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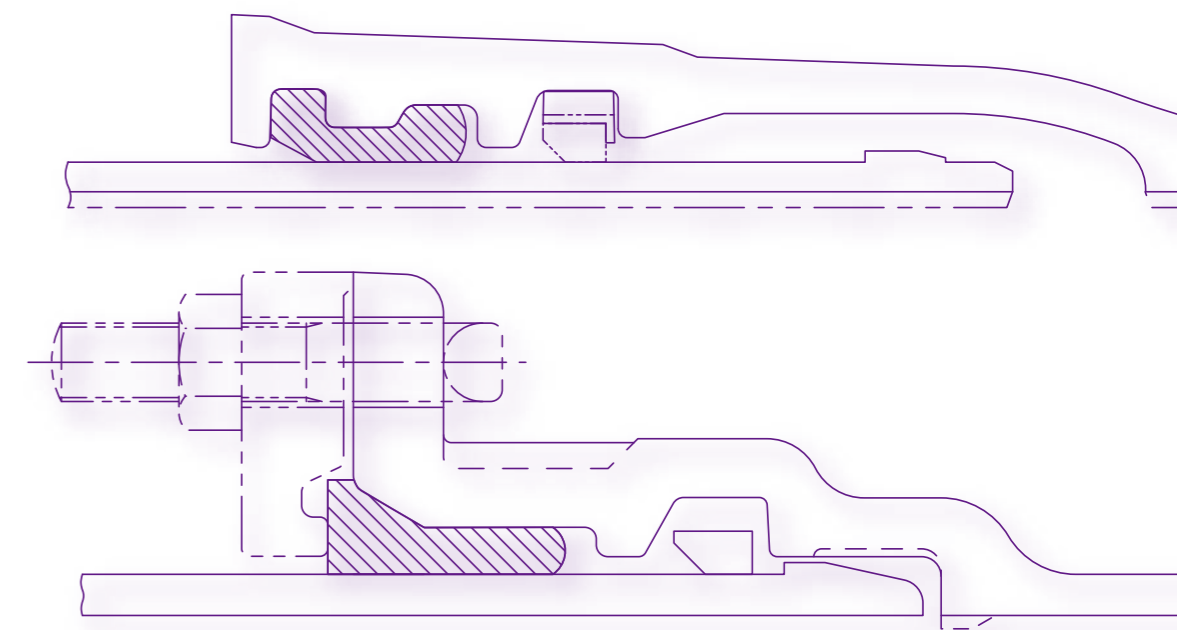
Ductile Iron Pipes
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**KUBOTA HAZARD RESILIENT
DUCTILE IRON PIPE (GENEX®)**
Dimensions of Pipes, Fittings and Accessories



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SPECIFICATIONS

【Applicable Standards】

Pipes and fittings conform to the requirements of the following specifications.

ANSI/AWWA C151	Ductile-iron pipe, centrifugally cast
ANSI/AWWA C153	Ductile-iron compact fittings, 3 in. through 16 in., for water and other liquids
JWWA A113	Mortar lining of ductile iron pipes for water supply
JWWA G112	Epoxy-Powder coating for interior of ductile iron pipes and fittings for water supply
JWWA G113	Ductile iron pipes for water supply
JWWA G114	Ductile iron fittings for water supply
JWWA G120	GX Type ductile iron pipes for water supply
JWWA G121	GX Type ductile iron fittings for water supply
JWWA K139	Synthetic resin paints for ductile iron pipes for water supply
JWWA K156	Rubber materials for water supply
JIS G 5502	Spheroidal graphite iron castings
JIS R 5210	Portland cement
ASME/ANSI B16.1	Gray iron pipe flanges and flanged fittings : Classes 125 and 250
ASME/ANSI B16.5	Pipe flanges and flanged fittings
ISO 16134	Earthquake- and subsidence- resistant design of ductile iron pipelines

【Nominal Thickness】

Size (inches)	Pipes			Fittings
	Class 54	Class 52	Class 350	
6	0.37	0.31	0.25	0.36
8	0.39	0.33	0.25	0.38
12	0.43	0.37	0.28	0.42

Note: Upon request, other class of pipes may be applied.

【Mechanical Properties】

Grade of material	Minimum tensile strength PSI (N/mm ²)	Minimum elongation %
FCD(420-10)	60,000 (420)	10

Note: In case of dispute, Brinell hardness will be measured. It shall be maximum 230HBW.

【Standard Coating and Lining】

	Pipes	Fittings
Outside	C-protect (Zn-alloy coating) ¹⁾	
Inside	Cement mortar lining/Epoxy coating	Epoxy coating

Note: 1) Pipes and fittings will be coated externally with metallic zinc-alloy followed by synthetic resin coating in accordance with JWWA G 120 and G 121 respectively. The minimum application mass of the zinc alloy coating will be 0.95 oz./ft² [290 g/m²]. The synthetic resin paint used for finishing layer will conform to JWWA K 139 and the minimum mean dry film thickness of the coating will be 3.1 mil [0.08 mm].

【Material of Accessories】

Accessories	Material
Rubber gasket	Synthetic rubber(SBR) conforming to JWWA K 156
Lock ring	Ductile iron coated with fusion-bonded epoxy or synthetic resin paint
Lock ring holder	Polypropylene or polyethylene
Gland	Ductile iron coated with the same manner as the external of fittings
T-head bolt and nut	Stainless steel
Liner	Ductile iron coated with fusion-bonded epoxy
Liner board	Polyamide
Spigot ring	Ductile iron coated with fusion-bonded epoxy

【Performance of the Joint】

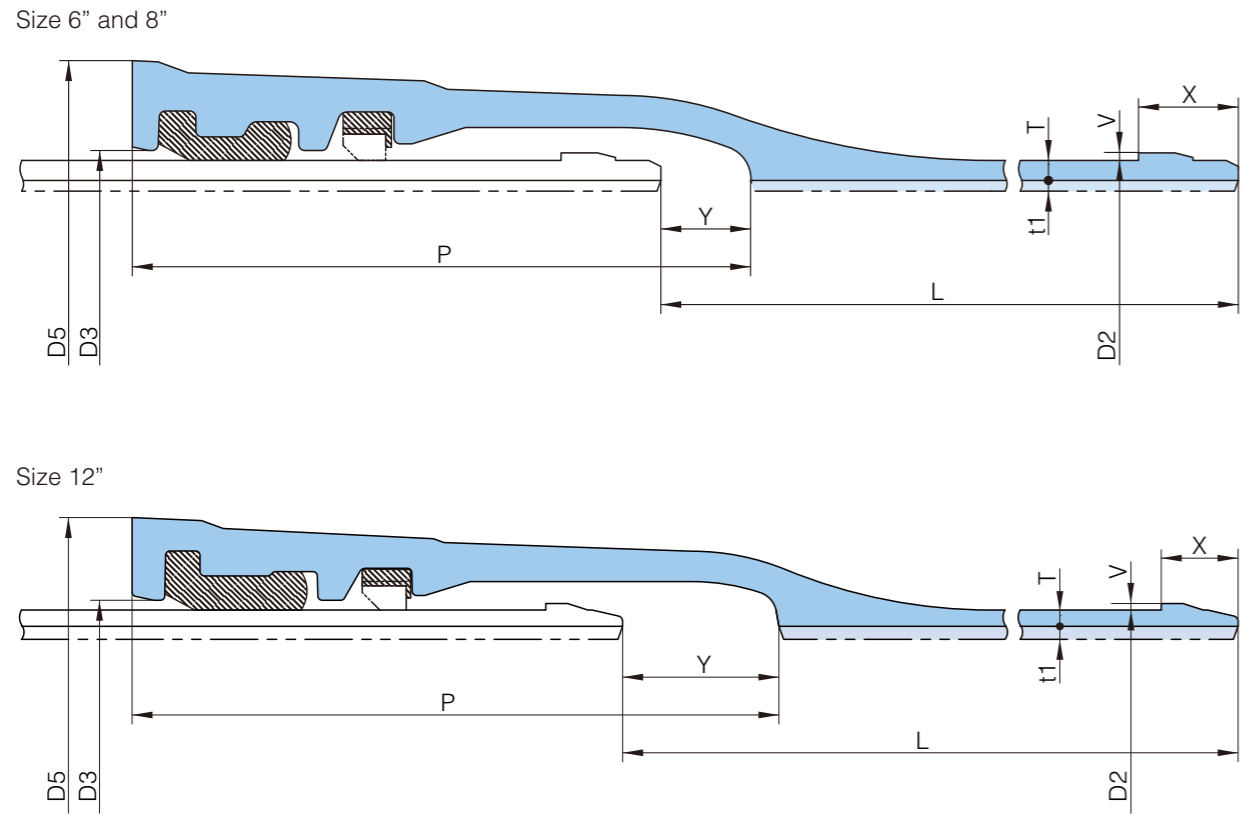
Pipe size in. [mm]	Pull-out resistance ¹⁾ lbf [kN]	Expansion and contraction ^{1),2)} inches [mm]	Allowable deflection angle ^{2),3)}	Maximum deflection angle ^{2),3)}
6 [150]	102,600 [450]	±1.97 [±50]	4° 00'	8° 00'
8 [200]	136,800 [600]	±1.97 [±50]		
12 [300]	205,200 [900]	±2.36 [±60]		

Note: 1) Pull-out resistance conforms to Class A (i.e. 3 D kN [D; pipe size in mm] = 17,100 D lbf [D; pipe size in inches]). and expansion and contraction to Class S-1 (i.e. ±1% of the nominal pipe length) of ISO 16134.

2) Expansion, contraction and deflection angles are for pipes only

3) Allowable angle is applied for an installation phase and maximum angle is applied for earthquake/ground subsidence.

GX-Pipe

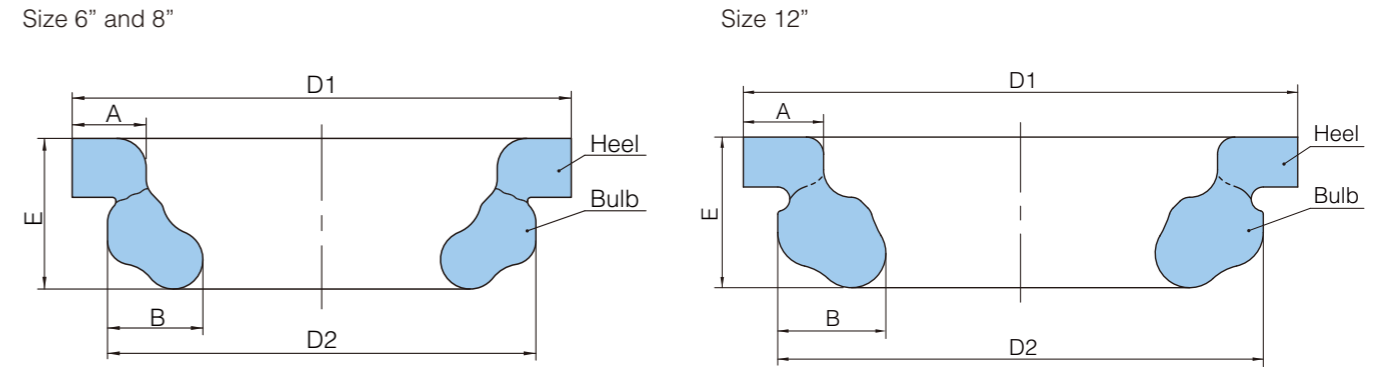


Size (inches)	Wall Thickness (inches)			Outside Diameter (inches)	Dimensions (inches)						
	T				D 2	D 3	D 5	P	V	X	Y
	Class 54	Class 52	Class 350								
6	0.37	0.31	0.25	6.90	7.25	9.78	9.69	0.12	1.30	2.36	
8	0.39	0.33	0.25	9.05	9.41	11.96	10.04	0.12	1.30	2.36	
12	0.43	0.37	0.28	13.20	13.56	16.56	11.73	0.12	1.39	2.83	

Size (inches)	Nominal laying length (feet)	Mass (lb)			Lining ¹⁾			
		Per 1 piece			Thickness (inches)	Mass(lb)		
		Class 54	Class 52	Class 350		t 1	Class 54	Class 52
6	16.40	425	366	309	0.16	50.0	51.1	52.0
8	16.40	595	514	408	0.16	67.7	68.8	69.9
12	19.69	1164	1016	802	0.24	182	184	186

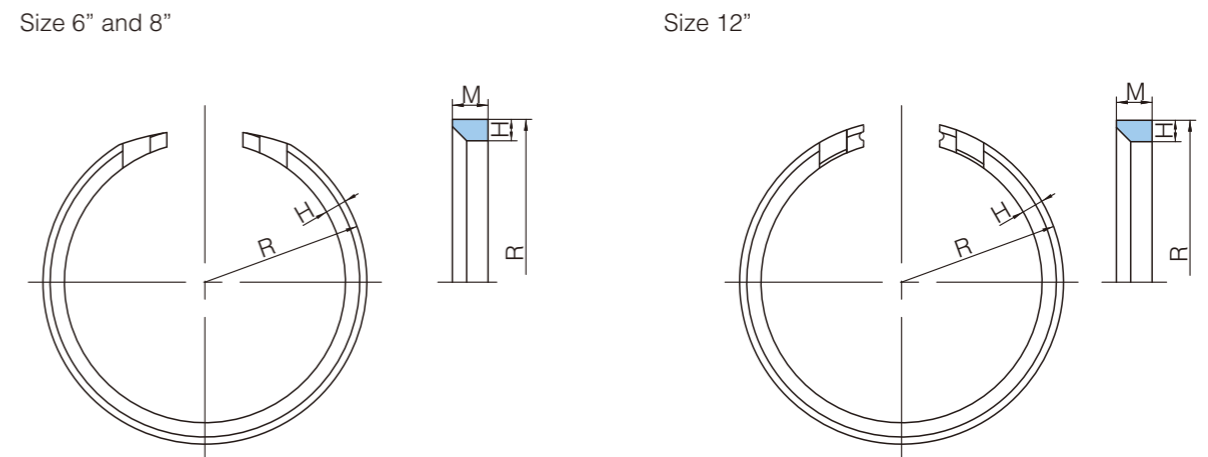
Note: 1) In case of epoxy coating, thickness of coating will be min. 300µm.

Rubber Gasket for Pipes



Size (inches)	Dimensions (inches)				
	D 1	D 2	A	B	E
6	8.67	8.03	0.63	0.88	1.40
8	11.07	10.31	0.79	1.02	1.61
12	15.72	14.94	0.92	1.24	1.72

Lock Ring

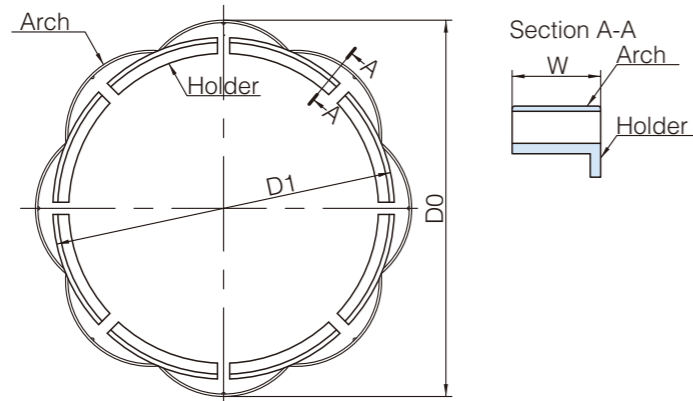


Size (inches)	Dimensions (inches)			Mass (lb)
	H	M	R	
6	0.35	0.59	3.81	0.92
8	0.35	0.59	4.88	1.21
12	0.43	0.79	7.00	3.04

Note: Same Lock ring is used for fittings.

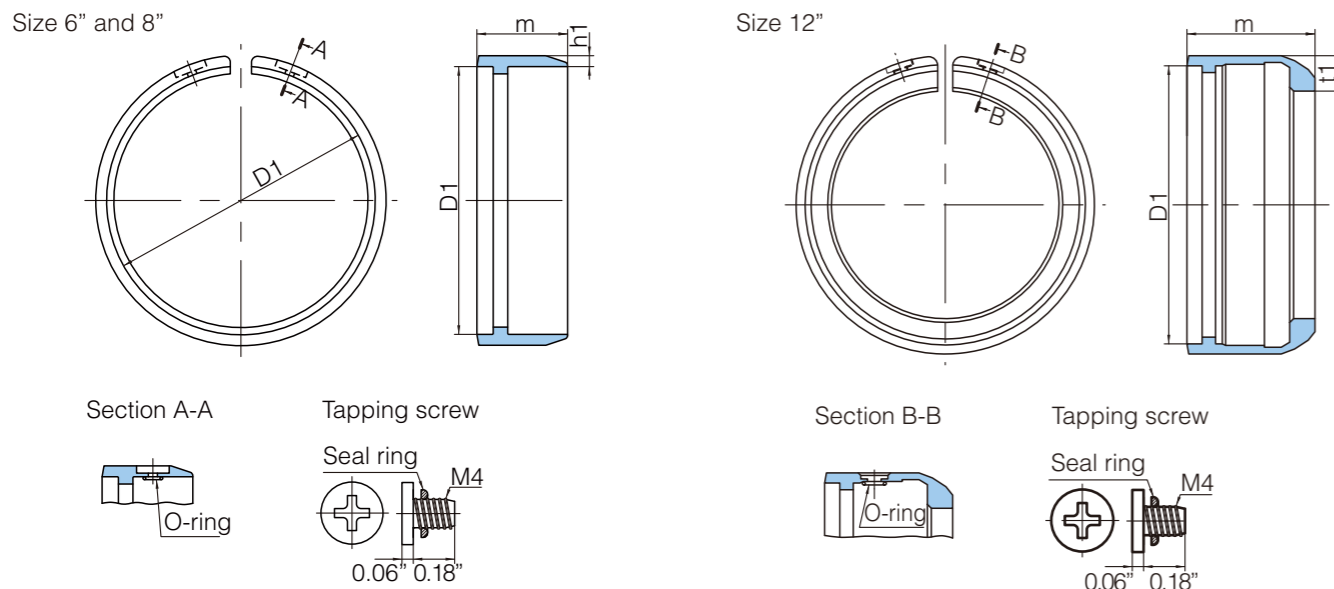
ACCESSORIES FOR PIPES

Lock Ring Holder



Size (inches)	Dimensions (inches)			Number of holder
	D 0	D 1	W	
6	8.33	7.77	0.67	10
8	10.49	9.92	0.67	12
12	14.72	14.15	0.87	12

Spigot Ring for Cut Pipe



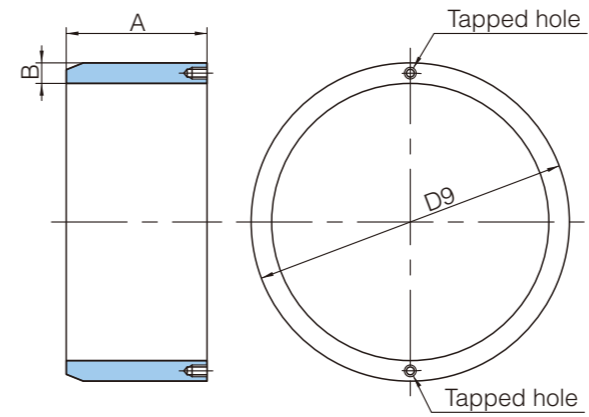
Size (inches)	Dimensions (inches)			Mass(lb)
	D 1	h 1	m	
6	6.90	0.12	1.00	0.67
8	9.05	0.12	1.00	0.88

Size (inches)	Dimensions (inches)			Mass(lb)
	D 1	m	t 1	
12	13.20	1.50	0.41	2.36

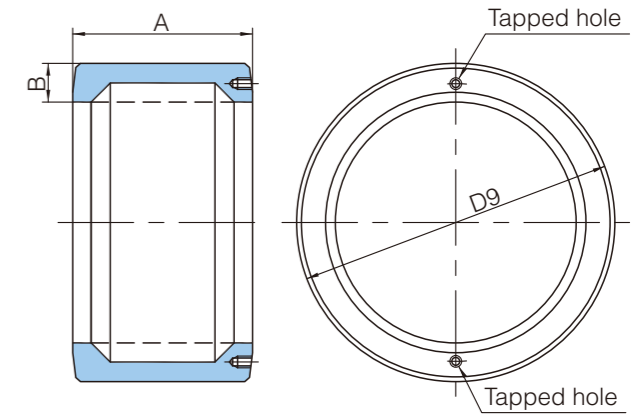
Note: 1. Spigot Ring forms the spigot projection on the spigot end of the on-site cut pipe.
2. Threads of the tapping screw are metric.

Liner

Size 6" and 8"



Size 12"

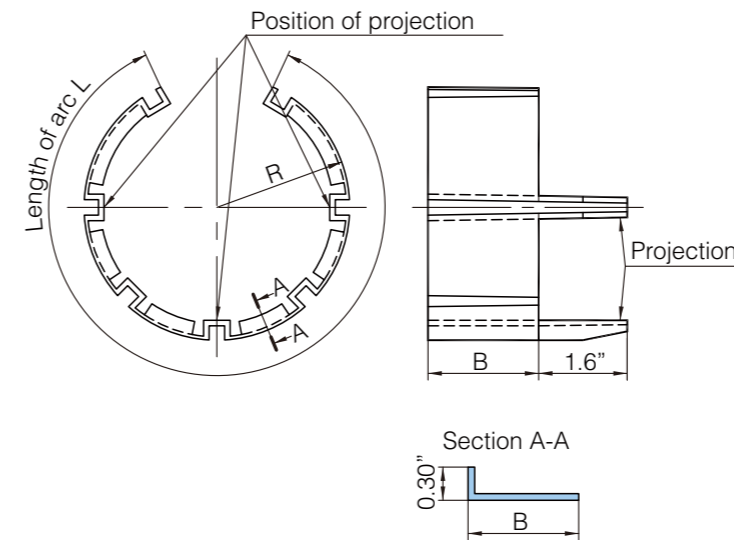


Size (inches)	Dimensions (inches)			Mass (lb)
	D 9	A	B	
6	6.90	3.90	0.26	5.34
8	9.05	3.90	0.26	7.08
12	13.35	4.96	0.79	22.70

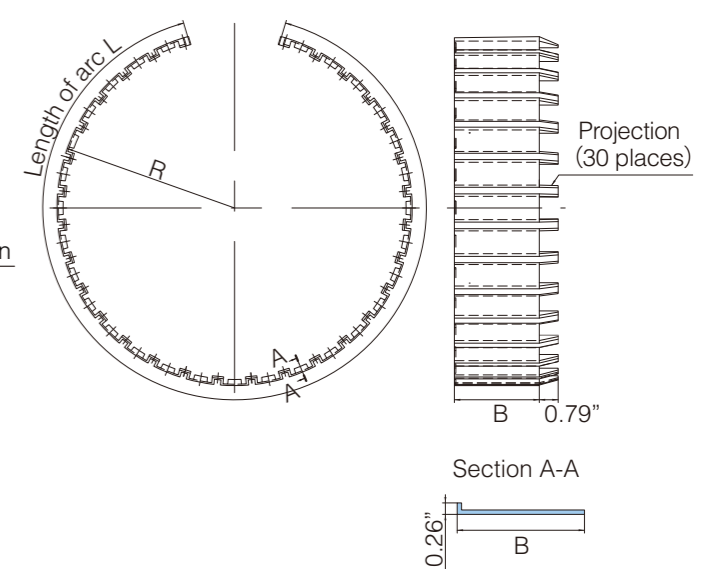
Note: 1. Liner is an accessory to be installed in the pipe socket to convert the joint type into a restrained type when the pipe joint is located in a thrust force area.
2. Two holes might be tapped on the face end in the fabrication process. In this case, these holes will be filled with epoxy resin.
3. Size 12" Liner is allowed to form along the dotted lines.

Liner Board

Size 6" and 8"

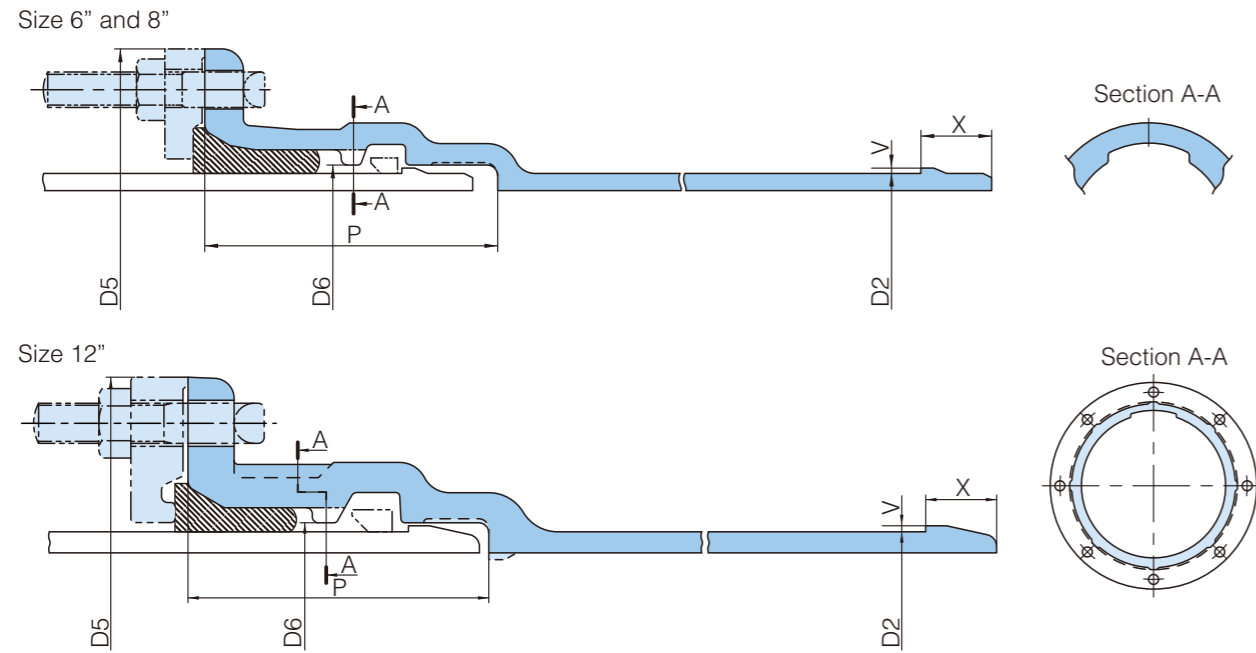


Size 12"



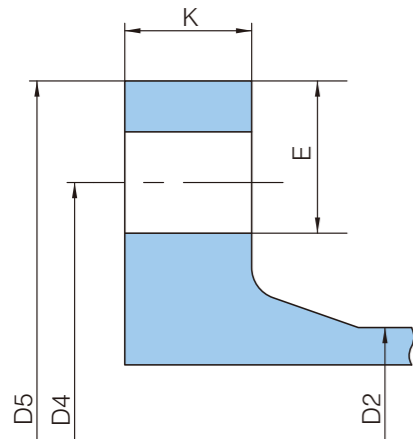
Size (inches)	Dimensions (inches)		
	R	B	L
6	4.04	1.97	22.40
8	5.12	1.97	28.94
12	7.60	3.54	42.76

GX-Fitting



Size (inches)	Outside Diameter (inches)	Dimensions (inches)					Number of bolt holes
		D 2	D 5	D 6	P	V	
6	6.90	12.26	7.25	5.59	0.12	1.30	6
8	9.05	14.33	9.41	5.67	0.12	1.30	6
12	13.20	19.27	13.56	5.91	0.12	1.39	8

Flange



ASME B 16.1 Class125

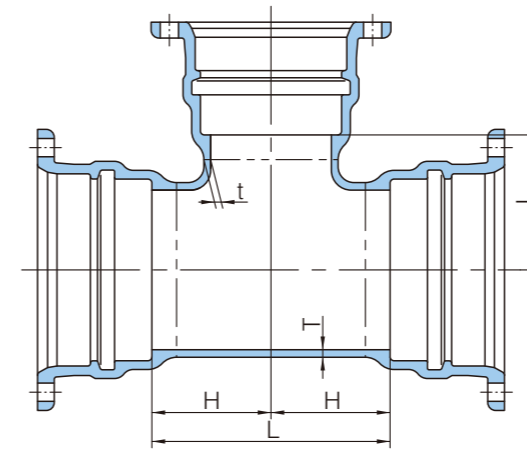
Size (inches)	Outside Diameter (inches)	Dimensions (inches)				Number of bolt holes	Mass (lb)
		D 2	D 4	D 5	K		
6	6.90	9.50	11.00	1.00	0.91	8	14.7
8	9.05	11.75	13.50	1.13	0.91	8	23.6
12	13.20	17.00	19.00	1.25	1.00	12	50.0

ASME B 16.1 Class250

Size (inches)	Outside Diameter (inches)	Dimensions (inches)				Number of bolt holes	Mass (lb)
		D 2	D 4	D 5	K		
6	6.90	10.63	12.50	1.44	0.91	12	35.3
8	9.05	13.00	15.00	1.63	1.00	12	52.2
12	13.20	17.75	20.50	2.00	1.26	16	109

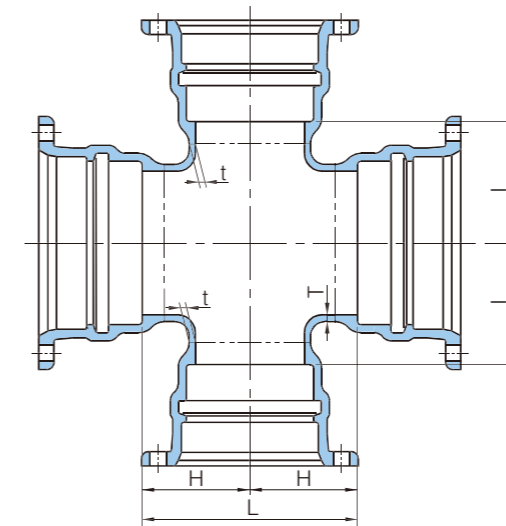
Note: Upon request, other class of flanges may be applied.

GX-All Socket Tee



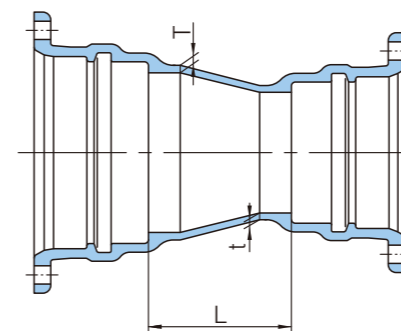
Size (inches)		Wall Thickness (inches)		Dimensions (inches)			Mass (lb)
D	d	T	t	H	I	L	
6	6	0.36	0.36	5.91	5.91	11.81	117
8	6	0.38	0.36	5.91	6.69	11.81	142
8	8	0.38	0.38	6.69	6.69	13.39	155
12	6	0.42	0.36	5.71	9.25	11.42	238
12	8	0.42	0.38	6.89	9.25	13.78	256
12	12	0.42	0.42	9.25	9.25	18.50	317

GX-All Socket Cross



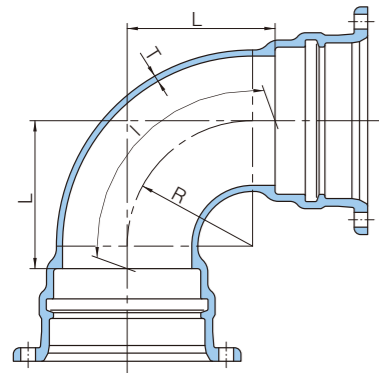
Size (inches)		Wall Thickness (inches)		Dimensions (inches)			Mass (lb)
D	d	T	t	H	I	L	
6	6	0.36	0.36	5.91	5.91	11.81	149
8	8	0.38	0.38	6.69	6.69	13.39	196
12	12	0.42	0.42	9.25	9.25	18.50	399

GX-Double Socket Reducer



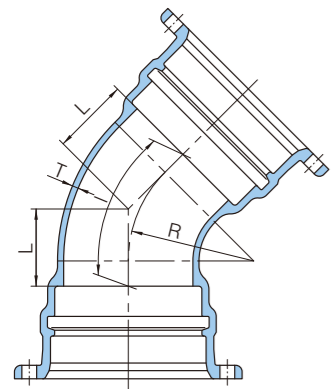
Size (inches)		Wall Thickness (inches)		Nominal laying length (inches)	Mass (lb)
D	d	T	t	L	
8	6	0.38	0.36	7.09	84.7
12	6	0.42	0.36	13.98	151
12	8	0.42	0.38	10.04	151

GX-Double Socket 90° Bend



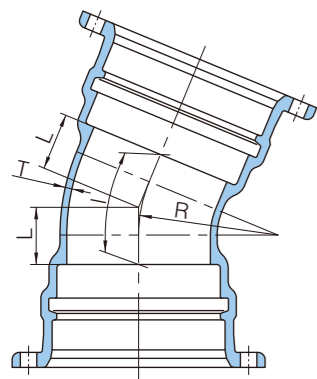
Size (inches)	Wall Thickness (inches)	Dimensions (inches)			Length of centerline (inches)	Mass (lb)
	T	R	L	I		
6	0.36	5.71	7.09	11.73	82.2	
8	0.38	7.68	9.06	14.80	117	
12	0.42	9.06	10.43	16.97	229	

GX-Double Socket 45° Bend



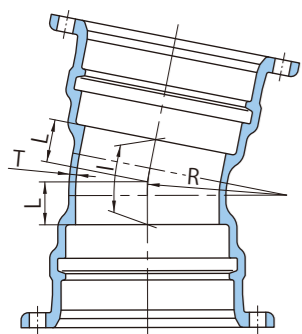
Size (inches)	Wall Thickness (inches)	Dimensions (inches)			Length of centerline (inches)	Mass (lb)
	T	R	L	I		
6	0.36	5.71	3.94	7.64	74.5	
8	0.38	7.68	4.72	9.13	101	
12	0.42	9.06	5.12	9.84	197	

GX-Double Socket 22 1/2° Bend



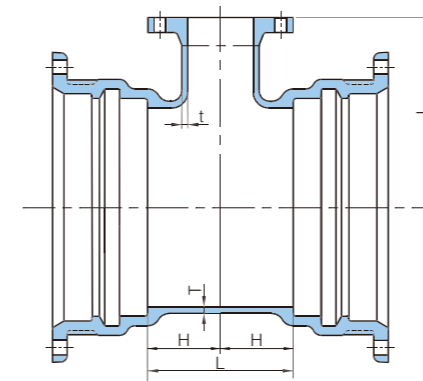
Size (inches)	Wall Thickness (inches)	Dimensions (inches)			Length of centerline (inches)	Mass (lb)
	T	R	L	I		
6	0.36	5.71	2.76	5.47	70.3	
8	0.38	7.68	3.15	6.26	93.5	
12	0.42	9.06	3.35	6.65	183	

GX-Double Socket 11 1/4° Bend



Size (inches)	Wall Thickness (inches)	Dimensions (inches)			Length of centerline (inches)	Mass (lb)
	T	R	L	I		
6	0.36	5.71	1.97	3.94	67.5	
8	0.38	7.68	2.36	4.72	89.5	
12	0.42	9.06	2.36	4.72	175	

GX-Double Socket Tee with Flanged Branch

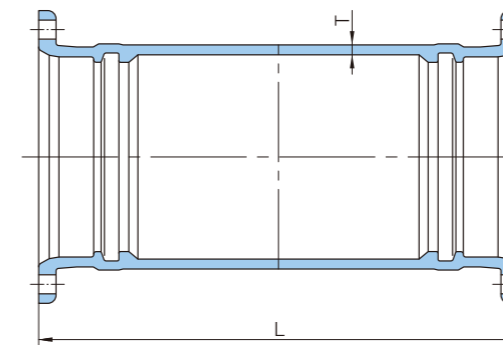


ASME B 16.1 Class 125

Size (inches)		Wall Thickness (inches)		Dimensions (inches)			Mass (lb)
D	d	T	t	H	I	L	
6	4	0.36	0.34	5.91	9.84	11.81	101
6	6	0.36	0.36	5.91	9.84	11.81	108
8	4	0.38	0.34	5.91	9.84	11.81	125
8	6	0.38	0.36	5.91	9.84	11.81	132
8	8	0.38	0.38	6.69	10.63	13.39	150
12	4	0.42	0.34	5.71	11.81	11.42	220
12	6	0.42	0.36	5.71	12.20	11.42	227
12	8	0.42	0.38	6.89	12.60	13.78	249
12	12	0.42	0.42	9.25	12.99	18.50	306

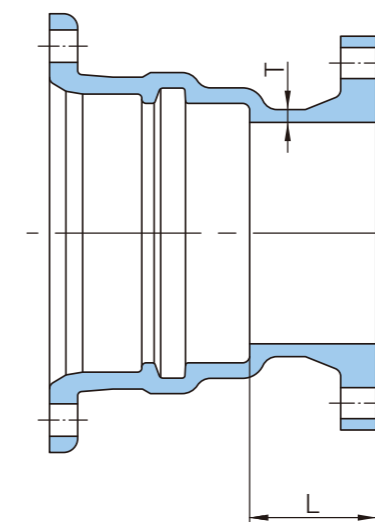
Note : Upon request, other class of flanges may be applied.

GX-Collar



Size (inches)	Wall Thickness (inches)	Dimensions (inches)	Mass (lb)
	T	L	
6	0.47	21.65	94.8
8	0.47	22.05	121
12	0.55	25.39	234

GX-Flanged Socket



ASME B 16.1 Class125

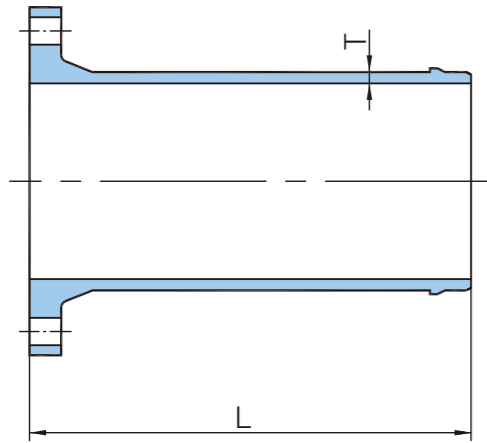
Size (inches)	Wall Thickness (inches)	Nominal laying length (inches)	Mass (lb)
	T	L	
6	0.36	3.54	51.4
8	0.38	3.54	71.4
12	0.52	3.94	144

ASME B 16.1 Class250

Size (inches)	Wall Thickness (inches)	Nominal laying length (inches)	Mass (lb)
	T	L	
6	0.36	5.12	73.2
8	0.38	5.12	103
12	0.52	6.10	208

Note : Upon request, other class of flanges may be applied.

GX-Flanged Spigot



ASME B 16.1 Class125

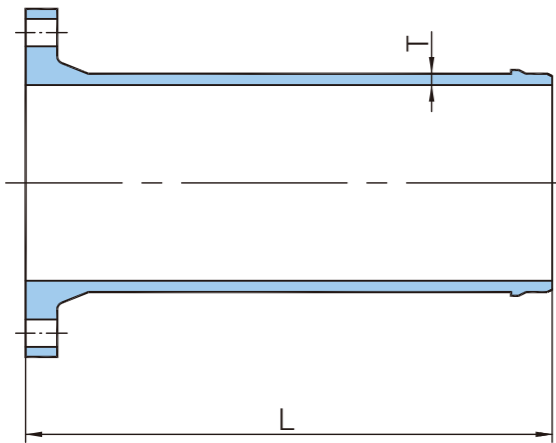
Size (inches)	Wall Thickness (inches)	Nominal laying length (inches)	Mass (lb)
	T	L	
6	0.36	15.75	44.8
8	0.38	16.14	67.2
12	0.42	18.90	133

ASME B 16.1 Class250

Size (inches)	Wall Thickness (inches)	Nominal laying length (inches)	Mass (lb)
	T	L	
6	0.36	17.32	66.6
8	0.38	18.11	99.6
12	0.42	18.90	181

Note : Upon request, other class of flanges may be applied.

GX-Flanged Spigot for GX-Collar Connection



ASME B 16.1 Class125

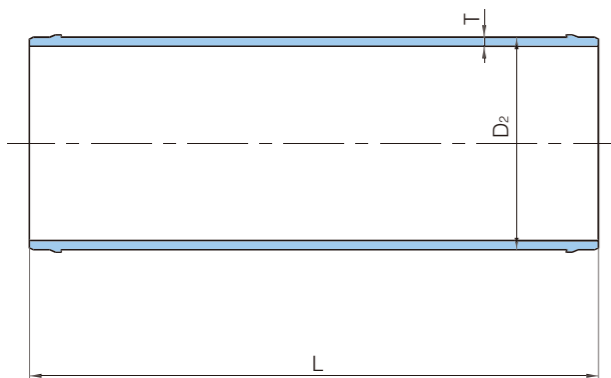
Size (inches)	Wall Thickness (inches)	Nominal laying length (inches)	Mass (lb)
	T	L	
6	0.36	23.31	59.3
8	0.38	24.09	88.6
12	0.42	28.31	174

ASME B 16.1 Class250

Size (inches)	Wall Thickness (inches)	Nominal laying length (inches)	Mass (lb)
	T	L	
6	0.36	23.31	78.9
8	0.38	24.09	117
12	0.42	28.31	231

Note : Upon request, other class of flanges may be applied.

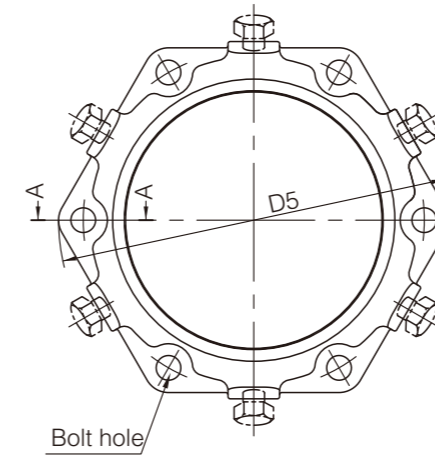
GX-Nipple



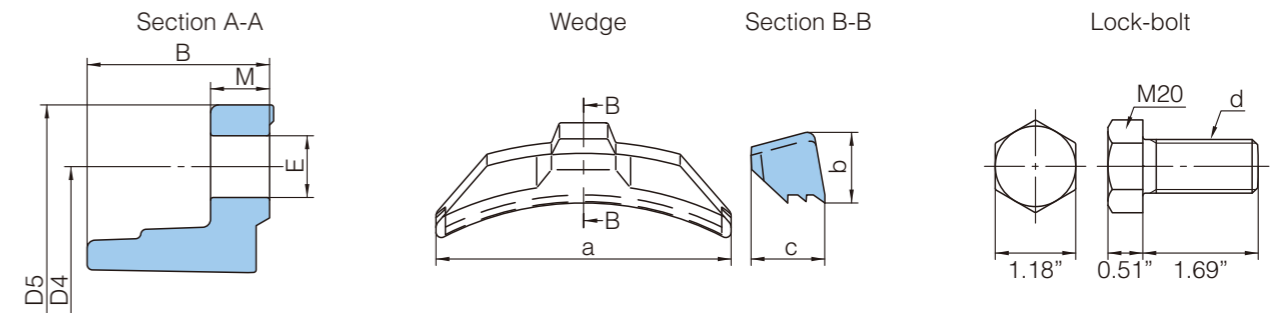
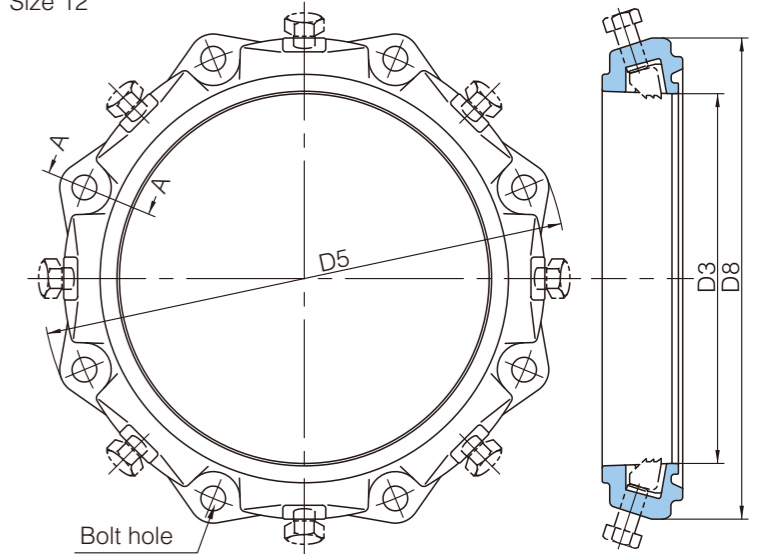
Size (inches)	Wall Thickness (inches)	Nominal laying length (inches)	Mass (lb)
	T	L	
6	0.41	24.02	51.8
8	0.43	24.02	72.5
12	0.46	24.02	116

G-Link for Cut Pipe

Size 6" and 8"



Size 12"

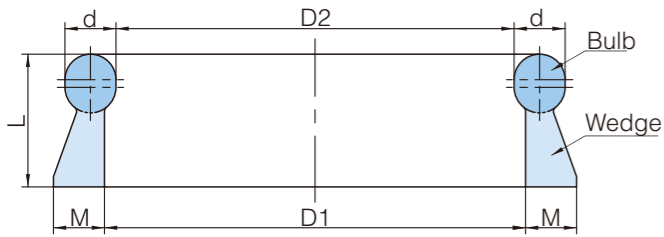


Size (inches)	Body									Wedge			Lock-bolt			
	Dimensions(inches)								Number of bolt holes	Mass (lb)	Dimensions(inches)			Number of wedges	Size d	Number of lock-bolt
	D3	D4	D5	D8	B	M	E	a			b	c				
6	7.26	10.44	12.26	10.81	2.40	0.83	0.91	6	14.8	3.31	0.84	0.96	6	M20	6	
8	9.41	12.52	14.33	13.11	2.68	0.87	0.91	6	21.7	4.33	1.04	1.08	6	M20	6	
12	13.56	17.46	19.27	17.65	2.95	1.02	0.91	8	44.8	4.84	1.16	1.16	8	M20	8	

Note: 1. Wedge will be of ductile iron conforming to FCD450-10 of JIS G 5502. In addition, wedge will be in the groove with rubber in an appropriate manner.
 2. Lock-bolt will be of stainless steel (SUS304, SUS304J3 or SUSXM7) and is indicated metric threads.
 3. Threads of the Lock-bolt are metric.

ACCESSORIES FOR FITTINGS

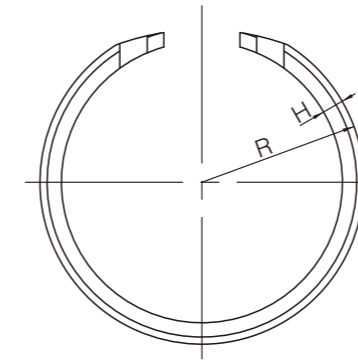
Rubber Gasket for Fittings



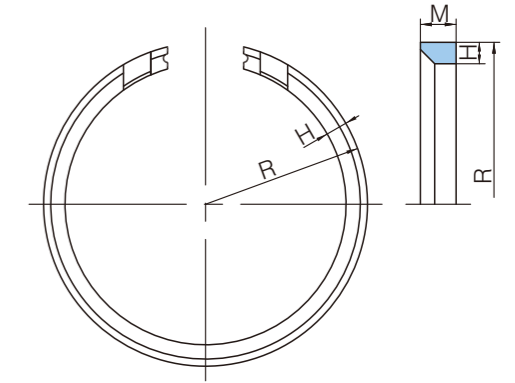
Size (inches)	Dimensions (inches)				
	D 1	D 2	d	L	M
6	6.74	6.39	0.79	1.97	0.79
8	8.89	8.54	0.79	1.97	0.79
12	12.93	12.56	0.85	2.13	0.87

Lock Ring

Size 6" and 8"



Size 12"

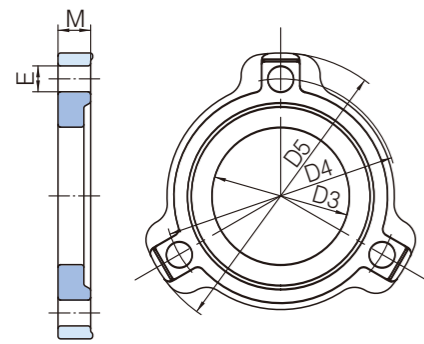


Size (inches)	Dimensions (inches)			Mass (lb)
	H	M	R	
6	0.35	0.59	3.81	0.92
8	0.35	0.59	4.88	1.21
12	0.43	0.79	7.00	3.04

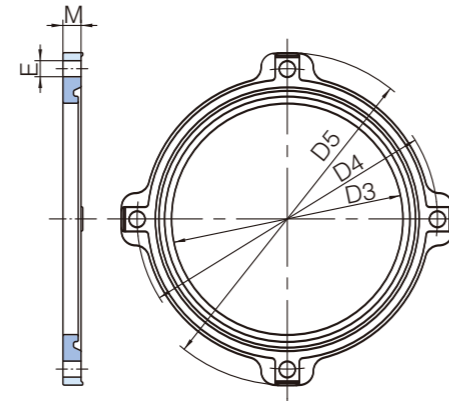
Note: Same Lock ring is used for pipes.

Gland

Size 6" and 8"

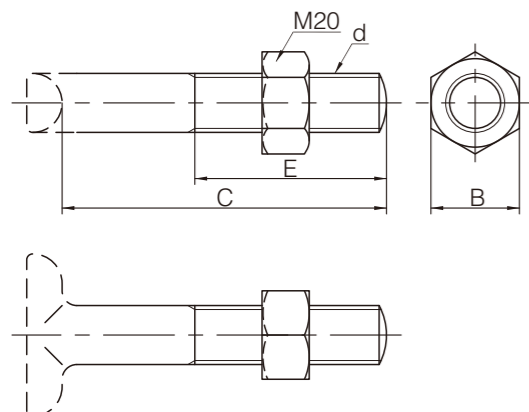


Size 12"



Size (inches)	Dimensions (inches)					Number of bolt holes	Mass (lb)
	D 3	D 4	D 5	M	E		
6	7.26	10.44	12.26	0.83	0.91	3	7.72
8	9.41	12.52	14.33	0.87	0.91	3	11.00
12	13.56	17.46	19.27	1.02	0.91	4	19.20

T-head Bolt and Nut



Size (inches)	d	Dimensions (inches)			No.
		B	C	E	
6	M 20	1.18	3.94	2.76	3 (6)
8	M 20	1.18	3.94	2.76	3 (6)
12	M 20	1.18	4.33	2.95	4 (8)

Note: 1. Threads of T-head Bolt and Nut are metric.
2. No. in parentheses shows G-Link use.

A series of horizontal dashed lines for writing.