AMERICAN Ductile Iron Pipe



AMERICAN DUCTILE IRON PIPE



AMERICAN Ductile Iron Fastite® Joint Pipe ANSI/AWWA C151/A21.51 Standard Dimensions

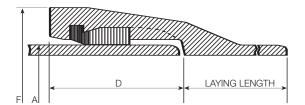


Table No. 3-3

			Dimensions in Inches	
Size in.	Nominal Laying Length ft.	A Outside Diameter	D Depth of Socket	F* Bell O.D.
4	18	4.80	3.31	6.40
6	20	6.90	3.38	8.60
8	20	9.05	3.75	11.16
10	20	11.10	3.75	13.25
12	20	13.20	3.75	15.22
14	20	15.30	5.23	17.73
16	20	17.40	5.23	19.86
18	20	19.50	5.50	22.16
20	20	21.60	5.50	24.28
24	20	25.80	5.50	28.50
30	20	32.00	6.50	34.95
36	20	38.30	6.50	41.37
42	20	44.50	7.50	48.27
48	20	50.80	8.00	54.71
54	20	57.56	8.50	61.65
60	20	61.61	8.75	65.80
64	20	65.67	9.00	70.04

*Dimensions subject to change at our option. Check AMERICAN if exact dimensions required. For Fastite assembly instructions see Section 2.



The liberal allowable deflection in the Fastite Joint facilitates pipeline installation with sweeping horizontal or vertical curves without the use of fittings.



AMERICAN Ductile Iron Fastite® Joint Pipe Allowable Joint Deflection



Table No. 3-4

Size	Nominal Laying	Maximum Recommended Deflection				
in.	Length ft.					
4	18	19	5°			
6	20	21	5°			
8	20	21	5°			
10	20	21	5°			
12	20	21	5°			
14	20	21	5°			
16	20	21	5°			
18	20	21	5°			
20	20	21	5°			
24	20	21	5°			
30	20	21	5°			
36	20	17	4°			
42	20	12	3°			
48	20	12	3°			
54	20	12	3°			
60	20	12	3°			
64	20	12	3°			

For optimum assembly, the joints should be assembled with the pipe in reasonably straight alignment. After joint assembly, the pipe may be deflected up to the maximum shown above. Offset distances are based on nominal lengths shown. See Section 2 Table 2-4 for maximum allowable internal separation of 24" and larger Fastite joints.

Special Fastite Deflection Bells

Special Fastite bells are available which allow greater maximum joint deflection as follows:

Table No. 3-5

Size in.	X Offset per Length in.	Y Deflection Angle
36	21	5°
42	21	5°
48	17	4°
54	17	4°
60	17	4°
64	17	4°

Offset distances are for 36"-64" Special Deflection Bells based on 20-foot lengths.



AMERICAN Ductile Iron Pipe ANSI/AWWA C150/A21.50 and ANSI/AWWA C151/A21.51 Nominal Wall Thicknesses for Special Thickness Classes

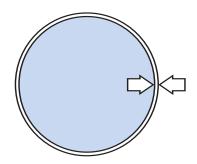


Table No. 3-12

Size	Outside Diameter	s	SPECIAL THICKNESS CLASSES—Wall Thickness in Inches*								
in.	in.	50	51	52	53	54	55	56			
 4	4.80	-	.26	.29	.32	.35	.38	.41			
 6	6.90	.25	.28	.31	.34	.37	.40	.43			
8	9.05	.27	.30	.33	.36	.39	.42	.45			
10	11.10	.29	.32	.35	.38	.41	.44	.47			
12	13.20	.31	.34	.37	.40	.43	.46	.49			
14	15.30	.33	.36	.39	.42	.45	.48	.51			
16	17.40	.34	.37	.40	.43	.46	.49	.52			
18	19.50	.35	.38	.41	.44	.47	.50	.53			
20	21.60	.36	.39	.42	.45	.48	.51	.54			
24	25.80	.38	.41	.44	.47	.50	.53	.56			
30	32.00	.39	.43	.47	.51	.55	.59	.63			
36	38.30	.43	.48	.53	.58	.63	.68	.73			
42	44.50	.47	.53	.59	.65	.71	.77	.83			
48	50.80	.51	.58	.65	.72	.79	.86	.93			
54	57.56	.57	.65	.73	.81	.89	.97	1.05			

^{*}These are Special Thickness Classes as shown in AWWA C150 and C151. They were previously designated standard thickness classes. AMERICAN can furnish any thickness in between these Special Thicknesses if deemed economical for major projects.

Special classes are most appropriately used for some threaded, grooved, or ball and socket pipes or for extraordinary design conditions, and they are generally less available than standard pressure class pipe.

For pressure rating and maximum depth of cover capabilities of Special Thickness Classes, check AMERICAN. These

For pressure rating and maximum depth of cover capabilities of Special Thickness Classes, check AMERICAN. These capabilities can be estimated by comparing metal thickness and capabilities of those of Pressure Classes in Table No. 3-11, or may be calculated by using the design formulas shown in AWWA C150.



AMERICAN Ductile Iron Fastite® Joint and Mechanical Joint Pipe ANSI/AWWA C151/A21.51

Wall Thickness and Weights for Special Thickness Classes Table No. 3-13

Size in. 1 4 6 8 10	Thickness Class 51 52 53 54 55 56 50 51 52 53 54 55 56 50 51 52 53 54 55 56 50 51 52 53 54 55 56 50 51 52 53 54 55 56 50 51 52 53 54 55 56 50 51 52 53 54 55 56 50 51 52 53 54	Wall Thickness in. .26 .29 .32 .35 .38 .41 .25 .28 .31 .34 .37 .40 .43 .27 .30 .33 .36 .39 .42 .45 .29 .32 .35	Per Foot Plain End 11.3 12.6 13.8 15.0 16.1 17.3 16.0 17.8 19.6 21.4 23.2 25.0 26.7 22.8 25.2 27.7 30.1 32.5 34.8 37.2 30.1 33.2	Per Foot inc. Bell 11.7 13.0 14.2 15.4 16.5 17.7 16.7 18.5 20.3 22.1 23.9 25.7 27.4 23.8 26.2 28.7 31.1 33.5 35.8 38.3 31.4	213 236 257 279 300 321 335 370 410 445 480 515 550 480 525 575 625 675 720 770	Mechan Per Foot inc. Bell	Per Nominal** Length 290 450
6 8	51 52 53 54 55 56 50 51 52 53 54 55 56 50 51 52 53 54 55 56 50 51 52 53 54 55 56 50 51 52 55 56 56 56 56 56 56 56 56 56 56 56 56	in. .26 .29 .32 .35 .38 .41 .25 .28 .31 .34 .37 .40 .43 .27 .30 .33 .36 .39 .42 .45 .29 .32 .35	11.3 12.6 13.8 15.0 16.1 17.3 16.0 17.8 19.6 21.4 23.2 25.0 26.7 22.8 25.2 27.7 30.1 32.5 34.8 37.2 30.1	11.7 13.0 14.2 15.4 16.5 17.7 16.7 18.5 20.3 22.1 23.9 25.7 27.4 23.8 26.2 28.7 31.1 33.5 35.8 38.3	213 236 257 279 300 321 335 370 410 445 480 515 550 480 525 575 625 675 720 770		Nominal** Length 290 450 630
8	52 53 54 55 56 50 51 52 53 54 55 56 50 51 52 53 54 55 56 50 51 52 53 54 55 55 56 50 51 52 53 56 50 51 52 53 56 50 51 50 51 51 51 51 51 51 51 51 51 51 51 51 51	.29 .32 .35 .38 .41 .25 .28 .31 .34 .37 .40 .43 .27 .30 .33 .36 .39 .42 .45	12.6 13.8 15.0 16.1 17.3 16.0 17.8 19.6 21.4 23.2 25.0 26.7 22.8 25.2 27.7 30.1 32.5 34.8 37.2 30.1	13.0 14.2 15.4 16.5 17.7 18.5 20.3 22.1 23.9 25.7 27.4 23.8 26.2 28.7 31.1 33.5 35.8 38.3 31.4	236 257 279 300 321 335 370 410 445 480 515 550 480 525 575 625 675 720 770	22.3	- - - - - 450 - - - - - - - - - - - - - - - - - - -
8	53 54 55 56 50 51 52 53 54 55 56 50 51 52 53 54 55 56 50 51 52 53 54 55 56 50 51 52 53 54 55 56 50 51 52 53 54 55 56 50 51 52 53 54 55 56 50 51 52 53 54 55 56 56 57 57 57 57 57 57 57 57 57 57	.32 .35 .38 .41 .25 .28 .31 .34 .37 .40 .43 .27 .30 .33 .36 .39 .42 .45	13.8 15.0 16.1 17.3 16.0 17.8 19.6 21.4 23.2 25.0 26.7 22.8 25.2 27.7 30.1 32.5 34.8 37.2 30.1	14.2 15.4 16.5 17.7 16.7 18.5 20.3 22.1 23.9 25.7 27.4 23.8 26.2 28.7 31.1 33.5 35.8 38.3	257 279 300 321 335 370 410 445 480 515 550 480 525 575 625 675 720 770	22.3	- - - - - 450 - - - - - - - - - - - - - - - - - - -
8	53 54 55 56 50 51 52 53 54 55 56 50 51 52 53 54 55 56 50 51 52 53 54 55 56 50 51 52 53 54 55 56 50 51 52 53 54 55 56 50 51 52 53 54 55 56 50 51 52 53 54 55 56 56 57 57 57 57 57 57 57 57 57 57	.32 .35 .38 .41 .25 .28 .31 .34 .37 .40 .43 .27 .30 .33 .36 .39 .42 .45	13.8 15.0 16.1 17.3 16.0 17.8 19.6 21.4 23.2 25.0 26.7 22.8 25.2 27.7 30.1 32.5 34.8 37.2 30.1	14.2 15.4 16.5 17.7 16.7 18.5 20.3 22.1 23.9 25.7 27.4 23.8 26.2 28.7 31.1 33.5 35.8 38.3	257 279 300 321 335 370 410 445 480 515 550 480 525 575 625 675 720 770	22.3	- - - - - 450 - - - - - - - - - - - - - - - - - - -
8	54 55 56 50 51 52 53 54 55 56 50 51 52 53 54 55 56 50 51 52 53	.35 .38 .41 .25 .28 .31 .34 .37 .40 .43 .27 .30 .33 .36 .39 .42 .45 .29 .32	15.0 16.1 17.3 16.0 17.8 19.6 21.4 23.2 25.0 26.7 22.8 25.2 27.7 30.1 32.5 34.8 37.2 30.1	15.4 16.5 17.7 16.7 18.5 20.3 22.1 23.9 25.7 27.4 23.8 26.2 28.7 31.1 33.5 35.8 38.3 31.4	279 300 321 335 370 410 445 480 515 550 480 525 575 625 675 720 770	22.3	- - - - - 450 - - - - - - - - - - - - - - - - - - -
8	56 50 51 52 53 54 55 56 50 51 52 53 54 55 56 50 51 52 53	.38 .41 .25 .28 .31 .34 .37 .40 .43 .27 .30 .33 .36 .39 .42 .45 .29 .32	16.1 17.3 16.0 17.8 19.6 21.4 23.2 25.0 26.7 22.8 25.2 27.7 30.1 32.5 34.8 37.2 30.1	17.7 16.7 18.5 20.3 22.1 23.9 25.7 27.4 23.8 26.2 28.7 31.1 33.5 35.8 38.3 31.4	321 335 370 410 445 480 515 550 480 525 575 625 675 720 770	- 22.3 - - - - -	- 450 - - - - - - 630
8	56 50 51 52 53 54 55 56 50 51 52 53 54 55 56 50 51 52 53	.41 .25 .28 .31 .34 .37 .40 .43 .27 .30 .33 .36 .39 .42 .45	17.3 16.0 17.8 19.6 21.4 23.2 25.0 26.7 22.8 25.2 27.7 30.1 32.5 34.8 37.2 30.1	17.7 16.7 18.5 20.3 22.1 23.9 25.7 27.4 23.8 26.2 28.7 31.1 33.5 35.8 38.3 31.4	321 335 370 410 445 480 515 550 480 525 575 625 675 720 770	- 22.3 - - - - -	- 450 - - - - - - 630
8	50 51 52 53 54 55 56 50 51 52 53 54 55 56 50 51 55 56	.25 .28 .31 .34 .37 .40 .43 .27 .30 .33 .36 .39 .42 .45	16.0 17.8 19.6 21.4 23.2 25.0 26.7 22.8 25.2 27.7 30.1 32.5 34.8 37.2	16.7 18.5 20.3 22.1 23.9 25.7 27.4 23.8 26.2 28.7 31.1 33.5 35.8 38.3	335 370 410 445 480 515 550 480 525 575 625 675 720 770	- 22.3 - - - - -	- 450 - - - - - - 630
10	52 53 54 55 56 50 51 52 53 54 55 56 50 51 52 53	.28 .31 .34 .37 .40 .43 .27 .30 .33 .36 .39 .42 .45 .29 .32	17.8 19.6 21.4 23.2 25.0 26.7 22.8 25.2 27.7 30.1 32.5 34.8 37.2 30.1	18.5 20.3 22.1 23.9 25.7 27.4 23.8 26.2 28.7 31.1 33.5 35.8 38.3 31.4	370 410 445 480 515 550 480 525 575 625 675 720 770	- 22.3 - - - - -	- 450 - - - - - - - - - 630
10	53 54 55 56 50 51 52 53 54 55 56 50 51 52 53	.34 .37 .40 .43 .27 .30 .33 .36 .39 .42 .45 .29 .32	21.4 23.2 25.0 26.7 22.8 25.2 27.7 30.1 32.5 34.8 37.2 30.1	22.1 23.9 25.7 27.4 23.8 26.2 28.7 31.1 33.5 35.8 38.3 31.4	445 480 515 550 480 525 575 625 675 720 770	- - - - -	- - - - - - 630
10	54 55 56 50 51 52 53 54 55 56 50 51 52 53	.37 .40 .43 .27 .30 .33 .36 .39 .42 .45 .29 .32	23.2 25.0 26.7 22.8 25.2 27.7 30.1 32.5 34.8 37.2 30.1	23.9 25.7 27.4 23.8 26.2 28.7 31.1 33.5 35.8 38.3 31.4	480 515 550 480 525 575 625 675 720 770	- - - - -	- - - - - - 630
10	55 56 50 51 52 53 54 55 56 50 51 52 53	.40 .43 .27 .30 .33 .36 .39 .42 .45 .29 .32	25.0 26.7 22.8 25.2 27.7 30.1 32.5 34.8 37.2 30.1	25.7 27.4 23.8 26.2 28.7 31.1 33.5 35.8 38.3 31.4	515 550 480 525 575 625 675 720 770	- - - - -	- - - - - - 630
10	55 56 50 51 52 53 54 55 56 50 51 52 53	.40 .43 .27 .30 .33 .36 .39 .42 .45 .29 .32	25.0 26.7 22.8 25.2 27.7 30.1 32.5 34.8 37.2 30.1	25.7 27.4 23.8 26.2 28.7 31.1 33.5 35.8 38.3 31.4	515 550 480 525 575 625 675 720 770	- - -	- - - - 630
10	56 50 51 52 53 54 55 56 50 51 52 53	.43 .27 .30 .33 .36 .39 .42 .45 .29 .32	26.7 22.8 25.2 27.7 30.1 32.5 34.8 37.2 30.1	27.4 23.8 26.2 28.7 31.1 33.5 35.8 38.3 31.4	550 480 525 575 625 675 720 770	- -	- - 630
10	50 51 52 53 54 55 56 50 51 52 53	.27 .30 .33 .36 .39 .42 .45 .29 .32	22.8 25.2 27.7 30.1 32.5 34.8 37.2 30.1	23.8 26.2 28.7 31.1 33.5 35.8 38.3 31.4	480 525 575 625 675 720 770	- -	- - 630
10	51 52 53 54 55 56 50 51 52 53	.30 .33 .36 .39 .42 .45 .29 .32	25.2 27.7 30.1 32.5 34.8 37.2 30.1	26.2 28.7 31.1 33.5 35.8 38.3 31.4	525 575 625 675 720 770	- - 31.3 - -	
	52 53 54 55 56 50 51 52 53	.33 .36 .39 .42 .45 .29 .32	27.7 30.1 32.5 34.8 37.2 30.1	28.7 31.1 33.5 35.8 38.3 31.4	575 625 675 720 770	- 31.3 - -	
	53 54 55 56 50 51 52 53	.36 .39 .42 .45 .29 .32 .35	30.1 32.5 34.8 37.2 30.1	31.1 33.5 35.8 38.3 31.4	625 675 720 770	31.3 - -	
	54 55 56 50 51 52 53	.39 .42 .45 .29 .32 .35	32.5 34.8 37.2 30.1	33.5 35.8 38.3 31.4	675 720 770	-	
	55 56 50 51 52 53	.42 .45 .29 .32 .35	34.8 37.2 30.1	35.8 38.3 31.4	720 770	-	
	56 50 51 52 53	.45 .29 .32 .35	37.2 30.1	38.3 31.4	770		_
	50 51 52 53	.29 .32 .35	30.1	31.4		_	_
	51 52 53	.32 .35			630	_	_
12	52 53	.35		34.5	695	_	_
12	53		36.2	37.5	755	_	_
12		.38	39.2	40.5	815	40.7	820
12		.41	42.1	43.5	875	40.7	- 020
12	55	.44	45.1	46.5	935	_	_
12	56	.47	48.0	49.3	990	_	_
	50	.31	38.4	40.0	805	_	_
	51	.34	42.0	43.6	875	_	
	52	.37	45.6	47.2	950	_	
	53	.40	49.2	50.8	1020	51.1	1030
	54	.43	52.8	54.3	1090	51.1	1000
	55	.46	56.3	57.9	1165	_	_
	56	.49	59.9	61.5	1235	_	_
14	50	.33	47.5	50.3	1010	_	_
1-	51	.36	51.7	54.6	1010	_	_
	52	.39	55.9	58.7	1175	_	_
	52 53	.42	60.1	62.9	1260	_	_
	54	.45	64.2	67.0	1345	_	_
	55	.48	68.4	71.3	1430	_	_
	56	.51	72.5	75.3	1510	_	_
16	50	.34	55.8	59.0	1180		_
10	51	.37	60.6	63.8	1280	_	
	52	.40	65.4	68.6	1375		
	53	.43	70.1	73.3	1470		
	54	.46	74.9	78.1	1565		
	55	.49	79.7	82.9	1660	_	_
	56	.52	84.4	87.6	1755	_	
18	50	.35	64.4	68.0	1365	_	_
	51	.38	69.8	73.4	1470	_	_
	52	.41	75.2	78.8	1580	_	_
	U	.44	80.6	84.2	1690	_	_
			86.0	89.6	1795	_	_
	53	4/	91.3	95.0	1905	_	_
		.47 .50	1 01.0	100.3	2010	_	1 -

 $^{^*}$ Mechanical Joint Pipe is available in 4"-12" diameters and Special Thickness Class 53 only.



AMERICAN Ductile Iron Fastite® Joint and Mechanical Joint Pipe ANSI/AWWA C151/A21.51 Wall Thickness and Weights for Special Thickness Classes

Table No. 3-13—Continued

			Weight in Pounds							
Size	Thickness	Wall Thickness	Per Foot	Fasti	te Joint	Mechan	ical Joint*			
in.	Class	in.	Plain End	Per Foot inc. Bell	Per 20' Nominal Length	Per Foot inc. Bell	Per 20' Nominal Length			
20	50	.36	73.5	77.5	1555	-	-			
1	51	.39	79.5	83.5	1675	-	-			
1	52	.42	85.5	89.5	1795	-	-			
1	53	.45	91.5	95.5	1915	-	-			
1	54	.48	97.5	101.5	2035	-	-			
	55	.51	103.4	107.5	2155	-	-			
24	50	.38	92.9	97.7	1960	-	-			
1	51	.41	100.1	104.9	2100	-	-			
1	52	.44	107.3	112.1	2245	-	-			
1	53	.47	114.4	119.2	2390	-	-			
1	54	.50	121.6	126.4	2535	-	-			
1	55	.53	128.8	133.5	2675	-	-			
	56	.56	135.9	140.7	2820	-	-			
30	50	.39	118.5	126.7	2540	-	-			
1	51	.43	130.5	138.7	2780	-	-			
1	52	.47	142.5	150.7	3020	-	-			
1	53	.51	154.4	162.6	3260	-	-			
1	54	.55	166.3	174.5	3495	-	-			
1	55	.59	178.2	186.4	3735	-	-			
	56	.63	190.0	198.2	3970	_	-			
36	50	.43	156.5	167.2	3350	-	-			
1	51 52	.48 .53	174.5 192.4	185.2 203.1	3710 4070	-	-			
1	53	.58	210.3	203.1	4430	_	-			
1	54	.63	210.3	238.8	4785	_	_			
1	55	.68	245.9	256.5	5140	_	_			
1	56	.73	263.7	274.4	5500		_			
42	50	.47	198.9	213.3	4265	_	_			
72	51	.53	224.0	238.4	4770	_	_			
1	52	.59	249.1	263.5	5270	_	_			
1	53	.65	274.0	288.5	5770	_	_			
1	54	.71	298.9	313.3	6265	_	_			
1	55	.77	323.7	338.2	6765	_	_			
1	56	.83	348.4	362.8	7255	_	_			
48	50	.51	246.6	264.3	5285	-	-			
1	51	.58	280.0	297.7	5955	-	-			
1	52	.65	313.4	331.1	6620	-	-			
1	53	.72	346.6	364.3	7285	-	-			
1	54	.79	379.8	397.5	7950	-	-			
1	55	.86	412.9	430.6	8610	-	-			
	56	.93	445.9	463.6	9270	-	-			
54	50	.57	312.3	334.3	6685	-	-			
1	51	.65	355.6	377.5	7550	-	-			
1	52	.73	398.8	420.8	8415	-	-			
1	53	.81	441.9	463.8	9275	-	-			
1	54	.89	484.9	506.8	10135	-	-			
1	55	.97	527.7	549.7	10995	-	-			
	56	1.05	570.4	592.3	11845	-	-			

 $^{60\}ensuremath{\text{"}}$ and $64\ensuremath{\text{"}}$ sizes are not available in Special Classes.

^{** 4&}quot; Fastite and Mechanical joint pipes are furnished in 18-foot nominal lengths - weights for all other sizes are for 20foot nominal lengths.

Dimensions, lengths, weights, etc., are subject to change at our option.



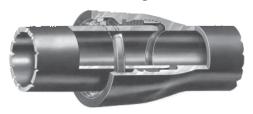
Other AMERICAN Joints

AMERICAN Fastite® Joint with Fast-Grip® Gasket, 4"-30"



The AMERICAN Fast-Grip Gasket furnished in sizes 4"-30" provides flexible, field-adaptable joint restraint in a standard AMERICAN Fastite (or Flex-Ring) Bell. See Sections 4 and 9.

AMERICAN Flex-Ring® Joint, 4"-12"



The AMERICAN Flex-Ring Joint provides flexible joint restraint against thrust due to internal water working pressure or external forces. It is also used in horizontal directional drilling (HDD) and pipe bursting applications.

See Sections 4 and 9.

AMERICAN Flex-Ring® Joint, 14"-48"



The AMERICAN Flex-Ring Joint provides flexible joint restraint against thrust due to internal water working pressure or external forces.

See Section 9.



AMERICAN Fastite® Conductive Joints Fastite Conductive Gaskets

For cold climates where electrical thawing of service connections is required, metal contact strips are molded into the Fastite gasket, providing a "built-in" contact which will carry the necessary current between the socket and the pipe end. Under compression, the rubber gasket forces the contact strips firmly against the metal surfaces. This design assures an enclosed and protected contact which remains effective against expansion, contraction or future movement of the joint. Special preparation of the pipe sockets and plain ends is required when using conductive gaskets. Instructions are outlined on each can of AMERICAN Fastite Joint Lubricant. The Fastite Joint Conductive Gasket is satisfactory for transmission of electrical current up to 600 amps.

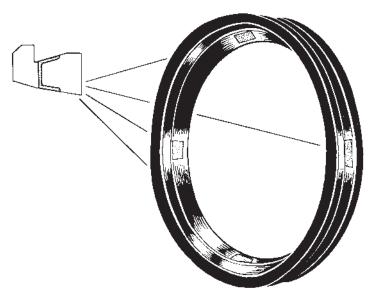
Other types of joint bonding are used to provide electrical conductivity across joints for low voltage/current requirements,

such as for corrosion monitoring or cathodic protection.

In assembling Fastite pipe with conductive gaskets, both plain end and socket must be thoroughly cleaned and be free of rust and from asphaltic or other coating material. A protective coating is applied to the sockets and beveled ends of Fastite Conductive Joint pipe prior to shipment to prevent oxidation on the gasket seating surfaces during transportation and storage prior to assembly. Thorough cleaning of the gasket seating surfaces in the socket and on the plain end is required prior to assembly to provide proper electrical contact between the copper clips and the metallic surfaces of the joint.

Assembly from this point is the same as described previously for the Fastite Joint.

Note: Fastite Conductive Gaskets should not be used with Fastite restrained plugs.



Fastite Conductive Gasket



City of Puyallup STAR® PIPE PIDesign Standard

Ductile Iron MJ Compact Fittings

ANSI/AWWA C153/A21.53

GENERAL SPECIFICATIONS

MATERIAL: Ductile Iron per ASTM A536

PRESSURE: 350 PSI rating for 2" - 24" sizes, 250 PSI rating for 30" - 48" sizes and 150 PSI rating for 54" - 64" sizes

TESTING: In accordance with ANSI/AWWA C153/A21.53 and UL requirements

LAYING LENGTH: In accordance with ANSI/AWWA C153/A21.53 (fittings not listed in ANSI/AWWA have dimensions per Star design as noted in the catalog)

DEFLECTION: 2"-4"=8° | 6"=7° | 8"-12"=5° | 14"-16"=3 ½° | 18"-24"=3° | 30"-48"=2°

WEIGHTS: Are in pounds, unless noted otherwise and do not include accessories, cement lining and coating FLANGES: Flanged ends on fittings match ANSI/AWWA C115/A21.15 and ANSI B16.1 class 125 flanges

CEMENT LINING: In accordance with ANSI/AWWA C104/A21.4 -- size 2" - 3" single thickness and sizes 4" - 64" double thickness

Asphaltic seal coat inside and out in accordance with ANSI/AWWA C104/A21.4 and referenced in ANSI/AWWA C153/A21.53 COATING:

GASKETS: SBR in accordance with ANSI/AWWA C111/A21.11 T-BOLTS/NUTS: Low alloy steel in accordance with ANSI/AWWA C111/A21.11

APPROVALS: 3" - 12" UL/ULC Listed | 2" and greater are UL/ANSI/NSF Standards 61 and 372 | 3" - 16" FM APPROVED. Please consult factory for

detail listing and approvals.

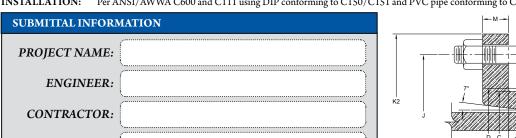
SPEC. SECTION:

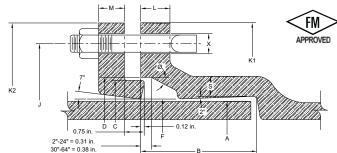
DIMENSIONS: All dimensions are in inches unless noted otherwise.

INSTALLATION: Per ANSI/AWWA C600 and C111 using DIP conforming to C150/C151 and PVC pipe conforming to C900/C905









MECH	ANICA	LJOINT	DIMEN	SIONS											
NOM.	A DIA.	В	C DIA.	D DIA.	F DIA.	J DIA.	K1 DIA.	K2 DIA.	L	М	s	Ø	X DIA.	BOLT	rs
SIZE	A DIA.	В	CDIA.	D DIA.	r DIA.) DIA.	KI DIA.	K2 DIA.	L	IVI	3	V	A DIA.	SIZE	NO.
2	2.50	2.50	3.39	3.50	2.61	4.75	6.19	6.25	0.58	0.62	0.36	28°	3/4	5/8 x 3	2
3	3.96	2.50	4.84	4.94	4.06	6.19	7.62	7.69	0.58	0.62	0.39	28°	3/4	5/8 x 3	4
→ 4	4.80	2.50	5.92	6.02	4.90	7.50	9.06	9.12	0.60	0.75	0.39	28°	7/8	3/4 x 3 1/2	4
6	6.90	2.50	8.02	8.12	7.00	9.50	11.06	11.12	0.63	0.88	0.43	28°	7/8	3/4 x 3 1/2	6
8	9.05	2.50	10.17	10.27	9.15	11.75	13.31	13.37	0.66	1.00	0.45	28°	7/8	3/4 x 3 1/2	6
10	11.10	2.50	12.22	12.34	11.20	14.00	15.62	15.62	0.70	1.00	0.47	28°	7/8	3/4 x 3 1/2	8
12	13.20	2.50	14.32	14.44	13.30	16.25	17.88	17.88	0.73	1.00	0.49	28°	7/8	3/4 x 3 1/2	8
14	15.30	3.50	16.40	16.54	15.44	18.75	20.25	20.25	0.79	1.25	0.55	28°	7/8	3/4 x 4	10
16	17.40	3.50	18.50	18.64	17.54	21.00	22.50	22.50	0.85	1.31	0.58	28°	7/8	3/4 x 4	12
18	19.50	3.50	20.60	20.74	19.64	23.25	24.83	24.75	1.00	1.38	0.68	28°	7/8	3/4 x 4	12
20	21.60	3.50	22.70	22.84	21.74	25.50	27.08	27.00	1.02	1.44	0.69	28°	7/8	3/4 x 4	14
24	25.80	3.50	26.90	27.04	25.94	30.00	31.58	31.50	1.02	1.56	0.75	28°	7/8	3/4 x 4 1/2	16
30	32.00	4.00	33.29	33.46	32.17	36.88	39.12	39.12	1.31	2.00	0.82	20°	1 1/8	1 x 5 ½	20
36	38.30	4.00	39.59	39.76	38.47	43.75	46.00	46.00	1.45	2.00	1.00	20°	1 1/8	1 x 5 ½	24
42	44.50	4.00	45.79	45.96	44.67	50.62	53.12	53.12	1.45	2.00	1.25	20°	1 3/8	1 ¼ x 6	28
48	50.80	4.00	52.09	52.26	50.97	57.50	60.00	60.00	1.45	2.00	1.35	20°	1 3/8	1 1/4 x 6	32
54							·								
60						{Fittir	ıgs & Din	nensions	Available	On Requ	iest }				

SIZE RANGE (Please specify):

LINING OPTIONS (Please check one):

Standard: Cement-lined and asphalt seal coat per ANSI/AWWA C104/A21.4 and UL/NSF-61

Optional: FBE (Fusion Bonded Epoxy) per ANSI/ AWWA C116/A21.15 and UL/NSF-61

Optional: P401 (Protecto 401) Ceramic Epoxy sewer applications only. Not NSF-61

Optional: Other (specify)

COATING OPTIONS (Please check one):

Standard: Asphaltic seal coat per ANSI/AWWA C104/A21.4

Optional: FBE (Fusion Bonded Epoxy) per ANSI/ AWWA C116/A21.15 and UL/NSF-61

Optional: Other (specify)

UCAT.13.01-SUB





64

Size Range



Ductile Iron Flanged Fittings ANSI/AWWA C110/A21.10

GENERAL SPECIFICATIONS

MATERIAL: Ductile iron per ASTM A536

PRESSURE: 250 PSI rating for 1" - 48" sizes and 150 PSI rating for 54" - 64"

TESTING: In accordance with ANSI/AWWA C110/A21.10, UL and FM requirements

LAYING LENGTH: 2" - 48" sizes in accordance with ANSI/AWWA C110/A21.10 and ANSI B16.1 and 54" - 64" sizes in accordance with ANSI/AWWA C153/A21.53 (fittings not listed in ANSI/AWWA have dimensions per Star design as noted in the catalog)

WEIGHTS: Are in pounds, unless noted otherwise and do not include accessories, cement lining and coatings

DRILLING: In accordance with ANSI/AWWA C110/A21.10, ANSI/AWWA C153/A21.53 and ANSI B16.1 Class 125 Flanges CEMENT LINING: In accordance with ANSI/AWWA C104/A21.4 -- sizes 1"- 3" single thickness and sizes 4"- 64" double thickness

COATING: Asphaltic seal coat inside in accordance with ANSI/AWWA C104/A21.4 and prime coat outside

2" - 12" Underwriters Laboratories and ULC Listed and Factory Mutual approved for 300 PSI rating. Please consult factory for detail listing and approvals. 2" and greater are UL/NSF-61. APPROVALS:

DIMENSIONS: All dimensions are in inches unless noted otherwise.

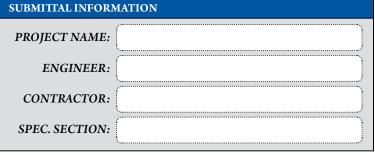
Per ANSI/AWWA C110 and C111 INSTALLATION:

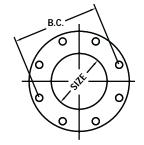


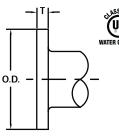














NOM.	O.D.	B.C.	T	BOLT HOLE	ВО	LTS
SIZE	О.Б.	B.C.	1	DIA.	SIZE	NO.
1	4.25	3.12	0.44	0.62	½ x 2	4
1 ½	5.00	3.88	0.56	0.62	½ x 2	4
2	6.00	4.75	0.62	0.75	5/8 x 2 1/4	4
2 1/2	7.00	5.50	0.69	0.75	5/8 x 2 ½	4
3	7.50	6.00	0.75	0.75	5/8 x 2 ½	4
	9.00	7.50	0.94	0.75	5/8 x 3	8
5	10.00	8.50	0.94	0.88	3/4 x 3	8
	11.00	9.50	1.00	0.88	3/4 x 3 1/2	8
→ 8	13.50	11.75	1.12	0.88	3/4 x 3 1/2	8
10	16.00	14.25	1.19	1.00	7⁄8 x 4	12
12	19.00	17.00	1.25	1.00	7/8 x 4	12
14	21.00	18.75	1.38	1.13	1 x 4 ½	12
16	23.50	21.25	1.44	1.13	1 x 4 ½	16
18	25.00	22.75	1.56	1.25	1 1/8 x 5	16
20	27.50	25.00	1.69	1.25	1 1/8 x 5	20
24	32.00	29.50	1.88	1.38	1 1/4 x 5 1/2	20
30	38.75	36.00	2.12	1.38	1 1/4 x 6 1/2	28
36	46.00	42.75	2.38	1.63	1 ½ x 7	32
42	53.00	49.50	2.62	1.63	1 ½ x 7 ½	36
48	59.50	56.00	2.75	1.63	1 ½ x 8	44
54	66.25	62.75	3.00	2.00	1 ¾ x 8 ½	44
60	73.00	69.25	3.12	2.00	1 3/4 x 9	52
64	80.00	76.00	3.38	2.00	1 3/4 x 9	52

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FM Approvals
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(E) (S)
ASTED AS

Size Range

SIZE RANGE (Please specify):

COATING OPTIONS (Please check one):

Standard: Cement-lined and asphalt seal coat per ANSI/AWWA C104/A21.4 and UL/NSF-61

Optional: FBE (Fusion Bonded Epoxy) per ANSI/ AWWA C116/A21.15 and UL/NSF-61 Optional: P401 (Protecto 401) Ceramic Epoxy -

sewer applications only. Not NSF-61

Optional: Other (specify)

LINING OPTIONS (Please check one):

Standard: Red Prime Coat

Optional: Asphaltic seal coat per ANSI/AWWA

C104/A21.4 Optional: FBE (Fusion Bonded Epoxy) per ANSI/AWWA C116/A21.15 and UL/NSF-61

Optional: Other (specify)

UCAT.13.01-SUB REGISTERED TRADEMARK OF STAR PIPE PRODUCTS

STAR' PIPE PRODUCTS HOUSTON **CORPORATE** TOLL FREE 1-800-999-3009 FAX 281-558-9000



Products

Technical Specifications

DETECTABLE UNDERGROUND TAPE

Harris DU-Series

Specialists in Safety Identification

I. SPECIFICATIONS:

Detectable warning tape consists of a nominal 4.5 mil (.0045") overall thickness, with a solid aluminum foil core. The imprinted warning message is "Buried, or Encased" to prevent ink rub-off, and is impervious to acids, alkalis and other destructive elements found in soil. The imprint is as such that it allows for total reflectivity. A tape must be visibly seen before it can be read.

II. TEST DATA:

Material Identification: 4.5 Mil Detectable,

2", 3" & 6" wide

½ 15 lbs.

Test Procedure: ASTM-D-882, Method A

Specimen Conditions: $73^{\circ}\text{F} / 50\% \text{ R.H.}$

Test Temperature: $73^{\circ}F$ Elongation: 90%Tensile Strength (Transverse) 5,530 psiTensile Strength (Longitudinal) 4,544 psiRoll Weight - (3" x 1000') $\frac{1}{7}$ 7.5 lbs.

III. LEGENDS/COLORS & IMPRINTS:

Roll Weight - (6" x 1000')

Caution Buried Line Below

(Red or Yellow - Electric), (Yellow - Gas), (Blue - Water), (Green - Sewer), (Orange - Fiber Optic - Telephone - Oil) are some examples. Please see our catalog for a full list.

IV. LOCATABILITY:

Harris recommends the use of an industrial grade non-ferrous metal locator utilizing inductive location. The metal mass in the tape is what the locator will pick up so the deeper the burial, the wider the tape should be.

Conductive location is attainable, however, when clipping on to the tape there must be complete contact with the foil. The foil is laminated between 2 layers of plastic making it somewhat difficult to achieve a proper clamp.

Note: Custom Imprinting is available upon request.

Harris West

5181 Argosy Avenue Huntington Beach, CA 92649

> Phone: (714) 898-8048 (800) 222-6866

Fax: (714) 898-7108 (800) 228-1274

Harris East

181 Conant Drive Pawtucket, RI 02860

> Phone: (401) 727-3160 (800) 443-2821

> Fax: (401) 727-3162