AMERICAN AUTOMATIC SPRINKLER COMPANY, INC.

Equipment Submittal Information

Job Name
1000 Random Road
Random City, VA 12345

Description	Model	Manufacture By
Sprinklers		
Pendent	V3802	Victaulic
Upright	V2704	Victaulic
Pipe & Fittings		
Schedule 40/10 Pipe	ASTM A53/A135	Wheatland
Threaded Fittings		Tyco
Welded Outlet Fittings		Merit
Grooved Fittings	Various Models	Victaulic
Grooved Couplings	009N	Victaulic
Hangers		
Ring Hanger	115	nVent Caddy
Drop-In Anchor	HDI+	Hilti
Powder Driven	W10	Hilti
Beam Clamp	300	nVent Caddy

Date: January 28, 2021
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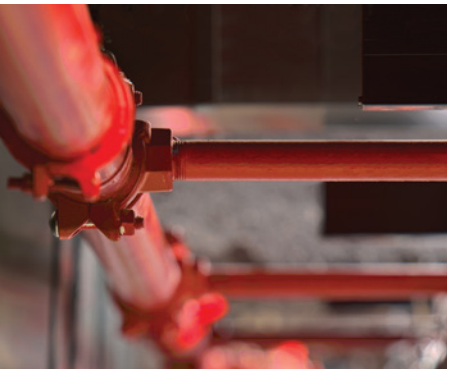
Schedule 10 and Schedule 40



High quality, high performance

Wheatland's Schedule 10 and Schedule 40 steel fire sprinkler pipe are subjected to the toughest possible testing to ensure the highest possible quality — not to mention reliable, long-lasting performance.

- Proprietary mill coating ensures clean, corrosion-resistant surface
- Outperforms and outlasts standard lacquer-coated pipe
- Easily painted, without special preparation
- Available in hot-dip galvanized or black finish

SCHEDULE 10 WEIGHTS AND DIMENSIONS

1 NPS NOW FM APPROVED

NPS	NOMINAL OD		NOMINAL ID		NOMINAL WALL		WT./FT.	WT./FT. H_2O FILLED	PCS./LIFT	WT./LIFT 21'	WT./LIFT 24'	WT./LIFT 25'	UL
	in.	mm	in.	mm	in.	mm	lbs.	lbs.		lbs.	lbs.	lbs.	CRR*
1	1.315	33.4	1.097	27.9	0.109	2.77	1.405	1.814	70	2065	2360	2459	11.4
1¼	1.660	42.2	1.442	36.6	0.109	2.77	1.807	2.514	61	2315	2645	2756	7.3
1½	1.900	48.3	1.682	42.7	0.109	2.77	2.087	3.049	61	2673	3055	3183	5.8
2	2.375	60.3	2.157	54.8	0.109	2.77	2.640	4.222	37	2051	2344	2442	4.7
2½	2.875	73.0	2.635	66.9	0.120	3.05	3.354	5.895	30	2226	2544	2651	3.5
3	3.500	88.9	3.260	82.8	0.120	3.05	4.336	7.949	19	1730	1977	2060	2.6
4	4.500	114.3	4.260	108.2	0.120	3.05	5.619	11.789	19	2242	2562	2669	1.6
5	5.563	141.3	5.295	134.5	0.134	3.40	7.780	17.309	13	2124	2427	2529	1.5
6	6.625	168.3	6.357	161.5	0.134	3.40	9.298	23.038	10	1953	2232	2325	1.0
8	8.625	219.1	8.249	209.5	0.188	4.78	16.960	40.086	7	2493	2849	2968	2.1

SCHEDULE 40 WEIGHTS AND DIMENSIONS

NPS	NOMINAL OD		NOMINAL ID		NOMINAL WALL		WT./FT.	WT./FT. H_2O FILLED	PCS./LIFT	WT./LIFT 21'	WT./LIFT 24'	WT./LIFT 25'	UL
	in.	mm	in.	mm	in.	mm	lbs.	lbs.		lbs.	lbs.	lbs.	CRR*
1	1.315	33.4	1.049	26.6	0.133	3.38	1.68	2.055	70	2470	2822	2940	1.000
1¼	1.660	42.2	1.380	35.1	0.140	3.56	2.27	2.922	51	2431	2778	2894	1.000
1½	1.900	48.3	1.610	40.9	0.145	3.68	2.72	3.602	44	2513	2872	2992	1.000
2	2.375	60.3	2.067	52.5	0.154	3.91	3.66	5.109	24	1845	2108	2196	1.000
2½	2.875	73.0	2.469	62.7	0.203	5.16	5.80	7.871	20	2436	2784	2900	1.000
3	3.500	88.9	3.068	77.9	0.216	5.49	7.58	10.783	13	2069	2365	2464	1.000
3½	4.000	101.6	3.548	90.1	0.226	5.74	9.12	13.400	10	1915	2189	2280	1.000
4	4.500	114.3	4.026	102.3	0.237	6.02	10.80	16.311	10	2268	2592	2700	1.000
5	5.563	141.3	5.047	158.2	0.258	6.55	14.63	23.262	7	2151	2458	2560	1.000
6	6.625	168.3	6.065	154.1	0.280	7.11	18.99	31.498	5	1994	2279	2374	1.000
8**	8.625	219.1	7.981	202.7	0.322	8.18	28.58	50.240	5	3001	3430	3573	1.000

** Calculated using Standard UL CRR formula, UL Fire Protection Directory, Category VIZY. The CRR is a ratio value used to measure the ability of a pipe to withstand corrosion. Threaded Schedule 40 steel pipe is used as the benchmark (value of 1.0).*

*** 8 NPS Schedule 40 is FM Approved but not UL Listed.*

Schedule 10 and Schedule 40 Meet or Exceed These Standards:

2" AND LARGER

- ASTM A135, Type E, Grade A (Schedule 10, 1–8 NPS)
- ASTM A795, Type E, Grade A (Schedule 40, 1–2 NPS)
- ASTM A53, Type E, Grade B (Schedule 40, 2–8 NPS)
- ASTM A53, Type F, Grade A (Schedule 40, 1–4 NPS)

1"-2"

- UL and C-UL Listed
- FM Approved
- NFPA 13

Pipe Fittings NPT Threaded, Ductile Iron

General Description

The TYCO Series 800 Threaded Pipe Fittings and California Tees & Elbows are manufactured from ductile iron. They are stronger and more corrosion resistant than cast iron fittings. The additional strength is provided by the ductile properties and by adding magnesium while the iron is being poured into the final cast shape. Although lighter than standard cast iron, the fittings have an added advantage of being less susceptible to cracking due to their added strength.

The Series 800, California, and Figure 719 Threaded Pipe Fittings are a redesignation for the Central Series 800, California, and Figure 719 Threaded Pipe Fittings.

NOTICE

The Threaded Pipe Fittings described herein must be installed and maintained in compliance with this document, as well as with the applicable standards of the NATIONAL FIRE PROTECTION ASSOCIATION (NFPA), in addition to the standards of any other authorities having jurisdiction. Failure to do so may impair the performance of these devices.

The owner is responsible for maintaining their fire protection system and devices in proper operating condition. Contact the installing contractor or product manufacturer with any questions.

Technical Data

Approvals
UL Listed
FM Approved

Maximum Working Pressure
300 psi (20,7 bar)

Material
Series 800 and California Fittings:
Ductile Iron

Figure 719 Plug:
Cast Iron

Pipe Thread
NPT per ANSI B1.20.1

Installation

Apply TEFLON tape or high quality pipe joint compound on male pipe threads and tighten two to three turns beyond hand tight.

NOTICE

Installers who have not used ductile iron threaded fittings should be instructed that the fittings are stronger than the pipe and overtightening the fitting can create leaks and cause damage to pipe threads. In general, there is about one-half turn difference between cast iron and ductile iron fittings. Apply TEFLON tape or high quality pipe joint compound on the male pipe threads and tighten two to three turns beyond hand tight. If an automatic make-on machine is being used, please exercise caution in setting the machine to the proper parameters prior to tightening fittings onto the male pipe threads.

Limited Warranty

For warranty terms and conditions, visit www.tyco-fire.com.

Ordering Procedure

Contact your local distributor for availability. When placing an order, indicate the full product name and Part Number (P/N).

IMPORTANT
Refer to Technical Data Sheet TFP2300 for warnings pertaining to regulatory and health information.

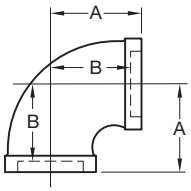


FIGURE 811
90° ELBOW

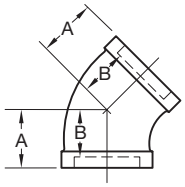


FIGURE 813
45° ELBOW

Nominal Pipe Size	Figure 811				Figure 813			
ANSI Inches DN	**A Inches (mm)**	**B Inches (mm)**	**Approx. Weight Lbs. (kg)**	**Part Number**	**A Inches (mm)**	**B Inches (mm)**	**Approx. Weight Lbs. (kg)**	**Part Number**
1/2 15	1.13 (28,7)	0.56 (14,2)	0.24 (0,11)	86206	0.88 (22,4)	0.38 (9,7)	0.22 (0,09)	86780
3/4 20	1.31 (33,3)	0.75 (19,0)	0.40 (0,18)	86205	1.00 (25,4)	0.44 (11,2)	0.33 (0,15)	86781
1 25	1.50 (38,1)	0.81 (20,6)	0.64 (0,29)	86200	1.13 (28,7)	0.81 (20,6)	0.48 (0,21)	86280
1-1/4 32	1.75 (44,5)	1.06 (26,9)	0.95 (0,43)	86201	1.31 (33,3)	0.63 (16,0)	0.73 (0,33)	86281
1-1/2 40	1.94 (49,3)	1.19 (30,2)	1.24 (0,56)	86202	1.44 (36,6)	0.69 (17,5)	0.93 (0,42)	86282
2 50	2.25 (57,1)	1.50 (38,1)	1.74 (0,79)	86203	1.68 (42,7)	0.94 (23,9)	1.55 (0,70)	86283
2-1/2 65	2.69 (68,3)	1.56 (39,6)	3.28 (1,49)	86204	1.94 (49,3)	1.00 (25,4)	2.70 (1,22)	86782

TABLE A
FIGURES 811 & 813
NOMINAL DIMENSIONS

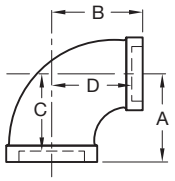


FIGURE 812
90° REDUCING ELBOW

Nominal Pipe Size	Figure 812					
ANSI Inches DN	**A Inches (mm)**	**B Inches (mm)**	**C Inches (mm)**	**D Inches (mm)**	**Approx. Weight Lbs. (kg)**	**Part Number**
3/4 x 1/2 20 x 15	1.19 (30,2)	1.19 (30,2)	0.63 (16,0)	0.63 (16,0)	0.33 (0,15)	86342
1 x 1/2 25 x 15	1.25 (31,8)	1.38 (35,1)	0.56 (14,2)	0.81 (20,6)	0.44 (0,20)	86210
1 x 3/4 25 x 20	1.38 (35,1)	1.44 (36,6)	0.69 (17,5)	0.88 (22,4)	0.53 (0,24)	86211
1-1/4 x 1/2 32 x 15	1.31 (33,3)	1.50 (38,1)	0.63 (16,0)	0.94 (23,9)	0.64 (0,29)	86212
1-1/4 x 3/4 32 x 20	1.44 (36,6)	1.63 (41,4)	0.75 (19,0)	1.06 (26,9)	0.75 (0,34)	86213
1-1/4 x 1 32 x 25	1.56 (39,6)	1.68 (42,7)	0.88 (22,4	1.00 (25,4)	0.77 (0,35)	86214
1-1/2 x 3/4 40 x 20	1.50 (38,1)	1.75 (44,4)	0.75 (19,0)	1.19 (30,2)	0.95 (0,43)	86221
1-1/2 x 1 40 x 25	1.63 (41,4)	1.81 (46,0)	0.88 (22,4)	1.13 (28,7)	0.99 (0,45)	86215
1-1/2 x 1-1/4 40 x 32	1.81 (46,0)	1.88 (47,8)	1.13 (28,7)	1.19 (30,2)	1.14 (0,52)	86216
2 x 3/4 50 x 20	1.63 (41,4)	1.94 (49,3)	0.88 (22,4)	1.38 (35,1)	1.39 (0,63)	86217
2 x 1 50 x 25	1.75 (44,4)	2.06 (52,3)	2.00 (50,8)	1.31 (33,3)	1.58 (0,72)	86218
2 x 1-1/2 50 x 40	2.00 (50,8)	2.19 (55,6)	1.25 (31,8)	1.44 (36,6)	1.67 (0,76)	86220
2-1/2 x 2 65 x 50	2.38 (60,5)	2.63 (66,8)	1.25 (31,8)	1.88 (47,8)	3.01 (1,36)	86762

TABLE B
FIGURE 812
NOMINAL DIMENSIONS

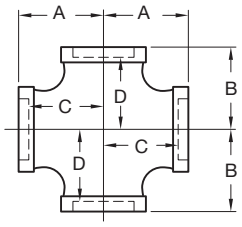


FIGURE 817
CROSS

Nominal Pipe Size	Figure 817					
ANSI Inches DN	**A Inches (mm)**	**B Inches (mm)**	**C Inches (mm)**	**D Inches (mm)**	**Approx. Weight Lbs. (kg)**	**Part Number**
1 25	1.50 (38,1)	1.50 (38,1)	0.81 (20,6)	0.81 (20,6)	0.97 (0,44)	86284
1-1/4 32	1.75 (44,4)	1.75 (44,4)	1.06 (26,9)	1.06 (27,0)	1.59 (0,72)	86285
1-1/2 40	1.94 (49,3)	1.94 (49,3)	1.19 (30,2)	1.19 (30,2)	1.89 (0,86)	86286
2 50	2.25 (57,1)	2.25 (57,1)	1.50 (38,1)	1.50 (38,1)	2.93 (1,33)	86287
1-1/4 x 1-1/4 x 1 x 1 32 x 32 x 25 x 25	1.69 (42,9)	1.56 (39,6)	1.00 (25,4)	0.88 (22,4)	1.25 (0,56)	86289
1-1/2 x 1-1/2 x 1 x 1 40 x 40 x 25 x 25	1.81 (46,0)	1.63 (41,4)	1.06 (26,9)	1.94 (49,3)	1.48 (0,71)	86322
2 x 2 x 1 x 1 50 x 50 x 25 x 25	2.00 (50,8)	1.75 (44,4)	1.25 (31,8)	1.06 (26,9)	2.64 (1,20)	86291

TABLE C
FIGURE 817
NOMINAL DIMENSIONS

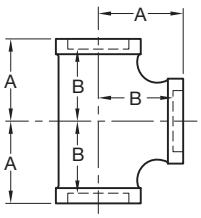


FIGURE 814
IRON TEE

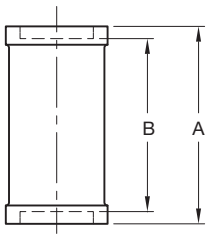


FIGURE 818
STRAIGHT COUPLING

Nominal Pipe Size	Figure 814				Figure 818			
ANSI Inches DN	**A Inches (mm)**	**B Inches (mm)**	**Approx. Weight Lbs. (kg)**	**Part Number**	**A Inches (mm)**	**B Inches (mm)**	**Approx. Weight Lbs. (kg)**	**Part Number**
1/2 15	1.13 (28,7)	0.56 (14,2)	0.33 (0,15)	86340	1.38 (35,1)	0.31 (7,9)	0.18 (0,08)	72779
3/4 20	1.31 (33,3)	0.75 (19,0)	0.50 (0,23)	86341	1.63 (41,4)	0.56 (14,0)	0.26 (0,11)	72778
1 25	1.50 (38,1)	0.81 (20,6)	0.85 (0,38)	86230	1.75 (44,4)	0.38 (9,7)	0.44 (0,20)	72755
1-1/4 32	1.75 (44,4)	1.06 (26,9)	1.30 (0,59)	86231	2.00 (50,8)	0.56 (14,0)	0.54 (0,24)	72754
1-1/2 40	1.94 (49,3)	1.19 (30,2)	1.63 (0,74)	86232	2.19 (55,6)	0.75 (19,0)	0.71 (0,32)	72753
2 50	2.25 (57,1)	1.50 (38,1)	2.63 (1,19)	86233	2.63 (66,8)	1.13 (28,7)	1.15 (0,52)	72752
2-1/2 65	2.69 (68,3)	1.56 (39,6)	4.55 (2,06)	86234	3.00 (76,2)	0.75 (19,0)	2.29 (1,04)	72758

TABLE D
FIGURES 814 & 818
NOMINAL DIMENSIONS

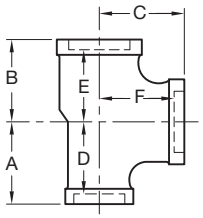


FIGURE 815
REDUCING TEE

Nominal Pipe Size	Figure 815							
ANSI Inches DN	**A Inches (mm)**	**B Inches (mm)**	**C Inches (mm)**	**D Inches (mm)**	**E Inches (mm)**	**F Inches (mm)**	**Approx. Weight Lbs. (kg)**	**Part Number**
3/4 x 3/4 x 1/2 20 x 20 x 15	1.19 (30,2)	1.19 (30,2)	1.25 (31,8)	0.63 (16,0)	0.63 (16,0)	0.69 (17,5)	0.46 (0,21)	86235
3/4 x 3/4 x 1 20 x 20 x 25	1.44 (36,6)	1.44 (36,6)	1.38 (35,1)	0.88 (22,4)	0.88 (22,4)	0.69 (17,5)	0.68 (0,31)	86755
1 x 1/2 x 1 25 x 15 x 25	1.50 (38,1)	1.38 (35,1)	1.50 (38,1)	0.81 (20,6)	0.81 (20,6)	0.81 (20,6)	0.70 (0,32)	86236
1 x 3/4 x 1/2 25 x 20 x 15	1.25 (31,8)	1.19 (30,2)	1.38 (35,1)	0.56 (14,2)	0.63 (16,0)	0.81 (20,6)	0.63 (0,28)	86756
1 x 3/4 x 3/4 25 x 20 x 20	1.38 (35,1)	1.31 (33,3)	1.44 (36,6)	0.69 (17,5)	0.75 (19,0)	0.88 (22,4)	0.68 (0,31)	86757
1 x 3/4 x 1 25 x 20 x 25	1.50 (38,1)	1.44 (36,6)	1.50 (38,1)	0.81 (20,6)	0.88 (22,4)	0.81 (20,6)	0.77 (0,35)	86237
1 x 1 x 1/2 25 x 25 x 15	1.25 (31,8)	1.25 (31,8)	1.38 (35,1)	0.56 (14,3)	0.56 (14,3)	0.81 (20,6)	0.66 (0,30)	86238
1 x 1 x 3/4 25 x 25 x 20	1.38 (35,1)	1.38 (35,1)	1.44 (36,6)	0.69 (17,5)	0.69 (17,5)	0.88 (22,4)	0.73 (0,33)	86239
1 x 1 x 1-1/4 25 x 25 x 32	1.69 (42,9)	1.69 (42,9)	1.56 (39,6)	1.00 (25,4)	1.00 (25,4)	0.88 (22,4)	0.97 (0,44)	86240
1 x 1 x 1-1/2 25 x 25 x 40	1.81 (46,0)	1.81 (46,0)	1.63 (41,4)	1.13 (28,6)	1.13 (28,6)	0.88 (22,4)	1.14 (0,52)	86241
1-1/4 x 1 x 1/2 32 x 25 x 15	1.94 (49,2)	1.25 (31,8)	1.56 (39,6)	0.63 (15,9)	0.56 (14,3)	1.00 (25,4)	0.81 (0,37)	86242
1-1/4 x 1 x 3/4 32 x 25 x 20	1.44 (36,6)	1.38 (35,1)	1.62 (41,2)	0.75 (19,0)	0.69 (17,5)	1.06 (27,0)	0.90 (0,41)	86243
1-1/4 x 1 x 1 32 x 25 x 25	1.56 (39,6)	1.50 (38,1)	1.69 (42,9)	0.88 (22,4)	0.81 (20,6)	1.00 (25,4)	1.03 (0,47)	86244
1-1/4 x 1 x 1-1/4 32 x 25 x 32	1.75 (44,4)	1.69 (42,9)	1.75 (44,4)	1.06 (27,0)	1.00 (25,4)	1.06 (27,0)	1.10 (0,50)	86245
1-1/4 x 1 x 1-1/2 32 x 25 x 40	1.88 (47,6)	1.81 (46,0)	1.81 (46,0)	1.19 (30,1)	1.13 (28,6)	1.06 (27,0)	1.43 (0,65)	86246
1-1/4 x 1-1/4 x 1/2 32 x 32 x 15	1.38 (35,1)	1.38 (35,1)	1.56 (39,6)	0.69 (17,5)	0.69 (17,5)	1.00 (25,4)	0.87 (0,39)	86247
1-1/4 x 1-1/4 x 3/4 32 x 32 x 20	1.44 (36,6)	1.44 (36,6)	1.63 (41,4)	0.75 (19,0)	0.75 (19,0)	1.06 (27,0)	0.96 (0,43)	86248
1-1/4 x 1-1/4 x 1 32 x 32 x 25	1.56 (39,6)	1.56 (39,6)	1.69 (42,9)	0.88 (22,4)	0.88 (22,4)	1.00 (25,4)	1.10 (0,50)	86249
1-1/4 x 1-1/4 x 1-1/2 32 x 32 x 40	1.88 (47,6)	1.88 (47,6)	1.81 (46,0)	1.81 (46,0)	1.81 (46,0)	1.06 (27,0)	1.50 (0,68)	86250
1-1/4 x 1-1/4 x 2 32 x 32 x 50	2.13 (54,1)	2.13 (54,1)	2.00 (50,8)	1.44 (36,6)	1.44 (36,6)	1.13 (28,6)	2.00 (0,91)	86251
1-1/2 x 1 x 1/2 40 x 25 x 15	1.44 (36,6)	1.31 (33,3)	1.69 (42,9)	0.69 (17,5)	0.63 (15,9)	1.13 (28,6)	0.97 (0,44)	86252
1-1/2 x 1 x 3/4 40 x 25 x 20	1.50 (38,1)	1.38 (35,1)	1.75 (44,4)	0.75 (19,0)	0.69 (17,5)	1.19 (30,2)	1.14 (0,52)	86253
1-1/2 x 1 x 1 40 x 25 x 25	1.63 (41,4)	1.50 (38,1)	1.81 (46,0)	0.88 (22,4)	0.81 (20,6)	1.13 (28,7)	1.14 (0,52)	86254
1-1/2 x 1 x 1-1/2 40 x 25 x 40	1.94 (49,3)	1.81 (46,0)	1.94 (49,2)	1.19 (30,2)	1.13 (28,6)	1.19 (30,2)	1.52 (0,69)	86256

TABLE E (1 OF 2)
FIGURE 815
NOMINAL DIMENSIONS

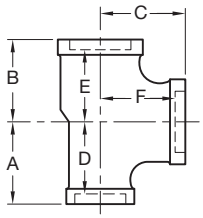


FIGURE 815
REDUCING TEE

Nominal Pipe Size	Figure 815							
ANSI Inches DN	**A Inches (mm)**	**B Inches (mm)**	**C Inches (mm)**	**D Inches (mm)**	**E Inches (mm)**	**F Inches (mm)**	**Approx. Weight Lbs. (kg)**	**Part Number**
1-1/2 x 1-1/4 x 1/2 40 x 32 x 15	1.44 (36,6)	1.31 (33,3)	1.69 (42,9)	0.69 (17,5)	0.63 (16,0)	1.13 (28,7)	1.03 (0,47)	86257
1-1/2 x 1-1/4 x 3/4 40 x 32 x 20	1.50 (38,1)	1.44 (36,6)	1.75 (44,5)	0.75 (19,0)	0.75 (19,0)	1.19 (30,1)	1.10 (0,50)	86258
1-1/2 x 1-1/4 x 1 40 x 32 x 25	1.63 (41,4)	1.56 (39,7)	1.81 (46,0)	0.88 (22,4)	0.88 (22,4)	1.13 (28,7)	1.31 (0,59)	86259
1-1/2 x 1-1/4 x 2 40 x 32 x 50	2.19 (55,6)	2.13 (54,1)	2.00 (50,8)	1.44 (36,6)	1.44 (36,6)	1.25 (57,1)	1.94 (0,88)	86260
1-1/2 x 1-1/2 x 1/2 40 x 40 x 15	1.44 (36,6)	1.44 (36,6)	1.69 (42,9)	0.69 (17,5)	0.69 (17,5)	1.13 (28,7)	1.14 (0,52)	86261
1-1/2 x 1-1/2 x 3/4 40 x 40 x 20	1.50 (38,1)	1.50 (38,1)	1.75 (44,4)	0.75 (19,0)	0.75 (19,0)	1.19 (30,1)	1.23 (0,56)	86262
1-1/2 x 1-1/2 x 1 40 x 40 x 25	1.63 (41,2)	1.63 (41,2)	1.81 (46,0)	0.88 (22,4)	0.88 (22,4)	1.13 (28,7)	1.38 (0,62)	86263
1-1/2 x 1-1/2 x 1-1/4 40 x 40 x 32	1.81 (46,0)	1.81 (46,0)	1.88 (47,6)	1.06 (27,0)	1.06 (27,0)	1.19 (30,1)	1.50 (0,68)	86264
1-1/2 x 1-1/2 x 2 40 x 40 x 50	2.19 (55,5)	2.19 (55,5)	2.00 (50,8)	1.44 (36,6)	1.44 (36,6)	1.25 (31,7)	2.00 (0,91)	86265
2 x 1 x 2 50 x 25 x 50	2.25 (57,2)	2.00 (50,8)	2.25 (57,2)	1.50 (38,1)	1.31 (33,3)	1.50 (38,1)	2.18 (0,99)	86266
2 x 1-1/4 x 2 50 x 32 x 50	2.25 (57,2)	2.13 (54,1)	2.25 (57,2)	1.50 (38,1)	1.44 (36,6)	1.50 (38,1)	2.31 (1,05)	86267
2 x 1-1/2 x 1/2 50 x 40 x 15	1.50 (38,1)	1.44 (36,6)	1.88 (47,8)	0.75 (19,0)	0.69 (17,5)	1.31 (33,3)	1.50 (0,68)	86268
2 x 1-1/2 x 3/4 50 x 40 x 20	1.63 (41,4)	1.50 (38,1)	1.94 (49,3)	0.88 (22,4)	0.75 (19,0)	1.38 (35,0)	1.61 (0,73)	86269
2 x 1-1/2 x 1 50 x 40 x 25	1.75 (44,5)	1.63 (41,4)	2.00 (50,8)	1.00 (25,4)	0.88 (22,4)	1.31 (33,3)	1.65 (0,75)	86270
2 x 1-1/2 x 1-1/2 50 x 40 x 40	2.06 (52,4)	1.94 (49,2)	2.19 (55,5)	1.31 (33,3)	1.19 (30,2)	1.44 (36,6)	2.03 (0,92)	86272
2 x 1-1/2 x 2 50 x 40 x 50	2.25 (57,1)	2.19 (55,5)	2.50 (63,5)	1.50 (38,1)	1.44 (36,6)	1.50 (38,1)	2.37 (1,07)	86273
2 x 2 x 1/2 50 x 50 x 15	1.50 (38,1)	1.50 (38,1)	1.88 (47,8)	0.75 (19,0)	0.75 (19,0)	1.31 (33,3)	1.50 (0,68)	86222
2 x 2 x 3/4 50 x 50 x 20	1.63 (41,4)	1.63 (41,4)	1.94 (49,3)	0.88 (22,4)	0.88 (22,4)	1.38 (35,0)	1.67 (0,76)	86223
2 x 2 x 1 50 x 50 x 25	1.75 (44,5)	1.75 (44,5)	2.00 (50,8)	1.00 (25,4)	1.00 (25,4)	1.31 (33,3)	1.91 (0,86)	86224
2 x 2 x 1-1/4 50 x 50 x 32	1.88 (47,8)	1.88 (47,8)	2.13 (54,1)	1.13 (28,7)	1.13 (28,7)	1.44 (36,6)	2.05 (0,93)	86225
2 x 2 x 1-1/2 50 x 50 x 40	2.00 (50,8)	2.00 (50,8)	2.19 (55,6)	1.25 (31,8)	1.25 (31,8)	1.50 (38,1)	2.11 (0,96)	86226
2 x 2 x 2-1/2 50 x 50 x 65	2.63 (66,8)	2.63 (66,8)	2.38 (60,5)	1.75 (44,5)	1.88 (47,8)	1.44 (36,6)	3.67 (1,66)	86227
2-1/2 x 2 x 3/4 65 x 50 x 20	1.75 (44,5)	1.63 (41,4)	2.31 (58,7)	0.63 (15,9)	0.88 (22,4)	1.75 (44,5)	2.22 (1,01)	86274

TABLE E (2 OF 2)
FIGURE 815
NOMINAL DIMENSIONS

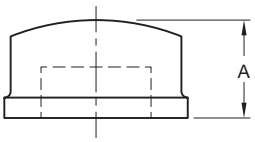


FIGURE 820
CAP

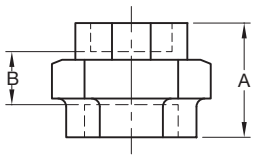


FIGURE 830
BRASS SEAT UNION

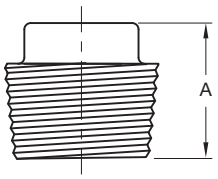


FIGURE 719
PLUG

Nominal Pipe Size	Figure 820			Figure 830				Figure 719		
ANSI Inches DN	A Inches (mm)	Approx. Weight Lbs. (kg)	Part Number	A Inches (mm)	B Inches (mm)	Approx. Weight Lbs. (kg)	Part Number	A Inches (mm)	Approx. Weight Lbs. (kg)	Part Number
1/2 15	0.88 (22,4)	0.15 (0,06)	72776	1.88 (47,8)	0.81 (20,6)	0.47 (0,21)	86207	0.94 (23,9)	0.10 (0,04)	86292
3/4 20	1.00 (25,4)	0.22 (0,10)	72777	2.00 (50,8)	0.94 (23,9)	0.66 (0,30)	86275	1.13 (28,7)	0.18 (0,08)	86293
1 25	1.18 (30,0)	0.33 (0,15)	72824	2.19 (55,6)	0.81 (20,6)	1.08 (0,49)	86276	1.25 (31,7)	0.28 (0,13)	86294
1-1/4 32	1.31 (33,3)	0.54 (0,24)	72756	2.50 (63,5)	1.06 (26,9)	1.54 (0,70)	86277	1.38 (35,1)	0.50 (0,23)	86295
1-1/2 40	1.38 (35,1)	0.68 (0,31)	72822	2.63 (66,8)	1.19 (30,2)	2.03 (0,92)	86278	1.44 (36,6)	0.70 (0,32)	86296
2 50	1.50 (38,1)	0.96 (0,43)	72823	3.13 (79,5)	1.63 (41,4)	3.15 (1,43)	86279	1.50 (38,1)	0.90 (0,41)	86297
2-1/2 65	1.75 (44,5)	1.80 (0,82)	72825	—	—	—	—	—	—	—

TABLE F
FIGURES 820, 830 & 719
NOMINAL DIMENSIONS

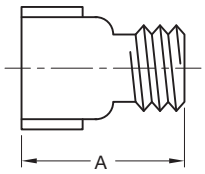


FIGURE 825
EXTENSION PIECE

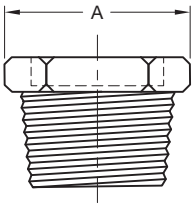


FIGURE 827
HEX BUSHING

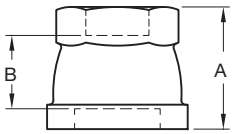


FIGURE 816
REDUCING COUPLING

Nominal Pipe Size	Figure 825 Extension Piece			Figure 827 Hex Bushing			Figure 816 Reducing Coupling			
ANSI Inches DN	**A Inches (mm)**	**Approx. Weight Lbs. (kg)**	**Part Number**	**A Inches (mm)**	**Approx. Weight Lbs. (kg)**	**Part Number**	**A Inches (mm)**	**B Inches (mm)**	**Approx. Weight Lbs. (kg)**	**Part Number**
1/2 x 1/2 15 x 15	1.50 (38,1)	0.20 (0,09)	72751	—	—	—	—	—	—	—
1/2 x 1/2 15 x 15	2.00 (50,8)	0.27 (0,12)	72980	—	—	—	—	—	—	—
3/4 x 3/4 20 x 20	1.50 (38,1)	0.22 (0,10)	72981	—	—	—	—	—	—	—
3/4 x 3/4 20 x 20	2.00 (50,8)	0.31 (0,14)	73982	—	—	—	—	—	—	—
3/4 x 1/2 20 x 15	—	—	—	—	—	—	1.75 (43,2)	0.69 (17,5)	0.38 (0,17)	86772
1 x 1/2 25 x 15	—	—	—	1.06 (26,9)	0.22 (0,10)	72726	1.69 (42,9)	0.50 (12,7)	0.38 (0,17)	86228
1 x 3/4 25 x 20	—	—	—	1.06 (26,9)	0.18 (0,08)	72762	1.75 (43,2)	0.50 (12,7)	0.53 (0,24)	86229
1-1/4 x 1 32 x 25	—	—	—	1.19 (30,2)	0.31 (0,14)	72763	—	—	—	—
1-1/2 x 1 40 x 25	—	—	—	1.25 (31,7)	0.53 (0,24)	72757	—	—	—	—
1-1/2 x 1-1/4 40 x 32	—	—	—	1.25 (31,7)	0.35 (0,10)	72764	—	—	—	—
2 x 1 50 x 25	—	—	—	1.38 (35,1)	0.75 (0,34)	72759	—	—	—	—
2 x 1-1/4 50 x 32	—	—	—	1.38 (35,1)	0.69 (0,31)	72761	—	—	—	—
2 x 1-1/2 50 x 40	—	—	—	1.38 (35,1)	0.62 (0,28)	72775	—	—	—	—

TABLE G
FIGURE 825, 827 & 816
NOMINAL DIMENSIONS

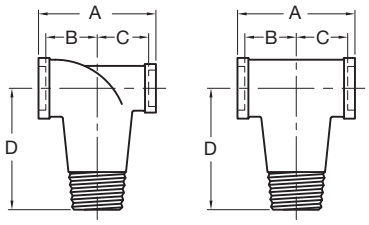


FIGURE 832
CALIFORNIA TEES

Nominal Pipe Size	Figure 832					
ANSI Inches DN	**A Inches (mm)**	**B Inches (mm)**	**C Inches (mm)**	**D Inches (mm)**	**Approx. Weight Lbs. (kg)**	**Part Number**
1 x 1/2 x 1 25 x 15 x 25	1.50 (38,1)	0.88 (22,4)	0.75 (19,1)	3.00 (76,2)	0.95 (0,43)	42000
1 x 1 x 1 25 x 25 x 25	1.50 (38,1)	0.75 (19,1)	0.75 (19,1)	3.00 (76,2)	0.95 (0,43)	42001

TABLE H
FIGURE 832
NOMINAL DIMENSIONS

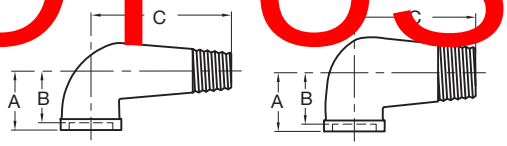


FIGURE 831
STREET ELBOWS

Nominal Pipe Size	Figure 831				
ANSI Inches DN	**A Inches (mm)**	**B Inches (mm)**	**C Inches (mm)**	**Approx. Weight Lbs. (kg)**	**Part Number**
1 x 1/2 25 x 15	1.50 (38,1)	0.75 (19,1)	3.00 (76,2)	0.70 (0,32)	42003
1 x 1 25 x 25	1.50 (38,1)	0.75 (19,1)	3.00 (76,2)	0.90 (0,40)	42002

TABLE J
FIGURE 831
NOMINAL DIMENSIONS

WELD-MISER TEE-LET Welded Outlet Fittings

For Fire Protection & Other Low Pressure Piping Systems

Merit Weld-Miser Tee-Let Welding Branch Outlet Fittings offer the user a high strength, low cost, welded steel, threaded and grooved line of fittings. Tee-Lets are specifically designed and manufactured to be installed on Schedules 5 thru 40 and proprietary thin wall flow pipe.

Merit Tee-Lets are steel welding outlet fittings. The material used in manufacture meets the chemical and physical requirements of ASTM A 53, Grades A or B, Type E. Tee-Lets employ a low weld volume design to provide for either a partial or full penetration weld employing a single pass with minimum burn-through and pipe distortion. Threads are NPT per ASME B1.20.1 or ISO 7/1 Taper as ordered. Tee-Lets are UL Listed and FM Approved for use conforming to the requirements of NFPA 13. When used in fire sprinkler systems, Tee-Lets are rated for 300 psi or 175 psi on 6" EZ-Flow Pipe.

c UL us LISTED FM APPROVED

For Listings/Approval Details and Limitations, visit our website at www.anvilintl.com or contact an Anvil® Sales Representative.

TEE-LET WELDED OUTLET FITTING (UL VIZU — EX3788 FM Approval Guide Chapter 1 – Pipe Fittings)

Outlet Model	Outlet Pipe Size	Header Pipe Size**	Rated Pressure
	In.	*In.*	*psig*
Tee-Let Type A (F-Threaded End)	½, ¾, 1, 1¼, 1½, 2, 2½, 3, 4	1¼ - 8	300
Tee-Let Type C (Grooved End)	1¼ - 8	1¼ - 8	300
Tee-Let Type C/R (Roll Grooved End)	1¼ - 6	1¼ - 8	300

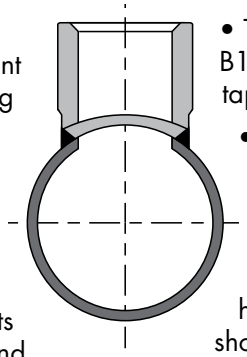
** Contact your local Anvil Representative for a complete list of UL approved propreitary flow pipe and sizes.

PROJECT INFORMATION	APPROVAL STAMP
Project:	☐ **Approved**
Address:	☐ **Approved as noted**
Contractor:	☐ **Not approved**
Engineer:	**Remarks:**
Submittal Date:	
Notes 1:	
Notes 2:	

WELD-MISER TEE-LET Welded Outlet Fittings

UNIFIED DESIGN™ SERIES

Merit's Unified Design Series carries all important design considerations into its entire line of welding branch outlet fittings.



Merit® Weld-Miser™ Tee-Lets® are designed and Manufactured to reduce the amount of weld required to install the Tee-Lets on thin wall or proprietary flow pipe. Typically only one weld-pass completes the installation. Merit Tee-Lets install with less weld volume than any other brand of welding outlet fittings for fire sprinkler applications. To accomplish this:

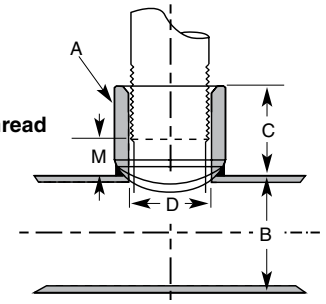
- The contoured end of the fittings employs a reduced outside diameter. Two major advantages are immediately apparent:
- The thinner wall on the contoured end permits welding temperatures to be matched to the thickness of the branch line or main thereby insuring complete penetration without cold welds, weld roll-off, burn-through or excessive distortion.
- On smaller sizes a heavier section is maintained on the threaded end of the fitting. This protects the threads from damage during shipping and handling prior to installation as well as from weld distortion.
- Each outlet size 1½" and larger, whether male or female threaded, cut grooved or beveled requires the same hole size in the header pipe. This simplifies the installation process.

GENERAL SPECIFICATIONS

- Tee-Let welding outlet fittings are manufactured from highly weldable steel which conforms to the chemical and physical requirements of ASTM A-53, Grades A or B, Type E. Ease of installation is assured when automatic welding equipment is used to install Merit Tee-Lets.
- Threads are cut in accordance with ASME B1.20.1 for NPT tapered pipe threads. ISO 7/1 taper threads are available upon request.
- Tee-Let threaded and grooved welding outlet fittings are UL/ULC Listed and FM Approved for use in the fire sprinkler systems installed in accordance with the requirements of NFPA 13.
- Tee-Lets are offered in a wide variety of header sizes. The consolidated header sizes shown in the following charts allow the fittings to be installed on more than one header size, permitting the first size listed to fit the header perfectly, while a small gap along the longitudinal center line of the header will appear for the second size listed.
- Merit Weld-Miser Tee-Lets are identified by a lot number that provides full traceability per ISO 9000 specifications.

FOR YOUR PIPING SYSTEMS SPECIFY WELD-MISER TEE-LET

Branch Outlet Fittings shall be Merit Weld-Miser Tee-Let, Lightweight steel, employing low weld volume profile to provide for full penetration welds with minimum burn through and distortion on Schedules 5 thru 40 and proprietary thin wall pipe. Threads may be NPT per ASME B1.20.1 or ISO 7/1 taper, and the bore of the fittings calculated to improve flow. Welding outlets to be UL Listed, FM Approved for use conforming to NFPA 13 and pressure rated for 300 PSI maximum.



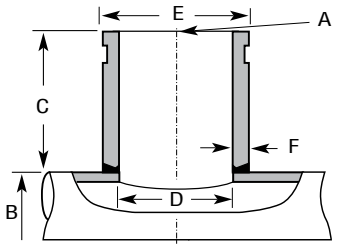
WELD-MISER™ TEE-LET® - Type A

Nominal Outlet A	Nominal Header B	Outlet Length C	Inside Diameter D	Make Up M	Weight Each
In./mm	*In./mm*	*In./mm*	*In./mm*	*In./mm*	*Lbs./kg*
¼ x *6 x*	1¼ - 8 *6 - 200*				0.080 *0.04*
½ x *13 x*	1¼ - 2 *32 - 50*	1.063 *27.0*	0.700 *17.8*	0.500 *12.7*	0.171 *0.08*
	2 - 2½ *50 - 65*	1.063 *27.0*	0.700 *17.8*	0.500 *12.7*	0.171 *0.08*
	2½ - 8 *65 - 200*	1.063 *27.0*	0.700 *17.8*	0.500 *12.7*	0.169 *0.08*
¾ x *19 x*	1¼ - 2 *32 - 50*	1.125 *28.6*	0.900 *22.9*	0.500 *12.7*	0.260 *0.12*
	2 - 2½ *50 - 65*	1.125 *28.6*	0.900 *22.9*	0.500 *12.7*	0.260 *0.12*
	2½ - 8 *65 - 200*	1.125 *28.6*	0.900 *22.9*	0.500 *12.7*	0.256 *0.12*
1 x *25 x*	1¼ - 1½ *32 - 40*	1.250 *31.8*	1.145 *29.1*	0.500 *12.7*	0.331 *0.15*
	1½ - 2 *40 - 50*	1.250 *31.8*	1.145 *29.1*	0.500 *12.7*	0.331 *0.15*
	2 - 2½ *50 - 65*	1.250 *31.8*	1.145 *29.1*	0.500 *12.7*	0.320 *0.15*
	2½ - 4 *65 - 100*	1.250 *31.8*	1.145 *29.1*	0.500 *12.7*	0.309 *0.14*
	5 - 8 *125 - 200*	1.250 *31.8*	1.145 *29.1*	0.500 *12.7*	0.291 *0.13*
1¼ x *32 x*	1½ - 2 *40 - 50*	1.375 *34.9*	1.490 *37.8*	0.500 *12.7*	0.421 *.019*
	2 - 2½ *50 - 65*	1.375 *34.9*	1.490 *37.8*	0.500 *12.7*	0.421 *.019*
	2½ - 3 *65 - 80*	1.375 *34.9*	1.490 *37.8*	0.500 *12.7*	0.411 *.019*
	3 - 4 *80 - 100*	1.375 *34.9*	1.490 *37.8*	0.500 *12.7*	0.389 *.018*
	5 - 8 *125 - 200*	1.375 *34.9*	1.490 *37.8*	0.500 *12.7*	0.389 *.018*
1½ x *40 x*	1½ *40*	1.625 *41.3*	1.610 *40.9*	0.875 *22.2*	0.477 *.022*
	2 *50*	1.625 *41.3*	1.610 *40.9*	0.875 *22.2*	0.477 *.022*
	2½ *65*	1.625 *41.3*	1.610 *40.9*	0.875 *22.2*	0.477 *.022*
	3 - 4 *80 - 100*	1.625 *41.3*	1.610 *40.9*	0.875 *22.2*	0.477 *.022*
	4 *100*	1.625 *41.3*	1.610 *40.9*	0.875 *22.2*	0.477 *.022*
	5 - 8 *125 - 200*	1.625 *41.3*	1.610 *40.9*	0.875 *22.2*	0.477 *.022*

WELD-MISER™ TEE-LET® - Type A

Nominal Outlet A	Nominal Header B	Outlet Length C	Inside Diameter D	Make Up M	Weight Each
In./mm	*In./mm*	*In./mm*	*In./mm*	*In./mm*	*Lbs./kg*
2 x *50 x*	2 *50*	1.750 *44.5*	2.067 *52.5*	0.875 *22.2*	0.857 *0.38*
	2½ *65*	1.750 *44.5*	2.067 *52.5*	0.875 *22.2*	0.829 *0.38*
	3 *80*	1.750 *44.5*	2.067 *52.5*	0.875 *22.2*	0.829 *0.39*
	4 *100*	1.750 *44.5*	2.067 *52.5*	0.875 *22.2*	0.800 *0.36*
	5 *125*	1.750 *44.5*	2.067 *52.5*	0.875 *22.2*	0.743 *0.34*
	6 *150*	1.750 *44.5*	2.067 *52.5*	0.875 *22.2*	0.743 *0.34*
	8 *200*	1.750 *44.5*	2.067 *52.5*	0.875 *22.2*	0.743 *0.34*
2½ x *65 x*	2½ *65*	2.215 *54.0*	2.469 *62.7*	1.125 *28.6*	1.250 *0.55*
	3 *80*	2.215 *54.0*	2.469 *62.7*	1.125 *28.6*	1.200 *0.55*
	4 *100*	2.215 *54.0*	2.469 *62.7*	1.125 *28.6*	1.150 *0.52*
	5 *125*	2.215 *54.0*	2.469 *62.7*	1.125 *28.6*	1.150 *0.52*
	6 *150*	2.215 *54.0*	2.469 *62.7*	1.125 *28.6*	1.150 *0.52*
	8 *200*	2.215 *54.0*	2.469 *62.7*	1.125 *28.6*	1.150 *0.52*
3 x *80 x*	3 *80*	2.500 *63.5*	3.068 *77.9*	1.500 *38.1*	1.750 *0.79*
	4 *100*	2.500 *63.5*	3.068 *77.9*	1.500 *38.1*	1.700 *0.77*
	5 *125*	2.500 *63.5*	3.068 *77.9*	1.500 *38.1*	1.700 *0.77*
	6 *150*	2.500 *63.5*	3.068 *77.9*	1.500 *38.1*	1.650 *0.75*
	8 *200*	2.500 *63.5*	3.068 *77.9*	1.500 *38.1*	1.650 *0.75*
4 x *100 x*	4 *100*	3.000 *76.2*	4.026 *102.3*	2.000 *50.8*	3.000 *1.36*
	5 *125*	3.000 *76.2*	4.026 *102.3*	2.000 *50.8*	2.900 *1.32*
	6 *150*	3.000 *76.2*	4.026 *102.3*	2.000 *50.8*	2.800 *1.27*
	8 *200*	3.000 *76.2*	4.026 *102.3*	2.000 *50.8*	2.800 *1.27*

Type C
Cut Groove
Standard Weight



WELD-MISER™ TEE-LET® - Type C (Nominal Sizes 1" thru 2")

Nominal Outlet A	Nominal Header B	Outlet Length C	Inside Diameter D	Outside Diameter E	Wall Thickness F
In./mm	*In./mm*	*In./mm*	*In./mm*	*In./mm*	*In./mm*
1 x *25 x*	1¼ - 1½ *32 - 40*	3 *80*	1.049 *26.6*	1.315 *33.4*	0.133 *3.4*
	1½ - 2 *40 - 50*	3 *80*	1.049 *26.6*	1.315 *33.4*	0.133 *3.4*
	2 - 2½ *50 - 65*	3 *80*	1.049 *26.6*	1.315 *33.4*	0.133 *3.4*
	2½ - 4 *65 - 100*	3 *80*	1.049 *26.6*	1.315 *33.4*	0.133 *3.4*
	5 - 8 *125 - 200*	3 *80*	1.049 *26.6*	1.315 *33.4*	0.133 *3.4*
1¼ x *32 x*	1¼ *32*	3 *80*	1.368 *34.7*	1.660 *42.2*	0.140 *3.6*
	1½ *40*	3 *80*	1.368 *34.7*	1.660 *42.2*	0.140 *3.6*
	2 - 2½ *50 - 65*	3 *80*	1.368 *34.7*	1.660 *42.2*	0.140 *3.6*
	3 - 4 *80 - 100*	3 *80*	1.368 *34.7*	1.660 *42.2*	0.140 *3.6*
	5 - 8 *125 - 200*	3 *80*	1.368 *34.7*	1.660 *42.2*	0.140 *3.6*
1½ x *40 x*	1½ *40*	3 *80*	1.610 *40.9*	1.900 *48.3*	0.145 *3.7*
	2 *50*	3 *80*	1.610 *40.9*	1.900 *48.3*	0.145 *3.7*
	2½ *65*	3 *80*	1.610 *40.9*	1.900 *48.3*	0.145 *3.7*
	3 - 4 *80 - 100*	3 *80*	1.610 *40.9*	1.900 *48.3*	0.145 *3.7*
	5 - 8 *125 - 200*	3 *80*	1.610 *40.9*	1.900 *48.3*	0.145 *3.7*
2 x *50 x*	2 *50*	3 *80*	2.067 *52.5*	2.375 *60.3*	0.154 *3.9*
	2½ *65*	3 *80*	2.067 *52.5*	2.375 *60.3*	0.154 *3.9*
	3 *80*	3 *80*	2.067 *52.5*	2.375 *60.3*	0.154 *3.9*
	4 *100*	3 *80*	2.067 *52.5*	2.375 *60.3*	0.154 *3.9*
	5 *125*	3 *80*	2.067 *52.5*	2.375 *60.3*	0.154 *3.9*
	6 *150*	3 *80*	2.067 *52.5*	2.375 *60.3*	0.154 *3.9*
	8 *200*	3 *80*	2.067 *52.5*	2.375 *60.3*	0.154 *3.9*

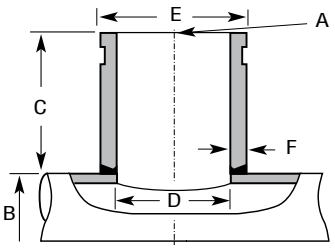
Note: Tee-Lets are manufactured to fit size-on-size, that is the contoured shape on a given Tee-Let is made to fit perfectly on the first listed header size. If installed on the second header size marked on the fitting, a slight gap of approximately 1/32" will appear along the longitudinal centerline of the header. For example, a 1" x 2 - 2½" Tee-Let, is a 1" outlet fitting manufactured to fit perfectly on the 2" header size listed, while leaving a 1/32" gap along the longitudinal centerline of the 2½" size. If a perfect fit is required for a 2½" header pipe, then a 1" x 2½ - 3" Tee-Let would be ordered. Size consolidations are employed to reduce inventory and provide for greater flexibility.

WELD-MISER TEE-LET Welded Outlet Fittings

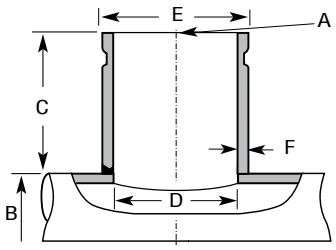
MERIT

ANVIL INTERNATIONAL

Type C
Cut Groove
Standard Weight



Type C/R
Roll Groove
Schedule 10



WELD-MISER™ TEE-LET® - Type C and C/R (Nominal Sizes 2½" thru 8")

Nominal Outlet A	Nominal Header B	Outlet Length C	Inside Diameter - D		Outside Diameter E	Wall Thickness - F	
			Standard Weight	Schedule 10		Standard Weight	Schedule 10
In./mm	*In./mm*	*In./mm*	*In./mm*	*In./mm*	*In./mm*	*In./mm*	*In./mm*
2½ x *65 x*	2½ *65*	3 *80*	2.469 *62.7*	2.635 *67.0*	2.875 *76.2*	0.203 *5.0*	0.120 *3.0*
	3 *80*	3 *80*	2.469 *62.7*	2.635 *67.0*	2.875 *76.2*	0.203 *5.0*	0.120 *3.0*
	4 *100*	3 *80*	2.469 *62.7*	2.635 *67.0*	2.875 *76.2*	0.203 *5.0*	0.120 *3.0*
	5 *125*	3 *80*	2.469 *62.7*	2.635 *67.0*	2.875 *76.2*	0.203 *5.0*	0.120 *3.0*
	6 *175*	3 *80*	2.469 *62.7*	2.635 *67.0*	2.875 *76.2*	0.203 *5.0*	0.120 *3.0*
	8 *200*	3 *80*	2.469 *62.7*	2.635 *67.0*	2.875 *76.2*	0.203 *5.0*	0.120 *3.0*
3 x *80 x*	3 *80*	3 *80*	3.068 *78.0*	3.260 *83.0*	3.500 *88.0*	0.216 *5.0*	0.120 *3.0*
	3½ *85*	3 *80*	3.068 *78.0*	3.260 *83.0*	3.500 *88.0*	0.216 *5.0*	0.120 *3.0*
	4 *100*	3 *80*	3.068 *78.0*	3.260 *83.0*	3.500 *88.0*	0.216 *5.0*	0.120 *3.0*
	5 *125*	3 *80*	3.068 *78.0*	3.260 *83.0*	3.500 *88.0*	0.216 *5.0*	0.120 *3.0*
	6 *150*	3 *80*	3.068 *78.0*	3.260 *83.0*	3.500 *88.0*	0.216 *5.0*	0.120 *3.0*
	8 *200*	3 *80*	3.068 *78.0*	3.260 *83.0*	3.500 *88.0*	0.216 *5.0*	0.120 *3.0*
4 x *100 x*	4 *100*	4 *100*	4.026 *102.0*	4.260 *108.0*	4.500 *114.0*	0.237 *6.0*	0.120 *3.0*
	5 *125*	4 *100*	4.026 *102.0*	4.260 *108.0*	4.500 *114.0*	0.237 *6.0*	0.120 *3.0*
	6 *150*	4 *100*	4.026 *102.0*	4.260 *108.0*	4.500 *114.0*	0.237 *6.0*	0.120 *3.0*
	8 *200*	4 *100*	4.026 *102.0*	4.260 *108.0*	4.500 *114.0*	0.237 *6.0*	0.120 *3.0*
6 x *150 x*	6 *150*	4 *100*	6.065 *155.0*	6.357 *161.5*	6.625 *168.3*	0.280 *7.1*	0.134 *3.0*
	8 *200*	4 *100*	6.065 *155.0*	6.357 *161.5*	6.625 *168.3*	0.280 *7.1*	0.134 *3.0*
8 x *200 x*	8 *200*	4 *100*	7.981 *203.0*	8.329 *212.0*	8.625 *213.0*	0.322 *8.0*	0.148 *3.0*

Note: Tee-Lets are manufactured to fit size-on-size, that is the contoured shape on a given Tee-Let is made to fit perfectly on the first listed header size. If installed on the second header size marked on the fitting, a slight gap of approximately 1/32" will appear along the longitudinal centerline of the header. For example, a 1" x 2 - 2½" Tee-Let, is a 1" outlet fitting manufactured to fit perfectly on the 2" header size listed, while leaving a 1/32" gap along the longitudinal centerline of the 2½" size. If a perfect fit is required for a 2½" header pipe, then a 1" x 2½ - 3" Tee-Let would be ordered. Size consolidations are employed to reduce inventory and provide for greater flexibility.

Victaulic® FireLock™ Fittings

10.03

1.0 PRODUCT DESCRIPTION

Available Sizes

- 1 ¼ – 8"/DN32 – DN200

Maximum Working Pressure

- Pressure ratings for Victaulic FireLock™ Fittings conform to the ratings of Victaulic FireLock EZ™ Style 009N couplings (refer to publication 10.64 for more information).

Application

- FireLock™ fittings are designed for use exclusively with Victaulic couplings that have been Listed or Approved for Fire Protection Services. Use of other couplings or flange adapters may result in bolt pad interference.
- Connects pipe, provides change in direction and adapts sizes or components

Pipe Materials

- Carbon steel

2.0 CERTIFICATION/LISTINGS

EN 10311
Regulation (EU)
No. 305/2011

3.0 SPECIFICATIONS – MATERIAL

Fitting: Ductile iron conforming to ASTM A536, Grade 65-45-12.

Fitting Coating:

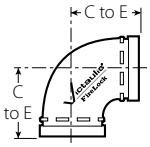
- ☐ Orange enamel.
- ☐ Red enamel in Europe, Middle East, Africa, and India.
- ☐ Optional: Hot dipped galvanized.

ALWAYS REFER TO ANY NOTIFICATIONS AT THE END OF THIS DOCUMENT REGARDING PRODUCT INSTALLATION, MAINTENANCE OR SUPPORT.

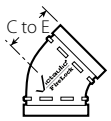
System No.		Location	
Submitted By		Date	

Spec Section		Paragraph	
Approved		Date	

4.0 DIMENSIONS



No. 001



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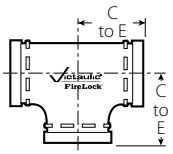


No. 002

No. 006

Nominal Size inches DN	Actual Outside Diameter inches mm	No. 001 90° Elbow C to E inches mm	No. 001 90° Elbow Approximate Weight Each lb kg	No. 003 45° Elbow C to E inches mm	No. 003 45° Elbow Approximate Weight Each lb kg	No. 002 Straight Tee C to E inches mm	No. 002 Straight Tee Approximate Weight Each lb kg	No. 006 Cap T inches mm	No. 006 Cap Approximate Weight Each lb kg
1 ¼ DN32	1.660 42.4	— —	— —	— —	— —	— —	— —	0.82 21	0.3 0.1
1 ½ DN40	1.900 48.3	— —	— —	— —	— —	— —	— —	0.82 21	0.4 0.2
2 DN50	2.375 60.3	2.75 70	1.7 0.8	2.00 51	1.8 0.8	2.75 70	2.4 1.1	0.88 22	0.6 0.3
2 ½	2.875 73.0	3.00 76	3.1 1.4	2.25 57	2.2 1.0	3.00 76	3.6 1.6	0.88 22	1.0 0.5
DN65	3.000 76.1	3.00 76	3.30 1.5	2.25 57	2.4 1.1	3.00 76	3.8 1.7	—	—
3 DN80	3.500 88.9	3.38 86	4.0 1.8	2.50 64	3.1 1.4	3.38 86	5.3 2.4	0.88 22	1.2 0.5
	4.250 108.0	4.00 102	5.7 2.6	3.00 76	5.1 2.3	4.00 102	7.5 3.4	—	—
4 DN100	4.500 114.3	4.00 102	6.7 3.0	3.00 76	5.6 2.5	4.00 102	8.7 3.9	1.00 25	2.4 1.1
5	5.563 141.3	4.88 124	12.6 5.7	3.25 83	8.3 3.8	4.88 124	15.7 7.1	1.00 25	4.1 1.9
DN125	5.500 139.7	4.88 124	12.4 5.6	3.25 82.6	8.2 3.7	4.88 124	15.4 6.9	—	—
	6.250 158.8	5.50 140	12.6 5.7	3.50 89	9.2 4.2	5.50 140	17.9 8.0	—	—
6 DN150	6.625 168.3	5.50 140	18.3 8.3	3.50 89	11.7 5.3	5.50 140	22.7 10.3	1.00 25	5.9 2.7
	6.500 165.1	5.43 140	17.6 7.9	3.50 89	11.4 5.2	5.50 140	22.0 9.9	—	—
8 DN200	8.625 219.1	6.81 173	25.5 11.6	4.25 108	20.4 9.3	6.94 176	38.7 17.6	1.13 29	12.7 5.8
	8.515 216.3	6.81 173	23.1 10.5	— —	— —	6.94 176	33.6 15.2	— —	— —

5.0 PERFORMANCE

Flow Data

Size		Frictional Resistance Equivalent of Straight Pipe[1]			
		Elbows		No. 002 Straight Tee	
Nominal Size inches DN	Actual Outside Diameter inches mm	No. 001 90° Elbow feet meters	No. 003 45° Elbow feet meters	Branch feet meters	Run feet meters
1 ¼ DN32	1.660 42.4	— —	— —	— —	— —
1 ½ DN40	1.900 48.3	— —	— —	— —	— —
2 DN50	2.375 60.3	3.5 1.1	1.8 0.5	8.5 2.6	3.5 1.1
2 ½	2.875 73.0	4.3 1.3	2.2 0.7	10.8 3.3	4.3 1.3
DN65	3.000 76.1	4.5 1.4	2.3 0.7	11.0 3.4	4.5 1.4
3 DN80	3.500 88.9	5.0 1.5	2.6 0.8	13.0 4.0	5.0 1.5
	4.250 108.0	6.4 2.0	3.2 0.9	15.3 4.7	6.4 2.0
4 DN100	4.500 114.3	6.8 2.1	3.4 1.0	16.0 4.9	6.8 2.1
5	5.563 141.3	8.5 2.6	4.2 1.3	21.0 6.4	8.5 2.6
DN125	5.500 139.7	8.3 2.5	4.1 1.3	20.6 6.3	8.3 2.5
	6.250 158.8	9.4 2.9	4.9 1.5	25.0 7.6	9.6 2.9
6 DN150	6.625 168.3	10.0 3.0	5.0 1.5	25.0 7.6	10.0 3.0
	6.500 165.1	9.8 3.0	4.9 1.5	24.5 7.5	9.8 3.0
8 DN200	8.625 219.1	13.0 4.0	5.0 1.5	33.0 10.1	13.0 4.0
	8.515 216.3	13.0 4.0	— —	33.0 10.1	13.0 4.0

[1] The flow data listed is based upon the pressure drop of Schedule 40 pipe.

6.0 NOTIFICATIONS

General Notes

NOTE: When assembling FireLock EZ™ couplings onto end caps, take additional care to make certain the end cap is fully seated against the gasket end stop. For FireLock EZ™ Style 009N/009H couplings, use FireLock™ No. 006 end caps containing the “EZ” marking on the inside face or No. 60 end caps containing the “QV EZ” marking on the inside face. Non-Victaulic end cap products shall not be used with Style 009/009V/009H/009N couplings.

7.0 REFERENCE MATERIALS

10.64: Victaulic® FireLock™ Rigid Coupling Style 009N

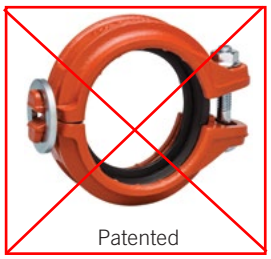
10.02: Victaulic® FireLock™ Rigid Coupling Style 005H with Vic-Plus™ Gasket System

29.01: Victaulic® Terms and Conditions of Sale

Victaulic® FireLock™ Installation-Ready™ Rigid Couplings Style 009N and ~~Style 109~~

10.64

Patented



Patented

1.0 PRODUCT DESCRIPTION

Available Sizes

- Style 009N: 1 ¼ – 12"/DN32 – DN300
- ~~Style 109: 1 ¼ – 2 ½"/DN32 – 73.0 mm~~

Pipe Material

- Schedule 10, Schedule 40 or specialty carbon steel pipe listed in Section 5. For use with alternative materials and wall thicknesses please contact Victaulic
- Carbon Steel
- Stainless Steel
- For exceptions reference section 6.0 Notifications

Maximum Working Pressure

- Up to 365 psi/2517 kPa

Function

- Joins carbon steel pipe with grooved ends conforming to publication 25.01
- Provides a rigid pipe joint designed to restrict axial or angular movement

2.0 CERTIFICATION/LISTINGS

C104-1a/36

EN 10311
Regulation (EU)
No. 305/2011

ALWAYS REFER TO ANY NOTIFICATIONS AT THE END OF THIS DOCUMENT REGARDING PRODUCT INSTALLATION, MAINTENANCE OR SUPPORT.

System No.		Location	
Submitted By		Date	

Spec Section		Paragraph	
Approved		Date	

3.0 SPECIFICATIONS – MATERIAL

Housing: Ductile iron conforming to ASTM A 536, Grade 65-45-12. Ductile iron conforming to ASTM A 395, Grade 65-45-15, is available upon special request.

Housing Coating: (specify choice)

- ☐ Orange enamel (North America, Asia Pacific)
- ☐ Red enamel (Europe)
- ☐ Optional for Style 009N: Hot dipped galvanized

Gasket: (specify choice)

- ☐ **Grade "E" EPDM (Type A) Vic-Plus™ Pre-lubricated Gasket**
  EPDM (Violet Color Code). Applicable for wet and dry (oil-free air) fire protection systems only. Listed/Approved for continuous use in wet and dry systems. Listed/Approved for dry systems at -40°F/-40°C and above. Not compatible for use with hot water services or steam services.

NOTES

- Reference should always be made to publication I-100, Victaulic Field Installation Handbook for gasket lubrication instructions.
- Services listed are General Service Guidelines only. It should be noted that there are services for which these gaskets are not compatible. Reference should always be made to publication 05.01, Victaulic Gasket Selection Guide for specific gasket service guidelines and for a listing of services which are not compatible.

Bolts/Nuts: (specify choice)

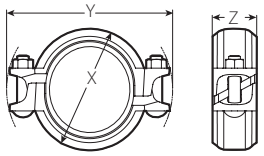
- ☐ Standard: Carbon steel oval neck track bolts meeting the mechanical property requirements of ASTM A449 (imperial) and ISO 898-1 Class 9.8 (M10-M16) Class 8.8 (M20 and greater). Carbon steel hex nuts meeting the mechanical property requirements of ASTM A563 Grade B (imperial) and ASTM A563M Class 9 (metric). Track bolts and hex nuts are zinc electroplated per ASTM B633 Fe/Zn 5, finish Type III (imperial) or Type II (metric).
- ☐ Optional for Style 009N: Stainless steel oval neck track bolts meeting the requirements of ASTM F593, Group 2 (316 stainless steel), condition CW. Stainless steel Heavy Hex nuts meeting the requirements of ASTM F594, Group 2 (316 stainless steel), condition CW, with galling-resistant coating.[1]

[1] Optional bolts/nuts are available in imperial size only.

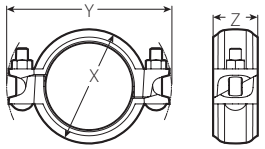
Coupling Linkage: High Strength Steel with comparable physical properties to that of the Track Bolt (ASTM A449). Linkage is zinc electroplated per ASTM B633 Fe/Zn 5, Type III Finish.

4.0 DIMENSIONS

Style 009N Two-Bolt *Installation-Ready* Coupling



Style 009N Pre-Assembled



Style 009N Joint Assembled

Size		Maximum Working Pressure[2]	Maximum End Load[2]	Allow. Pipe End Separation[3]	Bolt/Nut		Dimensions					Weight
							Pre-assembled		Joint Assembled			
Nominal inches DN	Actual Outside Diameter inches mm	psi kPa	lb N	inches mm	Qty.	Size inches mm	X inches mm	Y inches mm	X inches mm	Y inches mm	Z inches mm	Approx. (Each) lb kg
1 ¼ DN32	1.660 42.4	365 2517	790 3514	0.10 2.54	2	⅜ × 2 M10 x 51	3.13 79	5.00 127	2.75 70	5.00 127	2.00 51	1.4 0.6
1 ½ DN40	1.900 48.3	365 2517	1035 4604	0.10 2.54	2	⅜ × 2 M10 x 51	3.38 86	5.13 130	3.00 76	5.13 130	2.00 51	1.5 0.7
2 DN50	2.375 60.3	365 2517	1617 7193	0.12 3.05	2	⅜ × 2 ½ M10 x 63	4.00 102	5.63 143	3.50 89	5.63 143	2.00 51	1.9 0.9
2 ½	2.875 73.0	365 2517	2370 10542	0.12 3.05	2	⅜ × 2 ½ M10 x 63	4.50 114	6.13 156	4.00 102	6.13 156	2.00 51	2.1 1.0
DN65	3.000 76.1	365 2517	2580 11476	0.12 3.05	2	⅜ × 2 ½ M10 x 63	4.63 118	6.00 152	4.13 105	6.13 156	2.00 51	2.1 1.0
3 DN80	3.500 88.9	365 2517	3512 15622	0.12 3.05	2	⅜ × 2 ½ M10 x 63	5.13 130	6.75 171	4.63 117	6.75 171	2.00 51	2.3 1.0
4 DN100	4.500 114.3	365 2517	5805 25822	0.17 4.32	2	⅜ × 2 ½ M10 x 63	6.00 152	7.88 200	5.63 143	7.50 191	2.13 54	2.9 1.3
	4.250 108.0	365 2517	5178 23020	0.17 4.32	2	⅜ × 2 ½ M10 x 63	5.63 152	7.38 1.87	5.38 137	7.38 187	2.13 54	3.1 1.4
5	5.563 141.3	365 2517	8872 39456	0.17 4.32	2	½ × 3 M12 x 76	7.25 184	9.25 235	6.75 171	9.13 232	2.25 57	5.0 2.3
	5.250 133.0	365 2517	7901 35106	0.17 4.32	2	½ × 3 M12 x 76	6.63 168	9.00 229	6.38 162	9.00 229	2.25 57	4.8 2.2
DN125	5.500 139.7	365 2517	8672 38529	0.17 4.32	2	½ × 3 M12 x 76	6.88 175	9.25 235	6.75 171	9.13 232	2.25 57	4.9 2.2
6 DN150	6.625 168.3	365 2517	12582 44469	0.17 4.32	2	½ × 3 ¼ M12 x 83	8.38 213	10.38 264	7.88 200	10.13 257	2.25 57	6.0 2.7
	6.250 159.0	365 2517	11198 49753	0.17 4.32	2	½ × 3 ¼ M12 x 83	7.88 200	10.00 254	7.38 187	9.88 251	2.25 57	5.6 2.5
	6.500 165.1	365 2517	12112 53813	0.17 4.32	2	½ × 3 ¼ M12 x 83	8.00 203	10.25 260	7.75 197	10.13 257	2.25 57	6.0 2.7
8 DN200	8.625 219.1	365 2517	21326 94863	0.17 4.32	2	⅝ × 4 M16 x 101	10.88 276	13.38 340	10.25 260	13.13 333	2.50 64	11.4 5.2
	8.500 216.0	365 2517	20712 55968	0.17 4.32	2	⅝ × 4 M16 x 101	10.63 270	13.25 337	10.25 260	10.13 257	2.63 67	11.4 5.2
10 DN250	10.750 273.0	300 2068	27229 121121	0.25 6.4	2	⅞ × 6 ½ M22 x 165	13.75 349	17.00 432	13.25 337	17.13 435	2.75 70	22.6 10.3
12 DN300	12.750 323.9	300 2068	38303 170380	0.25 6.4	2	⅞ × 6 ½ M22 x 165	16.00 406	19.00 483	15.50 394	19.13 486	2.75 70	27.6 12.5

[2] Working Pressure and End Load are total, from all internal and external loads, based on standard weight (ANSI) steel pipe, standard roll or cut grooved in accordance with Victaulic specifications. See the Listings/Approvals section of this publication for ratings on other pipe.

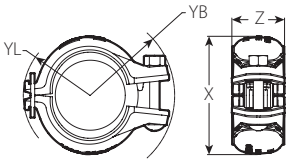
[3] The allowable pipe separation dimension shown is for system layout purposes only. Style 009N couplings are considered rigid connections and will not accommodate expansion or contraction of the piping system.

NOTES

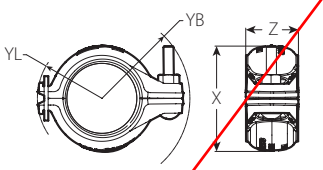
- When assembling Style 009N or Style 109 couplings onto end caps, take additional care to make certain the end cap is fully seated against the gasket end stop. For Style 009N or Style 109 couplings, use FireLock No. 006 end caps containing the "EZ" marking on the inside face or No. 60 end caps containing the "QV EZ" marking on the inside face. Non-Victaulic end cap products shall not be used with Style 009N or Style 109 couplings. IMPORTANT: Gaskets intended for the Style 009 or Style 009V couplings cannot be used with the Style 009N or Style 109 coupling. There is no interchanging of gaskets or housings between coupling styles.
- **Use Of FlushSeal Gaskets For Dry Pipe Systems** Style 009N or Style 109 couplings are supplied with Grade "E" Type A gaskets. These gaskets include an integral pipe stop, that once installed provides the similar benefits as a FlushSeal gasket for dry pipe systems. It should be noted that standard Victaulic FlushSeal gaskets cannot be used with the Style 009N or Style 109 couplings.

4.1 DIMENSIONS

Style 109 One-Bolt *Installation-Ready* Coupling



Style 109 Pre-Assembled



Style 109 Joint Assembled

Size		Maximum Working Pressure[4]	Maximum End Load[4]	Pipe End Separation Allowable[5]	Bolt/Nut		Dimensions								Weight
							Pre-assembled				Joint Assembled				
Nominal	Actual Outside Diameter				Qty.	Size	YL	YB	X	Z	YL	YB	X	Z	Approx. (Each)
inches mm	inches mm	psi kPa	lb N	inches mm		inches mm	inches mm	inches mm	inches mm	inches mm	inches mm	inches mm	inches mm	inches mm	lb kg
1 ¼ DN32	1.660 42.4	365 2517	790 3514	0.10 2.54	1	⅜ x 2 ¼ M10 x 57	1.88 48	2.50 64	3.13 79	1.88 48	1.88 48	2.63 67	2.75 70	1.88 48	1.4 0.6
1 ½ DN40	1.900 48.3	365 2517	1035 4604	0.10 2.54	1	⅜ x 2 ¼ M10 x 57	2.00 51	2.63 67	3.25 83	1.88 48	2.00 51	2.75 70	3.00 76	1.88 48	1.5 0.7
2 DN50	2.375 60.3	365 2517	1616 7193	0.12 3.05	1	⅜ x 2 ½ M10 x 63	2.25 57	2.88 73	3.88 98	2.00 51	2.25 57	3.13 79	3.50 89	2.00 51	1.8 0.8
2 ½	2.875 73.0	365 2517	2370 10542	0.12 3.05	1	⅜ x 2 ½ M10 x 63	2.50 64	3.13 79	4.38 111	2.00 51	2.50 64	3.38 86	3.88 98	2.00 51	2.1 0.9

[4] Working Pressure and End Load are total, from all internal and external loads, based on standard weight (ANSI) steel pipe, standard roll or cut grooved in accordance with Victaulic specifications. See the Listings/Approvals section of this publication for ratings on other pipe.

[5] The allowable pipe separation dimension shown is for system layout purposes only. Style 109 couplings are considered rigid connections and will not accommodate expansion or contraction of the piping system.

NOTES

- When assembling Style 009N or Style 109 couplings onto end caps, take additional care to make certain the end cap is fully seated against the gasket end stop. For Style 009N or Style 109 couplings, use FireLock No. 006 end caps containing the "EZ" marking on the inside face or No. 60 end caps containing the "QV EZ" marking on the inside face. Non-Victaulic end cap products shall not be used with Style 009N or Style 109 couplings. IMPORTANT: Gaskets intended for the Style 009 or Style 009V couplings cannot be used with the Style 009N or Style 109 coupling. There is no interchanging of gaskets or housings between coupling styles.
- **Use Of FlushSeal Gaskets For Dry Pipe Systems** Style 009N or Style 109 couplings are supplied with Grade "E" Type A gaskets. These gaskets include an integral pipe stop, that once installed provides the similar benefits as a FlushSeal gasket for dry pipe systems. It should be noted that standard Victaulic FlushSeal gaskets and cannot be used with the Style 009N or Style 109 couplings.

5.0 PERFORMANCE

Style 009N Two-Bolt *Installation-Ready* Coupling Listings/Approvals[6]

The information provided below is based on the latest listing and approval data at the time of publication. Listings/Approvals are subject to change and/or additions by the approval agencies. Contact Victaulic for performance on other pipe and the latest listings and approvals.

Size		cULus[11]		FM[11]		VdS	LPCB
Nominal inches DN	**Actual Outside Diameter** inches mm	**Sch. 10** psi kPa bar	**Sch. 40** psi kPa bar	**Sch. 10** psi kPa bar	**Sch. 40** psi kPa bar	psi kPa bar	psi kPa bar
1 ¼ DN32	1.660 42.4	365 2517 25	365 2517 25	363 2503 25	363 2503 25	363 2500 25	363 2500 25
1 ½ DN40	1.900 48.3	365 2517 25	365 2517 25	363 2503 25	363 2503 25	363 2500 25	363 2500 25
2 DN50	2.375 60.3	365 2517 25	365 2517 25	363 2503 25	363 2500 25	363 2500 25	363 2500 25
2 ½	2.875 73.0	365 2517 25	365 2517 25	363 2503 25	363 2500 25	363 2500 25	363 2500 25
DN65	3.000 76.1	365[7] 2517[7] 25[7]	N/A	363[8] 2503[8] 25[8]	N/A	363 2500 25	363 2500 25
3 DN80	3.500 88.9	365 2517 25	365 2517 25	363 2503 25	363 2503 25	363 2500 25	363 2500 25
4 DN100	4.500 114.3	365 2517 25	365 2517 25	363 2503 25	363 2503 25	363 2500 25	363 2500 25
	4.250 108.0	N/A	N/A	363 2503 25	363 2503 25	N/A	N/A
5	5.563 141.3	290 2000 20	365 2517 25	363 2503 25	363 2503 25	232 1600 16	363 2500 25
	5.250 133.0	N/A	N/A	363[8] 2503[8] 25	N/A	N/A	N/A
DN125	5.500 139.7	290[9] 2000[9] 20[9]	N/A	363[8] 2503[8] 25[8]	N/A	232 1600 25	363 2500 25
6 DN150	6.625 168.3	300 2068 20	365 2517 25	363 2503 25[7]	363 2503 25	232 1600 16	363 2500 25
	6.250 159.0	N/A	N/A	363[8] 2503[8] 25	N/A	N/A	N/A
	6.500 165.1	290[10] 2000[10] 20	N/A	363[8] 2503[8] 25[8]	N/A	N/A	363 2500 25

6 Listed/Approved for continuous use in wet and dry systems. Listed/Approved for dry systems -40° F/C and above. Please see the Victaulic Installation Manual I-009N for details concerning when supplemental lubrication is required.

7 cULus listed for DIN 2458 (EN 10220) 2.6 mm pipe wall.

8 FM approved for BS 1387 (EN 10255) Medium 3.6 mm pipe wall.

9 cULus listed for EN 10220 4.0 mm pipe wall.

10 cULus listed for EN 10255 4.5 mm pipe wall.

11 With optional stainless steel fasteners, cULus Listed to 175psi/1207 kPa/12 bar and FM Approved to the FM ratings shown in the above table. The stainless steel fasteners have a marking designation of "316" on the end face of the bolt.

12 cUL listed to 250 psi/1720 kPa /17 bar.

5.0 PERFORMANCE (CONTINUED)

Style 009N Two-Bolt *Installation-Ready* Coupling Listings/Approvals[6]

The information provided below is based on the latest listing and approval data at the time of publication. Listings/Approvals are subject to change and/or additions by the approval agencies. Contact Victaulic for performance on other pipe and the latest listings and approvals.

Size		cULus[11]		FM[11]		VdS	LPCB
Nominal inches DN	**Actual Outside Diameter** inches mm	**Sch. 10** psi kPa bar	**Sch. 40** psi kPa bar	**Sch. 10** psi kPa bar	**Sch. 40** psi kPa bar	psi kPa bar	psi kPa bar
8 DN200	8.625 219.1	300 2068 20	365 2517 25	363 2503 25	363 2503 25	232 1600 16	363 2500 25
	8.500 216.0	290 2000 20	N/A	363[8] 2503[8] 25[7]	N/A	N/A	N/A
10 DN250	10.750 273.0	300 2068 20	300 2068 20	300 2068 20	300 2068 20	N/A	N/A
12 DN300	12.750 323.9	300[12] 2068[12] 20[12]	300 2068 25	250 1720 17	300 2068 20	N/A	N/A

6 Listed/Approved for continuous use in wet and dry systems. Listed/Approved for dry systems -40° F/C and above. Please see the Victaulic Installation Manual I-009N for details concerning when supplemental lubrication is required.

7 cULus listed for DIN 2458 (EN 10220) 2.6 mm pipe wall.

8 FM approved for BS 1387 (EN 10255) Medium 3.6 mm pipe wall.

9 cULus listed for EN 10220 4.0 mm pipe wall.

10 cULus listed for EN 10255 4.5 mm pipe wall.

11 With optional stainless steel fasteners, cULus Listed to 175psi/1207 kPa/12 bar and FM Approved to the FM ratings shown in the above table. The stainless steel fasteners have a marking designation of "316" on the end face of the bolt.

12 cUL listed to 250 psi/1720 kPa /17 bar.

5.1 PERFORMANCE

Style 109 One-Bolt *Installation-Ready* Coupling Listings/Approvals[13]

The information provided below is based on the latest listing and approval data at the time of publication. Listings/Approvals are subject to change and/or additions by the approvals agencies. Contact Victaulic for performance on other pipe and the latest listings and approvals.

Size		cULus		FM	
Nominal inches DN	**Actual Outside Diameter** inches mm	**Sch. 10** psi kPa bar	**Sch. 40** psi kPa bar	**Sch. 10** psi kPa bar	**Sch. 40** psi kPa bar
1 ¼ DN32	1.660 42.4	365 2517 25	365 2517 25	365 2517 25	365 2517 25
1 ½ DN40	1.900 48.3	365 2517 25	365 2517 25	365 2517 25	365 2517 25
2 DN50	2.375 60.3	365 2517 25	365 2517 25	365 2517 25	365 2517 25
2½	2.875 73.0	365 2517 25	365 2517 25	365 2517 25	365 2517 25

13 Listed/Approved for continuous use in wet and dry systems. Listed/Approved for dry systems -40° F/C and above. Please see the Victaulic Installation Manual I-109 for details concerning when supplemental lubrication is required.

5.2 PERFORMANCE

Specialty Pipe
Style 009N Two-Bolt *Installation-Ready* Coupling Listings/Approvals

Pipe Type	Size inches DN	Pressure Rating cULus psi kPa bar	Pressure Rating FM psi kPa bar
EF	1 ¼ – 4 DN32 – DN100	300 2068 20	N/A
EL	1 ¼ – 2 DN32 – DN50	300 2068 20	300 2068 20
ET40	1 ¼ – 2 DN32 – DN50	300 2068 20	N/A
EZF	3 – 4 DN80 – DN100	300 2068 20	N/A
EZT	1 ¼ – 2 DN32 – DN50	300 2068 20	300 2068 20
FF	1 ½ – 4 DN40 – DN100	300 2068 20	N/A
GL	1 ¼ – 2 DN32 – DN50	300 2068 20	300 2068 20
MF	1 ¼ – 4 DN32 – DN100	300 2068 20	300 2068 20
	6 DN150	175 1205 12	175 1205 12
MT	1 ¼ – 2 DN32 – DN50	300 2068 20	300 2068 20
MLT	1 ¼ – 2 DN32 – DN50	N/A	300 2068 20
TF	2 ½ – 4 73.0 mm – DN100	N/A	300 2068 20
WG5, WG5E, WF5, WG7, WG7E, WL7	1 ¼ – 4 DN32 – DN100	175 1205 12	300 2068 20
WLS	1 ¼ – 2 DN32 – DN50	300 2068 20	300 2068 20

NOTES

- EF = EDDY FLOW steel pipe manufactured by Bull Moose Tube Co.
- EL = EDDYLITE steel pipe manufactured by Bull Moose Tube Co.
- ET40 = Eddythread 40 steel pipe manufactured by Bull Moose Tube Co.
- EZF = EZ-Flow steel pipe manufactured by Northwest Pipe Co.
- EZT = EZ-Thread steel pipe manufactured by Youngstown Tube Co.
- FF = Fire-Flo steel pipe manufactured by Youngstown Tube Co.
- GL = GL steel pipe manufactured by Wheatland Tube Co.
- MF = Mega-Flow steel pipe manufactured by Wheatland Tube Co.
- MT = Mega-Thread steel pipe manufactured by Wheatland Tube Co.
- MLT = MLT steel pipe manufactured by Wheatland Tube Co
- TF = Tex-Flow steel pipe manufactured by Tex-Tube Co.
- WG5, WG5E, WF5 = WGalweld 5, WGalweld 5E, WFlow 5 steel pipe manufactured by Wuppermann Stahl GmbH.
- WG7, WG7E, WL7 = WGalweld 7, Wgalweld 7E, WLight 7 steel pipe manufactured by Wuppermann Stahl GmbH
- WLS = WLS steel pipe manufactured by Wheatland Tube Co.

5.3 PERFORMANCE

Specialty Pipe
Style 109 One-Bolt *Installation-Ready* Coupling Listings/Approvals

Pipe Type	Size inches DN	Pressure Rating cULus psi kPa bar	Pressure Rating FM psi kPa bar
EF	1 ¼ – 2 ½ DN32 – 73.0 mm	N/A	300 2068 20
	1 ½ – 2 ½ DN40 – 73.0 mm	300 2068 20	N/A
Easy-Flow	1 ¼ – 2 DN32 – DN50	N/A	300 2068 20
EL	1 ¼ – 2 DN32 – DN50	N/A	300 2068 20
ET40	1 ¼ – 2 DN32 – DN50	300 2068 20	300 2068 20
EZT	1 ¼ – 2 DN32 – DN50	N/A	300 2068 20
	1 ½ – 2 DN40 – DN50	300 2068 20	N/A
FF	1 ½ – 2 ½ DN40 – 73.0 mm	300 2068 20	300 2068 20
GL	1 ¼ – 2 DN32 – DN50	N/A	300 2068
MF	1 ¼ – 2 ½ DN32 – 73.0 mm	300 2068 20	300 2068 20
MT	1 ¼ – 2 DN32 – DN50	300 2068 20	300 2068 20
MLT	1 ¼ – 2 DN32 – DN50	300 2068 20	300 2068 20
TF	2 ½ 73.0 mm	N/A	300 2068 20
WG7, WG7E	1 ¼ – 2 DN32 – DN50	N/A	300 2068 20
WLS	1 ¼ – 2 DN32 – DN50	N/A	300 2068 20

NOTES

- EF = EDDY FLOW steel pipe manufactured by Bull Moose Tube Co.
- Easy-Flow = Easy-Flow steel pipe manufactured by Borusan Mannesmann Boru.
- EL = EDDYLITE steel pipe manufactured by Bull Moose Tube Co.
- ET40 = Eddythread 40 steel pipe manufactured by Bull Moose Tube Co.
- EZT = EZ-Thread steel pipe manufactured by Youngstown Tube Co.
- FF = Fire-Flo steel pipe manufactured by Youngstown Tube Co.
- GL = GL steel pipe manufactured by Wheatland Tube Co.
- MF = Mega-Flow steel pipe manufactured by Wheatland Tube Co.
- MT = Mega-Thread steel pipe manufactured by Wheatland Tube Co.
- MLT = MLT steel pipe manufactured by Wheatland Tube Co.
- TF = Tex-Flow steel pipe manufactured by Tex-Tube Co.
- WG7, WG7E = WGalweld 7 and WGalweld 7E steel pipe manufactured by Wuppermann Stahl GmbH.
- WLS = WLS steel pipe manufactured by Wheatland Tube Co.

6.0 NOTIFICATIONS

⚠ WARNING

- **Read and understand all instructions before attempting to install any Victaulic products.**
- **Always verify that the piping system has been completely depressurized and drained immediately prior to installation, removal, adjustment, or maintenance of any Victaulic products.**
- **Wear safety glasses, hardhat, and foot protection.**

Failure to follow these instructions could result in death or serious personal injury and property damage.

- **These products shall be used only in fire protection systems that are designed and installed in accordance with current, applicable National Fire Protection Association (NFPA 13, 13D, 13R, etc.) standards, or equivalent standards, and in accordance with applicable building and fire codes. These standards and codes contain important information regarding protection of systems from freezing temperatures, corrosion, mechanical damage, etc.**
- **The installer shall understand the use of this product and why it was specified for the particular application.**
- **The installer shall understand common industry safety standards and potential consequences of improper product installation.**
- **It is the system designer's responsibility to verify suitability of materials for use with the intended fluid media within the piping system and external environment.**
- **The material specifier shall evaluate the effect of chemical composition, pH level, operating temperature, chloride level, oxygen level, and flow rate on materials to confirm system life will be acceptable for the intended service.**

Failure to follow installation requirements and local and national codes and standards could compromise system integrity or cause system failure, resulting in death or serious personal injury and property damage.

NOTICE

- **Victaulic does not recommend the use of any furnace butt-welded pipe with sizes 2"/DN50 and smaller Victaulic gasketed joint products. This includes, but is not limited to, ASTM A53 Type F pipe.**

7.0 REFERENCE MATERIALS

05.01: Seal Selection Guide

25.01: Original Groove System (OGS) Groove Specifications

I-009N: Installation Instructions FireLock EZ™ Rigid Coupling Style 009N

I-100: Victaulic Field Installation Handbook

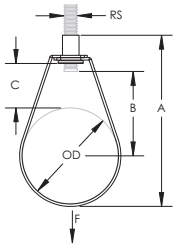
I-109: Installation Instructions FireLock™ One-Bolt Rigid Coupling Style 109

I-ENDCAP: Victaulic End Caps Installation Instructions

115 Standard Duty Loop Hanger

The 115 Standard Duty Loop Hanger is ideal for suspending stationary, non-insulated pipe lines, including CPVC pipes, in fire sprinkler systems. A knurled insert nut helps simplify vertical adjustments and flared edges on the base (1/2" to 4" sizes) help protect pipes from coming into contact with any sharp edges of the hanger.

- Flared edges help prevent any sharp surfaces from coming into contact with the pipe (1/2" to 4" sizes)
- Retained insert nut helps ensure the loop hanger and insert nut stay together
- Recommended for the suspension of stationary non-insulated pipe lines
- Manufactured to use the minimum rod size permitted by NFPA® for fire sprinkler piping
- Conforms with Federal Specification WW-H-171 (Type 10), Manufacturers Standardization Society (MSS) SP-58 (Type 10)



Material: Steel
Finish: Pregalvanized

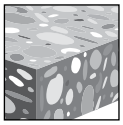
Part Number	Pipe Size	Outer Diameter OD	Rod Size RS	A	B	C	Static Load F	Certifications
1150050EG	1/2"	0.840"	3/8"	2 13/16"	1 1/8"	1"	300 lb	cULus
1150075EG	3/4"	1.050"	3/8"	3"	1 3/16"	15/16"	300 lb	cULus, FM
1150100EG	1"	1.315"	3/8"	3 1/4"	1 3/8"	15/16"	300 lb	cULus, FM
1150125EG	1 1/4"	1.660"	3/8"	3 9/16"	1 1/2"	15/16"	300 lb	cULus, FM
1150150EG	1 1/2"	1.900"	3/8"	3 13/16"	1 5/8"	15/16"	300 lb	cULus, FM
1150200EG	2"	2.375"	3/8"	4 1/4"	1 7/8"	15/16"	300 lb	cULus, FM
1150250EG	2 1/2"	2.875"	3/8"	5 15/16"	3 7/16"	2"	525 lb	cULus, FM
1150300EG	3"	3.500"	3/8"	6 9/16"	3 1/2"	1 15/16"	525 lb	cULus, FM
1150350EG	3 1/2"	4.000"	3/8"	7 1/16"	3 3/4"	1 15/16"	585 lb	cULus, FM
1150400EG	4"	4.500"	3/8"	7 9/16"	4"	1 15/16"	650 lb	cULus, FM
1150500EG	5"	5.563"	1/2"	9 13/16"	4 3/4"	2 1/4"	1,000 lb	cULus, FM
1150600EG	6"	6.625"	1/2"	11 5/16"	6 5/16"	3 5/16"	1,000 lb	cULus, FM
1150800EG	8"	8.625"	1/2"	12 7/8"	6 7/8"	2 7/8"	1,000 lb	cULus, FM

3.3.14 HDI-P DROP-IN ANCHORS

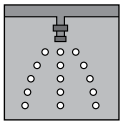
PRODUCT DESCRIPTION

HDI-P Drop-in Anchors

Anchor System	Features and Benefits
HDI-P Drop-in Anchor 	• Optimized anchor length to allow reliable fastenings in hollow core panels, precast plank and post tensioned slabs • Shallow drilling enables fast installation • Lip provides flush installation, consistent anchor depth and easy rod alignment • HSD-G 3/8 setting tool with hand guard leaves mark on flange when anchor is set properly to enable inspection and verification of proper expansion



Uncracked concrete



Fire sprinkler listings

MATERIAL SPECIFICATIONS

The HDI-P is manufactured from mild carbon steel, which is zinc plated for corrosion protection in accordance with ASTM B633, SC 1, Type III.

Approvals/Listings	
FM (Factory Mutual)	Pipe hanger components for automatic sprinkler systems for ¾=8-in. model

FM APPROVED

c UL us LISTED

DESIGN DATA IN CONCRETE USING ALLOWABLE STRESS DESIGN

Technical data

Table 1 - Hilti HDI-P loads in normal-weight concrete and hollow core concrete panels

Nominal anchor diameter	Length in. (mm)	Nom. bit dia. in.	Ultimate loads, lb (kN)				Allowable loads, lb (kN)[3]			
			f'_c = 4,000 psi concrete		Hollow core[1,2]		f'_c = 4,000 psi concrete		Hollow core[1,2]	
			Tension	Shear	Tension	Shear	Tension	Shear	Tension	Shear
1/4	5/8 (15.9)	3/8	1,430 (6.4)	1,870 (8.3)	1,550 (6.9)	2,275 (10.1)	285 (1.3)	375 (1.7)	310 (1.4)	455 (2.0)
3/8	3/4 (19.1)	1/2	1,900 (8.5)	3,000 (13.3)	2,100 (9.3)	4,000 (17.8)	380 (1.7)	600 (2.7)	420 (1.9)	800 (3.6)
1/2	1 (25.4)	5/8	3,000 (13.3)	6,075 (27.0)	3,110 (13.8)	5,495 (24.5)	600 (2.7)	1215 (5.4)	620 (2.8)	1,100 (4.9)

1 The Admissible Anchor Location must be established to prevent damage to the prestressed cable during the drilling process. Verify the location and height of the cable with the hollow core plank supplier to confirm Admissible Anchor Location.

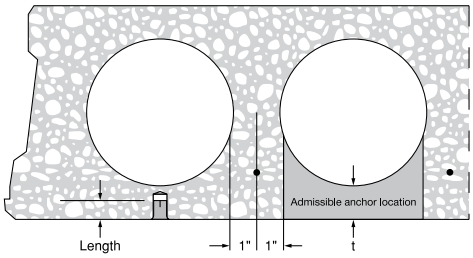
2 Minimum compressive strength of hollow core panels is 7,000 psi at the time of installation. The minimum thickness "t" is 1-3/8 inches.

3 Allowable loads calculated with a 5:1 factor-of-safety.

INSTALLATION INSTRUCTIONS

Installation Instructions For Use (IFU) are included with each product package. They can also be viewed or downloaded online at www.hilti.com (Canada). Because of the possibility of changes, always verify that downloaded IFU are current when used. Proper installation is critical to achieve full performance. Training is available on request. Contact Hilti Technical Services for applications and conditions not addressed in the IFU.

Figure 1 - Installation of Hilti HDI-P in hollow core concrete



ORDERING INFORMATION

HDI-P anchor

Description	Bit diameter	Qty / box
HDI-P 1/4	3/8	100
HDI-P 3/8	1/2	100
HDI-P 1/2	5/8	50

Setting tools for HDI-P anchors

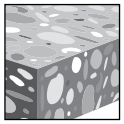
Description
HST-P 1/4 Hand Setting Tool
HST-P 3/8 Hand Setting Tool
HSD-G 3/8 Hand Setting Tool with hand guard
HST-P 1/2 Hand Setting Tool

3.3.12 HDI+, HDI-L+, AND HDI DROP IN ANCHORS

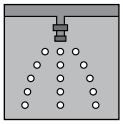
PRODUCT DESCRIPTION

HDI+, HDI-L+, and HDI Drop-in anchors

Anchor System		Features and Benefits
	HDI-L+ and HDI+ with Auto setting tools 1/4" to 1/2"	• Anchor, setting tool and Hilti drill bit form a matched tolerance system to provide reliable fastenings • Allows shallow embedment without sacrificing performance • Lip allows accurate flush surface setting, independent of hole depth for the HDI-L+ • Ideal for repetitive fastenings with threaded rods of equal length
	HDI and Manual setting tool 5/8" to 3/4"	• HDI+ and HDI-L+ have an innovative stepped plug that reduces number of hammer blows by up to 50% • HDI+ and HDI-L+ can be installed with the new HDI+ Setting Tool system (stop drill bit and machine setting tool) for improved productivity



Uncracked concrete



Fire sprinkler listings

Approvals/Listings	
FM (Factory Mutual)	Pipe hanger components for automatic sprinkler systems HDI+ 3/8, HDI-L+ 3/8, HDI+1/2, HDI-L+ 1/2, HDI 5/8 and HDI 3/4
UL and cUL (Underwriters Laboratory)	Pipe hanger equipment for fire protection services HDI+ 3/8, HDI-L+ 3/8, HDI+1/2, HDI-L+ 1/2, HDI 5/8 and HDI 3/4

FM APPROVED

c UL us LISTED

INSTALLATION PARAMETERS

Table 1 - Hilti HDI+, HDI-L+ and HDI specifications[1]

Setting Information	Symbol	Units	HDI+ and HDI-L+			HDI	
			1/4	3/8	1/2	5/8	3/4
Insert thread	d	UNC	1/4-20	3/8-16	1/2-13	5/8-11	3/4-10
Nominal bit diameter	d_{bit}	in.	3/8	1/2	5/8	27/32	1
Nominal embedment Anchor length Hole depth	h_{nom} ℓ h_o	in. (mm)	1 (25)	1-9/16 (40)	2 (51)	2-9/16 (65)	3-3/16 (81)
Useable thread length	ℓ_{th}	in. (mm)	7/16 (11)	5/8 (15)	11/16 (17)	7/8 (22)	1-3/8 (34)
Installation torque	T_{inst}	ft-lb (Nm)	4 (5)	11 (15)	22 (30)	37 (50)	80 (109)
Minimum slab thickness	h	in. (mm)	3 (76)	3-1/8 (79)	4 (102)	5-1/8 (130)	6-3/8 (162)

1 HDI+ and HDI-L+ are available in 1/4-, 3/8- and 1/2-in. The HDI is available in 5/8- and 3/4-in.

MATERIAL SPECIFICATIONS

HDI+, HDI-L and HDI anchors are manufactured from mild carbon steel. Anchor bodies are zinc plated in accordance with ASTM B633, AC 1, Type III

HDI stainless steel anchors are manufactured from AISI Type 303 stainless steel

DESIGN DATA IN CONCRETE USING ALLOWABLE STRESS DESIGN

Table 2 - Hilti HDI+, HDI-L+ and HDI carbon steel allowable loads in concrete[1,2]

Anchor type	Nominal anchor diameter in.	f'_c = 2,000				f'_c = 4,000				f'_c = 6,000			
		Tension, lb (kN)		Shear, lb (kN)		Tension, lb (kN)		Shear, lb (kN)		Tension, lb (kN)		Shear, lb (kN)	
HDI+	1/4	385	(1.7)	450	(2.0)	510	(2.3)	625	(2.8)	640	(2.8)	700	(3.1)
	3/8	635	(2.8)	965	(4.3)	920	(4.1)	1,250	(5.6)	1,260	(5.6)	1,500	(6.7)
	1/2	945	(4.2)	1,500	(6.7)	1,605	(7.1)	2,125	(9.5)	1,950	(8.7)	2,500	(11.1)
HDI+	5/8	1,875	(8.3)	2,500	(11.1)	2,920	(13.0)	3,250	(14.5)	3,715	(16.5)	3,750	(16.7)
	3/4	2,500	(11.1)	3,875	(17.2)	4,065	(18.1)	5,000	(22.2)	5,565	(24.8)	5,500	(24.5)

Table 3 - Hilti HDI+, HDI-L+ and HDI carbon steel ultimate loads in concrete[1]

Anchor type	Nominal anchor diameter in.	f'_c = 2,000				f'_c = 4,000				f'_c = 6,000			
		Tension, lb (kN)		Shear, lb (kN)		Tension, lb (kN)		Shear, lb (kN)		Tension, lb (kN)		Shear, lb (kN)	
HDI+	1/4	1,535	(6.8)	1,800	(8.0)	2,040	(9.1)	2,500	(11.1)	2,555	(11.4)	2,800	(12.5)
	3/8	2,540	(11.3)	3,850	(17.1)	3,685	(16.4)	5,000	(22.2)	5,035	(22.4)	6,000	(26.7)
	1/2	3,780	(16.8)	6,000	(26.7)	6,425	(28.6)	8,500	(37.8)	7,810	(34.7)	10,000	(44.5)
HDI+	5/8	7,500	(33.4)	10,000	(44.5)	11,685	(52.0)	13,000	(57.8)	14,865	(66.1)	15,000	(66.7)
	3/4	10,000	(44.5)	15,500	(68.9)	16,260	(72.3)	20,000	(89.0)	22,250	(99.0)	22,000	(97.9)

1 The shear tests were conducted with SAE Grade 5 bolts with minimum yield strength of 85 ksi and minimum tension strength of 120 ksi. Shear testing for the 1/4-in. models were conducted with SAE Grade 8 bolts with minimum yield strength of 120 ksi and minimum tension strength of 150 ksi in 6,000 psi concrete. High-strength bolts were used to force concrete failure modes. When using steel bolts with a lower tensile strength, steel failure must be considered.

2 Allowable loads calculated with a factor of safety of 4.

Table 4 - Hilti HDI+, HDI-L+ and HDI carbon steel allowable loads in lightweight concrete and lightweight concrete poured over metal deck[1,2,3,4]

Anchor type	Nominal anchor diameter in.	3,000 psi lightweight concrete				3,000 psi lightweight concrete over metal deck							
						Upper flute				Lower flute			
		Tension, lb (kN)		Shear, lb (kN)		Tension, lb (kN)		Shear, lb (kN)		Tension, lb (kN)		Shear, lb (kN)	
HDI+	1/4	465	(2.1)	340	(1.5)	530	(2.4)	335	(1.5)	375	(1.7)	250	(1.1)
	3/8	720	(3.2)	940	(4.2)	810	(3.6)	1,010	(4.5)	500	(2.2)	500	(2.2)
	1/2	1,035	(4.6)	1,700	(7.6)	1,035	(4.6)	1,755	(7.8)	625	(2.8)	750	(3.3)
HDI+	5/8	1,465	(6.5)	2,835	(12.6)	-		-		875	(3.9)	875	(3.9)
	3/4	2,075	(9.2)	3,680	(16.4)	-		-		1,250	(5.6)	1,000	(4.4)

1 The shear tests were conducted with SAE Grade 5 bolts with minimum yield strength of 85 ksi and minimum tension strength of 120 ksi. Shear testing for the 1/4-in. models were conducted with SAE Grade 8 bolts with minimum yield strength of 120 ksi and minimum tension strength of 150 ksi in 6,000 psi concrete. High-strength bolts were used to force concrete failure modes. When using steel bolts with a lower tensile strength, steel failure must be considered.

2 Minimum compressive strength of structural lightweight concrete is 3,000 psi.

3 See figure 1 for typical details.

4 Allowable loads calculated with a factor of safety of 4.

Table 5 - Hilti HDI stainless steel allowable loads in concrete[1,2,3]

Nominal anchor diameter in.	Nominal anchor	f'_c = 4,000				f'_c = 6,000			
		Tension, lb (kN)		Shear, lb (kN)		Tension, lb (kN)		Shear, lb (kN)	
HDI+	1/4	480	(2.1)	600	(2.7)	740	(3.3)	600	(2.7)
	3/8	1,040	(4.6)	1,230	(5.5)	1,460	(6.5)	1,230	(5.5)
	1/2	1,840	(8.2)	2,760	(12.3)	2,410	(10.7)	2,760	(12.3)
HDI+	5/8	2,630	(11.7)	4,510	(20.1)	3,770	(16.8)	4,510	(20.1)
	3/4	3,830	(17.0)	5,580	(24.8)	5,030	(22.4)	5,580	(24.8)

Table 6 - Hilti HDI stainless steel ultimate loads in concrete[1,2]

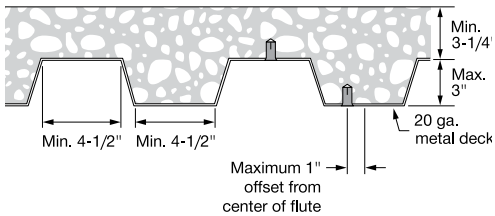
Nominal anchor diameter in.	Nominal anchor	f'_c = 4,000				f'_c = 6,000			
		Tension, lb (kN)		Shear, lb (kN)		Tension, lb (kN)		Shear, lb (kN)	
HDI+	1/4	1,930	(8.6)	2,400	(10.7)	2,950	(13.1)	2,400	(10.7)
	3/8	4,170	(18.5)	4,920	(21.9)	5,850	(26.0)	4,920	(21.9)
	1/2	7,350	(32.7)	11,040	(49.1)	9,630	(42.8)	11,040	(49.1)
HDI+	5/8	10,540	(46.9)	18,040	(80.2)	15,100	(67.2)	18,040	(80.2)
	3/4	15,340	(68.2)	22,320	(99.3)	20,130	(89.5)	22,320	(99.3)

1 Stainless steel models available in HDI version only.

2 Shear testing conducted with 18-8 stainless steel bolts.

3 Allowable loads calculated with a factor of safety of 4.

Figure 1 - Installation of Hilti HDI+ and HDI drop-in anchor in the soffit of concrete over metal deck floor and roof assemblies W – deck



Combined shear and tension loading

$$\left(\frac{N_d}{N_{rec}}\right)^{5/3} + \left(\frac{V_d}{V_{rec}}\right)^{5/3} \leq 1.0$$

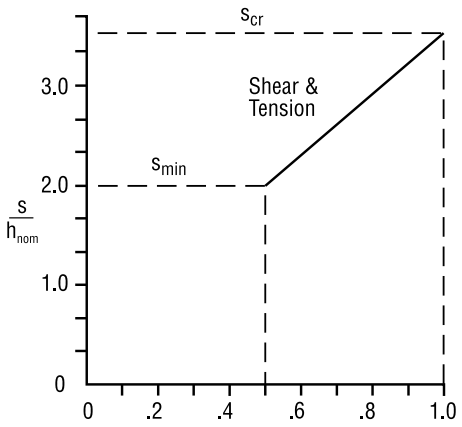
Anchor spacing and edge distance guidelines

Anchor spacing adjustment factors

s = Actual Spacing

s_{min} = 2.0 h_{nom}

s_{cr} = 3.5 h_{nom}



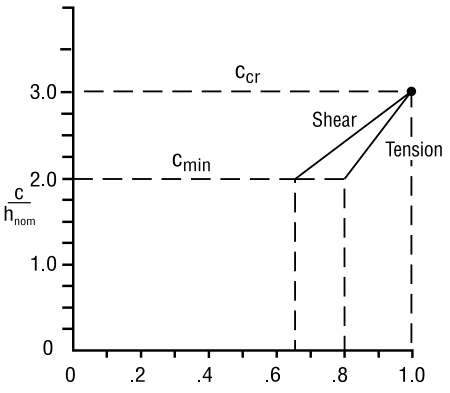
Anchor spacing adjustment Factor

Edge distance adjustment factors

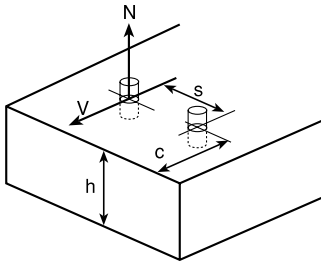
c = Actual edge distance

c_{min} = 2.0 h_{nom}

c_{cr} = 3.0 h_{nom}



Edge distance adjustment factor



Influence of anchor spacing and edge distance f_A and f_R

Anchor Size		h_{nom}	
in.	(mm)	in.	(mm)
1/4	(6.4)	1	(25)
3/8	(9.5)	1-9/16	(40)
1/2	(12.7)	2	(51)
5/8	(15.8)	2-9/16	(65)
3/4	(19.1)	3-3/16	(81)

h_{nom} = nominal embedment depth

Table 7 - Load adjustment factors for Hilti HDI drop-in anchors in concrete

Load adjustment factors for anchor spacing f_A							Load adjustment factors for edge distance f_R											
Tension/shear loads							Tension f_{RN}							Shear f_{RV}				
Spacing s		Anchor diameter					Edge distance c		Anchor diameter					Anchor diameter				
in.	(mm)	1/4	3/8	1/2	5/8	3/4	in.	(mm)	1/4	3/8	1/2	5/8	3/4	1/4	3/8	1/2	5/8	3/4
2	(51)	.50					2	(51)	.80					.65				
2-1/2	(64)	.67					2-1/2	(64)	.90					.83				
3	(76)	.83	.50				3	(76)	1.0	.80				1.0	.65			
3-1/2	(89)	1.0	.58				3-1/2	(89)		.85					.73			
4	(102)		.69	.50			4	(102)		.91	.80				.85	.65		
4-1/2	(114)		.79	.58			4-1/2	(114)		.98	.85				.96	.74		
5	(127)		.90	.67	.50		5	(127)		1.0	.90	.80			1.0	.83	.65	
5-1/2	(140)		1.0	.75	.55		5-1/2	(140)			.95	.83				.91	.70	
6	(152)			.83	.61	.50	6	(152)			1.0	.87				1.0	.77	
7	(178)			1.0	.74	.57	6-1/2	(165)				.91	.80				.84	.65
8	(203)				.87	.67	7	(178)				.95	.84				.91	.72
9	(229)				1.0	.77	8	(203)				1.0	.90				1.0	.83
10	(254)					.88	9	(229)					.96					.94
11	(279)					.98	10	(254)					1.0					1.0
12	(305)					1.0												

s_{min} = 2.0 h_{nom} s_{cr} = 3.5 h_{nom}

$f_A = 0.33 \frac{s}{h_{nom}} - 0.17$

for $s_{cr} > s > s_{min}$

c_{min} =2.0 h_{nom} c_{cr} = 3.0 h_{nom}

$f_{RN} = 0.2 \frac{c}{h_{nom}} + 0.4$

for $c_{cr} > c > c_{min}$

c_{min} = 2.0 h_{nom} c_{cr} = 3.0 h_{nom}

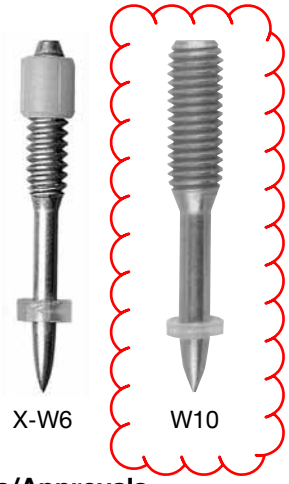
$f_{RV} = 0.35 \frac{c}{h_{nom}} - 0.05$

for $c_{cr} > c > c_{min}$

3.2.11 STUD FASTENERS FOR ATTACHMENT TO CONCRETE

3.2.11.1 PRODUCT DESCRIPTION

The Hilti threaded stud program is for use with Hilti powder-actuated tools to provide a fast and reliable solution for making attachments to concrete base materials. Threaded studs are available in standard carbon steel. The X-W6 and W10 threaded studs have varying shank lengths to provide reliable fastenings to standard and high strength concrete. Thread diameters of 1/4" have thread lengths ranging from 1/2" through 1-1/2". The 3/8" thread diameter has a single thread length of 1-3/16".



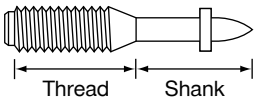
3.2.11.2 Material specifications

Fastener designation	Fastener material	Fastener plating
X-W6	Carbon Steel	5 µm Zinc[1]
W10	Carbon Steel	5 µm Zinc[1]

1 ASTM B633, SC1, Type III. Refer to Section 2.3.3.1 for more information.

3.2.11.3 Technical data

Fastener designation	Thread designation	Thread length in. (mm)	Shank length in. (mm)
X-W6-20-22	UNC 1/4-inch	**3/4** (20)	**7/8** (22)
X-W6-20-27	UNC 1/4-inch	**3/4** (20)	**1** (27)
X-W6-38-27	UNC 1/4-inch	**1-1/2** (38)	**1** (27)
W10-30-27	UNC 3/8-inch	**1-3/16** (30)	**1** (27)
W10-30-32	UNC 3/8-inch	**1-3/16** (30)	**1-1/4** (32)
W10-30-42	UNC 3/8-inch	**1-3/16** (30)	**1-5/8** (42)



Listings/Approvals

ICC-ES (International Code Council)
ESR-1663

COLA (City of Los Angeles)
RR 25646

FM (Factory Mutual)
W10-30-27P10, W10-30-32P10 and W10-30-42P10 Fasteners for Sprinkler Pipe Hangers

UL (Underwriters Laboratories)
W10-30-32P10 and W10-30-42P10, Fasteners for Sprinkler Pipe Hangers - Up to 2-1/2" diameter pipe

Allowable loads in normal weight concrete[1,2]

Description	Fastener	Shank diameter in. (mm)	Minimum embedment in. (mm)	Concrete compressive strength			
				2000 psi		4000 psi	
				Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear lb (kN)
1/4–20 Threaded stud	X-W6	**0.145** (3.7)	**3/4** (19)	**40** (0.18)	**55** (0.24)	**40** (0.18)	**55** (0.24)
			1 (25)	**85** (0.38)	**195** (0.87)	**110** (0.49)	**225** (1.00)
3/8–16 Threaded stud	W10	**0.205** (5.2)	**1** (25)	**85** (0.38)	**95** (0.42)	**100** (0.44)	**105** (0.47)
			1-1/4 (32)	**175** (0.78)	**345** (1.53)	**200** (0.89)	**380** (1.69)
			1-5/8 (41)	**285** (1.27)	**380** (1.69)	**385** (1.71)	**395** (1.76)

1 The tabulated allowable load values are for the low-velocity fasteners only, using a safety factor that is greater than or equal to 5.0, calculated in accordance with ICC-ES AC70. Wood or steel members connected to the substrate must be investigated in accordance with accepted design criteria.

2 Multiple fasteners are recommended for any attachment.

Allowable Loads in Minimum f'_c = 3000 psi Structural Lightweight Concrete[1,4]

Fastener description	Fastener	Shank dia. in. (mm)	Min. embed. in. (mm)	Fastener location				
				Installed into concrete		Installed through 3" deep metal deck into concrete[2,3]		
				Tension lb (kN)	Shear lb (kN)	Tension lb (kN)		Shear lb (kN)
						Upper flute	Lower flute	
1/4–20 Threaded Stud	X-W6	**0.145** (3.7)	**3/4** (20)	**125** (0.56)	**185** (0.82)	**125** (0.56)	**115** (0.54)	**185** (0.82)
			1 (25)	**175** (0.78)	**185** (0.82)	**160** (0.71)	**180** (0.80)	**185** (0.82)
3/8–16 Threaded Stud	W10	**0.205** (5.2)	**1** (25)	**265** (1.18)	**190** (0.85)	**160** (0.71)	–	**185** (0.82)
			1-1/4 (32)	**280** (1.25)	**380** (1.69)	**160** (0.71)	**210** (0.93)	**470** (2.09)
			1-5/8 (41)	**445** (1.98)	**540** (2.40)	**435** (1.93)	**325** (1.45)	**675** (3.00)

1 The tabulated allowable load values are for the low-velocity fasteners only, using a safety factor that is greater than or equal to 5.0, calculated in accordance with ICC-ES AC70. Wood or steel members connected to the substrate must be investigated in accordance with accepted design criteria.

2 The steel deck profile is 3" deep composite floor deck with a thickness of 20 gauge (0.0358"). Figure 1 (Section 3.2.1.6) shows the nominal flute dimensions, fastener locations and load orientations for the deck profile.

3 Structural lightweight concrete fill above top of metal deck shall be a minimum of 3-1/4" deep.

4 Multiple fasteners are recommended for any attachment.

Allowable Loads in Concrete Masonry Units[1,2,3,4,5,8]

Fastener description	Fastener	Shank diameter in. (mm)	Minimum embedment in. (mm)	Hollow CMU				Grout filled CMU			
				Face shell[6]		Mortar joint[6]		Face shell[6]		Mortar joint[6]	
				Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear[7] lb (kN)	Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear[7] lb (kN)
1/4-20 Threaded Stud	X-W6	**0.145** (3.7)	**1** (25)	**105** (0.47)	**175** (0.78)	**80** (0.36)	**110** (0.49)	**125** (0.56)	**175** (0.78)	**135** (0.60)	**150** (0.67)

1 The tabulated allowable load values are for the low-velocity fastener only, using a safety factor of 5.0 or higher. Wood or steel members connected to the substrate must be investigated in accordance with accepted design criteria.

2 The tabulated allowable load values are for low-velocity fasteners installed in normal weight or lightweight concrete masonry units conforming to ASTM C90.

3 The tabulated allowable load values are for low-velocity fasteners installed in concrete masonry units with mortar conforming to ASTM C270, Type N.

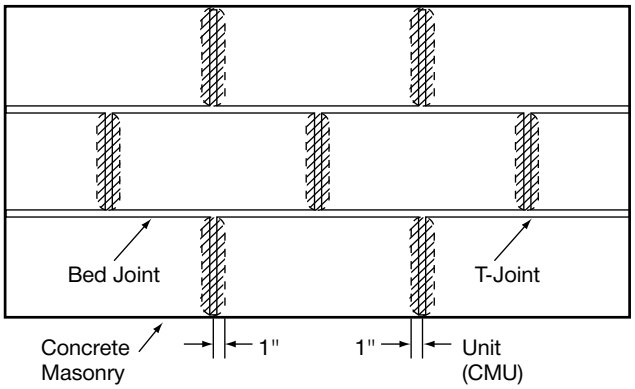
4 The tabulated allowable load values are for low-velocity fasteners installed in concrete masonry units with grout conforming to ASTM C476, as coarse grout.

5 The tabulated allowable load values are for one low-velocity fastener installed in an individual masonry unit cell and at least 4" from the edge of the wall.

6 Fastener can be located anywhere on the face shell or mortar joint as shown in the figure to the right.

7 Shear direction can be horizontal or vertical (Bed Joint or T-Joint) along the CMU wall plane.

8 Multiple fasteners are recommended for any attachment.



Acceptable locations (NON-SHADED AREAS) for threaded studs in CMU walls

Allowable bending moments for threaded stud fasteners installed in minimum 2,000 psi concrete[1,2]

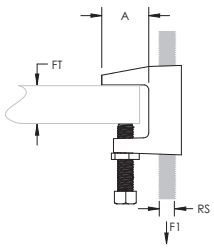
Fastener designation	M_{rec} ft-lb (Nm)
X-W6	**3.6** (4.9)
W10	**10.0** (13.6)

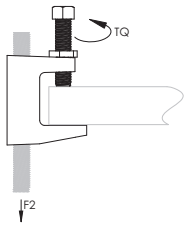
1 Based on a safety factor greater than or equal to 2.0.

2 For more information on bending moments, reference Section 3.2.2.7.

300 Universal Beam Clamp

- Conforms with Federal Specification WW-H-171 (Type 23), Manufacturers Standardization Society ANSI®/MSS-SP-58 (Type 19 and 23)





Material: Cast Iron

Part Number	Rod Size RS	Flange Thickness FT	A	Torque TQ	Static Load 1 F1	Static Load 2 F2	Certifications	Standard Packaging Quantity
Finish: Plain								
3000037PL	3/8"	13/16" Max	1 1/8"	5 ft lb	500 lb	250 lb	cULus, FM	100 pc
3000050PL	1/2"	13/16" Max	1 1/8"	8 ft lb	950 lb	760 lb	cULus, FM	50 pc
3000062PL	5/8"	13/16" Max	1 1/8"	5 ft lb	950 lb	760 lb	cULus	50 pc
3000075PL	3/4"	13/16" Max	1 1/8"	5 ft lb	950 lb	760 lb	cULus	50 pc
3000087PL	7/8"	13/16" Max	1 1/8"	5 ft lb	950 lb	760 lb	cULus	50 pc
Finish: Electrogalvanized								
3000037EG	3/8"	13/16" Max	1 1/8"	5 ft lb	500 lb	250 lb	cULus, FM	100 pc
3000050EG	1/2"	13/16" Max	1 1/8"	8 ft lb	950 lb	760 lb	cULus, FM	50 pc
3000062EG	5/8"	13/16" Max	1 1/8"	5 ft lb	950 lb	760 lb	cULus	50 pc
3000075EG	3/4"	13/16" Max	1 1/8"	5 ft lb	950 lb	760 lb	cULus	50 pc
3000087EG	7/8"	13/16" Max	1 1/8"	5 ft lb	950 lb	760 lb	cULus	50 pc

Setscrew must be tightened and torqued onto the sloped side of the I-beam.

Recognizing that torque wrenches are generally not used or available on many job sites, the setscrew should be tightened so it contacts the I-beam and then an additional 1/4 to 1/2 turn added.