




IRON STRONG

McWaneDuctile.com

A large, detailed photograph of a pipe joint, showing the internal gasket and the flange of the pipe. The image is partially overlaid by a blue semi-transparent rectangle containing text.

**TR FLEX<sup>®</sup>**  
**RESTRAINED**  
**JOINT PIPE**  
**4"-36"**



McWane Ductile is a division of McWane, LLC

For Generations

# TR FLEX® RESTRAINED JOINT PIPE FROM MCWANE DUCTILE

Ductile Iron Pipe and Fittings are manufactured by McWane Ductile in 4" through 36" sizes. The TR Flex Restrained Joint is one of the most utilized Ductile Iron pipe joint restraint systems around the world. It utilizes a factory welded spigot bead and internal locking segments in a special bell to provide positive restraint while maintaining joint flexibility.

McWane Ductile's TR Flex Restrained Joint Ductile Iron Pipe and Fittings are

## TR FLEX® RESTRAINED JOINT PIPE

boltless allowing quick, simple installation without

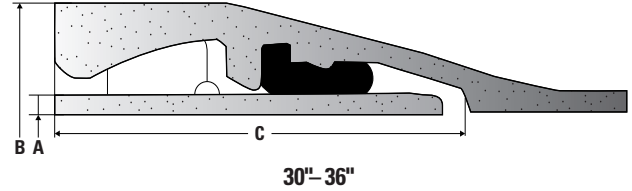
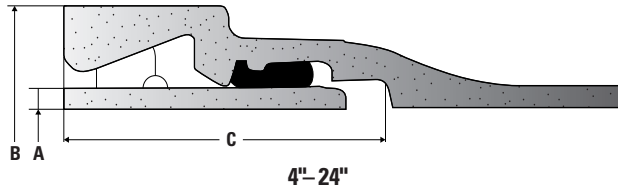
special wrenches or tools. McWane Ductile's TR Flex Restrained Joint Ductile Iron Pipe and Fittings are rated for 350-psi up through 24" and the joint is rated for 250-psi in 30" and 36" sizes. McWane Ductile's TR Flex Restrained Joint provides very high end-pull strength making it ideal for use in special installations such as casings, bridge and other

aerial crossings, Horizontal Directional Drilling (HDD) and pipe bursting. McWane Ductile's TR Flex Restrained Joint Pipe and Fittings utilize the same Tyton Joint gasket as McWane Ductile's Tyton Joint Pipe and can be furnished with various gasket compounds besides the standard SBR. Neoprene, EPDM, Nitrile and Viton are all available gasket types.

## 4"-36" DUCTILE IRON TR FLEX® PIPE

<b>MATERIAL</b>	Ductile Iron per AWWA C150/ANSI A21.50, AWWA C151/ANSI A21.51, ASTM A536
<b>PRESSURE</b>	350-psi Water Working Pressure 4"-24" & 250-psi for 30" & 36"
<b>TESTING</b>	ANSI/AWWA C151/ANSI 21.51 & UL-FM Requirements
<b>LAYING LENGTH</b>	18 foot Nominal Length
<b>CEMENT LINING</b>	ANSI/AWWA C104/ANSI 21.4
<b>COATING</b>	ANSI/AWWA C104/ANSI 21.4
<b>GASKETS</b>	ANSI/AWWA C111/ANSI A21.11
<b>STANDARDS</b>	AWWA C150/ANSI A21.50, AWWA C151/ANSI A21.51, AWWA C104/ANSI 21.4, AWWA C111/ANSI A21.11

# DETAILS & DIMENSIONS



PIPE SIZE IN.	WORKING PRESSURE RATING PSI	A	B	C	# OF D.I. LOCKING SEGMENTS	# OF RUBBER SEGMENTS RETAINERS	MAX DEFLECTION DEGREES	PULLOUT FT.
		INCHES						
4	350	4.80	7.25	4.84	2	1	5	0.03
6	350	6.90	9.52	5.27	2	1	5	0.04
8	350	9.05	11.93	5.82	2	1	5	0.04
10	350	11.10	14.37	6.03	2	1	5	0.05
12	350	13.20	16.68	6.30	4	2	5	0.06
14	350	15.30	19.16	7.75	4	2	3-1/4	0.05
16	350	17.40	21.46	7.95	4	2	3-1/4	0.05
18	350	19.50	23.76	8.19	4	2	3	0.05
20	350	21.60	26.04	8.40	4	2	2-1/2	0.05
24	350	25.80	30.61	8.86	8	4	2-1/4	0.05
30	250	32.00	36.88	10.28	8	4	1-3/4	0.05
36	250	38.30	43.85	10.87	8	4	1-1/2	0.05

\*THE TR FLEX® RESTRAINED JOINT HAS A WORKING PRESSURE RATING EQUIVALENT TO THE WORKING PRESSURE RATING OF THE PARENT PIPE WITH A MAXIMUM WORKING PRESSURE RATING OF 350-PSI FOR 4 IN. THROUGH 24 IN. AND 250-PSI FOR 30 IN. THROUGH 36 IN.

NOTE: THESE DEFLECTIONS ARE BASED ON JOINTS WITH NOMINAL DIMENSIONS.

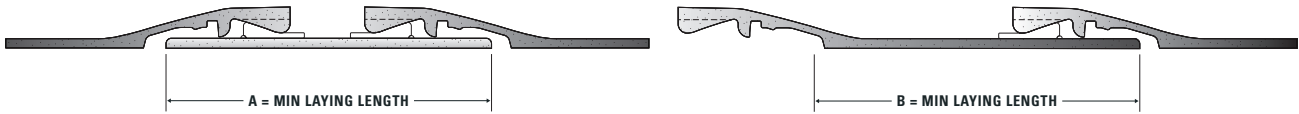
## DUCTILE IRON TR FLEX® PULLING FORCE AT EQUIVALENT PRESSURE FOR HDD APPLICATIONS

PIPE SIZE IN.	PIPE O.D. IN.	350-PSI EQUIVALENT FORCE	500-PSI EQUIVALENT FORCE	REC. MAXIMUM PULLING FORCE	ABSOLUTE MAXIMUM PULLING FORCE
4	4.80	6,333	9,048	6,000	9,000
6	6.90	13,087	18,696	13,000	18,000
8	9.05	22,514	32,163	22,000	32,000
10	11.10	33,869	48,384	33,000	48,000
12	13.20	47,897	68,424	47,000	68,000
14	15.30	64,349	91,927	64,000	91,000
16	17.40	83,226	118,894	83,000	118,000
18	19.50	104,527	149,324	104,000	149,000
20	21.60	128,252	183,218	128,000	183,000
24	25.80	182,977	261,396	182,000	261,000
30	32.00	201,062	281,487	201,000	281,000
36	38.30	288,023	403,232	288,000	403,000

NOTE:  
 350-PSI IS THE RATED PRESSURE OF THE JOINT.  
 500-PSI EQUIVALENT IS THE ABSOLUTE MAXIMUM PULLING FORCE THAT SHOULD BE USED.  
 30" AND 36" EQUIVALENT FORCES ARE 250-PSI EQUIVALENT

## ACTUAL LAYING LENGTH

PIPE SIZE IN.	FEET	INCH
4	18	1
6	18	1
8	18	1
10	17	11
12	17	11
14	17	10
16	17	10
18	17	10
20	17	9
24	17	9
30	17	9
36	17	7



**MINIMUM LAYING LENGTH FOR TR FLEX® CLOSURE SPOOLS**

PIPE SIZE IN.	DIMENSION "A"	DIMENSION "B"
4	12.75	10.25
6	14.00	11.00
8	15.25	12.00
10	15.75	12.25
12	16.50	13.00
14	19.75	15.25
16	20.25	15.50
18	21.00	16.00
20	21.50	16.25
24	23.00	17.25
30	26.25	19.00
36	28.00	20.25



**DUCTILE IRON PIPE DIMENSIONS AND WEIGHTS FOR PRESSURE CLASSES  
OF TR FLEX® RESTRAINED JOINT DUCTILE IRON PIPE**

PIPE SIZE IN.	PRESSURE CLASS	NOMINAL THICKNESS IN.	OD* IN.	WT. OF BARREL PER FT. † LB.	TR FLEX® JOINT		
					WT. OF BELL LB.	WT. PER LGTH.† LB.	AVG. WT. PER FT.‡ LB.
4	350	0.25	4.80	10.9	19	220	12.2
6	350	0.25	6.90	16.0	24	315	17.5
8	350	0.25	9.05	21.1	34	415	23.1
10	350	0.26	11.10	27.1	48	535	29.7
12	350	0.28	13.20	34.8	65	710	39.4
14	250	0.28	15.30	40.4	106	830	46.1
14	300	0.30	15.30	43.3	106	880	48.9
14	350	0.31	15.30	44.7	106	905	50.3
16	250	0.30	17.40	49.3	129	1055	58.6
16	300	0.32	17.40	52.5	129	1110	61.7
16	350	0.34	17.40	55.8	129	1170	65.0
18	250	0.31	19.50	57.2	153	1215	67.5
18	300	0.34	19.50	62.6	153	1315	73.1
18	350	0.36	19.50	66.2	153	1380	76.7
20	250	0.33	21.60	67.5	184	1435	79.7
20	300	0.36	21.60	73.5	184	1525	84.7
20	350	0.38	21.60	77.5	184	1610	89.4
24	200	0.33	25.80	80.8	237	1700	94.4
24	250	0.37	25.80	90.5	237	1870	103.9
24	300	0.40	25.80	97.7	237	2000	111.1
24	350	0.43	25.80	104.9	237	2125	118.1
30	150	0.34	32.00	103.5	297	2175	120.8
30	200	0.38	32.00	115.5	297	2385	132.5
30	250	0.42	32.00	127.5	297	2595	144.2
30	300	0.45	32.00	136.5	297	2755	153.1
30	350	0.49	32.00	148.4	297	2965	164.7
36	150	0.38	38.30	138.5	444	2990	166.1
36	200	0.42	38.30	152.9	444	3245	180.3
36	250	0.47	38.30	170.9	444	3560	197.8
36	300	0.51	38.30	185.3	444	3815	211.9
36	350	0.56	38.30	203.2	444	4130	229.4

† INCLUDING BELL; CALCULATED WEIGHT OF PIPE ROUNDED OFF TO THE NEAREST 5 LB.

‡ INCLUDING BELL; AVERAGE WEIGHT PER FOOT, BASED ON CALCULATED WEIGHT OF PIPE BEFORE ROUNDING.

**DUCTILE IRON PIPE DIMENSIONS AND WEIGHTS FOR SPECIAL CLASSES  
OF TR FLEX® RESTRAINED JOINT DUCTILE IRON PIPE**

PIPE SIZE IN.	THICKNESS CLASS	NOMINAL THICKNESS IN.	OD* IN.	WT. OF BARREL PER FT. † LB.	TR FLEX® JOINT		
					WT. OF BELL LB.	WT. PER LGTH.† LB.	AVG. WT. PER FT.‡ LB.
4	51	0.26	4.80	11.3	19	220	12.2
4	52	0.29	4.80	12.6	19	245	13.6
4	53	0.32	4.80	13.8	19	265	14.7
4	54	0.35	4.80	15	19	285	15.8
4	55	0.38	4.80	16.1	19	305	16.9
4	56	0.41	4.80	17.3	19	330	18.3
6	50	0.25	6.90	16	24	315	17.5
6	51	0.28	6.90	17.8	24	345	19.2
6	52	0.31	6.90	19.6	24	380	21.1
6	53	0.34	6.90	21.4	24	410	22.8
6	54	0.37	6.90	23.2	24	445	24.7
6	55	0.40	6.90	25	24	475	26.4
6	56	0.43	6.90	26.7	24	505	28.1
8	50	0.27	9.05	22.8	34	445	24.7
8	51	0.30	9.05	25.2	34	490	27.2
8	52	0.33	9.05	27.7	34	530	29.4
8	53	0.36	9.05	30.1	34	575	31.9
8	54	0.39	9.05	32.5	34	620	34.4
8	55	0.42	9.05	34.8	34	660	36.7
8	56	0.45	9.05	37.2	34	705	39.2
10	50	0.29	11.10	30.1	48	590	32.8
10	51	0.32	11.10	33.2	48	645	35.8
10	52	0.35	11.10	36.2	48	700	38.9
10	53	0.38	11.10	39.2	48	755	41.9
10	54	0.41	11.10	42.1	48	805	44.7
10	55	0.44	11.10	45.1	48	860	47.8
10	56	0.47	11.10	48	48	915	50.8
12	50	0.31	13.20	38.4	65	780	43.3
12	51	0.34	13.20	42	65	845	46.9
12	52	0.37	13.20	45.6	65	910	50.6
12	53	0.40	13.20	49.2	65	970	53.9
12	54	0.43	13.20	52.8	65	1035	57.5
12	55	0.46	13.20	56.3	65	1100	61.1
12	56	0.49	13.20	59.9	65	1165	64.7
14	50	0.33	15.30	47.5	106	955	53.1
14	51	0.36	15.30	51.7	106	1030	57.2
14	52	0.39	15.30	55.9	106	1105	61.4
14	53	0.42	15.30	60.1	106	1180	65.6
14	54	0.45	15.30	64.2	106	1255	69.7
14	55	0.48	15.30	68.4	106	1325	73.6
14	56	0.51	15.30	72.5	106	1400	77.8

† INCLUDING BELL; CALCULATED WEIGHT OF PIPE ROUNDED OFF TO THE NEAREST 5 LB.

‡ INCLUDING BELL; AVERAGE WEIGHT PER FOOT, BASED ON CALCULATED WEIGHT OF PIPE BEFORE ROUNDING.

**DUCTILE IRON PIPE DIMENSIONS AND WEIGHTS FOR SPECIAL CLASSES  
OF TR FLEX® RESTRAINED JOINT DUCTILE IRON PIPE**

PIPE SIZE IN.	THICKNESS CLASS	NOMINAL THICKNESS IN.	OD* IN.	WT. OF BARREL PER FT. † LB.	TR FLEX® JOINT		
					WT. OF BELL LB.	WT. PER LGTH.† LB.	AVG. WT. PER FT.† LB.
16	50	0.34	17.40	55.8	129	1170	65.0
16	51	0.37	17.40	60.6	129	1255	69.7
16	52	0.40	17.40	65.4	129	1340	74.4
16	53	0.43	17.40	70.1	129	1425	79.2
16	54	0.46	17.40	74.9	129	1510	83.9
16	55	0.49	17.40	79.7	129	1595	88.6
16	56	0.52	17.40	84.4	129	1680	93.3
18	50	0.35	19.50	64.4	153	1345	74.7
18	51	0.38	19.50	69.8	153	1445	80.3
18	52	0.41	19.50	75.2	153	1540	85.6
18	53	0.44	19.50	80.6	153	1635	90.8
18	54	0.47	19.50	86	153	1730	96.1
18	55	0.50	19.50	91.3	153	1825	101.4
18	56	0.53	19.50	96.7	153	1920	106.7
20	50	0.36	21.60	73.5	184	1540	85.6
20	51	0.39	21.60	79.5	184	1645	91.4
20	52	0.42	21.60	85.5	184	1755	97.5
20	53	0.45	21.60	91.5	184	1860	103.3
20	54	0.48	21.60	97.5	184	1965	109.2
20	55	0.51	21.60	103.4	184	2070	115.0
20	56	0.54	21.60	109.3	184	2180	121.1
24	50	0.38	25.80	92.9	237	1915	106.4
24	51	0.41	25.80	100.1	237	2040	113.3
24	52	0.44	25.80	107.3	237	2170	120.6
24	53	0.47	25.80	114.4	237	2295	127.5
24	54	0.50	25.80	121.6	237	2425	134.7
24	55	0.53	25.80	128.8	237	2550	141.7
24	56	0.56	25.80	135.9	237	2675	148.6
30	50	0.39	32.00	118.5	297	2440	135.6
30	51	0.43	32.00	130.5	297	2650	147.2
30	52	0.47	32.00	142.5	297	2860	158.9
30	53	0.51	32.00	154.4	297	3070	170.6
30	54	0.55	32.00	166.3	297	3280	182.2
30	55	0.59	32.00	178.2	297	3490	193.9
30	56	0.63	32.00	190.0	297	3700	205.6
36	50	0.43	38.30	156.5	444	3310	183.9
36	51	0.48	38.30	174.5	444	3625	201.4
36	52	0.53	38.30	192.4	444	3940	218.9
36	53	0.58	38.30	210.3	444	4255	236.4
36	54	0.63	38.30	228.1	444	4565	253.6
36	55	0.68	38.30	245.9	444	4880	271.1
36	56	0.73	38.30	263.7	444	5190	288.3

† INCLUDING BELL; CALCULATED WEIGHT OF PIPE ROUNDED OFF TO THE NEAREST 5 LB.

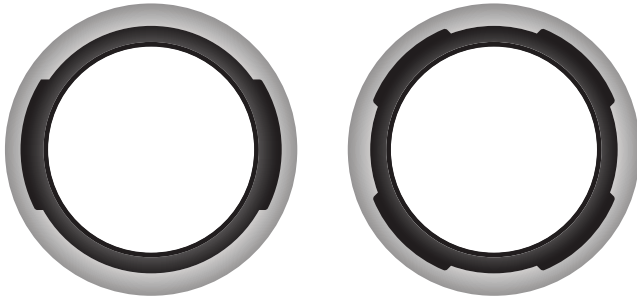
‡ INCLUDING BELL; AVERAGE WEIGHT PER FOOT, BASED ON CALCULATED WEIGHT OF PIPE BEFORE ROUNDING.

## ASSEMBLY INSTRUCTIONS

**STEP 1. (4"-10")** Lay pipe such that one of the bell slots is accessible.

**(12"-20")** Lay pipe such that both of the bell slots are accessible, in the horizontal position if possible.

**(24"-36")** Lay pipe such that all four of the bell slots are accessible, in the diagonal position if possible.



**STEP 2.** Clean the bell socket and insert gasket.

**STEP 3.** Clean the spigot end to the assembly stripes.

**STEP 4.** Lubricate the exposed surface of the gasket and pipe spigot end back to the weld bead.

**Note:** Use only lube as supplied and/or approved by the manufacturer. *Currently approved lubricants provided by McWane Ductile include Phoenix XL-27 and Black Swan.*

**STEP 5.** Make a normal push-on joint assembly, completely homing the pipe until the first assembly stripe is in the bell socket. Keep the joint in straight alignment during the assembly process.

**STEP 6. (4"-10")** Insert the right-hand locking segment into a bell slot and slide the segment clockwise around the pipe.

**(12"-36")** Insert lower locking segment into a bell slot and slide the segment around the pipe.

**STEP 7. (4"-10")** Insert left-hand locking segment into the bell slot and slide the segment counter-clockwise around the pipe.

**(12"-36")** Insert upper locking segment into the same bell slot and rotate around the pipe.

**STEP 8. (4"-10")** Hold the segments apart and wedge the rubber retainer into the slot between the two locking segments.

**(12"-36")** Hold the upper segment in place and wedge the rubber retainer into the slot between the two locking segments.

**STEP 9. (4"-10")** None.

**(12"-20")** Repeat steps 6-8 for other slot. Make sure that all 4 locking segments and 2 rubber retainers are securely in place.

**(24"-36")** Repeat steps 6-8 for other slot. Make sure that all 8 locking segments and 4 rubber retainers are securely in place.

**STEP 10.** Extend the joint to remove the slack in the locking segment cavity. Joint extension is necessary to attain the marked laying length on the pipe and to minimize growth or extension of the line as it is pressurized.

**STEP 11.** Set the joint deflection as required.



### POCKET ENGINEER

Available for **iOS + Android**  
or online at [pe.mcwane.com](http://pe.mcwane.com)

CONNECT WITH US ON



#### NEW JERSEY

183 Sitgreaves St.  
Phillipsburg, NJ 08865  
908-454-1161

#### OHIO

2266 S. 6th St.  
Coshocton, OH 43812  
740-622-6651

#### UTAH

1401 E. 2000 South  
Provo, UT 84606  
801-373-6910



#### CANADA

55 Frid St. Unit #1  
Hamilton, ON, L8P 4M3  
905-547-3251