF089048Z
3 x 2	88.9 x 60.3	64	65,6	20.7	68	38	86	54	175	105	2.1	DSF089060V	DSF089060Z
4 x ½	114.3 x 21.3	38	39,6	20.7	76	14	89	67	197	95	1.3	DSF114021V	DSF114021Z
4 x ¾	114.3 x 26.7	38	39,6	20.7	78	14	89	67	197	95	1.3	DSF114026V	DSF114026Z
4 x 1	114.3 x 33.7	38	39,6	20.7	73	14	89	67	197	95	1.2	DSF114033V	DSF114033Z
4 x 1¼	114.3 x 42.4	51	52,6	20.7	81	48	98	67	191	95	2.0	DSF114042V	DSF114042Z
4 x 1½	114.3 x 48.3	51	52,6	20.7	81	48	98	67	191	95	2.1	DSF114048V	DSF114048Z
4 x 2	114.3 x 60.3	64	65,6	20.7	84	48	102	67	191	105	3.5	DSF114060V	DSF114060Z
4 x 2½	114.3 x 73.0	70	71,6	20.7	78	48	102	67	191	111	2.4	DSF114073V	DSF114073Z
4 x 3 O.D.	114.3 x 76.1	70	71,6	20.7	76	48	102	67	191	111	2.4	DSF114076V	DSF114076Z
4 x 3	114.3 x 88.9	89	90,6	20.7	83	48	108	67	191	133	2.9	DSF114089V	DSF114089Z
6 x 1¼	168.3 x 42.4	51	52,6	20.7	106	51	124	98	257	95	3.5	DSF168042V	DSF168042Z
6 x 1½	168.3 x 48.3	51	52,6	20.7	106	51	124	98	257	95	3.5	DSF168048V	DSF168048Z
6 x 2	168.3 x 60.3	64	65,6	20.7	106	51	124	98	257	105	3.5	DSF168060V	DSF168060Z
6 x 2½	168.3 x 73.0	70	71,6	20.7	106	51	130	98	257	111	3.8	DSF168073V	DSF168073Z
6 x 3 O.D.	168.3 x 76.1	70	71,6	20.7	105	51	130	98	257	111	3.8	DSF168076V	DSF168076Z
6 x 3	168.3 x 88.9	89	90,6	20.7	111	51	137	98	257	133	4.4	DSF168089V	DSF168089Z
8 x 2	219.1 x 60.0	64	65,6	20.7	132	57	149	127	324	105	5.1	DSF219060V	DSF219060Z
8 x 2½	219.1 x 73.0	70	71,6	20.7	134	57	159	127	324	111	5.0	DSF219073V	DSF219073Z
8 x 3 O.D.	219.1 x 76.1	70	71,6	20.7	133	57	159	127	324	111	5.0	DSF219076V	DSF219076Z
8 x 3	219.1 x 88.9	89	90,6	20.7	137	57	162	127	324	133	5.9	DSF219089V	DSF219089Z
8 x 4	219.1 x 114.3	114	115,6	20.7	137	57	165	127	324	165	7.3	DSF219114V	DSF219114Z

NOTE: 21/2", 5" and 6" Nom. size run pipe may be used on 3" O.D., 51/2" O.D. and 61/2" O.D. pipe
▼ Based on use with standard wall pipe.
Not for use in copper systems

Mechanical Tee Grooved Mod. 3G





APPROVED
For Listing/Approval Details and Limitations contact MEFA Sales Representative.

Mechanicali Tee Grooved

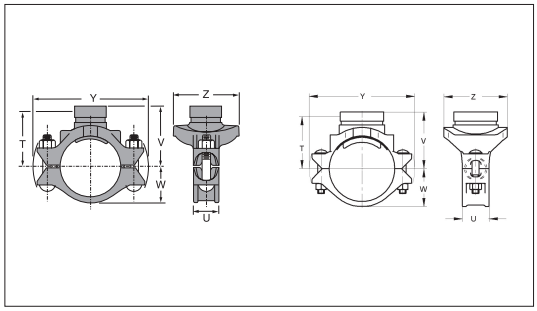
Material Specifications:

The Couplok Mechanical Tee provides a quick and easy outlet at any location along the pipe. A hole drilled or cut in the pipe to receive the locating collar of the Couplok Mechanical Tee is all that is required. The full, smooth outlet area provides for optimum flow characteristics. The Couplok Mechanical Tee housing is specially engineered to conform to the pipe O.D. and the Couplok Mechanical Tee gasket providing a leak tight reliable seal in both positive pressure and vacuum conditions. The maximum working pressure for all sizes is 500 PSI (34.5 bar) when assembled on standard wall steel pipe. The Couplok Mechanical Tee provides for a branch or cross connection in light wall or standard wall steel pipe. Couplok Mechanical Tee cross connections are available in most sizes allowing greater versatility in piping design.

- **Housing**
  Ductile Iron conforming to ASTM-A536, Grade 65-45-12 or Malleable Iron conforming to ASTM A47, Grade 32510.
- **Coatings:**
  Rust inhibiting lead-free paint
  Color: Red (Standard)
  Hot Dipped Zinc Galvanized (Optional)
  For other coating requirements contact your MEFA Representative.
- **ANSI Bolts and Heavy Hex Nuts:**
  Heat treated, oval-neck track head bolts conforming to ASTM A183 Grade 2 with a minimum tensile strength of 110,000 psi and heavy hex nuts of carbon steel conforming to ASTM A563. Bolts and nuts are provided zinc electroplated as standard.
- **Lubrication:**
  Standard MEFA
- **Gasket:** Materials *(Specify when ordering)*
  Properties as designated by ASTM D2000.
  Grade "E" EPDM(Standard)
  Green color code
  Service Temperature Range: -40°F to +230°F(-40°C to +110°C)
  Recommended for water service, diluted acids, alkaline solutions, oil-free air and many chemical services.
  NOT FOR USE IN PETROLEUM APPLICATIONS.

Clamp-t flow data (frictional resistance)

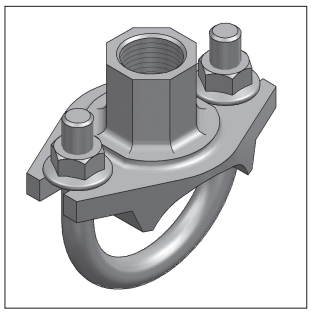
Branch Size Inches	Equiv. Pipe Length
Inch.	meters
1/2	0.3
1 1/4	1.5
1 1/2	1.1
2	1.4
2 1/2	2.1
3	2.9
4	2.1

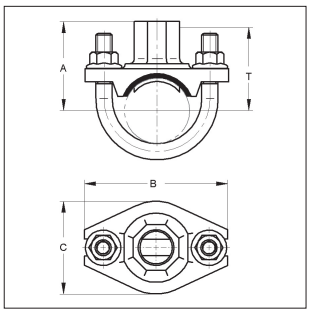


Mechanical Tee Grooved											Painted	Galvanized
Nominal Size	O.D.	Hole Dimensions		▼ Max. Working Pressure	Coupling Dimensions					Approx. Wt. Ea.	Code	Code
		Min.	Max.		T	U	W	Y	Z			
Inch.	mm	mm	mm	bar	mm	mm	mm	mm	mm	Kg		
3 x 1¼	88.9 x 42.4	51	52,6	20,7	38	89	54	175	95	1.5	DSS089042V	DSS089042Z
3 x 1½	88.9 x 48.3	51	52,6	20,7	38	89	54	175	95	2.0	DSS089048V	DSS089048Z
3 x 2	88.9 x 60.3	64	65,6	20,7	38	89	54	175	105	2.1	DSS089060V	DSS089060Z
4 x 1¼	114.3 x 42.4	51	52,6	20,7	48	102	67	191	95	1.9	DSS114042V	DSS114042Z
4 x 1½	114.3 x 48.3	51	52,6	20,7	48	102	67	191	95	2.0	DSS114048V	DSS114048Z
4 x 2	114.3 x 60.3	64	65,6	20,7	48	102	67	191	105	2.1	DSS114060V	DSS114060Z
4 x 2½	114.3 x 73.0	70	71,6	20,7	48	102	67	191	111	2.3	DSS114073V	DSS114073Z
4 x 3 O.D.	114.3 x 76.1	70	71,6	20,7	48	102	67	191	111	2.3	DSS114076V	DSS114076Z
4 x 3	114.3 x 88.9	89	90,6	20,7	48	102	67	191	133	2.5	DSS114089V	DSS114089Z
5 x 1¼	141.3 x 42.4	51	52,6	20,7	48	108	83	232	95	2.5	DSS141042V	DSS141042Z
5 x 1½	141.3 x 48.3	51	52,6	20,7	48	108	83	232	95	2.5	DSS141048V	DSS141048Z
5 x 2	141.3 x 60.3	64	65,6	20,7	48	108	83	232	105	2.5	DSS141060V	DSS141060Z
5 x 2½	141.3 x 73.0	70	71,6	20,7	48	108	83	232	111	2.6	DSS141073V	DSS141073Z
5 x 3	141.3 x 88.9	89	90,6	20,7	48	117	83	232	133	3.2	DSS141089V	DSS141089Z
6 x 1½	168.3 x 48.3	51	52,6	20,7	51	127	98	257	95	3.3	DSS168048V	DSS168048Z
6 x 2	168.3 x 60.3	64	65,6	20,7	51	127	98	257	105	3.5	DSS168060V	DSS168060Z
6 x 2½	168.3 x 73.0	70	71,6	20,7	51	130	98	257	111	3.4	DSS168073V	DSS168073Z
6 x 3 O.D.	168.3 x 76.1	70	71,6	20,7	51	130	98	257	111	3.4	DSS168076V	DSS168076Z
6 x 3	168.3 x 88.9	89	90,6	20,7	51	130	98	257	133	3.6	DSS168088V	DSS168088Z
6 x 4	168.3 x 114.3	114	115,6	20,7	51	133	98	257	165	4.7	DSS168114V	DSS168114Z
8 x 2	219.1 x 60.3	64	65,6	20,7	57	156	127	324	108	4.7	DSS219060V	DSS219060Z
8 x 2½	219.1 x 73.0	70	71,6	20,7	57	156	127	324	111	4.8	DSS219073V	DSS219073Z
8 x 3	219.1 x 88.9	89	90,6	20,7	57	156	127	324	133	5.2	DSS219089V	DSS219089Z
8 x 4	219.1 x 114.3	114	115,6	20,7	57	159	127	324	165	7.3	DSS219114V	DSS219114Z

NOTE: 2 1/2", 5" and 6" Nom. size run pipe may be used on 3" O.D., 5 1/2" O.D. and 6 1/2" O.D. pipe
▼ Based on use with standard wall pipe.
Not for use in copper systems

Sprinkler Tee Mod. 3L





FM UL

APPROVED
For Listing/Approval Details and Limitations visit our website www.anvilintl.com or contact an Anvil® /AnvilStar™ Sales Representative.

Sprinkler Tee

Material Specifications:

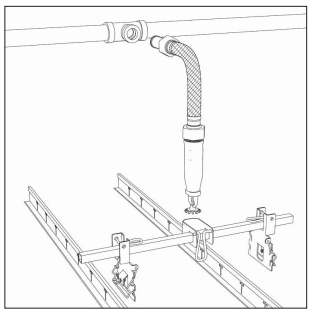
The Couplok Sprinkler Tee serves the same function as the Mechanical Tee, but uses a steel electro-plated U-bolt to save space and for easier installation in tight places. The Sprinkler Tee is ideal for direct connections with sprinkler heads and drop nipples.

- **Housing**
  Ductile Iron conforming to ASTM A-536, Grade 65-45-12
- **Protezione:**
  Zinc Electroplated
  For other coating requirements contact your MEFA Representative.
- **U-bolt and Nuts:**
  U-bolt is carbon steel SAE J429 Gr. 2, zinc plated complete with hex flanged lock nuts conforming to ASTM A-563 Gr. A or B or SAE J995 Gr. 2.
- **Threads:**
  British Standard Parallel (BSPT) per EN10226-1.
- **Gasket:** *Materials*
  Properties as designated by ASTM D-2000.
  Grade "E" EPDM(Standard)
  Green color code
  Service Temperature Range: -40°F to +230°F(-40°C to +110°C)
  Recommended for water service, diluted acids, alkaline solutions, oil-free air and many chemical services.
  NOT FOR USE IN PETROLEUM APPLICATIONS.

Sprinkler Tee										Painted	Galvanized
Nominal Size	O.D.	Hole Diameter		Max. Working Pressure	Dimensions				Approx. Wt. Ea.	Code	Code
		Min.	Max.		A	B	C	T			
Inch.	mm	mm	mm	bar	mm	mm	mm	mm	Kg		
1¼ x ½	42.4 x 21.3	30	31,6	20.7	54	89	57.2	42	0.4	ST042021V	ST042021Z
1¼ x ¾	42.4 x 26.7	30	31,6	20.7	54	89	57.2	42	0.4	ST042026V	ST042026Z
1¼ x 1	42.4 x 33.7	30	31,6	20.7	58	89	57.2	41	0.5	ST042033V	ST042033Z
1½ x ½	48.3 x 21.3	30	31,6	20.7	57	89	57.2	48	0.4	ST048021V	ST048021Z
1½ x ¾	48.3 x 26.7	30	31,6	20.7	57	89	57.2	48	0.4	ST048026V	ST048026Z
1½ x 1	48.3 x 33.7	30	31,6	20.7	61	89	57.2	44	0.5	ST048033V	ST048033Z
2 x ½	60.3 x 21.3	30	31,6	20.7	64	95	57.2	51	0.4	ST060021V	ST060021Z
2 x ¾	60.3 x 26.7	30	31,6	20.7	64	95	57.2	51	0.4	ST060026V	ST060026Z
2 x 1	60.3 x 33.7	30	31,6	20.7	67	95	57.2	51	0.5	ST060033V	ST060033Z
3 O.D. x ½	76.1 x 21.3	30	31,6	20.7	73	108	57.2	59.0	0.4	ST076021V	ST076021Z
3 O.D. x ¾	76.1 x 26.7	30	31,6	20.7	73	108	57.2	59.0	0.4	ST076026V	ST076026Z
3 O.D. x 1	76.1 x 33.7	30	31,6	20.7	76	108	57.2	56	0.5	ST076033V	ST076033Z

NOTE: Tighten nuts alternatively to a recommended torque of 18-22 ft.-lbs. (25-30 Nm) on pipe wall less than schedule 10 (DIN 2440) or 23-27 ft.-lbs. (31-37 Nm) on pipe walls schedule 10 (DIN 2440) and above.

Easyflex Flexible Pipe



Easyflex Flexible Pipe

APPROVED
For Listing/Approval Details and Limitations contact MEFA Sales Representative.

Quality System Certificate No. 020
BS EN ISO 9001:1994

Technical Feature:

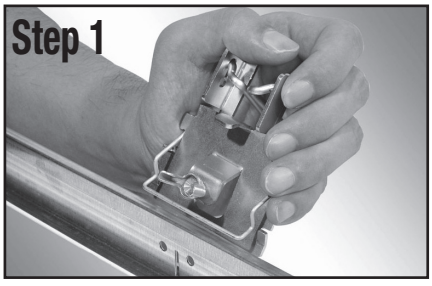
EASYFLEX Sprinkler Drops are designed to significantly reduce labor and installation costs. Available in 5 different lengths with either a 1/2" or 3/4" NPT on reducer thread, EASYFLEX has been tested and listed by Underwriters Laboratories and approved by FM, United States and Canada, per NFPA 13, 13R & 13D, as well as UL 1474 standards for safety regarding, but not limited to, pressure cycling, corrosion resistance, flow characteristics, vibration resistance, leakage, and mechanical as well as hydrostatic strength.
EASYFLEX is an active member of AFSA, NFPA and NFSA.

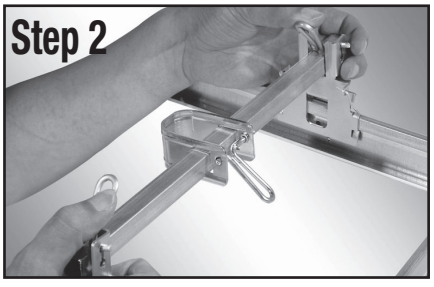
- **Temperature Rating:** Maximum temperature : 300°F(149°C)
- **Pressure:** 1205 kPa (1600 kPa per LPCB)
- **Maximum Working Pressure:** 175 psi/ 1205kPa
- **Test Pressure:** 1000 psi / 6875kPa (burst)
- **Connection:** 1"
- **To Branch Line (Inlet):** 1"NPT male thread.
- **To sprinkler Head (Outlet):** 1/2"or 3/4"PT female thread.
- **Minimum bend radius:** 8"(203mm). Do not bend within 2 ½ "from connection nut.
- **Maximum number of bends per flexible tube:** 3

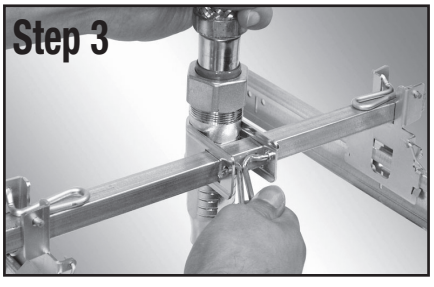
Easyflex Flexible Pipe

Fitting Type		Model No.	Length Inch / mm	Equiv. Length Pipe mm	Packing
Inlet	Outlet				Pieces
1"	1/2"	EFU/EFB 224	24.0 / 610	2600	20
1"	1/2"	EFU/EFB 231	29.5 / 750	2700	20
1"	1/2"	EFU/EFB 236	39.4 / 1000	4200	20
1"	1/2"	EFU/EFB 248	48.0 / 1220	5000	20
1"	1/2"	EFU/EFB 260	59.0 /1500	6200	10
1"	1/2"	EFU/EFB 275	75.0 / 1905	7600	10
1"	3/4"	EFU/EFB 324	24.0 / 610	2000	20
1"	3/4"	EFU/EFB 331	31.0 / 787	2300	20
1"	3/4"	EFU/EFB 336	36.0 / 914	2700	20
1"	3/4"	EFU/EFB 348	48.0 / 1219	3800	20
1"	3/4"	EFU/EFB 360	60.0 / 1524	5100	10
1"	3/4"	EFU/EFB 375	75.0 / 1905	6200	10

* EFU - Unbraided Type
Braided Type

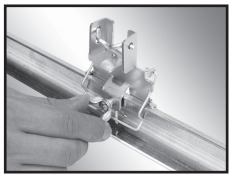






1 Grip the end brackets

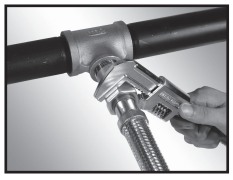
Grip the end brackets and set them on the T-Bar with the protrusion part to the outside of the T-Bar



Secure the end brackets to the T-Bar with the butterfly nut.

2 Press the lever

Press the lever of the end brckets to latch firmly with both levers facing each other



Connect EASYFLEX to branch line.

3 Adjust the level

To adjust level of the reducer with the ceiling tile, move the reducer vertically, and push the latch down firmly to secure into position.

Technical Data

Specified Bolt Torque

Specified bolt torque is for the oval neck track bolts used on Couplok couplings and flanges. The nuts must be tightened alternately and evenly until fully tightened. **CAUTION:** Use of an Impact wrench is not recommended because the torque output can vary significantly due to many variables including air pressure supply, battery strength and operational variations.

CAUTION: Proper torquing of coupling bolts is required to obtain specified performance. **Over torquing the bolts may result in damage to the bolt and/or casting which could result in pipe joint separation.** Under torquing the bolts may result in lower pressure retention capabilities, lower bend load capabilities, joint leakage and pipe joint separation. Pipe joint separation may result in sig-nificant property damage and serious injury.

NOTE: Use specified bolt torque unless otherwise indicated on product installation pages.

ANSI
SPECIFIED BOLT TORQUE

Bolt Size	Wrench Size	Specified Bolt Torque*
In.	*In.*	*Ft.-Lbs.*
3/8	11/16	30-45
1/2	7/8	80-100
5/8	1 1/16	100-130
3/4	1 1/4	130-180
7/8	1 7/16	180-220
1	1 5/8	200-250
1 1/8	1 13/16	225-275
1 1/4	2	250-300

* Non-lubricated bolt torques

METRIC
SPECIFIED BOLT TORQUE

Bolt Size	Wrench Size	Specified Bolt Torque*
mm	*mm*	*N-m*
M10	17	40-60
M12	19	110-150
M16	24	135-175
M20	30	175-245
M22	34	245-300
M24	36	270-340

* Non-lubricated bolt torques

Design Factors

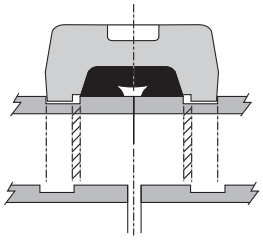
Movement:

Each flexible design Couplok coupling can provide for pipe system movement up to the design maximum for the specific size and type coupling being utilized. Movement is possible in the Couplok coupling due to two factors: (1) designed-in clearance between the key of the coupling and the groove diameter and groove width, and (2) the gap between pipe ends joined by the coupling.

LINEAR MOVEMENT:

Flexible Coupling Linear Movement

Linear movement is accommodated within the coupling by allowing the pipe ends to move together or apart in response to pressure thrusts and temperature changes. The available linear movement provided by Standard Couplok couplings is shown below:



Represents Linear Movement Capabilities

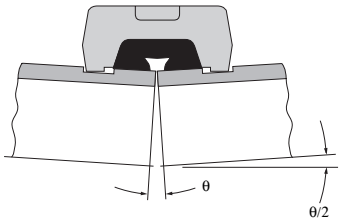
LINEAR MOVEMENT

Sizes	Roll Groove Pipe	Cut Groove Pipe
1" through 3/2"	1/16	1/16
4" though 24"	3/32	3/16

ANGULAR MOVEMENT:

Flexible Coupling Angular Movement

Designed-in clearances allow limited deflection of the pipe joint within the coupling, without introducing eccentric loads into the coupling joint.The maximum available angular movement of Couplok coupling joints is shown in the performance data for each coupling type. The amount of angular flexibility varies for each coupling size and type. For design purposes the published figures should be reduced by the below listed factors to account for pipe, groove and coupling tolerances.



ANGULAR MOVEMENT

Sizes	Design Factor	
	Roll Groove	Cut Groove
1" through 3/2"	50%	50%
4" though 24"	50%	25%

Rigid Couplings

Couplok rigid couplings are designed to provide a joint with the attributes of a welded or flanged connection. Therefore, these joints would remain in strict alignment and would resist deflection and linear movement during service.

Flexible Couplings

Flexible couplings provided in the Couplok product line. The following information on movement applies to these flexible couplings.

Technical Data

Gasket Grade Index & Gasket Recommendation

The lists are provided as an aid in selecting the optimum gasket grade for a specific application to assure the maximum service life.The recommendations have been developed from current information supplied by manufacturers of the elastomers, technical publications, and industry applications. The information supplied should be considered as a basis for evaluation but not as a guarantee. Selection of the optimum gasket grade for a specific service requires the consideration of many factors; primarily temperature, fluid concentration, and continuity of service. Unless otherwise noted, all gasket recommendations are based on 100°F (38°C) maximum temperature service condition. Where more than one gasket grade is shown, the preferred grade is listed first. Combinations of fluids should be referred to a Couplok Representative for an engineering evaluation and recommendation. In unusual or severe services, gasket materials should be subjected to simulated service conditions to determine the most suitable gasket grade.Gasket recommendations apply only to Couplok gaskets. Contact a Couplok Representative for recommendations for services not listed. These listings do not apply to Couplok Butterfly Valves.

All Couplok products marked with UL/ULC Listed, FM approved VdS and/or LPC symbols are Listed/Approved with EPDM material. For other Listed/Approved materials, please contact a Couplok Representative for more information.

GASKET GRADE INDEX

STANDARD GASKETS

Grade	Temp. Range	Compound	Color Code	General Service Applications
E	-40°F to +230°F (-40°C to110°C)	EPDM	Green	Water, dilute acids, alkalies, salts, and many chemical services not involving hydrocarbons, oils, or gases. Excellent oxidation resistance. **NOT FOR USE WITH HYDROCARBONS**
T	-20°F to +180°F (-29°C to 82°C)	Nitrile (Buna-N)	Orange	Petroleum products, vegetable oils, mineral oils, and air contaminated with petroleum oils. **NOT FOR USE IN HOT WATER SERVICES**

SPECIAL GASKETS

Grade	Temp. Range	Compound	Color Code	General Service Applications
O	+20°F to +300°F (-20°C to 149°C)	Fluoro Elasto-mer	Blue	High temperature resistance to oxidizing acids, petroleum oils, hydraulic fluids, halo-genated.hydrocarbons and lubricants
L	-40°F to +350°F (-40°C to 177°C)	Silicone	Red Gasket	Dry, hot air and some high temperature chemical services.
E Type A	-40°F to +150°F (-40°C to 66°C)	Silicone	Violet	Wet & Dry (oil free air) Pipe in Fire Pro-tection Systems. For dry pipe systems, Couplok Xtreme™ Temperature Lubricant is required

Gasket Recommendation Listing

WATER & AIR

Service	Gasket Grade
Air, (no oil vapors) Temp. -40°F to 230°F (-40°C to 110°C)	E
Air, (no oil vapors) Temp. -40°F to 350°F (-40°C to 177°C)	L
Air, Oil vapor Temp. -20°F to 150°F (-29°C to 66°C)	T
Air, Oil vapor Temp. 20°F to 300°F (-7°C to 149°C)	O
Water, Temp to 150°F (66°C)	E/T
Water, Temp to 230°F (110°C)	E
Water, Acid Mine	E/T
Water, Chlorine	(E/O)
Water, Deionized	E/T
Water, Seawater	E/T
Water, Waste	E/T
Water, Lime	E/T

Where more than one gasket grade is shown the preferred gasket grade is listed first. Where the gasket grade is shown in parentheses, Contact a Couplok Representative for an engineering evaluation and recommendation. Specify gasket grade when ordering. Use Couplok lubricant on gasket. Check gasket color code to be certain it is recommended for the service intended.

PETROLEUM PRODUCTS

Service	Gasket Grade
Crude Oil - Sour	T
Diesel Oil	T
Fuel Oil	T
Gasoline, Leaded	T
Gasoline, Unleaded*	(O)
Hydraulic Oil	T
JP-3, JP-4 and JP-5	T/O
JP-6, 100°F (38°C) Maximum Temp.	O
Kerosene	T
Lube Oil, to 150°F (66°C)	T
Motor Oil	T
Tar and Tar Oil	T
Transmission Fluid --Type A	O
Turbo Oil #15 Diester Lubricant	O

Unless otherwise noted, all gasket listings are based upon 100°F (38°C) maxi-mum temperature service conditions. For services not listed Contact a Couplok Representative for recommendation. *Contact Contact a Couplok Representative for service evaluation.

VACUUM SERVICE

VACUUM SERVICE

Size	Vacuum Level	Gasket Recommendation
1” - 6” (25 - 150mm)	0” - 29.92” Hg	Standard or Flush Gap
8” - 12” (200 - 300mm)	0” - 15 Hg	Standard or Flush Gap
11⁄2” - 12” (40 - 200mm)	0” - 29.92 Hg	Flush Gap

LARGER SIZES:
Contact a Couplok Representative for more information.

Technical Data

Couplok Gasket-Recommendations

CHEMICAL SERVICES	
Chemical Composition	Gasket Grade
Acetic Acid 50%	E
Acetic Acid Glacial	L/E
Acetone	E
Acethlene	E/T
Alkalis	T/E
Alums	E/T/O
Aluminum Chloride	E/T
Aluminum Fluoride	E/T/O
Aluminum Hydroxide	E/O
Aluminum Nitrate	E/T
Aluminum Salts	E
Ammonia Gas, Cold	E
Ammonia Liquid	E
Ammonium Chloride	T/E
Ammonium Fluoride	E
Ammonium Hydroxide	E
Ammonium Nitrate	T/E
Amyl Acetate	E
Amyl Alcohol	E
Aniline	E
Animal Fats	T
Argon-Gas	L
Arsenic Acid, to 75%	T/E/O
Barium Carbonate	E/T
Barium Chloride	E/T
Barium Hydroxide	E/T
Barium Nitrate	E/O
Barium Sulphide	E/T
Beet Sugar Liquors	T
Benzene	O
Benzene Sulfonic (Aromatic Acid)	(E)
Benzoic Acid	O
Benzyl Alcohol	E
Benzyl Chloride	E
Black Sulphate Liquor	T
Bleach, 5% Active Cl2	E/O
Borax	E/O
Boric Acid	E/T
Bromine	O
Butyl Alcohol	E/T
Butyl Stearate	E
Butylene	T/O
Calcium Bisulfate	T/O
Calcium Bisulphide	T/O
Calcium Bisulphite	T/O
Calcium Carbonate	E/T
Calcium Chloride	E/T
Calcium Hydroxide (Lime)	E/T

CHEMICAL SERVICES	
Chemical Composition	Gasket Grade
Calcium Sulfate	E/T
Calcium Sulfide	E/T
Caliche Liquors	E/T
Cane Sugar Liquors	T
Carbitol	E/T
Carbon Dioxide, Dry	E/T
Carbon Dioxide, Wet	E/T
Carbon Monoxide	E
Carbon Tetrachloride	O
Castor Oil	T
Caustic Potash	T
Caustic Soda	E
Cellosolve	E
Chlorine Dry	(O)
Chlorinate Solvents	(O)
Chlorobenzene	O
Chlorobenzene Chloride	O
Chlorobromomethane	O
Chloroform	O
Chrome Alum	E/T
Chrome Plating Solutions	O
Chromic Acid, to 50%	O
Citric Acid	E/T
Coconut Oil	T
Cod Liver Oil	T
Coke Oven Gas	T/O
Copper Carbonate	E/T
Copper Chloride	E/T
Copper Cyanide	E/T
Copper Sulphate	E/T
Corn Oil	T
Cotton Seed Oil	T
Cresole, Cresylic Acid	T/O
Creosote, Coal Tar	(T/O)
Creosote, Wood	T/O
Cupric Chloride	E/T
Cupric Fluoride	E/T
Cupric Sulphate	E/T
Cychohexanol	O
Diacetone Alcohol	E
Dichlorobenzene	O
Dichloroethylene	O
Dioctyl Phthalate	(E)
Epson-Salt	E/T
Ethane	E
Ethanolamine	E
Ethyl Acetate	(E)
Ethyl Alcohol	E/T

CHEMICAL SERVICES	
Chemical Composition	Gasket Grade
Ethyl-Chloride	E/T
Ethyl Ether	(T)
Ethylene Chloride	E
Ethylene Chlorohydrin	E
Ethylene Diamine	E/T
Ethylene Dichloride (Dichloroethane)	O
Ethylene Glycol	E/T
Ethylene Oxide	(E)
Ferric Chloride, to 35%	E/T
Ferric Nitrate	E/T
Ferric Sulphate	E/T
Ferrous Chloride	E/T
Fish Oils	T
Fluroboric Acid	E
Fluorosilicic Acid	E
Fly-Ash	E
Formaldehyde	E/T
Formamide	E/T
Formic Acid	E/O
Freon 11, 130°F (54°C) Max.	T
Freon 12, 113, 114, 115, 130°F (54°C) Max.	T
Fructose	T
Furfuryl Alcohol	(E)
Glucose	E/T
Glue	T
Glycerin	E/T
Glycerol	E/T
Glycol	E/T
Heptane	T
Hexaldehyde	E
Hexane	T
Hexylene Glycol	T
Hydrochloric Acid, to 36%, 75°F (24°C)-Max.	E
Hydrochloric Acid, to 36%, 158°F (70°C)-Max.	(O)
Hydrofluoric Acid, to 75%, 158°F (70°C)-Max.	(O)
Hydrofluosilicic Acid	T/E
Hydrogen Peroxide, to 50%	E/T/O
Hydrogen Peroxide, to 90%	(L/O)
Hydroquinone	T/O
Iodine,-Wet	E
Isoamyl Alcohol	E
Isooctane	T
Isobutyl Alcohol	E
Isopropyl Alcohol	E
Lacquer	(O)
Lacquer Solvent	(O)
Lactic Acid	T
Lard Oil	T

Where more than one gasket grade is shown the preferred gasket grade is listed first. Where the gasket grade is shown in parentheses, Contact a MEFA Representative for an engineering evaluation and recommendation. Check gasket grade when ordering. Use MEFA lubricant on gasket.

Unless otherwise noted, all gasket listings are based upon 100°F (38°C) maximum temperature service conditions. For services not listed, Contact a MEFA Representative for recommendation. Check gasket color code to be certain it is recommended for the service intended.

Technical Data

Couplok Gasket-Recommendations

CHEMICAL SERVICES	
Chemical Composition	Gasket Grade
Latex (1% Styrene &-Butadiene)	O
Lead Acetate	E/T
Linseed Oil	T
Lithium Bromide	T/O
Magnesium Chloride	E/T
Magnesium Hydroxide	E/T
Magnesium Nitrate	E
Magnesium Sulphate	E/T
Malonyl Nitrile	E/T
Mercuric Chloride	E/T
Mercuric Cyanide	E/T
Mercury	E/T
Methyl Acetate	(E)
Methyl Alcohol, Methanol	E/T
Methyl Cellosolve (Ether)	E
Methyl Chloride	(O)
Methyl Ethyl Ketone	(E)
Methyl Formate	E
Methyl Isobutyl Carbinol	E/T
Methyl Isobutyl Ketone	(E)
Mineral Oils	T
Naphtha, 160°F (71°C)-Max.	O
Naphthalene 176°F	O
Nickel Chloride	E/T
Nickel Nitrate	E
Nickel Plating Solution 125°F (52°C)-Max.	E
Nitric Acid, to 10%, 75°F-(24°C)-Max.	E
Nitric Acid, 10-50%, 75°F-(24°C)-Max.	O
Nitric Acid, 50-86%, 75°F (24°C)-Max.	(O)
Nitric Acid, Red Fuming	(O)
Nitro Benzene	(O)
Nitrous Oxide	E
Octyl Alcohol	T
Olive Oil	T
Oxalic Acid	E
Ozone	E
Phenol (Carbolic acid) 300°F (149°C)-Max.	O
Phenylhydrazine	(O)
Phosphate Ester	E
Phosphoric Acid, to 75% & 70°F (21°C)-Max.	E/T

CHEMICAL SERVICES	
Chemical Composition	Gasket Grade
Phosphoric Acid, to 85% & 150°F (66°C) Max.	O
Photographic Solutions	T
Potassium Bromide	E/T
Potassium Carbonate	E/T
Potassium Chloride	E/T
Plat ing Solutions (gold, brass cad-mium, copper, lead, silver, tin, zinc)	E
Potassium Chromate	T
Potassium Cyanide	E/T
Potassium Ferricyanide	E/T
Potassium Ferrocyanide	E/T
Potassium Hydroxide	T
Potassium Iodide	E/T
Potassium Nitrate	E/T
Potassium Permanganate, saturated, to 25%	E
Potassium Sulphate	E/T
Propanol	E
Propyl Alcohol	E/T
Propylene Glycol	E/T
Pydraul 312C	O
Pyroguard “C” &-“D”	T
Pyroguard 55	E
Pyrrole	E
Salicylic Acid	E/T
Silver Cyanide	E
Silver Nitrate	E
Skydrol, 200°F (93°C)-Max.	L
Skydrol 500 Phosphate Ester	(L/E)
Soda Ash,-Sodium Carbonate	E/T
Sodium Bicarbonate	E/T
Sodium Bisulphate	E/T
Sodium Bisulphite (black liquor)	E/T
Sodium Bromide	E/T
Sodium Chlorate	E/T
Sodium Chloride	E/T
Sodium Cyanide	E/T
Sodium Hydroxide, to 50%	E
Sodium Hypochlorite, to 20%	E
Sodium Metaphosphate	E/T
Sodium Nitrate	E/T

CHEMICAL SERVICES	
Chemical Composition	Gasket Grade
Sodium Peroxide	E
Sodium Phosphate	E/T
Sodium Silicate	E/T
Sodium Sulphide	E/T
Sodium Sulphite Solution, to 20%	E/T
Sodium Thiosulphate, “Hypo”	E/T
Soybean Oil	T
Stannous Chloride, to 15%	E/T/O
Starch	E/T
Stearic Acid	T
Styrene	O
Sucrose Solutions	T
Sulphur	E
Sulphuric Acid, to 25%, 150°F (66°C)-Max.	E
Sulphuric Acid, 25-50%, 200°F (93°C) Max.	O
Sulphuric Acid, 50-95%, 150°F-(66°C)-Max.	O
Sulphuric Acid, Fuming	(O)
Sulphuric Acid, Oleum	(O)
Sulphurous Acid	(O)
Tetrachloroethylene	O
Toluene	O
Tributyl Phosphate	(E)
Trichloroethylene, 200°F-(93°C)-Max	O
Triethanolamine	E/T
Trisodium Phosphate	(E/T)
Turpentine 158°F-(70°C)-Max.	T/O
Urea	E/T
Vegetable Oils	T
Vinegar	T
Vinyl Acetate	(E)
White Liquor	E
Xylene (Xylol)-158°F (70°C)-Max.	O
Zinc Sulphate	E/T

Where more than one gasket grade is shown the preferred gasket grade is listed first. Where the gasket grade is shown in parentheses, Contact a MEFA Representative for an engineering evaluation and recommendation. Check gasket grade when ordering. Use MEFA lubricant on gasket.

Unless otherwise noted, all gasket listings are based upon 100°F (38°C) maximum temperature service conditions. For services not listed, Contact a MEFA Representative for recommendation. Check gasket color code to be certain it is recommended for the service intended.

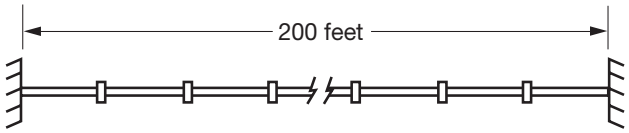
Technical Data

Movement-Applications

THERMAL MOVEMENT:

A sufficient amount of coupling joints must be provided to accommodate the calculated movement (expansion or contraction) in a pipe run or segment thereof .

EXAMPLE:
A 200 foot long straight run of 4" steel cut grooved pipe between anchor points. Minimum Temperature: 40° F (4 .4° C). (at time of installation). Maximum Oper. Temperature: 160° F (71 .1° C).



Thermal expansion tables show this system will expand a total of 1 .80" due to the temperature change .

Design Question:

How many couplings are required to account for the thermal growth?

Available linear movement per flexible coupling:

Using the table on page 171, we see that there is 0 .188" linear movement per coupling (4" Flexible Coupling)

Couplings required

As indicated above, the total movement is 1.80". Thus, the number of couplings is determined as follows:

No . of Couplings = Tot . Movement / Avail . Movement per Coupling

For our example:
No. of Couplings = (1.80") / (0.187") = 9.6,
Therefore 10 couplings are needed.

Position of couplings

In order for the couplings to provide for the movement indicated by the above example, it would be necessary to install all couplings with the maximum gap between pipe ends. Conversely, if the thermal movement was contraction due to a reduction of system temperature, the coupling joints would have be installed with the pipe ends butted, thus accommodating the "shrink" of the pipe system.

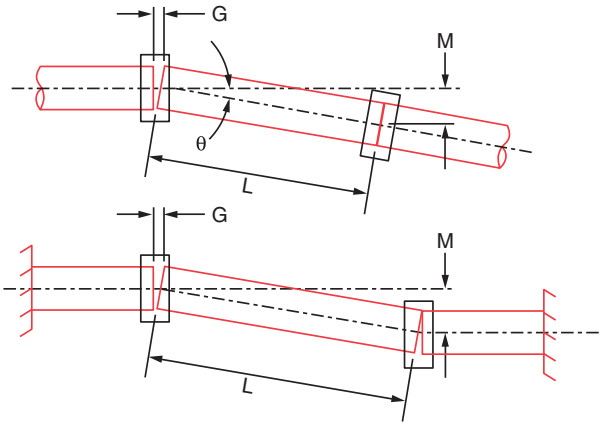
In either case the pipe run in question would have to be anchored at the proper locations to direct pipe system expansion or contraction into the coupling joints .

As can be seen from the above example, the pipe end gap within the coupling joint must be considered when designing a groovedend pipe system to accommodate thermal movement . The couplings do not automatically provide for expansion and contraction of piping .

MISALIGNMENT & DEFLECTIONS:

The angular movement capability of the Couplok coupling permits the assembly of pipe joints where the piping is not properly aligned . At least two couplings are required to provide for lateral pipe misalignment . Deflection (longitudinal misalignment) may be accommodated within a single coupling as long as the angle of deflection does not exceed the value shown in the coupling performance data for the particular size and coupling type.

A pipe joint that utilizes the angular deflection capability of the Couplok coupling will react to pressure and thermal forces dependent upon the manner in which it is restrained . An unrestrained joint will react to these forces by straightening, thus reducing, if not eliminating, the deflection at the joint . If joint deflection has been designed into the pipe layout and must be maintained, then sufficient anchors must be provided to resist the lateral forces and hold the joint in the deflected condition .



The amount of deflection from pipe run centerline can be calculated utilizing the following equations:

$M = L(\sin \theta)$
$\theta = \text{ArcSin}(G/D)$
$M = (G.L)/D$

Where:

M = Misalignment (inches)
G = Maximum Allowable Pipe End Movement (Inches) as shown under "Performance Data" (Value to be reduced by Design Factor)
θ = Maximum Deflection (Degrees) from centerline as shown under "Performance Data" (Value to be reduced by Design Factor)
D = Pipe Outside Diameter (Inches)
L = Pipe Length (Inches)

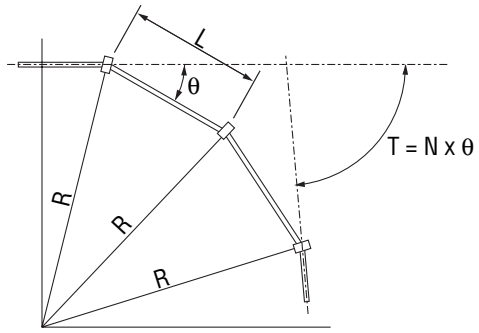
***NOTE**: verify the adequacy of the convertion from inches to millimeters*

Technical Data

Movement-Applications (cont.)

CURVE LAYOUT:

Utilizing the angular deflection at each coupling joint curves may be laid out using straight pipe lengths and Couplok Couplings.



This example shows how to calculate the curve radius, required pipe lengths, and number of required couplings.

R = L / (2.sinθ/29)
L = 2.R.sinθ/2
N = T/θ

Where:

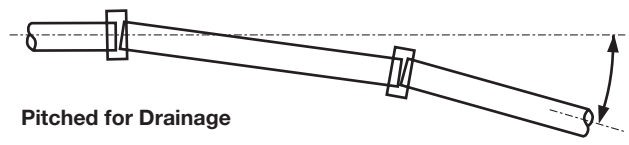
M = Number of Couplings
N = Radius of Curve (feet)
R = Pipe Length (feet)
L = Lunghezza dei tratti (m)
θ = Deflection from centerline (Degrees) of each Coupling (See coupling performance data, value to be reduced by Design Factor)
T = Total Angular Deflection of all Couplings.

***NOTE**: verify the adequacy of the convertion from inches to millimeters*

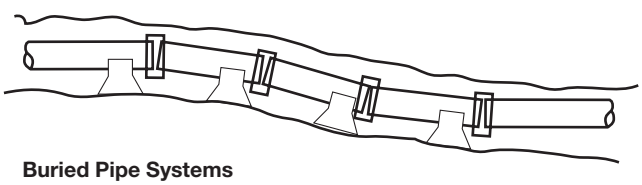
Drainage, Buried systems, etc.:

The flexible design of the Couplok coupling makes it ideal for use in a wide variety of systems in which random changes of the pipe direction can be accommodated by the Couplok coupling's angular deflection capability rather than requiring the use of special fittings.

Pitched drainage systems, buried pipe systems where pipe laying conditions are subject to settlement, and exposed pipe systems laid on rough ground are but a few of the many types of pipe installations that present conditions where the functional capability of the Couplok coupling are useful.



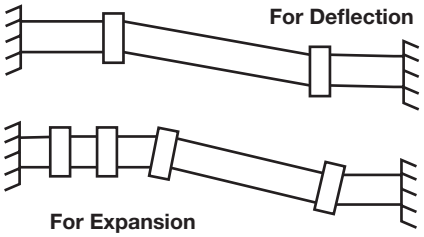
Pitched for Drainage



Buried Pipe Systems

COMBINED LINEAR & ANGULAR MOVEMENT:

The clearance in the grooved coupling joint, will allow a limited capability for combined linear and angular movement. A partially deflected joint will not provide full linear movement capability. A fully detected coupling joint provides no linear movement capability. The Couplok coupling will not allow for both maximum linear and maximum angular movement simultaneously.In systems where both are expected, additional joints may be required.



NOTE: Fully Deflected Joint Will Not Allow For Linear Expansion.

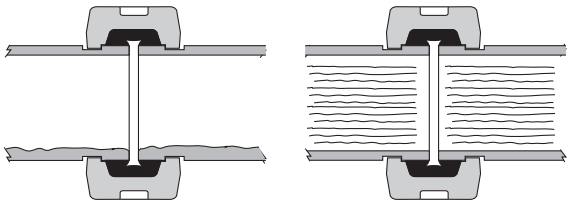
In the example above, two couplings were added to account for thermal expansion and the other couplings accommodate only the misalignment.

The additional stress from the combined movement is therefore relieved.

Rotational Movement:

Piping systems designed with Couplok Couplings can accommo-date minor rotational movement from thermal expansion, settle-ment, vibration, or other similar movements. However, Couplok Couplings
Should never be used as a continuous swivel joint.

Example:



Before Pipe Rotation **After Pipe Rotation**

Utilizing the rotational capability of the Couplok Coupling, the pipe life of a slurry or similar coarse material piping system can be extended.

For pipe rotation, the system must be shut down and internal pressure relieved.

The pipe may then be rotated one-quarter turn, the couplings retightened, and service resumed. If performed on a regular basis, pipe rotation will evenly distribute wear over the entire inner surface of the pipe.

Technical Data

Pipe Support

When designing the hangers, supports and anchors for a grooved-end pipe system, the piping designer must consider certain unique characteristics of the grooved type coupling in addition to many universal pipe hanger and support design factors. As with any pipe system, the hanger or support system must provide for

1) the weight of the pipe, couplings, fluid and pipe system components;

2) reduce stresses at pipe joints; and

3) permit required pipe system movement to relieve stress

The following factors should be considered when designing hang-ers and supports for a grooved-end pipe system.

Pipe Hanger Spacing:

The following charts show the maximum span between pipe hangers for straight runs of standard weight steel pipe filled with water or other similar fluids.

Do not use these values where critical span calculations are made or where there are concentrated loads between supports.

For straight runs without concentrated loads and where full linear movement is NOT required use the table on right.

Hanger spacing linear movement not req'd

Nominal Pipe Size Range	Maximum Span Between Supports
In./DNmm	Feet/meters
1	7
25	*2.1*
1¼-2	10
32-50	*3.0*
2½-4	12
65-100	*3.7*
5-8	14
125-200	*4.3*
10-12	16
250-300	*4.9*
14-16	18
350-400	*5.5*
18-24	20
450-600	*6.1*

For straight runs without concentrated loads and where full linear movement IS required use the following tables.

Hanger spacing - flexible system, steel pipe full linear movement is req'd average hangers per pipe length evenly spaced

Nominal Pipe Size Range	Pipe Length in Feet/Meters									
In.	7	10	12	15	20	22	25	30	35	40
DNmm	2.1	3.3.	3.7	4.6	6.1	6.7	7.6	9.1	10.7	12.2
1-2	1	2	2	2	3	3	4	4	5	6
25-50										
2½-4	1	1	2	2	2	2	2	3	4	4
65-100										
5-24	1	1	1	2	2	2	2	3	3	3
125-600										

Hanger spacing - rigid systems suggested maximum span between supports

Nominal Size	Steel Pipe Suggested Maximum Span Between Supports-Feet/Meters						Copper Tube	
	Water Service			Air Service			Water Service	Gas & Air Service
In./DNmm	*	**	***	*	**	***	**	**
1	7	9	12	9	10	12	-	-
25	*2.1*	*2.7*	*3.7*	*2.7*	*3.0*	*3.7*		
1¼	7	11	12	9	12	12	-	-
32	*2.1*	*3.4*	*3.7*	*2.7*	*3.6*	*3.7*		
1½	7	12	15	9	13	15	-	-
40	*2.1*	*3.7*	*4.6*	*2.7*	*4*	*4.6*		
2	10	13	15	13	15	15	9	12
50	*3*	*4*	*4.6*	*4*	*4.6*	*4.6*	*2.7*	*3.6*
2½	11	15	15	14	17	15	9	12
65	*3.4*	*4.6*	*4.6*	*4.3*	*5.1*	*4.6*	*2.7*	*3.6*
3 O.D.	*11*	*15*	*15*	*14*	*17*	*15*	-	-
76.1	3.4	4.6	4.6	4.3	5.1	4.6		
3	12	16	15	15	19	15	10	14
80	*3.7*	*4.8*	*4.6*	*4.6*	*5.7*	*4.6*	*3*	*4.2*
3½	13	18	15	15	21	15	-	-
90	*4*	*5.4*	*4.6*	*4.6*	*6.3*	*4.6*		
4	14	18	15	17	21	15	12	17
100	*4.3*	*5.4*	*4.6*	*5.2*	*6.4*	*4.6*	*3.7*	*5.1*
4¼ O.D.	*14*	*18*	*15*	*17*	*19*	*15*	-	-
108.0	4.3	5.4	4.6	5.2	5.7	4.6		
5	16	20	15	20	24	15	13	18
125	*4.9*	*6.0*	*4.6*	*6.1*	*7.3*	*4.6*	*4*	*5.7*
5¼ O.D.	*15*	*18*	*15*	*19*	*22*	*15*	-	-
133.0	4.6	5.5	4.6	5.2	6.6	4.6		
5½ O.D.	*16*	*19*	*15*	*20*	*24*	*15*	-	-
139.7	4.9	5.8	4.6	6.1	7.3	4.6		
6	17	21	15	21	26	15	14	21
150	*5.2*	*6.3*	*4.6*	*6.4*	*7.8*	*4.6*	*4.2*	*6.3*
6¼ O.D.	*16*	*20*	*1.5*	*20*	*24*	*1.5*	-	-
159.0	4.9	6.0	4.6	6.1	7.3	4.6		
6½ O.D.	*17*	*21*	*15*	*21*	*25*	*15*	-	-
165.1	5.2	6.3	4.6	6.4	7.6	4.6		
8	19	23	15	24	29	15	-	-
200	*5.8*	*6.9*	*4.6*	*7.3*	*8.7*	*4.6*		
10	19	25	15	24	33	15	-	-
250	*5.8*	*7.5*	*4.6*	*7.3*	*9.9*	*4.6*		
12	23	26	15	30	36	15	-	-
300	*7*	*7.8*	*4.6*	*9.1*	*10.8*	*4.6*		
14 O.D.	23	26	15	30	37	15	-	-
350	*7*	*7.8*	*4.6*	*9.1*	*11.1*	*4.6*		
16 O.D.	27	26	15	35	40	15	-	-
400	*8.2*	*7.8*	*4.6*	*10.7*	*12.0*	*4.6*		
18 O.D.	27	27	15	35	42	15	-	-
450	*8.2*	*8.1*	*4.6*	*10.7*	*12.6*	*4.6*		
20 O.D.	30	27	15	39	45	15	-	-
500	*9.1*	*8.1*	*4.6*	*11.9*	*13.5*	*4.6*		
24 O.D.	32	26	15	42	48	15	-	-
600	*9.8*	*7.8*	*4.6*	*12.8*	*14.7*	*4.6*		

* Spacing by ANSI-B31.1 Power Piping Code.

** Spacing by ANSI-B31.9 Building Service Piping Code, (1996 Edition), Fig. 921.1.3c, Table a, 250 psi and Fig. 921.1.3D, table a

*** Spacing by NFPA-13 Installation of Sprinkler Systems, (1999 Edition), Table 6-2.2.

Technical Data

Pipe Support

Considerations for the Hanging or Supporting of Grooved Piping Systems

Grooved piping products have a very good maintenance track record out in the field. Whenever there is a "perceived" problem with installed grooved product, a high percentage are often related to the hanging or supporting method or application chosen. Although supported very similarly to welded piping systems, a few considerations should be given to assure the proper selection and application of hangers and supports used on a grooved piping system such as Mefa's Couplok brand.

Review Requirements and Logistics

A variety of hangers and supports are typically used on grooved piping systems, ranging from a simple band hanger, clevis hanger, and trapeze supports to more intricate rack designs using structural steel or a mechanical framing/strut system. All of these are acceptable hanging or supporting methods but they are dependent on the project's type, design and specification requirements. With this in mind, a vital first step is to refer to the project and code requirements when choosing the proper hanging or supporting method.

Project logistics is another consideration regardless of system type. Quite often hangers and supports are an after thought on a project simply because the big-ticket items, such as labor, major equipment and schedule, are the focus of the project team. However, hangers and supports are one of the first components needed on a project since you cannot hang pipe without them.

In nearly every hanger or support assembly there are three components that make up the assembly. These components are an upper attachment (beam or structural attachment), intermediate attachment (rod, couplings, eye nuts, etc.) and the lower attachment (pipe clamps, U-bolts, trapezes). See accompanying illustrations for examples of typical assemblies. All three components should arrive on the project site together and early. To save costly field labor hours, consideration might be given to having the hangers or supports pre-assembled by the manufacturer or fabricated in the contractor's shop. Components can also be bundled and tagged by system or area of the project so they can be easily assembled and located on-site.

Make a match

The type of grooved coupling used on a project is the next consideration to choosing the correct hanger or support method. The proper maximum spacing allowables governed by project specifications, the applicable code and/or the hanger manufacturer's recommendations all must also be reviewed. Flexible couplings used on horizontal runs of pipe need to be supported at every coupling and usually require intermediate supports to satisfy the maximum spacing allowable requirements. Rigid couplings, on the other hand, can be hung or supported based on the maximum spacing requirements only. In addition, wherever there is a change in direction of the piping system a hanger or support is usually required immediately following that change in direction and then the system is hung or supported accordingly.

Pressure Point

System pressurization should also be reviewed when choosing the proper hanging or support method. As the couplings are installed, the pipe ends can either be butted up tight to one another or a gap can exist. Once the system is pressurized, those areas or joints where the pipe ends are butted up tight and held by a grooved coupling can "pop" or grow to the maximum gap depending on the coupling chosen. The joint at a flexible grooved coupling can expand about 1⁄4" at each coupling whereas the joint at a rigid grooved coupling can grow about 3⁄32". If there is a long run of horizontal or vertical pipe with multiple joints the overall length of the system will grow depending upon which grooved coupling you have chosen.
For example, if you have a grooved piping system that is 400 ft. long there will be roughly 19 grooved joints (assuming 21 ft. lengths of pipe are used). If you multiply the number of joints by the growth of each joint you can determine the overall growth of the system due to pressurization. If it is a flexible system, 19 joints x .25" = 4.75" of overall growth. A rigid system would be 19 joints x .0938" = 1.78" of overall growth.
As one can see, this growth due to pressurization can have a significant impact on the hangers or supports used on a project. One way to avoid this growth is to install the grooved joints at full gap so that pressurization has no impact at testing or start up. If this is not possible, then periodic air pressurization as the system is installed will expand the grooved joints to full gap and the hangers or supports can be adjusted accordingly.

Hot and Cold

Thermal expansion is another important consideration when choosing hangers or supports for a grooved system. This is especially important on hot systems versus chilled systems since the amount of thermal expansion will be greater on hot systems as opposed to the thermal contraction that will occur on chilled systems. This is all due to the temperature variation from ambient conditions when the pipe is installed to operating conditions.

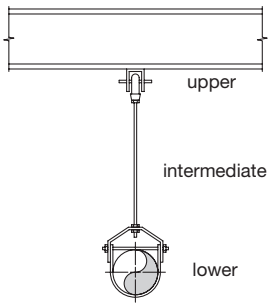
For example, if you again take 400 ft. of grooved piping, let us assume the system is heating hot water that will operate at 170°F. The pipe is installed under ambient conditions assumed to be at 70°F so you have a 100°F variation in temperature. At 70°F the pipe has a coefficient of thermal expansion of 0.0 in/ft but at 170°F the pipe has a coefficient of thermal expansion of 0.0076 in/ft. To determine the total thermal expansion of the pipe from ambient temperature to operating temperature you multiply the length of pipe by the coefficient of thermal expansion. In this case 400 ft. x 0.0076 in/ft. = 3.04 in. In other words the pipe has grown in length over 3 inches because of the thermal expansion.

This is significant growth especially if there is a change of direction at the end of the 400 ft. pipe run or there are branch lines coming off the main run. If this thermal growth exceeds the allowable deflection of a grooved joint, especially where a change of direction or a branch line connects, then problems could occur.

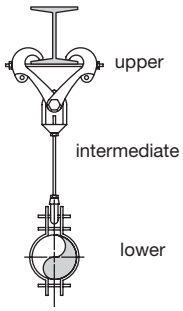
Technical Data

Pipe Support

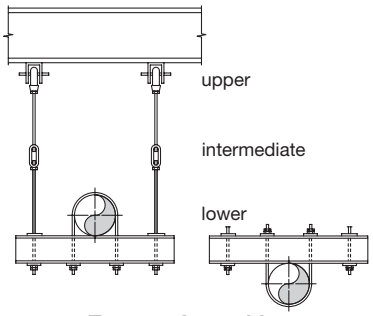
Considerations for the Hanging or Supporting of Grooved Piping Systems



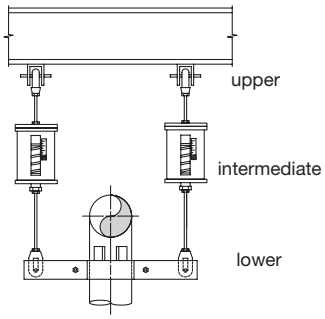
MEFA Hanger Assembly



Double Bolt Pipe Clamp Assembly



Trapeze Assembly



Spring Riser Hanger Assembly

Thermal growth cannot be stopped. It can only be controlled by the use of anchors and expansion joints or expansion loops.It is also important to hang or support the pipe with rolls or slides and use guides to control the thermal expansion of the pipe into an expansion joint or expansion loop. The use of static hangers, such as clevis hangers, should not be considered on pipe that is thermally expanding. When using trapeze hangers for multiple systems it is important to have “like” systems on the trapeze, that is, systems that are operating near the same temperature. If you combine hot systems with cold systems on a trapeze, the thermal expansion of the hot system can cause the trapeze to possibly twist and fail or excessive stress could be induced on the grooved joints on all of the systems on the trapeze. Hot systems should be hung or supported independently of cold or ambient systems or a means should be provided, such as pipe rolls or pipe slides, to allow the hot systems to thermally expand on the trapeze.

If the pipe is a vertical riser then consideration must be given to the use of spring hangers to allow the pipe to grow vertically up or down depending upon how the pipe is anchored while still supporting the pipe. Vertical pipe thermally expands the same amount as horizontal pipe and this has to be taken into consideration relating to supports, expansion joints or expansion loops. If the vertical pipe is supported by friction/riser clamps only and the pipe expands vertically upward, the clamps will grow with the pipe off the penetration or supporting structure and no longer provide support. If the growth is downward, the friction clamps resting on the penetration or supporting structure can either fail or the pipe may overcome the friction force and push it’s way through the clamp as the pipe thermally expands downward. In either case the clamps are no longer supporting the pipe as intended and this may induce excessive stress on the grooved joints.Whether it is horizontal or vertical grooved pipe, growth of the piping system due to pressurization and thermal expansion must be considered. On hot systems, both must be taken into account and added together to determine the overall growth of the system and the effect on the hangers or supports that are used.

In the previous examples, pressurization expansion on the 400 ft. run of pipe was 4.75” for a flexible joint system and 1.78” for a rigid joint system and the thermal expansion was 3.04”. Adding these combinations together would result in a total pipe growth of 7.79” for a flexible system or 4.82” for a rigid system, regardless of the horizontal or vertical orientation of the pipe. Again, this is a significant amount of growth relating to hangers and supports and the resulting stresses induced on grooved joints.

Consider Some Restraint

Although grooved systems in seismic zones perform extremely well, consideration should be given to how a grooved system is seismically restrained. If you have growth due to pressurization and/or thermal expansion consideration should be given on how to restrain the system while still allowing growth to occur. Seismic restraints in the longitudinal direction of a long pipe run may restrict the growth of the pipe inducing stresses into the grooved couplings. Seismic restraints in the lateral direction should have little impact on expansion except where the system has a change in direction. If the seismic restraints are placed laterally after a change in direction at the end of a long run of pipe, the expansion of the long pipe run may be restricted and this could induce excessive stress into the grooved joints.

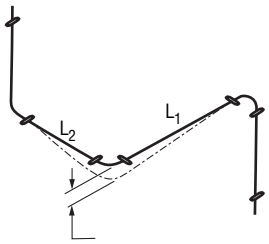
By reviewing the couplings to be used on a project, pressurization, thermal expansion and seismic restraints, one can best determine the proper selection and application of hangers and supports for a grooved piping system. This will, in turn, help ensure that grooved piping systems will continue to enjoy a

Technical Data

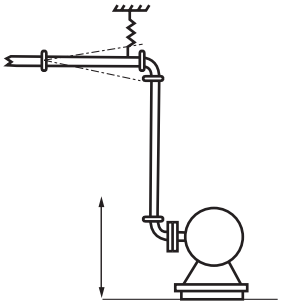
Coupling Flexibility

The grooved coupling's capability to allow angular and rotational movement within the coupling joint must be considered when deciding hanger and support locations. Spring hangers and supports providing for movement in more than one plane are often used to allow the pipe system to move without introducing additional stress into the pipe system.

EXAMPLE 1
This example demonstrates the need for each pipe length in a grooved system to be supported. The sag due to the flexibility of the Couplok joint could be eliminated with the proper positioning of hangers on both pipe segments "L1" and "L2".



EXAMPLE 2
This illustrates the effect of pump oscillation on a piping system. A spring hanger should be used to support the pipe section and also respond to the induced vibrations. The couplings in the horizontal run above the riser, should accommodate the deflection without transmitting bending stresses through the pipe system.



Pressure Thrusts:

Couplok couplings react to the application of system pressure and restrain the pipe ends from separation due to the pressure force. However, the coupling joint may not be in the self-restraining configuration prior to the application of system pressure. The Couplok coupling does not restrain adjacent pipe sections from separation due to pressure forces until the coupling key sections engage the groove walls.

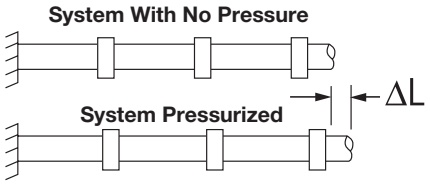
Random flexible coupling joint installation will produce installed coupling conditions ranging from pipe ends full butted to fully separated to the maximum available gap. Thus, only after system pressurization will the self-restraining function of the coupling be in effect.

The designer must account for the movement to be encountered when the system is pressurized and the joints are fully separated. Anchor and guide positions must be defined to direct the pipe joint movement that it is not detrimental to the pipe system.

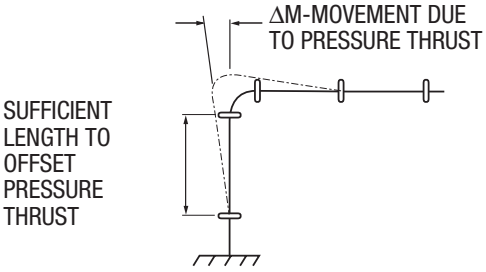
Examples of the effect of pressure thrust are shown in the following illustrations.

EXAMPLE 1
The coupling joints have been installed butted or partially open. When pressurized the pipe ends in the coupling joints will separate to the maximum amount permitted by the coupling design.

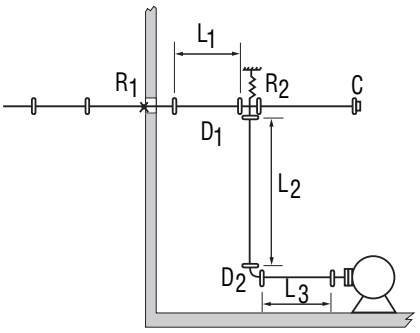
The coupling key sections will make contact with the groove walls and restrain the pipe from further separation. The movement at each coupling joint will add with all other joints and produce ΔL.



EXAMPLE 2
In the system shown here, the pipe will move and deflect at the elbow joint due to pressure thrust.



EXAMPLE 3
To restrain this system provide a pressure thrust anchor at "R1" to resist the pressure thrust acting through the tee "D1" at the cap "C". Provide a hanger at Point "R2", or a base support at Point "D2" to support the vertical column. If the offsets L1, L2, and L3 are of adequate length to handle expected pipe movements, no additional anchoring is required.
Thermal movement of the pipe system should also be considered, and intermediate anchors located as required, to direct the pipe movement so as to prevent introducing bending stresses into the system.

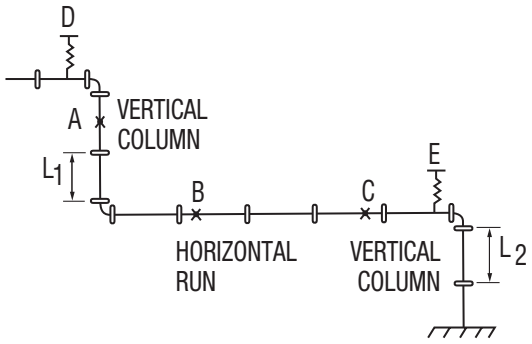


Technical Data

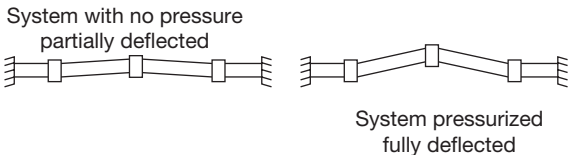
Coupling Flexibility (cont.)

EXAMPLE 4
Anchor at "A" to support weight of vertical water column. Use spring hanger at "D" and "E" to allow movement of vertical piping.

Anchors at "B" and "C" if offsets at L1 and L2 are insufficiently long to handle expected pipe movements.



Lateral Restraint



EXAMPLE 5
A grooved coupling joint installed in a partially deflected condition between anchor locations will deflect to its fully deflected condition when pressurized. Hangers and supports must be selected with consideration of the hanger's capability to provide lateral restraint.Light duty hangers, while acceptable in many installations, may deflect against the application of lateral forces and result in "snaking" conditions of the pipe system.

RISER DESIGN:

Risers assembled with Couplok Flexible couplings are generally installed in either of two ways. In the most common method, the pipe ends are butted together within the coupling joint. Note that when installing risers, the gasket is first placed onto the lower pipe and rolled back away from the pipe end prior to positioning the upper pipe. Anchoring of the riser may be done prior to pressurization with the pipe ends butted or while pressurized, when, due to pressure thrust, the pipe ends will be fully separated.

An alternative method or riser installation is to place a metal spacer of a predetermined thickness, between the pipe ends when an additional length of pipe is added to the riser stack. The upper pipe length is anchored, the spacer removed and the coupling is then installed. This method creates a predetermined gap at each pipe joint which can be utilized in pipe systems where thermal movement is anticipated and in systems with rigid (threaded, welded, flanged) branch connections where shear forces due to pressure thrust could damage the rigid connections.

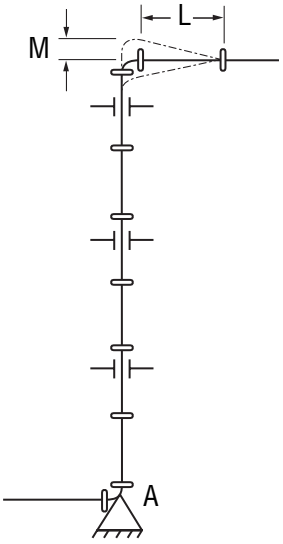
The following examples illustrate methods of installing commonly encountered riser designs.

Risers Without Branch Connections

Install the riser with the pipe ends butted.

Locate an anchor at the base of the riser (A) to support the total weight of the pipe, couplings and fluid. Provide pipe guides on every other pipe length, as a minimum, to prevent possible deflection of the pipe line at the coupling joints as the riser expands due to pressure thrust or thermal growth. Note that no intermediate anchors are required.

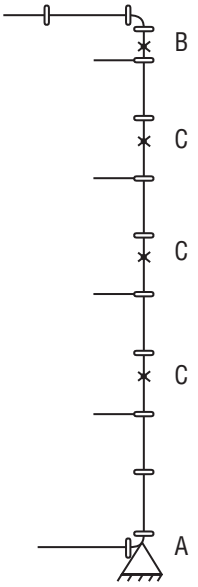
When the system is pressurized the pipe stack will "grow" due to pressure thrust which causes maximum separation of pipe ends within the couplings. The maximum amount of stack growth can be predetermined (see Linear Movement). In this example the pipe length "L" at the top of the riser must be long enough to permit sufficient deflection (see Angular Movement) to accommodate the total movement "M" from both pressure thrust and thermal gradients.



Risers With Branch Connections

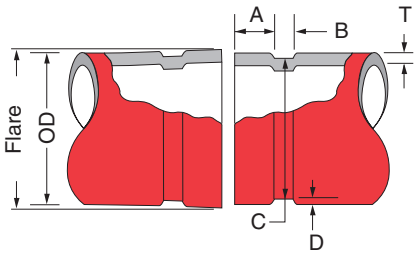
Install the riser with the predetermined gap method. Anchor the pipe at or near the base with a pressure thrust anchor "A" capable of supporting the full pressure thrust, weight of pipe and the fluid column. Anchor at "B" with an anchor capable of withstanding full pressure thrust at the top of the riser plus weight of pipe column. Place intermediate anchors "C" as shown, between anchors "A" and "B". Also place intermediate clamps at every other pipe length as a minimum.

When this system is pressurized, the pipe movement due to pressure thrust will be strained and there will be no shear forces acting at the branch connections.



Technical Data

Roll Groove Specifications



COLUMN 1 – Nominal IPS Pipe size.Nominal ISO Pipe size.

COLUMN 2 – IPS outside diameter. ISO outside diameter.

COLUMN 3 – Gasket seat must be free from scores, seams, chips, rust or scale which may interfere with proper sealing of the gasket. Gasket seat width (Dimension A) is to be measured from the pipe end to the vertical flank in the groove wall.

COLUMN 4 – Groove width (Dimension B) is to be measured between vertical flank of the groove size walls.

COLUMN 5 – The groove must be of uniform depth around the entire pipe circumference. (See column 6).

COLUMN 6 – Groove depth: for reference only. Groove must conform to the groove diameter "C" listed in column 5.

COLUMN 7 – Minimum allowable wall thickness which may be roll grooved.

COLUMN 8 – Maximum allowable pipe end flare diameter. Measured at the most extreme pipe end diameter of the gasket seat area.

Out of roundness: – Difference between maximum O. D. and minimum O.D. measured at 90° must not exceed total O.D. tolerance listed (reference column 2).

For IPS pipe, – the maximum allowable tolerance from square cut ends is 0.03" for 1" thru 31/2"; 0.045" for 4" thru 6"; and 0.060" for sizes 8" and above measured from a true square line.

For ISO size pipe, – the maximum allowable tolerance from square cut ends is 0.75mm for sizes 25mm-80mm; 1.15mm for sizes 100mm-150mm; and 1.50mm for sizes 200mm and above, measured from a true square line.

Beveled-End Pipe – in conformance with ANSI B16.25 (371/2°) is acceptable, however square cut is preferred. Seams must be ground flush with the pipe O.D. and ID prior to roll grooving. Failure to do so may result in damage to the roll grooving machine and unacceptable roll grooves may be produced.

Weld seams – must be ground flush with the pipe O.D. and ID prior to roll grooving. Failure to do so may result in damage to the roll grooving machine and unacceptable roll grooves may be produced.

Couplok standard roll groove specification
For steel & other ips or iso size pipe

-1-	-2-			-3-	-4-	-5-		-6-	-7-	-8-
Nominal-PipeSize	O.D. Actual	O.D. Tolerance		"A" ±0.030/ ±0.76	"B" ±0.030/ ±0.76	"C" Actual	"C" Tol. +0.000	"D" (Ref. Only)	"T" Min. Allow. Wall Thick	Max. Flare Dia.
In./DN(mm)	In./mm	In./mm	In./mm	In./mm	In./mm	In./mm	In./mm	In./mm	In./mm	In./mm
1	1.315	+0.028	-0.015	0.625	0.281	1.190	-0.015	0.063	0.065	1.430
25	*33.4*	*+0.71*	*-0.38*	*15.88*	*7.14*	*30.23*	*-0.38*	*1.60*	*1.7*	*36.3*
1¼	1.660	+0.029	-0.016	0.625	0.281	1.535	-0.015	0.063	0.065	1.770
32	*42.2*	*+0.74*	*-0.41*	*15.88*	*7.14*	*38.99*	*-0.38*	*1.60*	*1.7*	*45.0*
1½	1.900	+0.019	-0.019	0.625	0.281	1.775	-0.015	0.063	0.065	2.010
40	*48.3*	*+0.48*	*-0.48*	*15.88*	*7.14*	*45.09*	*-0.38*	*1.60*	*1.7*	*51.1*
2	2.375	+0.024	-0.024	0.625	0.344	2.250	-0.015	0.063	0.065	2.480
50	*60.3*	*+0.61*	*-0.61*	*15.88*	*8.74*	*57.15*	*-0.38*	*1.60*	*1.7*	*63.0*
2½	2.875	+0.029	-0.029	0.625	0.344	2.720	-0.018	0.078	0.083	2.980
65	*73.0*	*+0.74*	*-0.74*	*15.88*	*8.74*	*69.09*	*-0.46*	*1.98*	*2.1*	*75.7*
3 O.D.	*2.996*	*+0.030*	*-0.030*	*0.625*	*0.344*	*2.845*	*-0.018*	*0.076*	*0.083*	*3.100*
76.1	76.1	+0.76	-0.76	15.88	8.74	72.26	-0.46	1.93	2.1	78.7
3	3.500	+0.035	-0.031	0.625	0.344	3.344	-0.018	0.078	0.083	3.600
80	*88.9*	*+0.89*	*-0.79*	*15.88*	*8.74*	*84.94*	*-0.46*	*1.98*	*2.1*	*91.4*
3½	4.000	+0.040	-0.031	0.625	0.344	3.834	-0.020	0.083	0.083	4.100
90	*101.6*	*+1.02*	*-0.79*	*15.88*	*8.74*	*97.38*	*-0.51*	*2.11*	*2.1*	*104.1*
4¼ O.D.	*4.250*	*+0.042*	*-0.031*	*0.625*	*0.344*	*4.084*	*-0.020*	*0.083*	*0.083*	*4.350*
108.0	108.0	+1.07	-0.79	15.88	8.74	103.73	-0.51	2.11	2.1	110.5
4	4.500	+0.045	-0.031	0.625	0.344	4.334	-0.020	0.083	0.083	4.600
100	*114.3*	*+1.14*	*-0.79*	*15.88*	*8.74*	*110.08*	*-0.51*	*2.11*	*2.1*	*116.8*
5¼ O.D.	*5.236*	*+0.052*	*-0.031*	*0.625*	*0.344*	*5.084*	*-0.020*	*0.076*	*0.109*	*5.350*
133.0	133.0	+1.32	-0.79	15.88	8.74	129.13	-0.51	1.93	2.8	135.9
5½ O.D.	*5.500*	*+0.055*	*-0.031*	*0.625*	*0.344*	*5.334*	*-0.020*	*0.083*	*0.109*	*5.600*
139.7	139.7	+1.40	-0.79	15.88	8.74	135.48	-0.51	2.11	2.8	142.2
5	5.563	+0.056	-0.031	0.625	0.344	5.395	-0.022	0.084	0.109	5.660
125	*141.3*	*+1.42*	*-0.79*	*15.88*	*8.74*	*137.03*	*-0.56*	*2.13*	*2.8*	*143.8*
6¼ O.D.	*6.259*	*+0.063*	*-0.031*	*0.625*	*0.344*	*6.084*	*-0.022*	*0.088*	*0.109*	*6.350*
159.0	159.0	+1.60	-0.79	15.88	8.74	154.53	-0.56	2.24	2.8	161.3
6½ O.D.	*6.500*	*+0.063*	*-0.031*	*0.625*	*0.344*	*6.334*	*-0.022*	*0.085*	*0.109*	*6.600*
165.1	165.1	+1.60	-0.79	15.88	8.74	160.88	-0.56	2.16	2.8	167.6
6	6.625	+0.063	-0.031	0.625	0.344	6.455	-0.022	0.085	0.109	6.730
150	*168.3*	*+1.60*	*-0.79*	*15.88*	*8.74*	*163.96*	*-0.56*	*2.16*	*2.8*	*170.9*
8	8.625	+0.063	-0.031	0.750	0.469	8.441	-0.025	0.092	0.109	8.800
200	*219.1*	*+1.60*	*-0.79*	*19.05*	*11.91*	*214.40*	*-0.64*	*2.34*	*2.8*	*223.5*
10	10.750	+0.063	-0.031	0.750	0.469	10.562	-0.027	0.094	0.134	10.920
250	*273.1*	*+1.60*	*-0.79*	*19.05*	*11.91*	*268.27*	*-0.69*	*2.39*	*3.4*	*277.4*
12	12.750	+0.063	-0.031	0.750	0.469	12.531	-0.030	0.109	0.156	12.920
300	*323.9*	*+1.60*	*-0.79*	*19.05*	*11.91*	*318.29*	*-0.76*	*2.77*	*4.0*	*328.2*
14 O.D.	14.000	+0.063	-0.031	0.938	0.469	13.781	-0.030	0.109	0.156	14.100
355.6	*355.6*	*+1.60*	*-0.79*	*23.83*	*11.91*	*350.04*	*-0.76*	*2.77*	*4.0*	*358.1*
16 O.D.	16.000	+0.063	-0.031	0.938	0.469	15.781	-0.030	0.109	0.165	16.100
406.4	*406.4*	*+1.60*	*-0.79*	*23.83*	*11.91*	*400.84*	*-0.76*	*2.77*	*4.2*	*408.9*
18 O.D.	18.000	+0.063	-0.031	1.000	0.469	17.781	-0.030	0.109	0.165	18.160
457.2	*457.2*	*+1.60*	*-0.79*	*25.40*	*11.91*	*451.64*	*-0.76*	*2.77*	*4.2*	*461.3*
20 O.D.	20.000	+0.063	-0.031	1.000	0.469	19.781	-0.030	0.109	0.188	20.160
508.0	*508.0*	*+1.60*	*-0.79*	*25.40*	*11.91*	*502.44*	*-0.76*	*2.77*	*4.8*	*512.1*
24 O.D.	24.000	+0.063	-0.031	1.000	0.500	23.656	-0.030	0.172	0.218	24.200
609.6	*609.6*	*+1.60*	*-0.79*	*25.40*	*12.70*	*600.86*	*-0.76*	*4.37*	*5.5*	*614.7*
30 O.D.	30.000	+0.093	-0.031	1.750	0.625	29.500	-0.063	0.250	0.250	30.200
762.0	*762.0*	*2.36*	*0.79*	*44.45*	*15.88*	*749.30*	*1.60*	*6.35*	*6.35*	*761.1*

NOTe: VdS Roll Grooving Approval specifications can be provided by MEFA on request