

WARD MANUFACTURING

PIPE FITTINGS CATALOG



**MANUFACTURED IN BLOSSBURG, PENNSYLVANIA
SOLD AROUND THE WORLD!**

**Ward's mission is profitable growth
by exceeding customer expectations
through innovation, quality and commitment.**



WARD MANUFACTURING

TABLE OF CONTENTS

SECTION 1 Standard Malleable Fittings Class 150.....	Pgs. 6 – 16
SECTION 2 Extra Heavy Malleable Fittings Class 300.....	Pgs. 17 – 22
SECTION 3 Quality Pipe Unions Class 150, Class 250, Class 300, Brass-to-Brass.....	Pgs. 23 – 27
SECTION 4 Plugs & Bushings.....	Pgs. 28 – 36
SECTION 5 Top Beam Clamps & “C” Clamps.....	Pgs. 37 – 38
SECTION 6 Standard Cast Iron Pipe Fittings Class 125, Class 250.....	Pgs. 39 – 52
SECTION 7 Flanges, Flange Unions Companion Flanges, Flanged Fittings.....	Pgs. 53 – 68
SECTION 8 Cast Iron Drainage Fittings.....	Pgs. 69 – 75
SECTION 9 Wardlox™ Fittings.....	Pgs. 76 – 79
SECTION 10 Teelox™ Fittings.....	Pg. 80
SECTION 11 Standard Merchant Couplings.....	Pg. 81



THE WARD STORY



Ward Manufacturing, LLC was founded in Blossburg, PA by Mr. Joseph P. Ward in 1924.

Beginning in a modest fashion with approximately thirty employees, a small line of cast iron steam and drainage fittings were manufactured along with cast iron plugs and bushings.

In the following four years a rapidly increasing demand for Ward products was experienced. Accordingly, in 1928, the manufacturing facilities were doubled in size and cast iron steam fittings and the drainage fittings product lines were expanded to include 4 NPS. At the same time class 150 malleable fittings were introduced in sizes ranging from 1/8 through 4 NPS.

During the next decade Ward continued to grow in size and stature and became an increasingly important factor in the American pipe fittings industry.

Further expansion was completed in 1938 with the addition of a facility to produce malleable iron pipe unions. These products were an immediate success and assumed a prominent position in Ward's product offering.

Continued growth and the ever increasing demand for competitively priced products called for higher volume and more efficient molding facilities. To satisfy this business pressure, a totally new and highly automated foundry was erected in 1955 and, to this day, through careful maintenance, continuous improvement and reinvestment, this facility is equipped with some of the fastest automatic molding equipment in the world.

May 1980 marked another major milestone in Ward's history. Beginning with Class 300 malleable fittings, a series of new product offerings were introduced into the Ward line including Class 300 brass-to-brass seated unions, beam clamps, C-clamps, WARDLOX™ plain end fittings and COUPOX grooved end fittings. In 1990, TEELUX™ mechanical branch connectors, meter swivels, ferrules, connecting nuts and a revolutionary new product called WARDFLEX®; a corrugated stainless steel tubing used for fuel gas piping, were added to Ward's catalog.

As part of our continuing effort to support the needs of our customers, Ward acquired Wisconsin Nipple & Fitting Corporation in 2006 adding a full range of welded, seamless and stainless steel pipe nipples to our product line. In 2009 we continued to add new products by introducing Ward steel couplings in sizes ranging from ½ to 6 NPS.

Since 1924 Ward continues to maintain a leadership position in the manufacturing and distribution of piping components utilized around the world. We are committed to our customers and continue to invest in machinery and people in order to maintain our position in the industry as a global leader. At Ward, we won't settle for anything less than being the best manufacturer of malleable iron fittings, cast iron fittings, and steel pipe nipples.

Ward Manufacturing...Committed to Excellence, Dedicated to the Success of our Customers.

SECTION 1

Standard Malleable Pipe Fittings Class 150



Pressure / Temperature Ratings

Temp F°	PSI
-20 TO 150	300
200	265
250	225
300	185
350	150
366	150

Ward Class 150 Malleable Iron Fittings are made with the most sophisticated metallurgical and processing controls available. Iron samples are continuously analyzed using spectroscopy to conform the material quality. This sophisticated chemical analysis is complemented by rigorous quality control of incoming raw materials and iron processing. The final casting produced by this detailed attention to quality is a close-grained, high strength, non-porous iron.

Quality iron is the starting point for Ward fittings. From this iron, accurate threads are machined that comply with the precise standards developed by the American Society of Mechanical Engineers (ASME) and published as an American National Standard. The threads have an accurate form, thread length and straightness to allow them to easily engage threaded pipe. In addition, Ward fittings have a chamfered opening to allow faster and easier pipe engagement. This feature also protects the fitting threads from damage during handling.

All Ward black & galvanized Class 150 Malleable Iron Fittings having outlets ranging from 1/2" through 4" are air tested at 80 psig. This test is part of a constant program to maintain the highest quality fittings available.

General Dimensions / In Inches

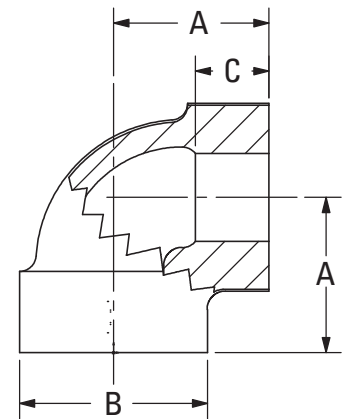
These dimensions apply to all standard malleable banded fittings, both straight and reducing. Length of thread also applies to plain fittings. For center-to-face dimensions, see fittings tables.

NPS	O.D. of Band (min)	Thread Length (min)
1/8	0.69	0.25
1/4	0.84	0.32
3/8	1.01	0.36
1/2	1.20	0.43
3/4	1.46	0.50
1	1.77	0.58
1 1/4	2.15	0.67
1 1/2	2.43	0.70
2	2.96	0.75
2 1/2	3.59	0.92
3	4.28	0.98
3 1/2	4.84	1.03
4	5.40	1.08

Material:	ASTM A197
Dimensions:	ASME B16.3 ANSI/ASME B1.20.1
Pressure Ratings:	ASME B16.3
Coatings:	ASTM A153 ASTM B633
Additional Specifications:	UL, ULC, FM, NSF 61 and NSF 61 Annex G where applicable

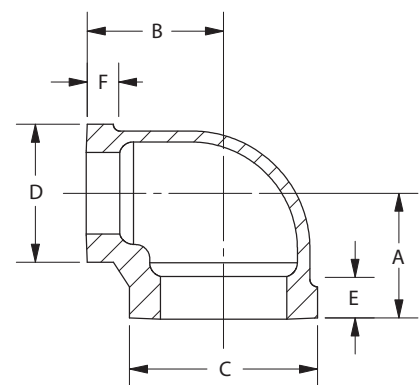
MALLEABLE IRON 90° STRAIGHT ELL CLASS 150

NPS	Center to End A	Outside Dia. of Band B (min)	Length of Threads C (min)	Take Out
1/8	0.69	0.69	0.25	0.42
1/4	0.81	0.84	0.32	0.40
3/8	0.95	1.01	0.36	0.54
1/2	1.12	1.20	0.43	0.58
3/4	1.31	1.46	0.50	0.76
1	1.50	1.77	0.58	0.81
1 1/4	1.75	2.15	0.67	1.04
1 1/2	1.94	2.43	0.70	1.21
2	2.25	2.96	0.75	1.49
2 1/2	2.70	3.59	0.92	1.56
3	3.08	4.28	0.98	1.88
3 1/2	—	—	—	—
4	3.79	5.40	1.08	2.49
5	—	—	—	—
6	5.13	7.77	1.28	3.61



MALLEABLE IRON REDUCING 90° ELL CLASS 150

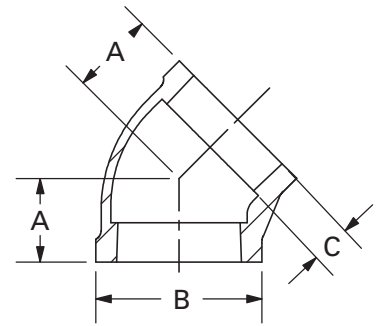
NPS	Center to End A	Center to End B	Outside Dia. of Band C (min)	Outside Dia. of Band D (min)	Length of Threads E (min)	Length of Threads F (min)	Take Out	Take Out
1/4 x 1/8	0.74	0.76	0.84	0.69	0.32	0.25	0.33	0.49
3/8 x 1/4	0.88	0.90	1.01	0.84	0.36	0.32	0.47	0.49
3/8 x 1/8	—	—	—	—	—	—	—	—
1/2 x 3/8	1.04	1.03	1.20	1.01	0.43	0.36	0.50	0.62
1/2 x 1/4	0.97	0.98	1.20	0.84	0.43	0.32	0.43	0.57
3/4 x 1/2	1.20	1.22	1.46	1.20	0.50	0.43	0.65	0.68
3/4 x 3/8	1.12	1.13	1.46	1.01	0.50	0.36	0.57	0.72
3/4 x 1/4	—	—	—	—	—	—	—	—
1 x 3/4	1.37	1.45	1.77	1.46	0.58	0.50	0.68	0.90
1 x 1/2	1.26	1.36	1.77	1.20	0.58	0.43	0.57	0.82
1 x 3/8	1.18	1.27	1.77	1.01	0.58	0.36	0.49	0.86
1 1/4 x 1	1.58	1.67	2.15	1.77	0.67	0.58	0.87	0.98
1 1/4 x 3/4	1.45	1.62	2.15	1.46	0.67	0.50	0.74	1.07
1 1/4 x 1/2	1.34	1.53	2.15	1.20	0.67	0.43	0.63	0.99
1 1/2 x 1 1/4	1.82	1.88	2.43	2.15	0.70	0.67	1.09	1.47
1 1/2 x 1	1.65	1.80	2.43	1.77	0.70	0.58	0.92	1.11
1 1/2 x 3/4	1.52	1.75	2.43	1.46	0.70	0.50	0.79	1.20
*1 1/2 x 1/2	1.41	1.66	2.43	1.20	0.70	0.43	0.68	1.12
2 x 1 1/2	2.02	2.16	2.96	2.43	0.75	0.70	1.26	1.626
2 x 1 1/4	1.90	2.10	2.96	2.15	0.75	0.67	1.14	1.69
2 x 1	1.73	2.02	2.96	1.77	0.75	0.58	0.97	1.33
2 x 3/4	1.60	1.97	2.96	1.46	0.75	0.50	0.84	1.42
*2 x 1/2	1.49	1.88	2.96	1.20	0.75	0.43	0.73	1.34
2 1/2 x 2	2.39	2.60	3.59	2.96	0.92	0.75	1.25	1.84
2 1/2 x 1 1/2	2.16	2.51	3.59	2.43	0.92	0.70	1.02	1.78
3 x 2 1/2	—	—	—	—	—	—	—	—
3 x 2	2.52	2.89	4.28	2.96	0.98	0.75	1.32	2.13
4 x 3	3.30	3.60	5.40	4.28	1.08	0.98	2.00	2.40



* Manufactured to WARD specifications

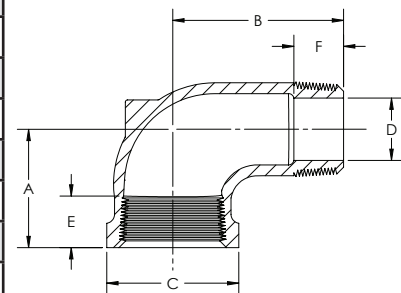
MALLEABLE IRON 45° ELL CLASS 150

NPS	Center to End A	Outside Dia. of Band B	Length of Threads C (min)	Take Out
1/8	0.73	0.69	0.25	0.46
1/4	0.73	0.84	0.32	0.32
3/8	0.80	1.01	0.36	0.39
1/2	0.88	1.20	0.43	0.34
3/4	0.98	1.46	0.50	0.43
1	1.12	1.77	0.58	0.43
1 1/4	1.29	2.15	0.67	0.58
1 1/2	1.43	2.43	0.70	0.70
2	1.68	2.96	0.75	0.92
2 1/2	1.95	3.59	0.92	0.81
3	2.17	4.28	0.98	0.97
4	2.61	5.40	1.08	1.31
5	—	—	—	—
6	—	—	—	—



MALLEABLE IRON 90° STREET ELL CLASS 150

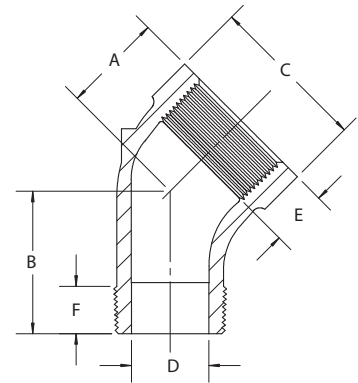
NPS	Center to End A	Center to Male B	Outside Dia. of Band C (min)	Port Dia. Male End D (max)	Length of Internal Threads E (min)	Length of External Threads F (min)	Take Out Male End	Take-Out Female End
1/8	0.69	1.00	0.69	0.20	0.25	0.26	0.73	0.42
1/4	0.81	1.19	0.84	0.26	0.32	0.40	0.78	0.40
3/8	0.95	1.44	1.01	0.37	0.36	0.41	1.03	0.54
1/2	1.12	1.63	1.20	0.51	0.43	0.53	1.09	0.58
1/2 x 3/8	—	—	—	—	—	—	—	—
3/4	1.31	1.89	1.46	0.69	0.50	0.55	1.34	0.76
*3/4 x 1/2	1.31	1.76	1.46	0.51	0.50	0.53	1.21	0.77
1	1.50	2.14	1.77	0.91	0.58	0.68	1.45	0.81
1 x 3/4	—	—	—	—	—	—	—	—
1 1/4	1.75	2.45	2.15	1.19	0.67	0.71	1.74	1.04
*1 1/4 x 1	1.75	2.29	2.15	0.91	0.67	0.68	1.58	1.06
1 1/4 x 3/4	—	—	—	—	—	—	—	0.54
1 1/2	1.94	2.69	2.43	1.39	0.70	0.72	1.96	1.21
*1 1/2 x 1 1/4	1.81	2.62	2.43	1.19	0.70	0.72	1.90	1.10
*1 1/2 x 1	1.94	2.54	2.43	0.91	0.70	0.68	1.81	1.25
2	2.25	3.26	2.96	1.79	0.75	0.76	2.50	1.49
2 x 1 1/2	—	—	—	—	—	—	—	—
2 1/2	2.70	3.86	3.59	2.20	0.92	1.14	2.72	1.56
3	3.08	4.51	4.28	2.78	0.98	1.20	3.31	1.88
4	—	—	—	—	—	—	—	—



* Manufactured to WARD specifications

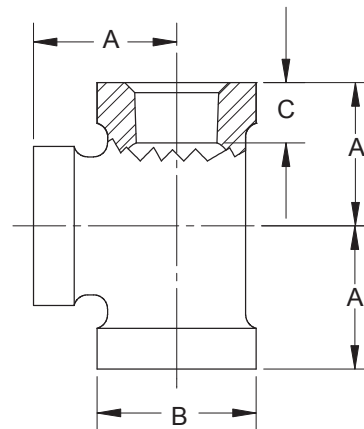
MALLEABLE IRON STREET 45° ELL CLASS 150

NPS	Center to End A	Center to Male B	Outside Dia. of Band C (min)	Port Dia. Male End D (max)	Length of Internal Threads E (min)	Length of External Threads F (min)	Take Out Male End	Take Out Female End
1/8	0.69	0.94	0.69	0.20	0.25	0.26	0.67	0.42
1/4	0.73	0.94	0.84	0.26	0.32	0.40	0.53	0.32
3/8	0.80	1.03	1.01	0.37	0.36	0.41	0.62	0.39
1/2	0.88	1.15	1.20	0.51	0.43	0.53	0.61	0.34
3/4	0.98	1.29	1.46	0.69	0.50	0.55	0.74	0.43
1	1.12	1.47	1.77	0.91	0.58	0.68	0.78	0.43
1 1/4	1.29	1.71	2.15	1.19	0.67	0.71	1.00	0.58
1 1/2	1.43	1.88	2.43	1.39	0.70	0.72	1.15	0.70
2	1.68	2.22	2.96	1.79	0.75	0.76	1.46	0.92



MALLEABLE IRON STRAIGHT TEES CLASS 150

NPS	Center to End A	Outside Dia. of Band B (min)	Length of Threads C (min)	Take Out
1/8	0.69	0.69	0.25	0.42
1/4	0.81	0.84	0.32	0.40
3/8	0.95	1.01	0.36	0.54
1/2	1.12	1.20	0.43	0.58
3/4	1.31	1.46	0.50	0.76
1	1.50	1.77	0.58	0.81
1 1/4	1.75	2.15	0.67	1.04
1 1/2	1.94	2.43	0.70	1.21
2	2.25	2.96	0.75	1.49
2 1/2	2.70	3.59	0.92	1.56
3	3.08	4.28	0.98	1.88
3 1/2	—	—	—	—
4	3.79	5.40	1.08	2.49
6	—	—	—	—



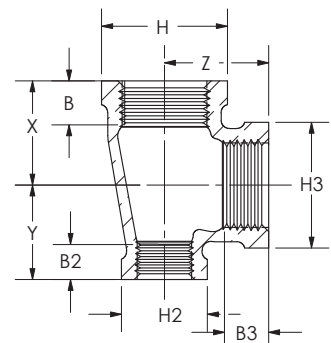
MALLEABLE IRON REDUCING TEES CLASS 150

NPS	Center to End X	Center to End Y	Center to End Z	Outside Dia. H (min)	Outside Dia. H2 (min)	Outside Dia. H3 (min)	Thread Length B (min)	Thread Length B2 (min)	Thread Length B3 (min)	Take Out	Take Out	Take Out
1/4 x 1/4 x 1/8	—	—	—	—	—	—	—	—	—	—	—	—
1/8 x 1/8 x 1/4	—	—	—	—	—	—	—	—	—	—	—	—
3/8 x 3/8 x 1/4	—	—	—	—	—	—	—	—	—	—	—	—
3/8 x 1/4 x 3/8	—	—	—	—	—	—	—	—	—	—	—	—
3/8 x 1/4 x 1/4	—	—	—	—	—	—	—	—	—	—	—	—
1/4 x 1/4 x 3/8	—	—	—	—	—	—	—	—	—	—	—	—
1/2 x 1/2 x 3/8	1.04	1.04	1.03	0.43	0.43	0.36	1.20	1.20	1.01	0.50	0.50	0.62
1/2 x 1/2 x 1/4	0.97	0.97	0.98	0.43	0.43	0.32	1.20	1.20	0.84	0.43	0.43	0.57
1/2 x 3/8 x 1/2	1.12	1.03	1.12	0.43	0.36	0.43	1.20	1.01	1.20	0.58	0.62	0.58
1/2 x 3/8 x 3/8	1.04	0.950	1.03	0.43	0.36	0.36	1.20	1.01	1.01	0.50	0.54	0.62
1/2 x 1/4 x 1/2	1.12	0.98	1.12	0.43	0.32	0.43	1.20	0.84	1.20	0.58	0.60	0.58
3/8 x 3/8 x 1/2	1.03	1.03	1.04	0.36	0.36	0.43	1.01	1.01	1.20	0.62	0.62	0.50
3/4 x 3/4 x 1/2	1.20	1.20	1.22	0.50	0.50	0.43	1.46	1.46	1.20	0.65	0.65	0.68
3/4 x 3/4 x 3/8	1.12	1.12	1.13	0.50	0.50	0.36	1.46	1.46	1.01	0.57	0.57	0.72
3/4 x 3/4 x 1/4	1.05	1.05	1.08	0.50	0.50	0.32	1.46	1.46	0.84	0.50	0.50	0.67
3/4 x 1/2 x 3/4	1.31	1.22	1.31	0.50	0.43	0.50	1.46	1.20	1.46	0.76	0.68	0.76
3/4 x 1/2 x 1/2	1.20	1.12	1.22	0.50	0.43	0.43	1.46	1.20	1.20	0.65	0.58	0.68
3/4 x 3/8 x 3/4	1.31	1.13	1.13	0.50	0.36	0.50	1.46	1.01	1.46	0.76	0.72	0.58
3/4 x 3/8 x 3/8	—	—	—	—	—	—	—	—	—	—	—	—
3/4 x 1/4 x 3/4	1.31	1.08	1.31	0.50	0.32	0.50	1.46	0.84	1.46	0.76	0.67	0.76
1/2 x 1/2 x 3/4	1.22	1.22	1.20	0.43	0.43	0.50	1.20	1.20	1.46	0.68	0.68	0.65
1 x 1 x 3/4	1.37	1.37	1.45	0.58	0.58	0.50	1.77	1.77	1.46	0.68	0.68	0.90
1 x 1 x 1/2	1.26	1.26	1.36	0.58	0.58	0.43	1.77	1.77	1.20	0.57	0.57	0.82
1 x 1 x 3/8	1.18	1.18	1.27	0.58	0.58	0.36	1.77	1.77	1.01	0.49	0.49	0.86
1 X 1 X 1/4	1.11	1.11	1.22	0.58	0.58	0.32	1.77	1.77	0.84	0.42	0.42	0.81
1 x 3/4 x 1	1.50	1.45	1.50	0.58	0.50	0.58	1.77	1.46	1.77	0.81	0.90	0.81
1 x 3/4 x 3/4	1.37	1.31	1.45	0.58	0.50	0.50	1.77	1.46	1.46	0.68	0.76	0.90
1 x 3/4 x 1/2	1.26	1.20	1.36	0.58	0.50	0.43	1.77	1.46	1.20	0.57	0.65	0.82
1 x 1/2 x 1	1.50	1.36	1.50	0.58	0.43	0.58	1.77	1.20	1.77	0.81	0.82	0.81
1 x 1/2 x 3/4	1.37	1.22	1.45	0.58	0.43	0.50	1.77	1.20	1.46	0.68	0.68	0.90
1 x 1/2 x 1/2	1.26	1.12	1.36	0.58	0.43	0.43	1.77	1.20	1.20	0.57	0.58	0.82
1 x 3/8 x 1	—	—	—	—	—	—	—	—	—	—	—	—
*1 x 1/4 x 1	1.50	1.20	1.50	0.58	0.32	0.58	1.77	0.84	1.77	0.81	0.79	0.81
1 x 1/8 x 1	—	—	—	—	—	—	—	—	—	—	—	—
3/4 x 3/4 x 1	1.45	1.45	1.37	0.50	0.50	0.58	1.46	1.46	1.77	0.90	0.90	0.68
1/2 x 1/2 x 1	—	—	—	—	—	—	—	—	—	—	—	—
1 1/4 x 1 1/4 x 1	1.58	1.58	1.67	0.67	0.67	0.58	2.15	2.15	1.77	0.87	0.87	0.98
1 1/4 x 1 1/4 x 3/4	1.45	1.45	1.62	0.67	0.67	0.50	2.15	2.15	1.46	0.74	0.74	1.07
1 1/4 x 1 1/4 x 1/2	1.34	1.34	1.53	0.67	0.67	0.43	2.15	2.15	1.20	0.63	0.63	0.99
1 1/4 x 1 1/4 x 3/8	—	—	—	—	—	—	—	—	—	—	—	—
1 1/4 x 1 x 1 1/4	1.75	1.67	1.75	0.67	0.58	0.67	2.15	1.77	2.15	1.04	0.98	1.04
1 1/4 x 1 x 1	1.58	1.50	1.67	0.67	0.58	0.58	2.15	1.77	1.77	0.87	0.81	0.98
1 1/4 x 1 x 3/4	1.45	1.37	1.62	0.67	0.58	0.50	2.15	1.77	1.46	0.74	0.68	1.07
1 1/4 x 1 x 1/2	1.34	1.26	1.53	0.67	0.58	0.43	2.15	1.77	1.20	0.63	0.57	0.99
1 1/4 x 3/4 x 1 1/4	1.75	1.62	1.75	0.67	0.50	0.67	2.15	1.46	2.15	1.04	1.07	1.04
1 1/4 x 3/4 x 1	1.58	1.45	1.67	0.67	0.50	0.58	2.15	1.46	1.77	0.87	0.90	0.98
1 1/4 x 3/4 x 3/4	1.45	1.31	1.62	0.67	0.50	0.50	2.15	1.46	1.46	0.74	0.76	1.07
1 1/4 x 1/2 x 1 1/4	1.75	1.53	1.75	0.67	0.43	0.67	2.15	1.20	2.15	1.04	0.99	1.04
1 1/4 x 1/2 x 1	—	—	—	—	—	—	—	—	—	—	—	—
1 x 1 x 1 1/4	1.67	1.67	1.58	0.58	0.58	0.67	1.77	1.77	2.15	0.98	0.96	0.87
3/4 x 3/4 x 1 1/4	—	—	—	—	—	—	—	—	—	—	—	—
1 1/2 x 1 1/2 x 1 1/4	1.82	1.82	1.88	0.70	0.70	0.67	2.43	2.43	2.15	1.09	1.09	1.17
1 1/2 x 1 1/2 x 1	1.65	1.65	1.80	0.70	0.70	0.58	2.43	2.43	1.77	0.92	0.92	1.11
1 1/2 x 1 1/2 x 3/4	1.52	1.52	1.75	0.70	0.70	0.50	2.43	2.43	1.46	0.79	0.79	1.20
1 1/2 x 1 1/2 x 1/2	1.41	1.41	1.66	0.70	0.70	0.43	2.43	2.43	1.20	0.68	0.68	1.12
1 1/2 x 1 1/4 x 1 1/2	1.94	1.88	1.94	0.70	0.67	0.70	2.43	2.15	2.43	1.21	1.17	1.21
1 1/2 x 1 1/4 x 1 1/4	1.82	1.75	1.88	0.70	0.67	0.67	2.43	2.15	2.15	1.09	1.04	1.17
1 1/2 x 1 1/4 x 1	1.65	1.58	1.80	0.70	0.67	0.58	2.43	2.15	1.77	0.92	0.87	1.11
1 1/2 x 1 1/4 x 3/4	1.52	1.45	1.75	0.70	0.67	0.50	2.43	2.15	1.46	0.79	0.74	1.20
1 1/2 x 1 1/4 x 1/2	1.41	1.34	1.66	0.70	0.67	0.43	2.43	2.15	1.20	0.68	0.63	1.12

* Manufactured to WARD specifications

NPS	Center to End X	Center to End Y	Center to End Z	Outside Dia. H (min)	Outside Dia. H2 (min)	Outside Dia. H3 (min)	Thread Length B (min)	Thread Length B2 (min)	Thread Length B3 (min)	Take Out	Take Out	Take Out
1 1/2 x 1 x 1 1/2	1.94	1.80	1.94	0.70	0.58	0.70	2.43	1.77	2.43	1.21	1.11	1.21
1 1/2 x 1 x 1 1/4	—	—	—	—	—	—	—	—	—	—	—	—
1 1/2 x 1 x 1	1.65	1.50	1.80	0.70	0.58	0.58	2.43	1.77	1.77	0.92	0.81	1.11
1 1/2 x 3/4 x 1 1/2	1.94	1.75	1.94	0.70	0.50	0.70	2.43	1.46	2.43	1.21	1.20	1.21
*1 1/2 x 3/4 x 3/4	1.55	1.35	1.77	0.70	0.50	0.50	2.43	1.46	1.46	0.82	0.80	1.22
1 1/2 x 1/2 x 1 1/2	1.94	1.66	1.94	0.70	0.43	0.70	2.43	1.20	2.43	1.21	1.12	1.21
1 1/4 x 1 1/4 x 1 1/2	1.88	1.88	1.82	0.67	0.67	0.70	2.15	2.15	2.43	1.17	1.17	1.09
1 x 1 x 1 1/2	1.80	1.80	1.65	0.58	0.58	0.70	1.77	1.77	2.43	1.11	1.11	0.92
2 x 2 x 1 1/2	2.02	2.02	2.16	0.75	0.75	0.70	2.96	2.96	2.43	1.26	1.26	1.43
2 x 2 x 1 1/4	1.90	1.90	2.10	0.75	0.75	0.67	2.96	2.96	2.15	1.14	1.14	1.39
2 x 2 x 1	1.73	1.73	2.02	0.75	0.75	0.58	2.96	2.96	1.77	0.97	0.97	1.33
2 x 2 x 3/4	1.60	1.60	1.97	0.75	0.75	0.50	2.96	2.96	1.46	0.84	0.84	1.42
2 x 2 x 1/2	1.49	1.49	1.88	0.75	0.75	0.43	2.96	2.96	1.20	0.73	0.73	1.34
2 x 1 1/2 x 2	2.25	2.16	2.25	0.75	0.70	0.75	2.96	2.43	2.96	1.49	1.43	1.49
2 x 1 1/2 x 1 1/2	2.02	1.94	2.16	0.75	0.70	0.70	2.96	2.43	2.43	1.26	1.21	1.43
2 x 1 1/2 x 1 1/4	1.90	1.82	2.10	0.75	0.70	0.67	2.96	2.43	2.15	1.14	1.09	1.39
2 x 1 1/2 x 1	1.73	1.65	2.02	0.75	0.70	0.58	2.96	2.43	1.77	0.97	0.92	1.33
2 x 1 1/4 x 2	2.25	2.10	2.25	0.75	0.67	0.75	2.96	2.15	2.96	1.49	1.39	1.49
2 X 1 1/4 X 1 1/2	—	—	—	—	—	—	—	—	—	—	—	—
2 x 1 1/4 x 1 1/4	1.90	1.75	2.10	0.75	0.67	0.67	2.96	2.15	2.15	1.14	1.04	1.39
2 x 1 x 2	2.25	2.02	2.25	0.75	0.58	0.75	2.96	1.77	2.96	1.49	1.33	1.49
*2 x 1 x 1	1.78	1.68	2.08	0.75	0.58	0.58	2.96	1.77	1.77	1.02	0.99	1.39
2 x 3/4 x 2	2.25	1.97	2.25	0.75	0.50	0.75	2.96	1.46	2.96	1.49	1.42	1.49
2 x 1/2 x 2	2.25	1.88	2.25	0.75	0.43	0.75	2.96	1.20	2.96	1.49	1.34	1.49
1 1/2 x 1 1/2 x 2	—	—	—	—	—	—	—	—	—	—	—	—
1 1/4 x 1 1/4 x 2	—	—	—	—	—	—	—	—	—	—	—	—
1 x 1 x 2	—	—	—	—	—	—	—	—	—	—	—	—
2 1/2 x 2 1/2 x 2	2.39	2.39	2.60	0.92	0.92	0.75	3.59	3.59	2.96	1.25	1.25	1.84
2 1/2 x 2 1/2 x 1 1/2	2.16	2.16	2.51	0.92	0.92	0.70	3.59	3.59	2.43	1.02	1.02	1.78
2 1/2 x 2 1/2 x 1 1/4	2.04	2.04	2.45	0.92	0.92	0.67	3.59	3.59	2.15	0.90	0.90	1.74
2 1/2 x 2 1/2 x 1	1.87	1.87	2.37	0.92	0.92	0.58	3.59	3.59	1.77	0.73	0.73	1.68
2 1/2 x 2 1/2 x 3/4	1.74	1.74	2.32	0.92	0.92	0.50	3.59	3.59	1.46	0.60	0.60	1.77
2 1/2 x 2 x 2 1/2	—	—	—	—	—	—	—	—	—	—	—	—
2 1/2 x 2 x 2	—	—	—	—	—	—	—	—	—	—	—	—
2 1/2 x 1 1/2 x 2 1/2	—	—	—	—	—	—	—	—	—	—	—	—
2 1/2 x 1 1/2 x 2	—	—	—	—	—	—	—	—	—	—	—	—
2 x 2 x 2 1/2	—	—	—	—	—	—	—	—	—	—	—	—
3 x 3 x 2 1/2	2.83	2.83	2.99	0.98	0.98	0.92	4.28	4.28	3.59	1.63	1.63	1.85
3 x 3 x 2	2.52	2.52	2.89	0.98	0.98	0.75	4.28	4.28	2.96	1.32	1.32	2.13
3 x 3 x 1 1/2	2.29	2.29	2.80	0.98	0.98	0.70	4.28	4.28	2.43	1.09	1.09	2.07
3 x 3 x 1 1/4	2.17	2.17	2.74	0.98	0.98	0.67	4.28	4.28	2.15	0.97	0.97	2.03
3 x 3 x 1	2.00	2.00	2.66	0.98	0.98	0.58	4.28	4.28	1.77	0.80	0.80	1.97
3 x 3 x 3/4	1.87	1.87	2.61	0.98	0.98	0.50	4.28	4.28	1.46	0.67	0.67	2.06
3 x 2 1/2 x 2 1/2	—	—	—	—	—	—	—	—	—	—	—	—
3 x 2 1/2 x 2	—	—	—	—	—	—	—	—	—	—	—	—
3 x 2 x 3	—	—	—	—	—	—	—	—	—	—	—	—
3 x 2 x 2	2.52	2.25	2.89	0.98	0.75	0.75	4.28	2.96	2.96	1.32	1.49	2.13
2 1/2 x 2 1/2 x 3	—	—	—	—	—	—	—	—	—	—	—	—
4 x 4 x 3	—	—	—	—	—	—	—	—	—	—	—	—
4 x 4 x 2 1/2	—	—	—	—	—	—	—	—	—	—	—	—
4 x 4 x 2	2.74	2.74	3.41	1.08	1.08	0.75	5.40	5.40	2.96	1.44	1.44	2.65
4 x 4 x 1 1/2	—	—	—	—	—	—	—	—	—	—	—	—
4 x 3 x 4	—	—	—	—	—	—	—	—	—	—	—	—

* Manufactured to WARD specifications

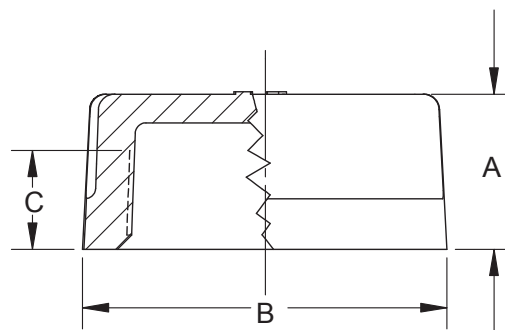


MALLEABLE IRON PIPE CAPS CLASS 150

NPS	Overall Height A (min)	Outside Dia. of Band B (min)	Length of Threads C (min)
*1/8	0.53	0.56	0.25
+1/4	0.63	0.84	0.32
+3/8	0.74	1.01	0.36
+1/2	0.87	1.20	0.43
+3/4	0.97	1.46	0.50
1	1.16	1.770	0.58
1 1/4	1.28	2.15	0.67
1 1/2	1.33	2.43	0.70
2	1.45	3.00	0.75
2 1/2	1.70	3.59	0.92
3	1.80	4.28	0.98
3 1/2	—	—	—
4	2.08	5.40	1.08
5	—	—	—
6	—	—	—
8	—	—	—

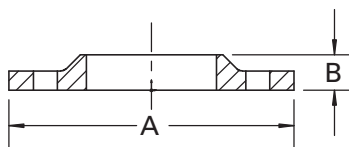
+ Made in Malleable Iron and Steel

* Made in Steel



MALLEABLE IRON WASTE NUTS CLASS 150

NPS	End to End A	Height B
*1/2	2.42	0.34
*3/4	2.65	0.32
*1	2.99	0.37

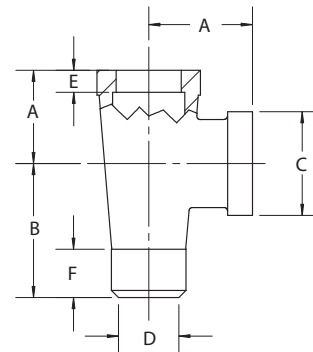


* Manufactured to WARD specifications

MALLEABLE IRON STREET TEES CLASS 150

NPS	Center to End A	Center to Male B	Outside Dia. of Band C (min)	Port Dia. Male End D (max)	Length of Internal Thread E (min)	Length of External Thread F (min)	Take Out Male End	Take Out Female End
1/4	—	—	—	—	—	—	—	—
3/8	—	—	—	—	—	—	—	—
1/2	—	—	—	—	—	—	—	—
3/4	1.31	1.89	1.46	0.69	0.50	0.55	1.34	0.76
1	1.50	2.14	1.77	0.91	0.58	0.68	1.45	0.81
1 1/4	1.75	2.45	2.15	1.19	0.67	0.71	1.74	1.04
1 1/2	1.94	2.69	2.43	1.39	0.70	0.72	1.96	1.21
2	2.25	3.26	2.96	1.79	0.75	0.76	2.50	1.49
*1 1/4 x 1 x 1 1/4	1.75	2.45	2.15	0.91	0.67	0.68	1.76	1.04

* Manufactured to WARD specifications



MALLEABLE IRON COUPLING, CLASS 150

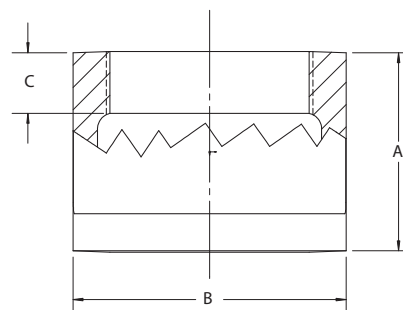
STRAIGHT COUPLING

NPS	Length of Coupling A	Outside Dia. of Band B (min)	Length of Threads C (min)	Take Out
+1/8	0.96	0.69	0.25	0.13
1/4	1.06	0.84	0.32	0.17
3/8	1.16	1.01	0.36	0.14
1/2	1.34	1.20	0.43	0.21
3/4	1.52	1.46	0.50	0.15
1	1.67	1.77	0.58	0.26
1 1/4	1.93	2.15	0.67	0.35
1 1/2	2.15	2.43	0.70	0.51
2	2.53	2.96	0.75	0.30
2 1/2	2.88	3.59	0.92	0.39
3	3.18	4.28	0.98	0.55
4	3.69	5.40	1.08	2.39

+ Steel

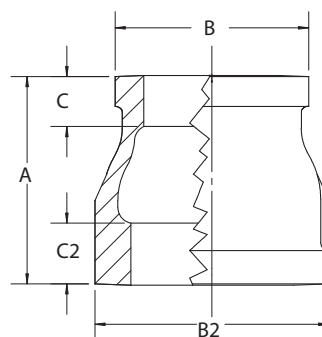
RIGHT & LEFT THREAD COUPLING

NPS	Length of Coupling A	Outside Dia. of Band B (min)	Length of Threads C (min)	Take Out
1/2	1.34	1.20	0.43	0.14
3/4	1.52	1.46	0.50	0.21
1	1.67	1.77	0.58	0.15
1 1/4	1.93	2.15	0.67	0.26
1 1/2	2.15	2.43	0.70	0.35
2	2.53	2.96	0.75	0.51



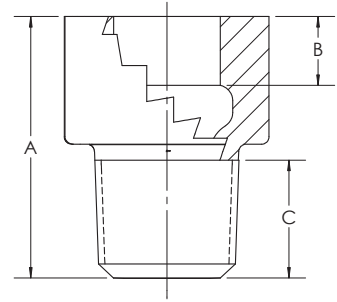
MALLEABLE IRON REDUCING COUPLING CLASS 150

NPS	Length of Coupling A	Outside Dia. Small Band B (min)	Outside Dia. Large Band B2 (min)	Length of Threads Small End C (min)	Length of Threads Large End C2 (min)	Take Out	Take Out
1/4 x 1/8	1.00	0.69	0.84	0.25	0.32	0.10	0.24
3/8 x 1/4	1.13	0.84	1.01	0.32	0.36	0.16	0.16
3/8 x 1/8	1.13	0.69	1.01	0.25	0.36	0.16	0.30
1/2 x 3/8	1.25	1.01	1.20	0.36	0.43	0.09	0.22
1/2 x 1/4	1.25	0.84	1.20	0.32	0.43	0.09	0.22
1/2 x 1/8	1.25	0.69	1.20	0.25	0.43	0.09	0.36
3/4 x 1/2	1.44	1.20	1.46	0.43	0.50	0.17	0.19
3/4 x 3/8	1.44	1.01	1.46	0.36	0.50	0.17	0.31
3/4 x 1/4	1.44	0.84	1.46	0.32	0.50	0.17	0.32
3/4 x 1/8	1.44	0.69	1.46	0.25	0.50	0.894	0.17
1 x 3/4	1.69	1.46	1.77	0.50	0.58	0.16	0.30
1 x 1/2	1.69	1.20	1.77	0.43	0.58	0.16	0.31
1 x 3/8	1.69	1.01	1.77	0.36	0.58	0.16	0.44
1 x 1/4	1.69	0.84	1.77	0.32	0.58	0.16	0.44
1 x 1/8	—	—	—	—	—	—	—
1 1/4 x 1	2.06	1.77	2.15	0.58	0.67	0.32	0.35
1 1/4 x 3/4	2.06	1.46	2.15	0.50	0.67	0.32	0.48
1 1/4 x 1/2	2.06	1.20	2.15	0.43	0.67	0.32	0.50
1 1/2 x 1 1/4	2.31	2.15	2.43	0.67	0.70	0.43	0.45
1 1/2 x 1	2.31	1.77	2.43	0.58	0.70	0.43	0.47
1 1/2 x 3/4	2.31	1.46	2.43	0.50	0.70	0.43	0.61
1 1/2 x 1/2	2.31	1.20	2.43	0.43	0.70	0.43	0.62
2 x 1 1/2	2.81	2.43	2.96	0.70	0.75	0.65	0.68
2 x 1 1/4	2.81	2.15	2.96	0.67	0.75	0.65	0.70
2 x 1	2.81	1.77	2.96	0.58	0.75	0.65	0.72
2 x 3/4	2.81	1.46	2.96	0.50	0.75	0.65	0.86
2 x 1/2	2.81	1.20	2.96	0.43	0.75	0.65	0.87
2 1/2 x 2	3.25	2.96	3.59	0.75	0.92	0.49	0.87
2 1/2 x 1 1/2	3.25	2.43	3.59	0.70	0.92	0.49	0.90
2 1/2 x 1 1/4	3.25	2.43	3.59	0.67	0.92	0.49	0.92
2 1/2 x 1	3.25	1.77	3.59	0.58	0.92	0.49	0.94
3 x 2 1/2	3.69	3.59	4.28	0.92	0.98	0.65	0.71
3 x 2	3.69	2.96	4.28	0.75	0.98	0.65	1.09
3 x 1 1/2	3.69	2.43	4.28	0.70	0.98	0.65	1.12
3 x 1 1/4	3.69	2.15	4.28	0.67	0.98	0.65	1.14
3 x 1	3.69	1.77	4.28	0.58	0.98	0.65	1.16
3 1/2 x 3	—	—	—	—	—	—	—
3 1/2 x 2	—	—	—	—	—	—	—
4 x 3 1/2	—	—	—	—	—	—	—
4 x 3	4.38	4.28	5.40	0.98	1.08	0.89	0.99
4 x 2 1/2	4.38	3.59	5.40	0.92	1.08	0.89	1.05
4 x 2	4.38	2.96	5.40	0.75	1.08	0.89	1.43
4 x 1 1/2	—	—	—	—	—	—	—
5 x 4	—	—	—	—	—	—	—
6 x 4	—	—	—	—	—	—	—



MALLEABLE IRON EXTENSION PIECES CLASS 150

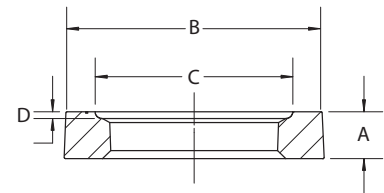
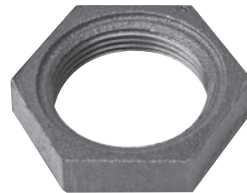
NPS	Overall Length A	Length of Internal Threads B (min)	Length of External Threads C (min)	Take Out Female End	Take Out Male End
*3/8	1.50	0.36	0.40	1.09	1.09
*1/2	1.95	0.43	0.53	1.41	1.41
*3/4	2.06	0.50	0.54	1.51	1.51
*1	2.23	0.58	0.68	1.54	1.54
*1 1/4	2.56	0.67	0.63	1.85	1.85
*2	—	—	—	—	—



* Manufactured to WARD specifications

MALLEABLE IRON LOCKNUTS CLASS 150

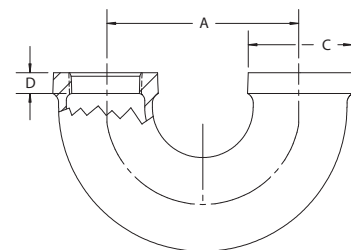
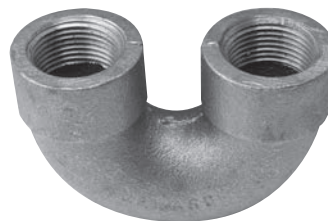
NPS	Overall Height A	Length-Across Flat B (min)	Packing Groove Width C	Packing Groove Depth D
+1/8	0.19	0.69	0.50	0.04
+1/4	0.25	0.84	0.66	0.06
3/8	0.28	1.00	0.77	0.06
1/2	0.31	1.18	0.97	0.06
3/4	0.34	1.43	1.23	0.06
1	0.38	1.75	1.50	0.06
1 1/4	0.42	2.10	1.86	0.06
1 1/2	0.47	2.35	2.12	0.06
2	0.53	2.88	2.63	0.09



+STEEL
Made to ASME B16.14

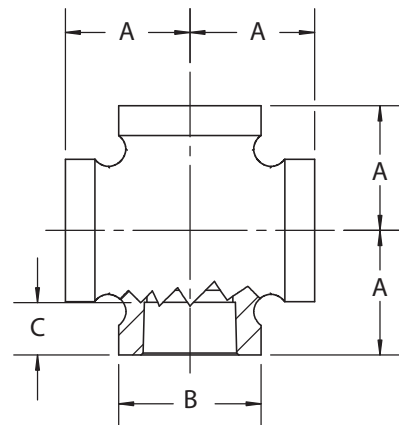
MALLEABLE IRON RETURN BEND OPEN CLASS 150

NPS	Center to Center A	Outside Dia. of Band C (min)	Length of Threads D (min)
1/2	1.50	1.20	0.43
3/4	2.00	1.46	0.50
1	3.00	1.77	0.58



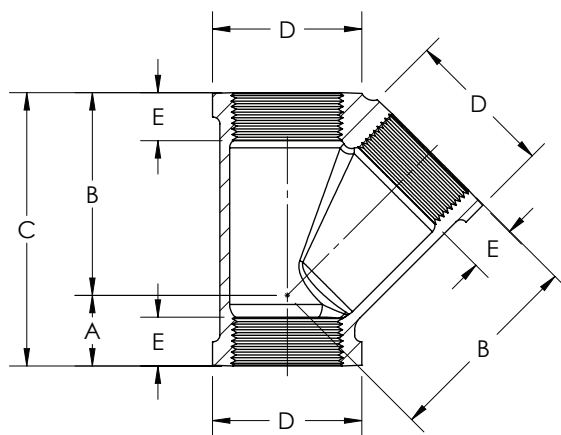
MALLEABLE IRON CROSS CLASS 150

NPS	Center to End A	Outside Dia. of Band B (min)	Length of Threads C (min)	Take Out
1/8	—	—	—	—
1/4	0.81	0.84	0.32	0.40
3/8	0.95	1.01	0.36	0.54
1/2	1.12	1.20	0.43	0.58
3/4	1.31	1.46	0.50	0.76
1	1.50	1.77	0.58	0.81
1 1/4	1.75	2.15	0.67	1.04
1 1/2	1.94	2.43	0.70	1.21
2	2.25	2.96	0.75	1.49
2 1/2	—	—	—	—
3	—	—	—	—
4	—	—	—	—



MALLEABLE IRON 45° Y CLASS 150

NPS	Center to End Inlet A	Center to End Outlet B	End to End C	Outside Dia. of Band D (min)	Length of Threads E (min)	Take Out	Take Out
3/8	—	—	—	—	—	—	—
1/2	—	—	—	—	—	—	—
3/4	—	—	—	—	—	—	—
1	—	—	—	—	—	—	—
1 1/4	1.02	2.92	3.94	2.15	0.67	0.67	2.21
1 1/2	—	—	—	—	—	—	—
2	—	—	—	—	—	—	—
2 1/2	—	—	—	—	—	—	—
3	—	—	—	—	—	—	—
4	—	—	—	—	—	—	—



SECTION 2

Extra Heavy Malleable Pipe Fittings Class 300 - (A.A.R.)

Ward Class 300 Malleable Iron Fittings are designed to handle higher pressures and more rugged service than our Class 150 fittings. Like all of Ward's fittings, Class 300 fittings are made with the most sophisticated metallurgical and processing controls available. Ward's quality assurance program ensures that the iron is made with high quality raw materials and processed according to rigorous standards. Iron samples are continuously analyzed to ensure that a close grained, high strength, non-porous iron is produced.

Ward starts with high quality iron, then accurately machines threads that comply with the precise standards developed by the American Society of Mechanical Engineers (ASME) and published as an American National Standard. The threads have an accurate form, thread length and straightness to allow them to easily engage thread pipe. In addition, Ward fittings have a chamfered opening to allow faster and easier pipe engagement. This feature also protects the fitting threads from damage during handling.



Table A
Pressure-Temperature Ratings
SIZES

General Dimensions In Inches

These dimensions apply to both straight and reducing fittings.

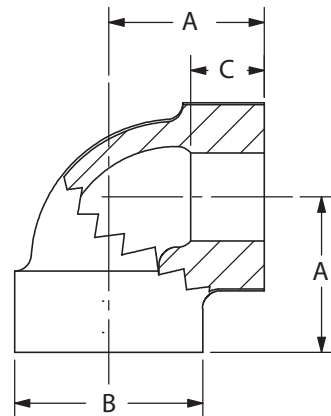
NPS	O.D. of Bands	Thread Length (min)
1/4	0.93	0.43
3/8	1.12	0.48
1/2	1.34	0.56
3/4	1.62	0.62
1	1.93	0.75
1 1/4	2.37	0.84
1 1/2	2.68	0.87
2	3.28	1.00
3	4.62	1.93

Temp. F°	PSI		
	Size 1/4 - 1	Size 1 1/4 - 2	Size 2 1/2 - 3
-20 TO 150	2000	1500	1000
200	1785	1350	910
250	1575	1200	825
300	1360	1050	735
350	1150	900	650
400	935	750	560
450	725	600	475
500	510	450	385
550	300	300	300

Material:	ASTM A197
Dimensions:	ASME B16.3 ANSI/ASME B1.20.1
Pressure Ratings:	ASME B16.3
Coatings:	ASTM A153 ASTM B633
Additional Specifications:	UL, ULC, FM NSF 61 and NSF 61 Annex G where applicable

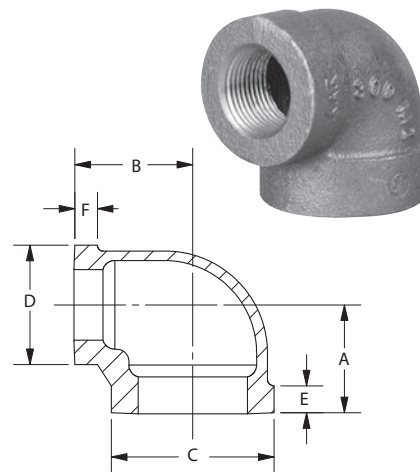
MALLEABLE IRON 90° STRAIGHT ELL CLASS 300

NPS	Center to End A	Outside Dia. of Band B (min)	Length of Threads C (min)	Take Out
1/4	0.94	0.93	0.43	0.53
3/8	1.06	1.12	0.47	0.65
1/2	1.25	1.34	0.57	0.71
3/4	1.44	1.63	0.64	0.89
1	1.63	1.95	0.75	0.94
1 1/4	1.94	2.39	0.84	1.23
1 1/2	2.13	2.68	0.87	1.40
2	2.50	3.28	1.00	1.74
2 1/2	2.94	3.86	1.17	1.80
3	3.38	4.62	1.23	2.18
4	—	—	—	—



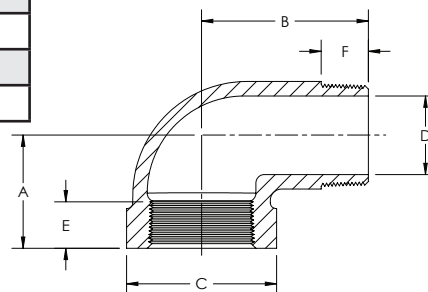
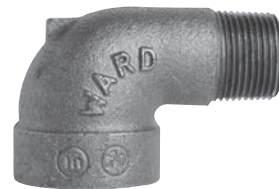
MALLEABLE IRON REDUCING 90° ELL CLASS 300

NPS	Center to End A	Center to End B	Outside Dia. of Band C (min)	Outside Dia. of Band D (min)	Length of Threads E (min)	Length of Threads F (min)	Take Out	Take Out
3/8 x 1/4	—	—	—	—	—	—	—	—
1/2 x 3/8	1.19	1.19	1.34	1.12	0.57	0.47	0.65	0.78
3/4 x 1/2	1.31	1.38	1.63	1.34	0.64	0.57	0.76	0.84
1 x 3/4	1.50	1.56	1.95	1.63	0.75	0.64	0.81	1.01
1 x 1/2	—	—	—	—	—	—	—	—
1 1/4 x 1	—	—	—	—	—	—	—	—
1 1/4 x 3/4	—	—	—	—	—	—	—	—
1 1/2 x 1 1/4	—	—	—	—	—	—	—	—
1 1/2 x 1	—	—	—	—	—	—	—	—
2 x 1 1/2	—	—	—	—	—	—	—	—
2 x 1 1/4	—	—	—	—	—	—	—	—



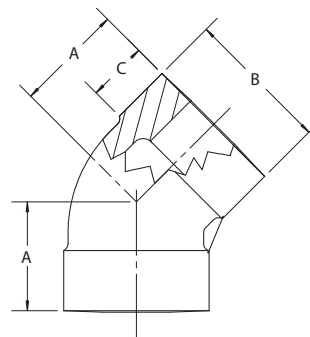
MALLEABLE IRON 90° STREET ELL CLASS 300

NPS	Center to End A	Center to Male End B	Outside Dia. of Band C (min)	Port Dia. Male End D (max)	Length of Internal Threads E (min)	Length of External Threads F (min)	Take Out Male End	Take Out Female End
1/4	0.94	1.44	0.93	0.26	0.43	0.40	1.03	0.53
3/8	1.06	1.63	1.12	0.36	0.47	0.41	1.22	0.65
1/2	1.25	2.00	1.34	0.49	0.57	0.53	1.46	0.71
3/4	1.44	2.19	1.63	0.67	0.64	0.55	1.64	0.89
1	1.63	2.25	1.95	0.88	0.75	0.68	1.82	0.94
1 1/4	1.94	2.88	2.39	1.16	0.84	0.71	2.17	1.23
1 1/2	2.13	3.13	2.68	1.35	0.87	0.72	2.40	1.40
2	2.50	3.69	3.28	1.75	1.00	0.76	2.93	1.74



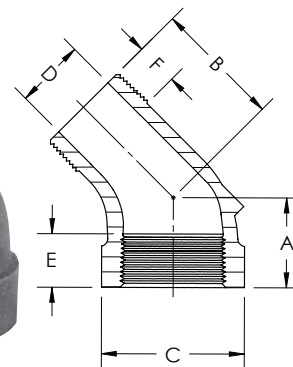
MALLEABLE IRON 45° ELL CLASS 300

NPS	Center to End A	Outside Dia. of Band B (min)	Length of Threads C (min)	Take Out
1/4	0.81	0.93	0.43	0.40
3/8	0.88	1.12	0.47	0.47
1/2	1.00	1.34	0.57	0.46
3/4	1.13	1.63	0.64	0.58
1	1.31	1.95	0.75	0.62
1 1/4	1.50	2.39	0.84	0.79
1 1/2	1.69	2.68	0.87	0.96
2	2.00	3.28	1.00	1.24
2 1/2	—	—	—	—
3	—	—	—	—
4	—	—	—	—



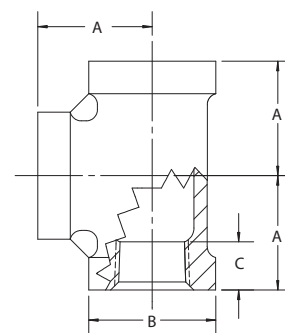
MALLEABLE IRON 45° STREET ELL CLASS 300

NPS	Center to End A	Center to End B	Outside Dia. of Band C (min)	Port Dia. Male D (max)	Internal Length of Threads E (min)	External Length of Threads F (min)	Take Out	Take Out
1/2	—	—	—	—	—	—	—	—
3/4	—	—	—	—	—	—	—	—
1	—	—	—	—	—	—	—	—
1 1/4	1.50	2.13	2.39	1.16	0.84	0.71	1.42	0.79
1 1/2	—	—	—	—	—	—	—	—
2	—	—	—	—	—	—	—	—



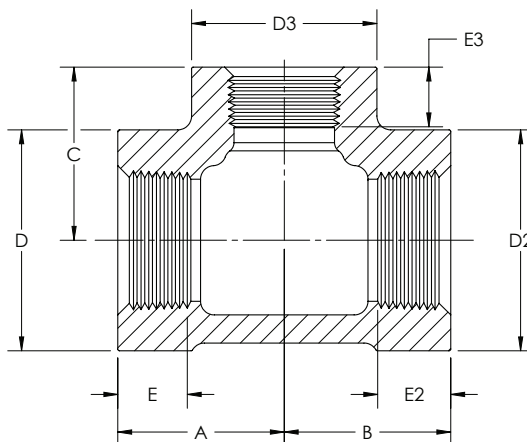
MALLEABLE IRON STRAIGHT TEE CLASS 300

NPS	Center to End A	Outside Dia. of Band B (min)	Length of Threads C (min)	Take Out
1/4	0.94	0.93	0.43	0.53
3/8	1.06	1.12	0.47	0.65
1/2	1.25	1.34	0.57	0.71
3/4	1.44	1.63	0.64	0.89
1	1.63	1.95	0.75	0.94
1 1/4	1.94	2.39	0.84	1.23
1 1/2	2.13	2.68	0.87	1.40
2	2.50	3.28	1.00	1.74
2 1/2	—	—	—	—
3	3.38	4.62	1.23	2.18
4	—	—	—	—



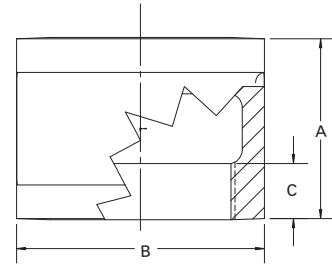
MALLEABLE IRON REDUCING TEES CLASS 300

NPS	Center to End A	Center to End B	Center to End C	Outside Dia. of Band D (min)	Outside Dia. of Band D2 (min)	Outside Dia. of Band D3 (min)	Length of Threads E (min)	Length of Threads E2 (min)	Length of Threads E3 (min)	Take Out	Take Out	Take Out
3/4 x 3/4 x 1/2	1.31	1.31	1.38	1.63	1.63	1.34	0.64	0.64	0.57	0.76	0.76	0.84
3/4 x 3/4 x 3/8	—	—	—	—	—	—	—	—	—	—	—	—
3/4 x 3/4 x 1/4	—	—	—	—	—	—	—	—	—	—	—	—
3/4 x 1/2 x 3/4	—	—	—	—	—	—	—	—	—	—	—	—
3/4 x 1/2 x 1/2	—	—	—	—	—	—	—	—	—	—	—	—
1 x 1 x 3/4	1.50	1.50	1.56	1.95	1.95	1.63	0.75	0.75	0.64	0.81	0.81	1.01
1 x 1 x 1/2	1.44	1.44	1.50	1.95	1.95	1.34	0.75	0.75	0.57	0.75	0.75	0.96
1 x 1 x 1/4	—	—	—	—	—	—	—	—	—	—	—	—
1 x 3/4 x 1	—	—	—	—	—	—	—	—	—	—	—	—
1 x 3/4 x 3/4	—	—	—	—	—	—	—	—	—	—	—	—
1 x 1/2 x 1	—	—	—	—	—	—	—	—	—	—	—	—
1 1/4 x 1 1/4 x 1	1.75	1.75	1.81	2.39	2.39	1.95	0.84	0.84	0.75	1.04	1.04	1.12
1 1/4 x 1 1/4 x 3/4	1.63	1.63	1.75	2.39	2.39	1.63	0.84	0.84	0.64	0.92	0.92	1.20
1 1/4 x 1 1/4 x 1/2	—	—	—	—	—	—	—	—	—	—	—	—
1 1/4 x 1 x 1	—	—	—	—	—	—	—	—	—	—	—	—
1 1/2 x 1 1/2 x 1 1/4	—	—	—	—	—	—	—	—	—	—	—	—
1 1/2 x 1 1/2 x 1	1.81	1.81	2.00	2.68	2.68	1.95	0.87	0.87	0.75	1.08	1.08	1.31
1 1/2 x 1 1/2 x 3/4	1.69	1.69	1.88	2.68	2.68	1.63	0.87	0.87	0.64	0.96	0.96	1.33
1 1/2 x 1 1/2 x 1/2	1.63	1.63	1.81	2.68	2.68	1.34	0.87	0.87	0.57	0.90	0.90	1.27
2 x 2 x 1 1/2	2.25	2.25	2.38	3.28	3.28	2.68	1.00	1.00	0.87	1.49	1.49	1.65
2 x 2 x 1 1/4	—	—	—	—	—	—	—	—	—	—	—	—
2 x 2 x 1	2.00	2.00	2.25	3.28	3.28	1.95	1.00	1.00	0.75	1.24	1.24	1.56
2 x 2 x 3/4	1.81	1.81	2.13	3.28	3.28	1.63	1.00	1.00	0.64	1.05	1.05	1.58
2 x 2 x 1/2	1.75	1.75	2.06	3.28	3.28	1.34	1.00	1.00	0.57	0.99	0.99	1.52
2 x 1 1/2 x 2	—	—	—	—	—	—	—	—	—	—	—	—
2 1/2 x 2 1/2 x 2	—	—	—	—	—	—	—	—	—	—	—	—
2 1/2 x 2 1/2 x 1 1/2	—	—	—	—	—	—	—	—	—	—	—	—
3 x 3 x 2	2.81	2.81	3.13	4.62	4.62	3.28	1.23	1.23	1.00	1.61	1.61	2.37



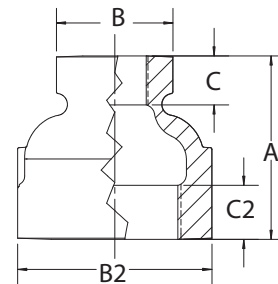
MALLEABLE IRON STRAIGHT COUPLING CLASS 300

NPS	Length of Coupling A (min)	Outside Dia. of Band B (min)	Length of Threads C (min)	Take Out
1/4	1.37	0.93	0.43	0.28
3/8	1.62	1.12	0.47	0.40
1/2	1.87	1.34	0.57	0.40
3/4	2.12	1.63	0.64	0.51
1	2.37	1.95	0.75	0.50
1 1/4	2.87	2.39	0.84	0.73
1 1/2	2.87	2.68	0.87	0.71
2	3.62	3.28	1.00	1.05
2 1/2	—	—	—	—
3	—	—	—	—



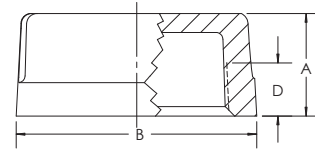
MALLEABLE IRON REDUCING COUPLING CLASS 300

NPS	Length of Coupling A	Outside Dia. of Band Small End B (min)	Outside Dia. of Large End B2 (min)	Length of Threads Small End C (min)	Length of Threads Large End C2 (min)	Take Out	Take Out
3/8 x 1/4	1.44	0.93	1.20	0.43	0.47	0.31	0.32
1/2 x 3/8	1.69	1.12	1.34	0.47	0.57	0.31	0.44
1/2 x 1/4	1.69	0.93	1.34	0.43	0.57	0.31	0.44
3/4 x 1/2	1.75	1.34	1.63	0.57	0.64	0.33	0.34
3/4 x 3/8	—	—	—	—	—	—	—
3/4 x 1/4	—	—	—	—	—	—	—
1 x 3/4	2.00	1.63	1.95	0.64	0.75	0.32	0.45
1 x 1/2	2.00	1.34	1.95	0.57	0.75	0.32	0.47
1 x 3/8	—	—	—	—	—	—	—
1 x 1/4	—	—	—	—	—	—	—
1 1/4 x 1	2.38	1.95	2.39	0.75	0.84	0.48	0.51
1 1/4 x 3/4	2.38	1.63	2.39	0.64	0.84	0.48	0.64
1 1/4 x 1/2	—	—	—	—	—	—	—
1 1/2 x 1 1/4	2.69	2.39	2.68	0.84	0.87	0.62	0.64
1 1/2 x 1	2.69	1.95	2.68	0.75	0.87	0.62	0.66
1 1/2 x 3/4	2.69	1.63	2.68	0.64	0.87	0.62	0.80
1 1/2 x 1/2	—	—	—	—	—	—	—
2 x 1 1/2	3.19	2.68	3.28	0.87	1.00	0.84	0.87
2 x 1 1/4	3.19	2.39	3.28	0.84	1.00	0.84	0.89
2 x 1	3.19	1.95	3.28	0.75	1.00	0.84	0.91
2 x 3/4	—	—	—	—	—	—	—
2 x 1/2	—	—	—	—	—	—	—
2 1/2 x 2	—	—	—	—	—	—	—
2 1/2 x 1 1/2	—	—	—	—	—	—	—
3 x 2 1/2	—	—	—	—	—	—	—
3 x 2	—	—	—	—	—	—	—
3 x 1 1/2	—	—	—	—	—	—	—
4 x 3	—	—	—	—	—	—	—
4 x 2	—	—	—	—	—	—	—



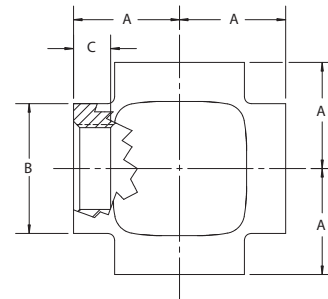
MALLEABLE IRON PIPE CAPS CLASS 300

NPS	Overall Height A	Outside Dia. of Band B (min)	Length of Threads C (min)
1/4	0.78	0.93	0.43
3/8	0.83	1.12	0.47
1/2	0.98	1.34	0.57
3/4	1.08	1.63	0.64
1	1.26	1.95	0.75
1 1/4	1.38	2.39	0.84
1 1/2	1.43	2.68	0.87
2	1.68	3.28	1.00
2 1/2	—	—	—
3	—	—	—



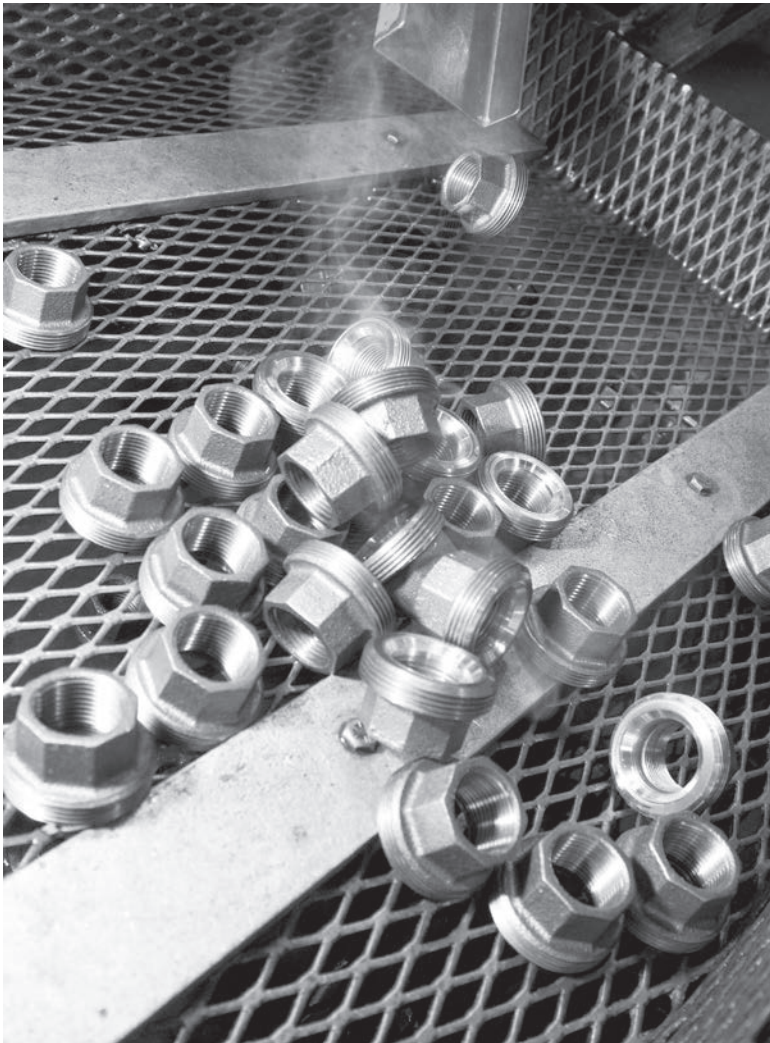
MALLEABLE IRON CROSS CLASS 300

NPS	Center to End A (min)	Outside Dia. of Band B (min)	Length of Threads C (min)	Take Out
1/4	—	—	—	—
1/2	1.25	1.34	0.57	0.71
3/4	1.44	1.63	0.64	0.89
1	1.63	1.95	0.75	0.94
1 1/4	1.94	2.39	0.84	1.23
1 1/2	2.13	2.68	0.87	1.40
2	2.50	3.28	1.00	1.74



WARD UNIONS

Rugged-Strong Made of the Best Quality Malleable Iron



Extra heavy brass seat ring accurately machined to insure perfect seating under difficult conditions.

- Suitably Chamfered
- Rust Resistant Treatment
- Properly Threaded

Continuous, careful inspection during each manufacturing operation.

TYPES AVAILABLE

- Class 150 Brass-to-Iron
- Class 250 Brass-to-Iron
- Class 300 Brass-to-Iron
- Class 150 All Iron Seat
- Class 300 All Iron Seat
- Class 150 Gasket Unions
- Class 300 Brass-to-Brass
- Class 150 Di-Electric Unions
(Female iron pipe to sweat copper)

SECTION 3

QUALITY PIPE UNIONS

Throughout the entire manufacturing process of WARD unions, special emphasis is placed upon the control and accuracy of each operation.

WARD unions are made from closely grained, high tensile iron and are produced under expert laboratory supervision. Modern methods of foundry practice and carefully supervised molding are combined to produce castings that are smooth and clean in every respect and free from imperfection.

WARD unions are manufactured in strict accordance with the requirements for threaded pipe unions standard, developed by American Society of Mechanical Engineers (ASME) and published as an American National Standard. Each opening is chamfered permitting easy assembly. WARD unions make up easily and pull tight for a sealed assembly.

Continuous and careful inspection by trained employees during and after each operation produces quality products which will give satisfaction to the user.



Temp.F	PSI		
	Class 150	Class 250	Class 300
-20 to 150	300	500	600
200	265	455	550
250	225	405	505
300	185	460	460
350	150	315	415
400	110	270	370
450	75	225	325
500	*	180	280
550	*	130	230

Material: ASTM A197

Dimensions: ASME B16.39
ANSI/ASME B1.20.1

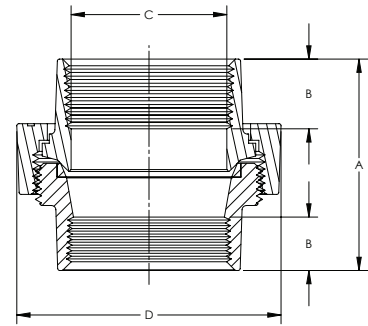
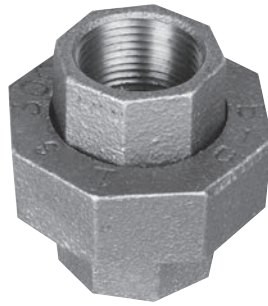
Pressure Ratings: ASME B16.39

Coatings: ASTM A153,
ASTM B633

Additional Specifications: UL, ULC and FM where applicable

WARD UNION BRASS TO IRON SEAT CLASS 150

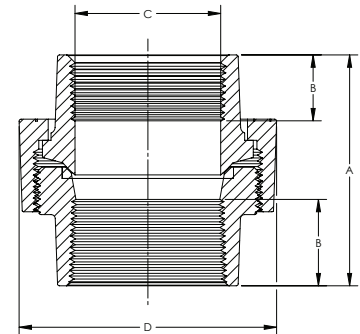
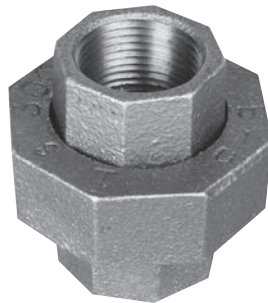
NPS	Overall Length A (min)	Length of Threads B (min)	Thru Hole C (min)	Width of Nut D (min)
1/8	1.26	0.30	0.21	0.93
1/4	1.44	0.32	0.36	1.10
3/8	1.61	0.36	0.52	1.26
1/2	1.72	0.43	0.61	1.45
3/4	1.94	0.50	0.80	1.71
3/4 X 1/2	1.94	0.50	0.80	1.71
1	2.06	0.58	1.00	2.07
1 1/4	2.26	0.67	1.31	2.50
1 1/2	2.41	0.70	1.55	2.82
2	2.75	0.75	2.03	3.41
2 1/2	3.22	0.92	2.38	4.12
3	3.50	0.98	3.00	4.75
*4	3.85	1.08	4.03	6.00



*UL Standards not applicable to 4" size union

WARD UNION BRASS TO IRON SEAT CLASS 250

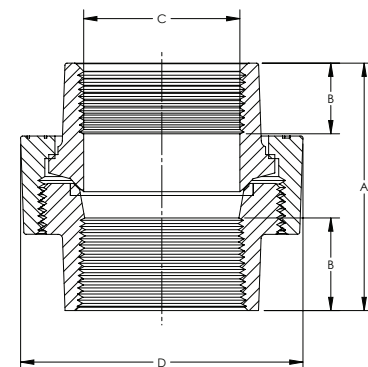
NPS	Overall Length A (min)	Length of Threads B (min)	Thru Hole C (min)	Width of Nut D (min)
1/8	1.26	0.30	0.21	0.93
1/4	1.55	0.43	0.30	1.11
3/8	1.71	0.47	0.42	1.26
1/2	1.18	0.57	0.54	1.45
3/4	2.07	0.64	0.74	1.71
1	2.31	0.75	0.95	2.07
1 1/4	2.62	0.84	1.27	2.57
1 1/2	2.78	0.87	1.50	2.89
2	3.31	1.00	1.93	3.48
2 1/2	3.52	1.17	2.32	4.15
3	3.84	1.23	2.90	4.69
*4	4.39	1.33	3.82	6.47



*UL Standards not applicable to 4" size union

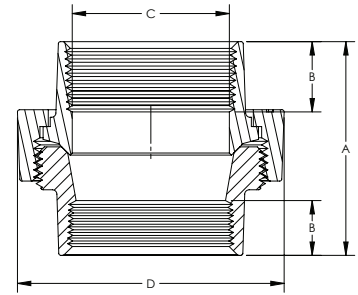
WARD UNION BRASS TO IRON SEAT CLASS 300

NPS	Overall Length A (min)	Length of Threads B (min)	Thru Hole C (min)	Width of Nut D (min)
1/8	1.26	0.30	0.21	1.26
1/4	1.55	0.43	0.30	1.55
3/8	1.71	0.47	0.42	1.71
1/2	1.81	0.57	0.54	1.81
3/4	2.12	0.64	0.74	2.12
1	2.31	0.75	0.95	2.31
1 1/4	2.66	0.84	1.27	2.66
1 1/2	2.85	0.87	1.50	2.85
2	2.23	1.00	1.93	3.23
2 1/2	3.33	1.17	2.320	3.33
3	4.09	1.23	2.90	4.09
4	—	—	—	—



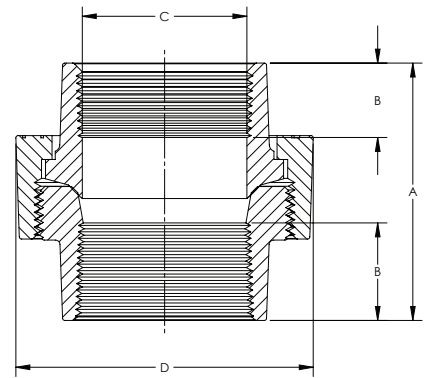
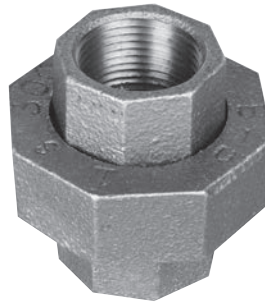
WARD UNION IRON TO IRON SEAT CLASS 150

NPS	Overall Length A (min)	Length of Threads B (min)	Thru Hole C (min)	Width of Nut D (min)
1/8	1.26	0.30	0.21	1.00
1/4	1.44	0.32	0.36	1.25
3/8	1.61	0.36	0.52	1.50
1/2	1.72	0.43	0.61	1.68
3/4	1.94	0.50	0.80	2.00
1	2.06	0.58	1.00	2.25
1 1/4	2.26	0.67	1.31	2.81
1 1/2	2.41	0.70	1.55	3.06
2	2.75	0.75	2.03	3.68
2 1/2	3.22	0.92	2.38	4.68
3	3.50	0.98	3.00	5.18



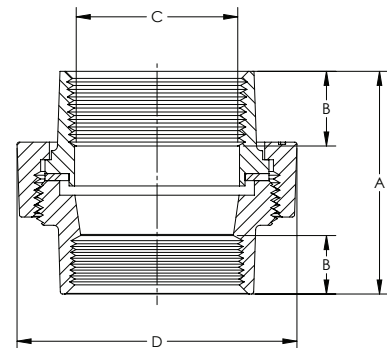
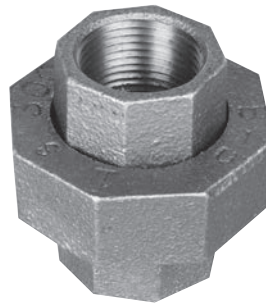
WARD UNION IRON TO IRON SEAT CLASS 300

NPS	Overall Length A (min)	Length of Threads B (min)	Thru Hole C (min)	Width of Nut D (min)
1/8	1.26	0.30	0.21	1.06
1/4	1.55	0.43	0.30	1.30
3/8	1.71	0.47	0.42	1.31
1/2	1.81	0.57	0.54	1.68
3/4	2.12	0.64	0.74	2.25
1	2.31	0.75	0.95	2.50
1 1/4	2.66	0.84	1.27	2.96
1 1/2	2.85	0.87	1.50	3.28
2	3.23	1.00	1.93	3.93
2 1/2	3.33	1.17	2.32	4.53
3	4.09	1.23	2.90	5.31



WARD GASKET TYPE UNION MALLEABLE IRON

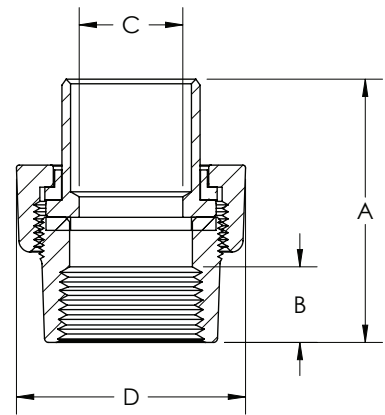
NPS	Overall Length A (min)	Length of Threads B (min)	Thru Hole C (min)	Width of Nut D (min)
3/8	1.61	0.36	0.52	1.26
1/2	1.72	0.43	0.61	1.45
3/4	1.94	0.50	0.80	1.71
1	2.06	0.58	1.00	2.07
1 1/4	2.26	0.67	1.31	2.50
1 1/2	2.41	0.70	1.55	2.82
2	2.75	0.75	2.03	3.41



WARD DI-ELECTRIC UNION IRON TO BRASS

NPS	Overall Length A (min)	Length of Threads B (min)	Thru Hole C (min)	Width of Nut D (min)
*1/2 x 1/2	1.87	0.57	0.54	1.68
*3/4 x 1/2	1.87	0.64	0.74	1.68
*3/4 x 3/4	1.31	0.64	0.74	1.68

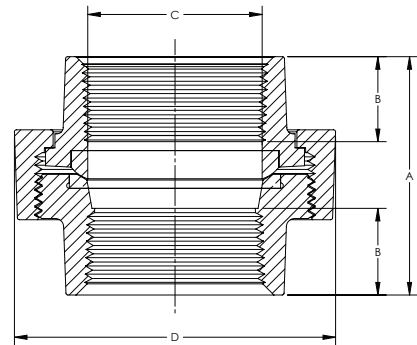
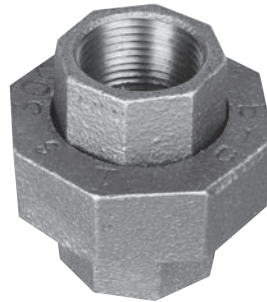
* Manufactured to WARD specifications



WARD UNION BRASS TO BRASS SEAT CLASS 300

NPS	Overall Length A (min)	Length of Threads B (min)	Thru Hole C (min)	Width of Nut D (min)
1/4	1.55	0.43	0.30	1.33
3/8	1.71	0.47	0.42	1.50
1/2	1.81	0.57	0.54	1.76
3/4	2.12	0.64	0.74	2.15
1	2.31	0.75	0.95	2.48
1 1/4	2.66	0.84	1.27	3.02
1 1/2	2.85	0.87	1.50	3.28
2	2.23	1.00	1.93	3.96
2 1/2	3.33	1.17	2.32	4.72
3	4.09	1.23	2.90	5.37
*4	4.47	1.33	3.82	7.00

*UL Standards not applicable to 4" size unions



SECTION 4

PLUGS AND BUSHINGS

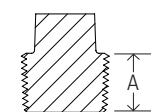
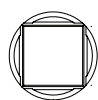
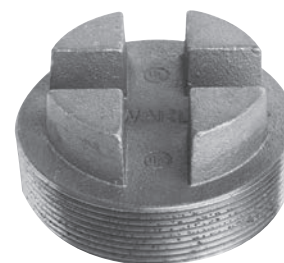
PLUGS

NPS	Thread Length A (min)
1/8	0.37
1/4	0.44
3/8	0.48
1/2	0.56
3/4	0.63
1	0.75
1 1/4	0.80
1 1/2	0.83
2	0.88
2 1/2	1.07
3	1.13
3 1/2	1.18
4	1.22
5	1.31
6	1.40
8	1.57
10	1.92

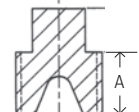
WARD Plugs and Bushings are produced in both Malleable Iron and Cast Iron grades. The iron from which they are made is held to strict formula by careful chemical analysis and control.

Tapping is done on the most modern type of threading machines. Every fitting is hand sorted and inspected to eliminate defective castings.

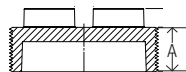
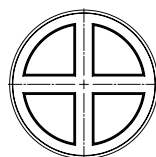
Ward plugs and bushings comply with the standards and specifications seen below.



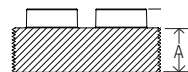
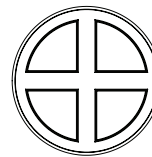
SOLID PLUG



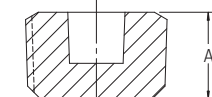
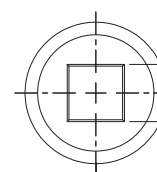
CORED PLUG



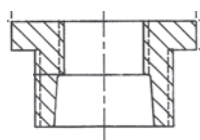
CORED BAR HEAD



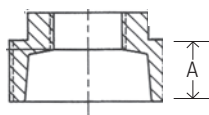
SOLID BAR HEAD



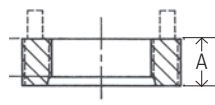
COUNTERSUNK



OUTSIDE HEAD



INSIDE HEAD



FACE

BUSHINGS

NPS	External Thread Length (min)	Internal Thread Length (min)
1/4	0.44	0.32
3/8	0.48	0.36
1/2	0.56	0.43
3/4	0.63	0.50
1	0.75	0.58
1 1/4	0.80	0.67
1 1/2	0.83	0.70
2	0.88	0.75
2 1/2	1.07	0.92
3	1.13	0.98
3 1/2	1.18	1.03
4	1.22	1.08
5	1.31	1.18
6	1.40	1.28
8	1.57	—
10	1.92	—

Material: ASTM A197 for malleable iron
ASTM A126 Class A Minimum for cast iron

Dimensions: ASME B16.14
ANSI/ASME B1.20.1

Pressure Ratings: ASME B16.3 for malleable iron
ASME B16.4 for cast iron

Coatings: ASTM A153
ASTM B633

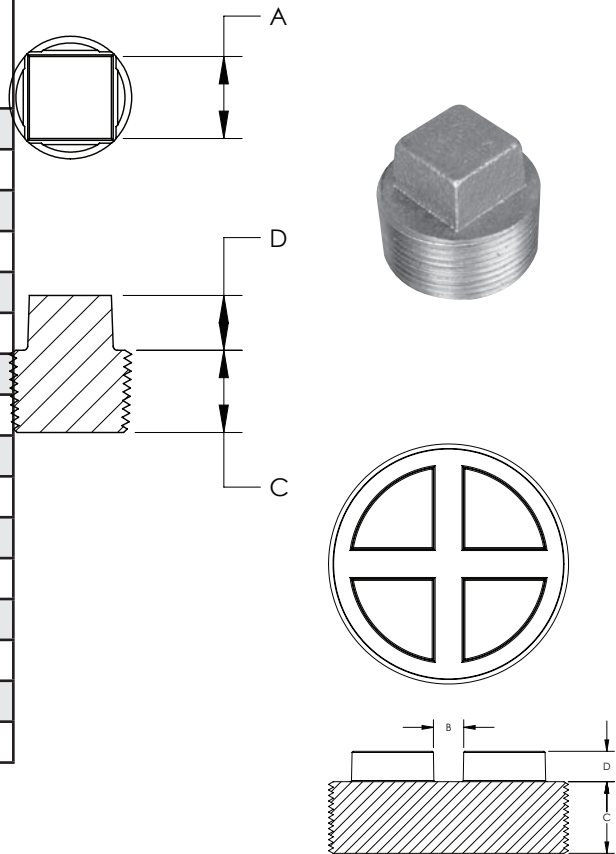
Additional Specifications: UL, ULC, FM, NSF 61 and
NSF 61 Annex G where applicable

CAST IRON SOLID PLUGS CLASS 125

NPS	Nominal Width Across Flats A	Distance Between Lugs B (min)	Length of Threads C (min)	Height of Square D (min)
*1/8	9/32	—	0.37	0.24
*1/4	3/8	—	0.44	0.28
*1/2	9/16	—	0.56	0.38
*3/4	5/8	—	0.63	0.44
*3/8	7/16	—	0.48	0.31
1	13/16	—	0.75	0.50
1 1/4	15/16	—	0.80	0.56
1 1/2	1 1/8	—	0.83	0.62
2	1 5/16	—	0.88	0.68
2 1/2	1 1/2	—	1.07	0.74
3	1 11/16	—	1.13	0.80
3 1/2	—	—	—	—
+ 4	—	7/8	1.22	1.00
+ 5	—	7/8	1.31	1.00
+ 6	—	1 1/4	1.40	1.25
+8	—	—	—	—

*Made from Cast Iron or Steel

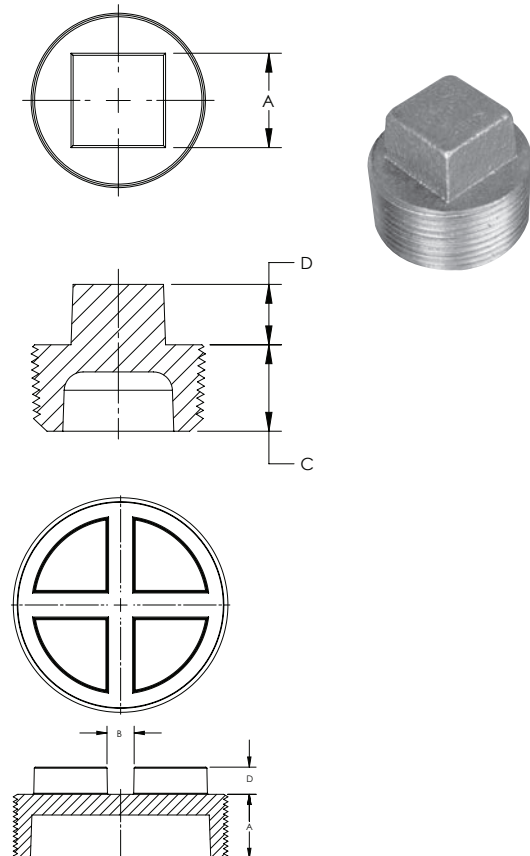
+ Bar Head



CAST IRON CORED PLUGS CLASS 125

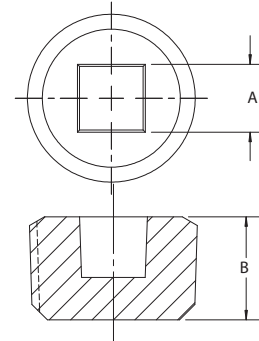
NPS	Nominal Width Across Flats A	Distance Between Lugs B (min)	Length of Threads C (min)	Height of Square D (min)
1/2	9/16	---	0.56	0.28
3/4	5/8	---	0.63	0.44
1	13/16	---	0.75	0.50
1 1/4	15/16	---	0.80	0.56
1 1/2	1 1/8	---	0.83	0.62
2	1 5/16	---	0.88	0.68
2 1/2	1 1/2	---	1.07	0.74
3	1 11/16	---	1.13	0.80
3 1/2	1 7/8	---	1.18	0.86
4 SQUARE	2 1/16	---	1.22	0.92
+ 4	---	7/8	1.22	1.00
+ 5	---	7/8	1.31	1.00
+ 6	---	1 1/4	1.40	1.25
+8	---	---	---	---

+ Bar Head



COUNTERSUNK PLUGS CLASS 125 AND 150

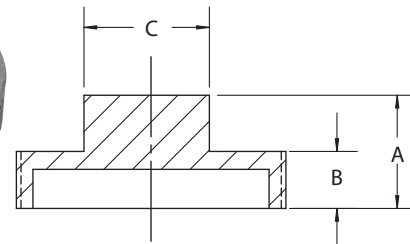
NPS	Nominal Size of Square A	Length of Threads B (min)
+1/4	1/4	0.44
+3/8	5/16	0.48
1/2	3/8	0.56
3/4	1/2	0.63
1	1/2	0.75
1 1/4	3/4	0.80
1 1/2	3/4	0.83
2	7/8	0.88
2 1/2	1 1/8	1.07
3	1 3/8	1.13
3 1/2	1 1/2	1.18



+Steel

CAST IRON HEX HEAD CLEANOUT PLUGS CLASS 125

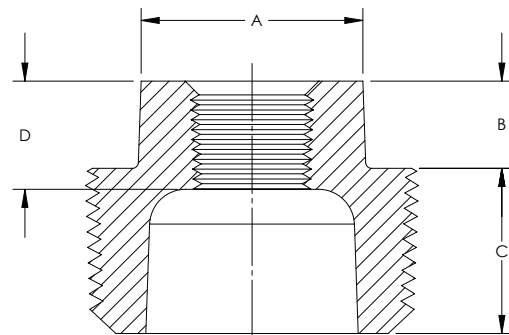
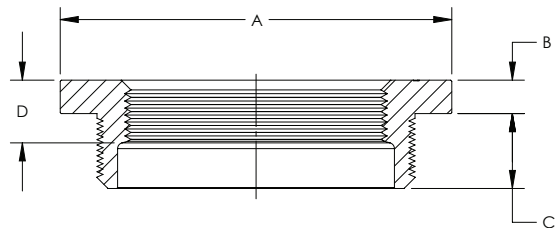
NPS	Overall Height A	Length of Threads B (min)	Nominal Width Across Flats C
1 1/4	1.03	0.53	1.01
1 1/2	1.02	0.52	1.01
2 1/2	1.25	0.62	1.20
3	1.37	0.68	1.40
4	1.40	0.77	1.54



* Manufactured to WARD specifications

CAST IRON HEXAGON BUSHINGS CLASS 125

NPS	Width of Head A	Height of Head B	Length of External Threads C (min)	Length of Internal Threads D (min)	Inside or Outside Head
1 1/4 x 3/4	1.76	0.28	0.80	0.50	Outside
1 1/4 x 1/2	1.34	0.34	0.80	0.43	Inside
1 1/4 x 3/8	1.12	0.34	0.80	0.36	Inside
1 1/4 x 1/4	1.12	0.34	0.80	0.32	Inside
*1 1/4 x 1/8	1.12	0.34	0.80	0.32	Inside
1 1/2 x 1	2.00	0.31	0.83	0.58	Outside
1 1/2 x 3/4	1.63	0.37	0.83	0.50	Inside
1 1/2 x 1/2	1.34	0.37	0.83	0.43	Inside
1 1/2 x 3/8	—	—	—	—	Inside
1 1/2 x 1/4	1.12	0.37	0.83	0.32	Inside
*1 1/2 x 1/8	1.12	0.37	0.83	0.32	Inside
2 x 1 1/4	2.48	0.34	0.88	0.67	Outside
2 x 1	1.95	0.41	0.88	0.58	Inside
2 x 3/4	1.63	0.41	0.88	0.50	Inside
2 x 1/2	1.34	0.41	0.88	0.43	Inside
2 x 3/8	1.12	0.41	0.88	0.36	Inside
2 x 1/4	1.12	0.41	0.88	0.32	Inside
*2 x 1/8	1.12	0.41	0.88	0.32	Inside
2 1/2 x 1 1/2	2.68	0.44	1.07	0.70	Outside
2 1/2 x 1 1/4	2.39	0.44	1.07	0.67	Inside
2 1/2 x 1	1.95	0.44	1.07	0.58	Inside
2 1/2 x 3/4	1.63	0.44	1.07	0.50	Inside
2 1/2 x 1/2	1.34	0.44	1.07	0.43	Inside
*2 1/2 x 3/8	1.34	0.44	1.07	0.36	Inside
3 x 2 1/2	3.86	0.40	1.13	0.92	Outside
3 x 2	3.28	0.48	1.13	0.75	Outside
3 x 1 1/2	2.68	0.48	1.13	0.70	Inside
3 x 1 1/4	2.390	0.48	1.13	0.67	Inside
3 x 1	1.95	0.48	1.13	0.58	Inside
3 x 3/4	1.63	0.48	1.13	0.50	Inside
3 x 1/2	—	—	—	—	Inside
*3 x 1/4	2.68	0.48	1.13	0.32	Inside
3 1/2 x 2 1/2	3.86	0.52	1.18	0.92	Outside
3 1/2 x 2	3.28	0.52	1.18	0.75	Inside

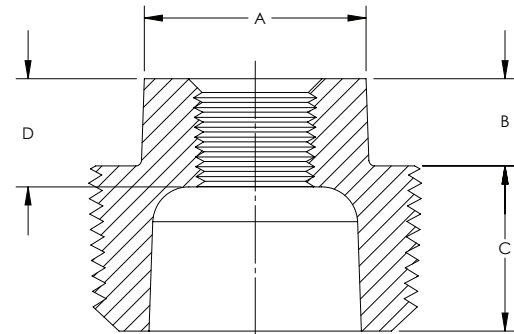
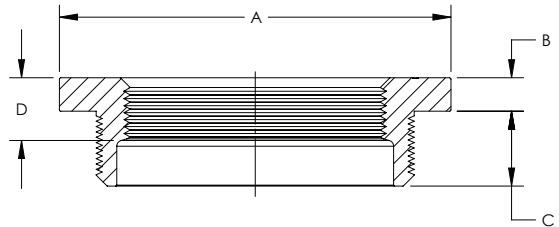


Continued on next page

* Manufactured to WARD specifications

CAST IRON HEXAGON BUSHINGS CLASS 125

NPS	Width of Head A	Height of Head B	Length of External Threads C (min)	Length of Internal Threads D (min)	Inside or Outside Head
3 1/2 x 1 1/2	—	—	—	—	Inside
3 1/2 x 1 1/4	2.39	0.52	1.18	0.67	Inside
3 1/2 x 1	1.95	0.52	1.18	0.58	Inside
*3 1/2 x 3/4	—	—	—	—	Inside
*3 1/2 x 1/2	—	—	—	—	Inside
*3 1/2 x 1/4	1.95	0.52	1.18	0.32	Inside
4 x 3	4.62	0.50	1.22	0.98	Outside
4 x 2 1/2	3.86	0.60	1.22	0.92	Inside
4 x 2	3.28	0.60	1.22	0.75	Inside
4 x 1 1/2	2.68	0.60	1.22	0.70	Inside
4 x 1 1/4	2.39	0.60	1.22	0.67	Inside
4 x 1	1.95	0.60	1.22	0.58	Inside
*4 x 3/4	—	—	—	—	Inside
*4 x 1/2	1.95	0.60	1.22	0.50	Inside
5 x 4	5.79	0.50	1.31	1.08	Outside
5 x 3 1/2	5.20	0.60	1.31	1.03	Outside
5 x 3	4.62	0.60	1.31	0.98	Inside
5 x 2 1/2	3.86	0.60	1.31	0.92	Inside
5 x 2	3.28	0.60	1.36	0.75	Inside
*5 x 1 1/2	3.28	0.60	1.31	0.70	Inside
*5 x 1 1/4	3.28	0.60	1.31	0.67	Inside
6 x 5	7.05	0.63	1.40	1.18	Outside
6 x 4	5.79	0.75	1.40	1.08	Inside
6 x 3	4.62	0.75	1.40	0.98	Inside
6 x 2 1/2	3.86	0.75	1.40	0.92	Inside
6 x 2	3.28	0.75	1.40	0.75	Inside
8 x 6	8.28	0.83	1.57	1.28	Outside
8 x 5	7.05	0.83	1.57	1.18	Inside
8 x 4	—	—	—	—	Inside
8 x 3	—	—	—	—	Inside

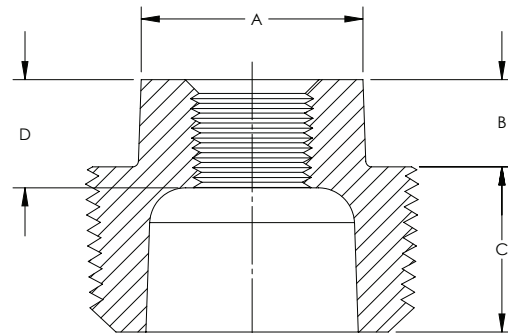
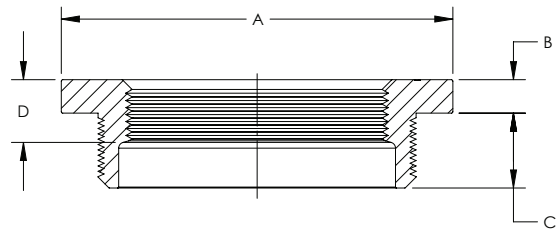


* Manufactured to WARD specifications

MALLEABLE IRON HEXAGON BUSHINGS CLASS 150

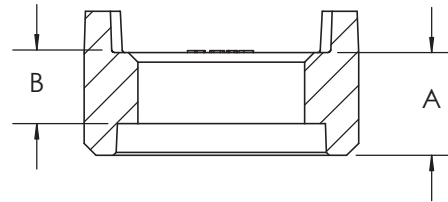
NPS	Width of Head A	Height of Head B	Length of External Threads C (min)	Length of Internal Threads D (min)	Inside or Outside Head
*1/4 x 1/8	0.64	0.14	0.44	0.26	Outside
*3/8 x 1/4	0.68	0.160	0.48	0.40	Outside
*3/8 x 1/8	0.68	0.16	0.48	0.25	Outside
*1/2 x 3/8	0.87	0.19	0.56	0.36	Outside
*1/2 x 1/4	0.87	0.19	0.56	0.32	Outside
*1/2 x 1/8	0.87	0.19	0.56	0.25	Outside
*3/4 x 1/2	1.15	0.22	0.63	0.53	Outside
*3/4 x 3/8	1.15	0.22	0.63	0.36	Outside
*3/4 x 1/4	1.15	0.22	0.63	0.32	Outside
*3/4 x 1/8	1.15	0.22	0.63	0.25	Outside
*1 x 3/4	1.42	0.25	0.75	0.50	Outside
*1 x 1/2	1.42	0.25	0.75	0.43	Outside
*1 x 3/8	1.12	0.30	0.75	0.36	Inside
*1 x 1/4	1.12	0.30	0.75	0.32	Inside
*1 x 1/8	1.12	0.30	0.75	0.25	Inside
1 1/4 x 1	1.76	0.28	0.80	0.58	Outside
1 1/2 x 1 1/4	2.00	0.31	0.83	0.77	Outside
2 x 1 1/2	2.48	0.34	0.88	0.70	Outside
2 1/2 x 2	2.98	0.37	1.07	0.75	Outside
3 1/2 x 3	4.62	0.43	1.18	0.98	Outside
4 x 3 1/2	5.20	0.50	1.22	1.03	Outside

* Made from Malleable Iron or Steel



CAST IRON FLUSH BUSHINGS CLASS 125

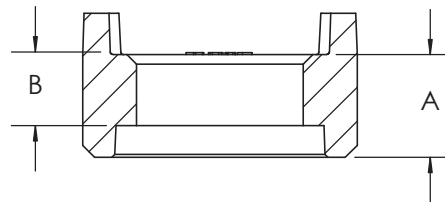
NPS	Length of External Threads A (min)	Length of Internal Threads B (min)
1 1/4 x 3/4	0.80	0.500
1 1/4 x 1/2	0.80	0.43
1 1/2 x 1	0.83	0.58
1 1/2 x 3/4	0.83	0.50
1 1/2 x 1/2	0.83	0.43
2 x 1 1/4	0.88	0.67
2 x 1	0.88	0.58
2 x 3/4	0.88	0.50
2 x 1/2	0.88	0.43
2 1/2 x 1 1/2	1.07	0.70
2 1/2 x 1 1/4	1.07	0.67
2 1/2 x 1	---	---
2 1/2 x 3/4	---	---
3 x 2	1.13	0.75
3 x 1 1/2	1.13	0.70
3 x 1 1/4	1.13	0.67
3 x 1	1.13	0.58
3 x 3/4	1.13	0.50
3 1/2 x 2 1/2	1.18	0.92
3 1/2 x 2	1.18	0.75
3 1/2 x 1 1/2	1.18	0.70
4 x 3	1.22	0.98
4 x 2 1/2	1.22	0.92
4 x 2	1.22	0.75
5 x 4	1.31	1.08
5 x 3	1.31	1.03
6 x 5	1.40	1.18
6 x 4	1.40	1.08
8 x 6	1.57	1.28
8 x 5	1.57	1.18



MALLEABLE IRON FLUSH BUSHINGS CLASS 150

NPS	Overall Height A	Length of External Threads B (min)
+1/4 x 1/8	0.44	0.26
+3/8 x 1/4	0.48	0.40
+1/2 x 3/8	0.56	0.41
+1/2 x 1/4	0.56	0.32
+1/2 x 1/8	0.56	0.25
+3/4 x 1/2	0.63	0.53
+3/4 x 3/8	0.63	0.36
+3/4 x 1/4	0.63	0.32
1 x 3/4	0.75	0.50
1 x 1/2	0.75	0.43
1 x 3/8	0.75	0.43
1 x 1/4	0.75	0.36
1 1/4 x 1	0.80	0.58
1 1/2 x 1 1/4	0.83	0.77
2 x 1 1/2	0.88	0.70
2 1/2 x 2	1.07	0.75
3 x 2 1/2	1.13	0.92
3 1/2 x 3	1.18	0.98
4 x 3 1/2	1.22	1.03

+Steel



STEEL HEX SOCKET PLUGS

NPS
1/8
1/4
3/8
1/2
3/4

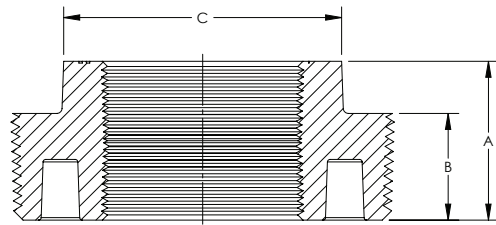
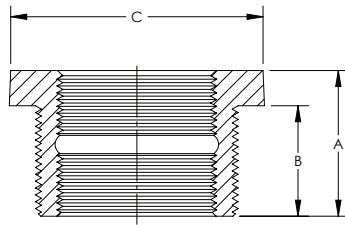
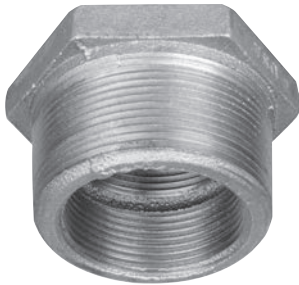


CAST IRON DOUBLE TAP TANK BUSHINGS (Heavy Type Only)

NPS	Overall Height A	Length of External Threads B (min)	Width of Head C	Inside or Outside Head
*1 x 3/4 x 3/4	1.57	1.16	---	---
*1 x 1/2 x 1/2	1.57	1.16	1.46	Outside
*1 1/2 x 1 x 1	1.58	1.16	2.02	Outside
*2 x 1 1/2 x 1 1/2	1.74	1.33	2.59	Outside
*2 x 1 1/4 x 1 1/4	1.77	1.33	2.59	Outside
*2 x 1 x 1	1.57	1.16	2.55	Outside
*2 x 3/4 x 3/4	1.57	1.16	2.55	Outside
*2 x 1/2 x 1/2	1.57	1.16	2.55	Outside
*2 x 3/8 x 3/8	1.57	1.16	2.55	Outside
*3 x 2 x 2	2.31	1.72	3.91	Outside
*3 x 1 x 1	2.31	1.72	3.91	Outside
*4 x 3 x 3	2.30	1.72	4.67	Outside
*4 x 2 1/2 x 2 1/2	2.30	1.55	3.30	Outside
*4 x 2 x 2	2.30	1.55	3.30	Inside
*4 x 1 1/2 x 1 1/2	2.30	1.55	3.30	Inside
*4 x 1 x 1	2.30	1.55	3.30	Inside



* Manufactured to WARD specifications





WARD Top Beam clamps and "C" clamps are manufactured from malleable iron with hardened steel cup point set screws and lock nuts. The finish is either black or galvanized.

Top Beam clamps are recommended for use under roof installations with bar joist type construction, or for attachment to the top flange of steel shapes.

"C" clamps are recommended for attachment to American Standard I-Beams and wide flange beams, where thickness of flange does not exceed .75 inches.

Care should be taken not to overtighten the set screw.

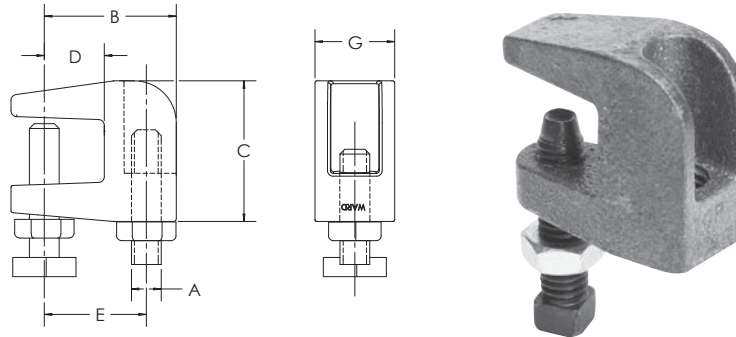
Material: ASTM A197

Coatings: ASTM A153
ASTM B633

Additional Specifications: UL, ULC AND FM where applicable

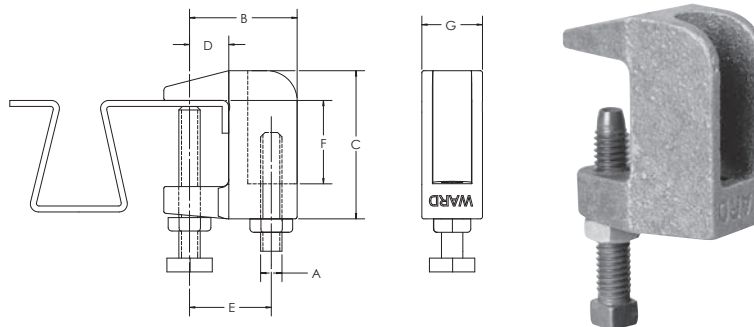
MALLEABLE IRON SMALL MOUTH TOP BEAM CLAMP

NPS	Thread Size	Recommended Pipe Size	Type	Dim A	Dim B	Dim C	Dim D	Dim E	Dim F	Dim G
3/8	3/8 - 16UNC	3/4 - 4	SMALL	0.37	1.37	1.50	0.62	1.06	0.75	0.75
1/2	1/2 13UNC	5 - 8	SMALL	0.50	1.50	1.62	0.62	1.18	0.75	0.87



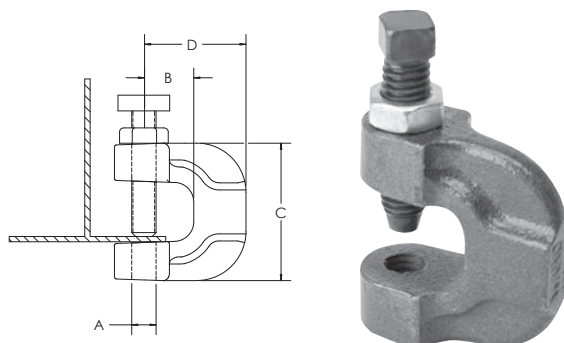
MALLEABLE IRON LARGE MOUTH TOP BEAM CLAMP

NPS	Thread Size	Recommended Pipe Size	Type	Dim A	Dim B	Dim C	Dim D	Dim E	Dim F	Dim G
3/8	3/8- 16UNC	3/4 - 4	LARGE	0.37	1.56	1.50	0.62	1.06	0.75	0.98
1/2	1/2- 13UNC	5 - 8	LARGE	0.500	1.56	1.62	0.62	1.18	0.75	0.98



MALLEABLE IRON "C" CLAMP

NPS	Thread Size	Recommended Pipe Size	Type	Dim A	Dim B	Dim C	Dim D
3/8	3/8 -16UNC	3/4 - 2	LARGE	0.37	0.625	1.750	1.30
1/2	1/2-13UNC	2 1/2 - 4	LARGE	0.50	0.625	1.750	1.30



SECTION 6 STANDARD CAST IRON PIPE FITTINGS CLASS 125, 250



The iron from which Class 125 cast iron fittings are made is held to strict formula by careful chemical analysis and control.

Tapping is done on the most modern machines. All tappings are to USA Standards for iron pipe threads. Straightness and correct depth of threads is assured through continuous capable inspection, by careful trained inspectors.

Every fitting is hand sorted and inspected to eliminate defective castings.

WARD fittings are made to specifications published as American National Standards for pipe fittings.

A chamfer is cut or cast in all openings, permitting easy entrance of pipe and preventing damage to the first thread in handling and threading.

Because of the close attention paid to formula control and the use of modern precision equipment we are able to produce castings of rugged strength and the ability to make a water tight seal.

NPS	O.D. of Band (min)	Thread Length (min)	Metal Thickness (min)
1/4	0.97	0.36	0.11
3/8	1.16	0.40	0.12
1/2	1.38	0.47	0.13
3/4	1.67	0.54	0.15
1	1.99	0.62	0.17
1 1/4	2.43	0.71	0.18
1 1/2	2.72	0.74	0.20
2	3.32	0.79	0.22
2 1/2	3.90	0.96	0.24
3	4.66	1.02	0.26
3 1/2	5.24	1.07	0.28
4	5.83	1.12	0.31

TEMPERATURE-PRESSURE RATING

Temp F°	PSI	
	CLASS 125	CLASS 250
-20 TO 150	175	400
200	165	370
250	150	340
300	140	310
350	125 (Note1)	300
400	—	250 (Note 2)

Notes:

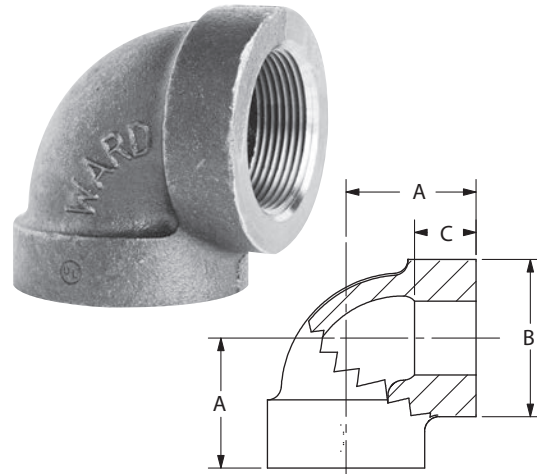
1) Permissible for service temperature up to 360° F reflecting temperature of saturated steam at 125 psi.

2) Permissible for service temperature up to 406° F reflecting temperature of saturated steam at 250 psig.

Material:	ASTM A126 Class A Minimum
Dimensions:	ANSI/ASME B16.4 ANSI/ASME B1.20.1
Pressure Ratings:	ANSI/ASME B16.4
Coatings:	ASTM A153 ASTM B633
Additional Specifications:	UL, ULC, FM, NSF 61 and NSF 61 Annex G where applicable

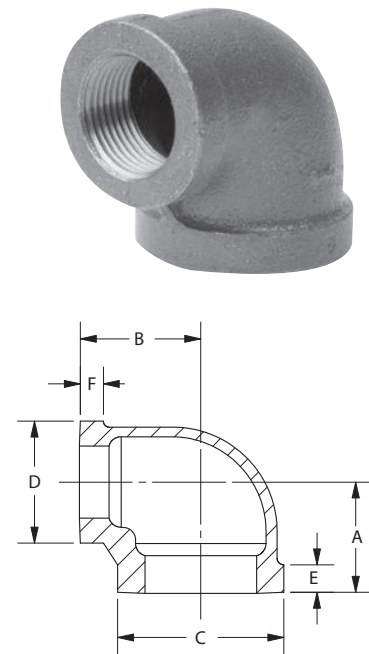
CAST IRON 90° STRAIGHT ELL CLASS 125

NPS	Center to End A	Outside Dia. of Band B (min)	Thread Length C (min)	Take Out
1/4	0.81	0.93	0.32	0.408
3/8	0.95	1.12	0.36	0.5
1/2	1.12	1.34	0.43	0.58
3/4	1.31	1.63	0.50	0.76
1	1.50	1.95	0.58	0.81
1 1/4	1.75	2.39	0.67	1.04
1 1/2	1.94	2.68	0.70	1.21
2	2.25	3.28	0.75	1.49
2 1/2	2.70	3.86	0.92	1.56
3	3.08	4.62	0.98	1.88
3 1/2	3.42	5.20	1.03	2.17
4	3.79	5.79	1.08	2.49
5	—	—	—	—
6	—	—	—	—
8	—	—	—	—



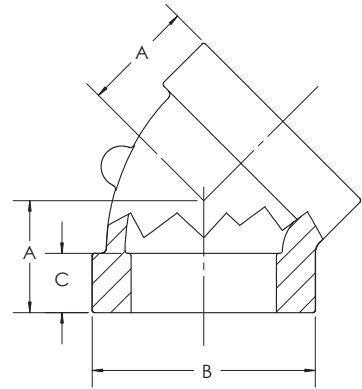
CAST IRON 90° REDUCING ELL CLASS 125

NPS	Center to End A	Center to End B	Outside Dia. of Band C (min)	Outside Dia. of Band D (min)	Length of Threads E (min)	Length of Threads F (min)	Take Out	Take Out
1/2 x 3/8	—	—	—	—	—	—	—	—
1/2 x 1/4	—	—	—	—	—	—	—	—
3/4 x 1/2	1.20	1.22	1.63	1.34	0.50	0.43	0.6	0.68
*3/4 x 3/8	1.20	1.22	1.63	1.12	0.50	0.36	0.6	0.81
1 x 3/4	1.37	1.45	1.95	1.63	0.58	0.50	0.6	0.90
1 x 1/2	1.26	1.36	1.95	1.34	0.58	0.43	0.5	0.82
1 1/4 x 1	1.58	1.67	2.39	1.95	0.67	0.58	0.8	0.98
1 1/4 x 3/4	1.45	1.62	2.39	1.63	0.67	0.50	0.7	1.07
1 1/4 x 1/2	1.34	1.53	2.39	1.34	0.67	0.43	0.6	0.99
1 1/2 x 1 1/4	1.82	1.88	2.68	2.39	0.70	0.67	1.09	1.17
1 1/2 x 1	1.65	1.80	2.68	1.95	0.70	0.58	0.92	1.11
1 1/2 x 3/4	1.52	1.75	2.68	1.63	0.70	0.50	0.79	1.20
1 1/2 x 1/2	1.41	1.66	2.68	1.34	0.70	0.43	0.79	1.21
2 x 1 1/2	2.02	2.16	3.28	2.68	0.75	0.70	1.26	1.43
2 x 1 1/4	1.90	2.10	3.28	2.39	0.75	0.67	1.14	1.39
2 x 1	1.73	2.02	3.28	1.95	0.75	0.58	0.97	1.33
2 x 3/4	1.60	1.97	3.28	1.63	0.75	0.50	0.84	1.42
2 x 1/2	1.60	1.97	3.28	1.34	0.75	0.43	0.84	1.43
2 1/2 x 2	2.39	2.60	3.86	3.28	0.92	0.75	1.25	1.84
2 1/2 x 1 1/2	2.16	2.51	3.86	2.68	0.92	0.70	1.02	1.78
2 1/2 x 1 1/4	2.04	2.45	3.86	2.39	0.92	0.67	0.90	1.74
2 1/2 x 1	1.87	2.37	3.86	1.95	0.92	0.58	0.73	1.68
*2 1/2 x 3/4	1.87	2.37	3.86	1.63	0.92	0.50	0.73	1.82
3 x 2 1/2	2.83	2.99	4.62	3.86	0.98	0.92	1.63	1.85
3 x 2	2.52	2.89	4.62	3.28	0.98	0.75	1.32	2.13
3 x 1 1/2	2.29	2.80	4.62	2.68	0.98	0.70	1.32	2.16
3 x 1 1/4	2.17	2.74	4.62	2.39	0.98	0.67	0.97	2.03
*3 x 1	2.17	2.74	4.62	1.95	0.98	0.58	0.97	2.05
3 1/2 x 3	—	—	—	—	—	—	—	—
4 x 3 1/2	3.54	3.69	5.79	5.20	1.08	1.03	2.24	2.44
4 x 3	3.30	3.60	5.79	4.62	1.08	0.98	2.00	2.40
4 x 2 1/2	3.05	3.51	5.79	3.86	1.08	0.92	2.00	2.46
4 x 2	2.74	3.41	5.79	3.28	1.08	0.75	1.44	2.65
*4 x 1 1/2	2.74	3.41	5.79	2.68	1.08	0.70	1.44	2.68
5 x 4	—	—	—	—	—	—	—	—
6 x 4	—	—	—	—	—	—	—	—
6 x 3	—	—	—	—	—	—	—	—



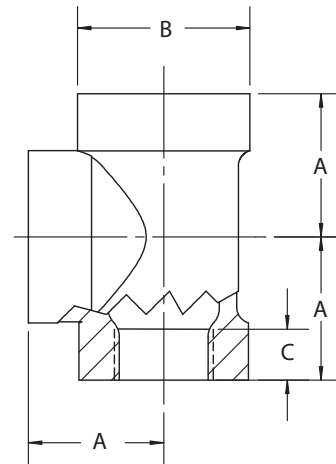
CAST IRON 45° ELL CLASS 125

NPS	Center to End A	Outside Dia. of Band B (min)	Length of Threads C (min)	Take Out
1/4	—	—	—	—
3/8	—	—	—	—
1/2	0.88	1.34	0.43	0.34
3/4	0.98	1.63	0.50	0.43
1	1.12	1.95	0.58	0.43
1 1/4	1.29	2.39	0.67	0.58
1 1/2	1.43	2.68	0.70	0.70
2	1.68	3.28	0.75	0.92
2 1/2	1.95	3.86	0.92	0.81
3	2.17	4.62	0.98	0.97
3 1/2	—	—	—	—
4	2.61	5.79	1.08	1.31
5	—	—	—	—
6	—	—	—	—

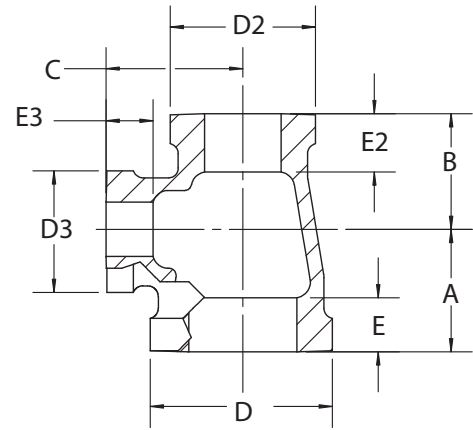


CAST IRON STRAIGHT TEE CLASS 125

NPS	Center to End A	Outside Dia. of Band B (min)	Length of Threads C (min)	Take Out
1/4	—	—	—	—
3/8	0.95	1.12	0.36	0.54
1/2	1.12	1.34	0.43	0.58
3/4	1.31	1.63	0.50	0.76
1	1.50	1.95	0.58	0.81
1 1/4	1.75	2.39	0.67	1.04
1 1/2	1.94	2.68	0.70	1.21
2	2.25	3.28	0.75	1.49
2 1/2	2.70	3.86	0.92	1.56
3	3.08	4.62	0.98	1.88
3 1/2	3.42	5.20	1.03	2.17
4	3.79	5.79	1.08	2.49
5	—	—	—	—
6	—	—	—	—



CAST IRON REDUCING TEES CLASS 125



NPS	Center to End A	Center to End B	Center to End C	Outside Dia. of Band D (min)	Outside Dia. of Band D2 (min)	Outside Dia. of Band D3 (min)	Length of Threads E (min)	Length of Threads E2 (min)	Length of Threads E3 (min)	Take Out	Take Out	Take Out
1/2 x 1/2 x 3/8	1.04	1.04	1.03	1.34	1.34	1.12	0.43	0.43	0.36	0.50	0.50	0.62
1/2 x 1/2 x 1/4	—	—	—	—	—	—	—	—	—	—	—	—
*1/2 x 3/8 x 1/2	1.12	1.12	1.12	1.34	1.12	1.34	0.43	0.36	0.43	0.58	0.71	0.58
*1/2 x 3/8 x 3/8	1.12	1.12	1.12	1.34	1.12	1.12	0.43	0.36	0.36	0.58	0.71	0.71
*3/8 x 3/8 x 1/2	1.12	1.12	1.12	1.12	1.12	1.34	0.36	0.36	0.43	0.71	0.71	0.58
3/4 x 3/4 x 1/2	1.20	1.20	1.22	1.63	1.63	1.34	0.50	0.50	0.43	0.65	0.65	0.68
3/4 x 3/4 x 3/8	1.12	1.12	1.13	1.63	1.63	1.12	0.50	0.50	0.36	0.57	0.57	0.72
3/4 x 3/4 x 1/4	—	—	—	—	—	—	—	—	—	—	—	—
3/4 x 1/2 x 3/4	1.31	1.22	1.31	1.63	1.34	1.63	0.50	0.43	0.50	0.76	0.68	0.76
3/4 x 1/2 x 1/2	1.20	1.12	1.22	1.63	1.34	1.34	0.50	0.43	0.43	0.65	0.58	0.68
1/2 x 1/2 x 3/4	1.22	1.22	1.20	1.340	1.340	1.630	0.430	0.430	0.500	0.68	0.68	0.65
1 x 1 x 3/4	1.37	1.37	1.45	1.95	1.95	1.63	0.58	0.58	0.50	0.68	0.68	0.90
1 x 1 x 1/2	1.26	1.26	1.36	1.95	1.95	1.34	0.58	0.58	0.43	0.57	0.57	0.82
1 x 1 x 3/8	1.18	1.18	1.27	1.95	1.95	1.12	0.58	0.58	0.36	0.49	0.49	0.86
1 x 1 x 1/4	—	—	—	—	—	—	—	—	—	—	—	—
1 x 3/4 x 1	1.50	1.45	1.50	1.95	1.63	1.95	0.58	0.50	0.58	0.81	0.90	0.81
1 x 3/4 x 3/4	1.37	1.31	1.45	1.95	1.63	1.63	0.58	0.50	0.50	0.68	0.76	0.90
1 x 3/4 x 1/2	1.26	1.20	1.36	1.95	1.63	1.34	0.58	0.50	0.43	0.57	0.65	0.82
1 x 1/2 x 1	1.50	1.36	1.50	1.95	1.34	1.95	0.58	0.43	0.58	0.81	0.82	0.81
1 x 1/2 x 3/4	1.37	1.22	1.45	1.95	1.34	1.63	0.58	0.43	0.50	0.68	0.68	0.90
1 x 1/2 x 1/2	—	—	—	—	—	—	—	—	—	—	—	—
1 x 3/8 x 1	1.50	1.27	1.50	1.95	1.12	1.95	0.58	0.36	0.58	0.81	0.86	0.81
*1 x 1/4 x 1	1.50	1.20	1.50	1.95	0.93	1.95	0.58	0.32	0.58	0.81	0.79	0.81
3/4 x 3/4 x 1	1.45	1.45	1.37	1.63	1.63	1.95	0.50	0.50	0.58	0.90	0.90	0.68
*3/4 x 1/2 x 1	1.45	1.45	1.37	1.63	1.34	1.95	0.50	0.43	0.58	0.90	0.91	0.68
1/2 x 1/2 x 1	—	—	—	—	—	—	—	—	—	—	—	—
1 1/4 x 1 1/4 x 1	1.58	1.58	1.67	2.39	2.39	1.95	0.67	0.67	0.58	0.87	0.87	0.98
1 1/4 x 1 1/4 x 3/4	1.45	1.45	1.62	2.39	2.39	1.63	0.67	0.67	0.50	0.74	0.74	1.07
1 1/4 x 1 1/4 x 1/2	1.34	1.34	1.53	2.39	2.39	1.34	0.67	0.67	0.43	0.63	0.63	0.99
1 1/4 x 1 1/4 x 1/8	---	---	---	---	---	---	---	---	---	---	---	---
1 1/4 x 1 x 1 1/4	1.75	1.67	1.75	2.39	1.95	2.39	0.67	0.58	0.67	1.04	0.98	1.04
1 1/4 x 1 x 1	1.58	1.50	1.67	2.39	1.95	1.95	0.67	0.58	0.58	0.87	0.81	0.98
1 1/4 x 1 x 3/4	1.45	1.37	1.62	2.39	1.95	1.63	0.67	0.58	0.50	0.74	0.68	1.07

* Manufactured to WARD specifications

CAST IRON REDUCING TEE CLASS 125

NPS	Center to End A	Center to End B	Center to End C	Outside Dia. of Band D (min)	Outside Dia. of Band D2 (min)	Outside Dia. of Band D3 (min)	Length of Threads E (min)	Length of Threads E2 (min)	Length of Threads E3 (min)	Take Out	Take Out	Take Out
1 1/4 x 1 x 1/2	1.34	1.26	1.53	2.39	1.95	1.34	0.67	0.58	0.43	0.63	0.57	0.99
1 1/4 x 3/4 x 1 1/4	1.75	1.62	1.75	2.39	1.63	2.39	0.67	0.50	0.67	1.04	1.07	1.04
1 1/4 x 3/4 x 1	1.58	1.45	1.67	2.39	1.63	1.95	0.67	0.50	0.58	0.87	0.90	0.98
1 1/4 x 3/4 x 3/4	1.45	1.31	1.62	2.39	1.63	1.63	0.67	0.50	0.50	0.74	0.76	1.07
*1 1/4 x 3/4 x 1/2	1.45	1.31	1.62	2.39	1.63	1.34	0.67	0.50	0.43	0.74	0.76	1.08
1 1/4 x 1/2 x 1 1/4	1.75	1.53	1.75	2.39	1.34	2.39	0.67	0.43	0.67	1.04	0.99	1.04
1 1/4 x 1/2 x 1	1.58	1.36	1.67	2.39	1.34	1.95	0.67	0.43	0.58	0.87	0.82	0.98
*1 1/4 x 1/2 x 3/4	1.45	1.31	1.62	2.39	1.34	1.63	0.67	0.43	0.50	0.74	0.77	1.07
*1 1/4 x 1/2 x 1/2	1.34	1.12	1.53	2.39	1.34	1.34	0.67	0.43	0.43	0.63	0.58	0.99
*1 1/4 x 1/2 x 3/8	1.58	1.45	1.45	2.39	1.34	1.12	0.67	0.43	0.36	0.87	0.91	1.04
*1 1/4 x 1/4 x 1 1/4	1.75	1.53	1.75	2.39	0.93	2.39	0.67	0.32	0.67	1.04	1.12	1.04
*1 1/4 x 1/8 x 1 1/4	1.75	1.53	1.75	2.39	0.81	2.39	0.67	0.32	0.67	1.04	1.26	1.04
1 x 1 x 1 1/4	1.67	1.67	1.58	1.95	1.95	2.39	0.58	0.58	0.67	0.98	0.98	0.87
*1 x 3/4 x 1 1/4	1.75	1.62	1.75	1.95	1.63	2.39	0.58	0.50	0.67	1.06	1.07	1.04
*1 x 1/2 x 1 1/4	1.75	1.53	1.75	1.95	1.34	2.39	0.58	0.43	0.67	1.06	0.99	1.04
1 1/2 x 1 1/2 x 1 1/4	1.82	1.82	1.88	2.68	2.68	2.39	0.70	0.70	0.67	1.09	1.09	1.17
1 1/2 x 1 1/2 x 1	1.65	1.65	1.80	2.68	2.68	1.95	0.70	0.70	0.58	0.92	0.92	1.11
1 1/2 x 1 1/2 x 3/4	1.52	1.52	1.75	2.68	2.68	1.63	0.70	0.70	0.50	0.79	0.79	1.20
1 1/2 x 1 1/2 x 1/2	1.41	1.41	1.66	2.68	2.68	1.34	0.70	0.70	0.43	0.68	0.68	1.12
1 1/2 x 1 1/2 x 3/8	1.41	1.41	1.66	2.68	2.68	1.12	0.70	0.70	0.36	0.68	0.68	1.25
1 1/2 x 1 1/4 x 1 1/2	1.94	1.88	1.94	2.68	2.39	2.68	0.70	0.67	0.70	1.21	1.17	1.21
1 1/2 x 1 1/4 x 1 1/4	1.82	1.75	1.88	2.68	2.39	2.39	0.70	0.67	0.67	1.09	1.04	1.17
1 1/2 x 1 1/4 x 1	1.65	1.58	1.80	2.68	2.39	1.95	0.70	0.67	0.58	0.92	0.87	1.11
1 1/2 x 1 1/4 x 3/4	1.52	1.45	1.75	2.68	2.39	1.63	0.70	0.67	0.50	0.79	0.74	1.20
1 1/2 x 1 1/4 x 1/2	1.41	1.34	1.66	2.68	2.39	1.34	0.70	0.67	0.43	0.68	0.63	1.12
1 1/2 x 1 x 1 1/2	1.94	1.80	1.94	2.68	1.95	2.68	0.70	0.58	0.70	1.21	1.11	1.21
1 1/2 x 1 x 1 1/4	1.94	1.80	1.94	2.68	1.95	2.39	0.70	0.58	0.67	1.21	1.11	1.23
1 1/2 x 1 x 1	1.65	1.50	1.80	2.68	1.95	1.95	0.70	0.58	0.58	0.92	0.81	1.11
*1 1/2 x 1 x 3/4	1.65	1.50	1.80	2.68	1.95	1.63	0.70	0.58	0.50	0.92	0.81	1.25
*1 1/2 x 1 x 1/2	1.41	1.34	1.66	2.68	1.95	1.34	0.70	0.58	0.43	0.68	0.65	1.12
1 1/2 x 3/4 x 1 1/2	1.94	1.75	1.94	2.68	1.63	2.68	0.70	0.50	0.70	1.21	1.20	1.21
1 1/2 x 3/4 x 1 1/4	1.82	1.62	1.88	2.68	1.63	2.39	0.70	0.50	1.09	1.21	1.07	1.17
*1 1/2 x 3/4 x 1	1.65	1.50	1.80	2.68	1.63	1.95	0.70	0.50	0.58	0.92	0.95	1.11
*1 1/2 x 3/4 x 3/4	1.65	1.50	1.80	2.68	1.63	1.63	0.70	0.50	0.50	0.92	0.95	1.25
*1 1/2 x 3/4 x 1/2	1.52	1.37	1.80	2.68	1.63	1.34	0.70	0.50	0.43	0.80	0.82	1.26
1 1/2 x 1/2 x 1 1/2	1.94	1.66	1.94	2.68	1.34	2.68	0.70	0.43	0.70	1.21	1.12	1.21
*1 1/2 x 1/2 x 1 1/4	1.94	1.66	1.94	2.68	1.34	2.39	0.70	0.43	0.67	1.21	1.12	1.23
*1 1/2 x 1/2 x 3/4	1.52	1.37	1.80	2.68	1.34	1.63	0.70	0.43	0.50	0.80	0.84	1.25
*1 1/2 x 1/2 x 1/2	1.52	1.37	1.80	2.68	1.34	1.34	0.70	0.43	0.43	0.80	0.84	1.26
1 1/4 x 1 1/4 x 1 1/2	1.88	1.88	1.82	2.39	2.39	2.68	0.67	0.67	0.70	1.17	1.17	1.09
1 1/4 x 1 x 1 1/2	1.88	1.80	1.82	2.39	1.95	2.68	0.67	0.58	0.70	1.17	1.11	1.09
*1 1/4 x 3/4 x 1 1/2	1.94	1.75	1.94	2.39	1.63	2.68	0.67	0.50	0.70	1.23	1.20	1.21
*1 1/4 x 1/2 x 1 1/2	1.94	1.66	1.94	2.39	1.34	2.68	0.67	0.43	0.70	1.23	1.12	1.21

* Manufactured to WARD specifications

CAST IRON REDUCING TEE CLASS 125

NPS	Center to End A	Center to End B	Center to End C	Outside Dia. of Band D (min)	Outside Dia. of Band D2 (Min)	Outside Dia. of Band D3 (min)	Length of Threads E (min)	Length of Threads E2 (min)	Length of Threads E3 (min)	Take Out	Take Out	Take Out
1 x 1 x 1 1/2	1.80	1.80	1.65	1.95	1.95	2.68	0.58	0.58	0.70	1.11	1.11	0.92
2 x 2 x 1 1/2	2.02	2.02	2.16	3.28	3.28	2.68	0.75	0.75	0.70	1.26	1.26	1.43
2 x 2 x 1 1/4	1.90	1.90	2.10	3.28	3.28	2.39	0.75	0.75	0.67	1.14	1.14	1.39
2 x 2 x 1	1.73	1.73	2.02	3.28	3.28	1.95	0.75	0.75	0.58	0.97	0.97	1.33
2 x 2 x 3/4	1.60	1.60	1.97	3.28	3.28	1.63	0.75	0.75	0.50	0.84	0.84	1.42
2 x 2 x 1/2	1.49	1.49	1.88	3.28	3.28	1.34	0.75	0.75	0.43	0.73	0.73	1.34
2 x 1 1/2 x 2	2.25	2.16	2.25	3.28	2.68	3.28	0.75	0.70	0.75	1.49	1.43	1.49
2 x 1 1/2 x 1 1/2	2.02	1.94	2.16	3.28	2.68	2.68	0.75	0.70	0.70	1.26	1.21	1.43
2 x 1 1/2 x 1 1/4	2.02	1.94	2.16	3.28	2.68	2.39	0.75	0.70	0.67	1.26	1.21	1.45
2 x 1 1/2 x 1	1.73	1.65	2.02	3.28	2.68	1.95	0.75	0.70	0.58	0.97	0.92	1.33
2 x 1 1/2 x 3/4	1.60	1.52	1.97	3.28	2.68	1.63	0.75	0.70	0.50	0.84	0.79	1.42
2 x 1 1/2 x 1/2	1.49	1.41	1.88	3.28	2.68	1.34	0.75	0.70	0.43	0.73	0.68	1.34
2 x 1 1/4 x 2	2.25	2.10	2.25	3.28	2.39	3.28	0.75	0.67	0.75	1.49	1.39	1.49
2 x 1 1/4 x 1 1/2	1.02	1.88	2.16	3.28	2.39	2.68	0.75	0.67	0.70	0.26	1.17	1.43
2 x 1 1/4 x 1 1/4	1.90	1.75	2.10	3.28	2.39	2.39	0.75	0.67	0.67	1.14	1.04	1.39
2 x 1 1/4 x 1	1.73	1.58	2.02	3.28	2.39	1.95	0.75	0.67	0.58	0.97	0.87	1.33
2 x 1 1/4 x 3/4	—	—	—	—	—	—	—	—	—	—	—	—
*2 x 1 1/4 x 1/2	1.49	1.41	1.88	3.28	2.39	1.34	0.75	0.67	0.43	0.73	0.70	1.34
2 x 1 x 2	2.25	2.02	2.25	3.28	1.95	3.28	0.75	0.58	0.75	1.49	1.33	1.49
2 x 1 x 1 1/2	2.02	1.80	2.16	3.28	1.95	2.68	0.75	0.58	0.70	1.26	1.11	1.43
2 x 1 x 1 1/4	1.90	1.67	2.10	3.28	1.95	2.39	0.75	0.58	0.67	1.14	0.98	1.39
*2 x 1 x 1	1.73	1.94	2.02	3.28	1.95	1.95	0.75	0.58	0.58	0.97	1.25	1.33
*2 x 1 x 3/4	1.73	1.94	2.02	3.28	1.95	1.63	0.75	0.58	0.50	0.97	1.25	1.47
2 x 3/4 x 2	2.25	1.97	2.25	3.28	1.63	3.28	0.75	0.50	0.75	1.49	1.42	1.49
*2 x 3/4 x 1 1/2	2.25	1.97	2.25	3.28	1.63	2.68	0.75	0.50	0.70	1.49	1.42	1.52
*2 x 3/4 x 1 1/4	2.25	1.97	2.25	3.28	1.63	2.39	0.75	0.50	0.67	1.49	1.42	1.54
*2 x 3/4 x 1	1.73	1.94	2.02	3.28	1.63	1.95	0.75	0.50	0.58	0.97	1.39	1.33
*2 x 3/4 x 3/4	1.60	1.60	1.97	3.28	1.63	1.63	0.75	0.50	0.50	0.84	1.05	1.42
*2 x 3/4 x 1/2	1.60	1.60	1.97	3.28	1.63	1.34	0.75	0.50	0.43	0.84	1.05	1.43
2 x 1/2 x 2	2.25	1.88	2.25	3.28	1.34	3.280	0.75	0.43	0.75	1.49	1.34	1.49
*2 x 1/2 x 1 1/2	2.02	1.66	2.16	3.28	1.34	2.68	0.75	0.43	0.70	1.26	1.12	1.43
*2 x 1/2 x 1 1/4	2.02	1.66	2.16	3.28	1.34	2.39	0.75	0.43	0.67	1.26	1.12	1.45
*2 x 1/2 x 3/4	1.60	1.60	1.97	3.28	1.34	1.63	0.75	0.43	0.50	0.84	1.06	1.42
*2 x 1/2 x 1/2	1.60	1.60	1.97	3.28	1.34	1.34	0.75	0.43	0.43	0.84	1.06	1.43
1 1/2 x 1 1/2 x 2	2.16	2.16	2.02	2.68	2.68	3.28	0.70	0.70	0.75	1.43	1.43	1.26
1 1/2 x 1 1/4 x 2	2.16	2.10	2.02	2.68	2.39	3.28	0.70	0.67	0.75	1.43	1.39	1.26
1 1/2 x 1 x 2	2.16	2.02	2.02	2.68	1.95	3.28	0.70	0.58	0.75	1.43	1.33	1.26
1 1/4 x 1 1/4 x 2	—	—	—	—	—	—	—	—	—	—	—	—
1 1/4 x 1 x 2	—	—	—	—	—	—	—	—	—	—	—	—
1 x 1 x 2	—	—	—	—	—	—	—	—	—	—	—	—
2 1/2 x 2 1/2 x 2	2.39	2.39	2.60	3.86	3.86	3.28	0.92	0.92	0.75	1.25	1.25	1.84
2 1/2 x 2 1/2 x 1 1/2	2.16	2.16	2.51	3.86	3.86	2.68	0.92	0.92	0.70	1.02	1.02	1.78

* Manufactured to WARD specifications

CAST IRON REDUCING TEE CLASS 125

NPS	Center to End A	Center to End B	Center to End C	Outside Dia. of Band D (min)	Outside Dia. of Band D2 (Min)	Outside Dia. of Band D3 (min)	Length of Threads E (min)	Length of Threads E2 (min))	Length of Threads E3 (min)	Take Out	Take Out	Take Out
2 1/2 x 2 1/2 x 1 1/4	2.04	2.04	2.45	3.86	3.86	2.39	0.92	0.92	0.67	0.90	0.90	1.74
2 1/2 x 2 1/2 x 1	1.87	1.87	2.37	3.86	3.86	1.95	0.92	0.92	0.58	0.73	0.73	1.68
2 1/2 x 2 1/2 x 3/4	1.87	1.87	2.32	3.86	3.86	1.63	0.92	0.92	0.50	0.73	0.73	1.77
2 1/2 x 2 1/2 x 1/2	1.87	1.87	2.23	3.86	3.86	1.34	0.92	0.92	0.43	0.73	0.73	1.69
2 1/2 x 2 x 2 1/2	2.70	2.60	2.70	3.86	3.28	3.86	0.92	0.75	0.92	1.56	1.84	1.56
2 1/2 x 2 x 2	2.39	2.25	2.60	3.86	3.28	3.28	0.92	0.75	0.75	1.25	1.49	1.84
2 1/2 x 2 x 1 1/2	2.16	2.02	2.51	3.86	3.28	2.68	0.92	0.75	0.70	1.02	1.26	1.78
2 1/2 x 2 x 1 1/4	2.04	1.90	2.45	3.86	3.28	2.39	0.92	0.75	0.67	0.90	1.14	1.74
2 1/2 x 2 x 1	1.87	1.73	2.37	3.86	3.28	1.95	0.92	0.75	0.58	0.73	0.97	1.68
2 1/2 x 2 x 3/4	1.74	1.60	2.32	3.86	3.28	1.63	0.92	0.75	0.50	0.60	0.84	1.77
2 1/2 x 2 x 1/2	1.63	1.49	2.23	3.86	3.28	1.34	0.92	0.75	0.43	0.49	0.73	1.696
2 1/2 x 1 1/2 x 2 1/2	2.70	2.51	2.70	3.86	2.68	3.86	0.92	0.70	0.92	1.56	1.78	1.563
2 1/2 x 1 1/2 x 2	2.39	2.16	2.60	3.86	2.68	3.28	0.92	0.70	0.75	1.25	1.43	1.84
2 1/2 x 1 1/2 x 1 1/2	2.16	1.94	2.51	3.86	2.68	2.68	0.92	0.70	0.70	1.02	1.21	1.786
*2 1/2 x 1 1/2 x 1 1/4	2.04	1.90	2.45	3.86	2.68	2.39	0.92	0.70	0.67	0.90	1.17	1.743
*2 1/2 x 1 1/2 x 1/2	1.63	1.49	2.23	3.86	2.68	1.34	0.92	0.70	0.43	0.49	0.76	1.696
2 1/2 x 1 1/4 x 2 1/2	2.70	2.45	2.70	3.86	2.39	3.86	0.92	0.67	0.92	1.56	1.74	1.563
2 1/2 x 1 1/4 x 2	2.70	2.45	2.70	3.86	2.39	3.28	0.92	0.67	0.75	1.56	1.74	1.94
*2 1/2 x 1 1/4 x 1 1/2	2.16	1.94	2.51	3.86	2.39	2.68	0.92	0.67	0.70	1.02	1.23	1.78
*2 1/2 x 1 1/4 x 1 1/4	2.04	1.90	2.45	3.86	2.39	2.39	0.92	0.67	0.67	0.90	1.19	1.74
*2 1/2 x 1 1/4 x 1	2.14	2.12	2.51	3.86	2.39	1.95	0.92	0.67	0.58	1.00	1.41	1.82
2 1/2 x 1 x 2 1/2	2.70	2.37	2.70	3.86	1.95	3.86	0.92	0.58	0.92	1.56	1.68	1.56
2 1/2 x 1 x 2	2.39	2.02	2.60	3.86	1.95	3.28	0.92	0.58	0.75	1.25	1.33	1.84
*2 1/2 x 1 x 1 1/4	2.14	2.12	2.51	3.86	1.95	2.39	0.92	0.58	0.67	1.00	1.43	1.80
*2 1/2 x 1 x 1	1.94	1.75	2.37	3.86	1.95	1.95	0.92	0.58	0.58	0.80	1.06	1.68
*2 1/2 x 1 x 3/4	1.94	1.75	2.37	3.86	1.95	1.63	0.92	0.58	0.50	0.80	1.06	1.82
2 1/2 x 3/4 x 2 1/2	2.70	2.32	2.70	3.86	1.63	3.86	0.92	0.50	0.92	1.56	1.77	1.56
*2 1/2 x 3/4 x 2	2.70	2.32	2.70	3.86	1.63	3.28	0.92	0.50	0.75	1.56	1.77	1.94
*2 1/2 x 3/4 x 3/4	1.94	1.75	2.37	3.86	1.63	1.63	0.92	0.50	0.50	0.80	1.20	1.82
2 1/2 x 1/2 x 2 1/2	2.70	2.23	2.70	3.86	1.34	3.86	0.92	0.43	0.92	1.56	1.69	1.56
*2 1/2 x 1/2 X 2	2.70	2.60	2.70	3.86	1.34	3.28	0.92	0.43	0.75	1.56	2.06	1.94
2 x 2 x 2 1/2	2.60	2.60	2.39	3.28	3.28	3.86	0.75	0.75	0.92	1.84	1.46	1.25
2 x 1 1/2 x 2 1/2	2.60	2.51	2.39	3.28	2.68	3.86	0.75	0.70	0.92	1.84	1.78	1.25
2 x 1 1/4 x 2 1/2	2.60	2.45	2.39	3.28	2.39	3.86	0.75	0.67	0.92	1.84	1.74	1.25
*2 x 1 x 2 1/2	2.70	2.45	2.70	3.28	1.95	3.86	0.75	0.58	0.92	1.94	1.76	1.56
*2 x 3/4 x 2 1/2	2.70	2.32	2.70	3.28	1.63	3.86	0.75	0.50	0.92	1.94	1.77	1.56
1 1/2 x 1 1/2 x 2 1/2	2.51	2.51	2.16	2.68	2.68	3.86	0.70	0.70	0.92	1.78	1.78	1.02
3 x 3 x 2 1/2	2.83	2.83	2.99	4.62	4.62	3.86	0.98	0.98	0.92	1.63	1.63	1.85
3 x 3 x 2	2.52	2.52	2.89	4.62	4.62	3.28	0.98	0.98	0.75	1.32	1.32	2.13
3 x 3 x 1 1/2	2.29	2.29	2.80	4.62	4.62	2.68	0.98	0.98	0.70	1.09	1.09	2.07
3 x 3 x 1 1/4	2.17	2.17	2.74	4.62	4.62	2.39	0.98	0.98	0.67	0.97	0.97	2.03
3 x 3 x 1	2.00	2.00	2.66	4.62	4.62	1.95	0.98	0.98	0.58	0.80	0.80	1.97

* Manufactured to WARD specifications

CAST IRON REDUCING TEE CLASS 125

NPS	Center to End A	Center to End B	Center to End C	Outside Dia. of Band D (min)	Outside Dia. of Band D2 (Min)	Outside Dia. of Band D3 (min)	Length of Threads E (min)	Length of Threads E2 (min)	Length of Threads E3 (min)	Take Out	Take Out	Take Out
3 x 3 x 3/4	—	—	—	—	—	—	—	—	—	—	—	—
3 x 3 x 1/2	—	—	—	—	—	—	—	—	—	—	—	—
3 x 2 1/2 x 3	3.08	2.99	3.08	4.62	3.86	4.62	0.98	0.92	0.98	1.88	1.85	1.88
3 x 2 1/2 x 2 1/2	2.83	2.70	2.99	4.62	3.86	3.86	0.98	0.92	0.92	1.63	1.56	1.85
3 x 2 1/2 x 2	2.52	2.39	2.89	4.62	3.86	3.28	0.98	0.92	0.75	1.32	1.25	2.13
3 x 2 1/2 x 1 1/2	—	—	—	—	—	—	—	—	—	—	—	—
3 x 2 1/2 x 1 1/4	2.17	2.04	2.74	4.62	3.86	2.39	0.98	0.92	0.67	0.97	0.90	2.03
3 x 2 1/2 x 1	—	—	—	—	—	—	—	—	—	—	—	—
3 x 2 x 3	3.08	2.89	3.08	4.62	3.28	4.62	0.98	0.75	0.98	1.88	2.13	1.88
3 x 2 x 2 1/2	2.83	2.60	2.99	4.62	3.28	3.86	0.98	0.75	0.92	1.63	1.84	1.85
3 x 2 x 2	2.52	2.25	2.89	4.62	3.28	3.28	0.98	0.75	0.75	1.32	1.49	2.13
3 x 2 x 1 1/2	2.29	2.02	2.80	4.62	3.28	2.68	0.98	0.75	0.70	1.09	1.26	2.07
3 x 1 1/2 x 3	3.08	2.80	3.08	4.62	2.68	4.62	0.98	0.70	0.98	1.88	2.07	1.88
*3 x 1 1/2 x 2	2.52	2.25	2.89	4.62	2.68	3.28	0.98	0.70	0.75	1.32	1.52	2.13
*3 x 1 1/2 x 1 1/2	2.52	2.25	2.89	4.62	2.68	2.68	0.98	0.70	0.70	1.32	1.52	2.16
3 x 1 1/4 x 3	3.08	2.74	3.08	4.62	2.39	4.62	0.98	0.67	0.98	1.88	2.03	1.88
*3 x 1 1/4 x 2	2.52	2.70	2.89	4.62	2.39	3.28	0.98	0.67	0.75	1.32	1.99	2.13
3 x 1 x 3	3.08	2.66	3.08	4.62	1.95	4.62	0.98	0.58	0.98	1.88	1.97	1.88
*3 x 1 x 2	2.52	2.63	2.89	4.62	1.95	3.28	0.98	0.58	0.75	1.32	1.94	2.13
3 x 3/4 x 3	3.08	2.61	3.08	4.62	1.63	4.62	0.98	0.50	0.98	1.88	2.06	1.88
2 1/2 x 2 1/2 x 3	2.99	2.99	2.83	3.86	3.86	4.62	0.92	0.92	0.98	1.85	1.85	1.63
2 1/2 x 2 x 3	2.99	2.89	2.83	3.86	3.28	4.62	0.92	0.75	0.98	1.85	2.13	1.63
2 x 2 x 3	2.89	2.99	2.52	3.28	3.28	4.62	0.75	0.75	0.98	2.13	2.23	1.32
*1 1/2 x 1 1/2 x 3	2.83	2.83	2.27	2.68	2.68	4.62	0.70	0.70	0.98	2.10	2.10	1.07
3 1/2 x 3 1/2 x 3	3.18	3.18	3.33	5.20	5.20	4.62	1.03	1.03	0.98	1.93	1.93	2.13
3 1/2 x 3 1/2 x 2 1/2	2.93	2.93	3.24	5.20	5.20	3.86	1.03	1.03	0.92	1.68	1.68	2.10
3 1/2 x 3 1/2 x 2	2.62	2.62	3.14	5.20	5.20	3.28	1.03	1.03	0.75	1.37	1.37	2.38
3 1/2 x 3 1/2 x 1 1/2	2.39	2.39	3.05	5.20	5.20	2.68	1.03	1.03	0.70	1.14	1.14	2.32
3 1/2 x 3 1/2 x 1 1/4	2.27	2.27	2.99	5.20	5.20	2.39	1.03	1.03	0.67	1.02	1.02	2.28
3 1/2 x 3 1/2 x 1	2.10	2.10	2.91	5.20	5.20	1.95	1.03	1.03	0.58	0.85	0.85	2.22
*3 1/2 x 3 x 3 1/2	3.42	3.42	3.42	5.20	4.62	5.20	1.03	0.98	1.03	2.17	2.22	2.17
3 1/2 x 3 x 3	3.18	3.08	3.33	5.20	4.62	4.62	1.03	0.98	0.98	1.93	1.88	2.13
3 1/2 x 3 x 2 1/2	2.93	2.83	3.24	5.20	4.62	3.86	1.03	0.98	0.92	1.68	1.63	2.10
3 1/2 x 3 x 2	2.62	2.52	3.14	5.20	4.62	3.28	1.03	0.98	0.75	1.37	1.32	2.38
3 1/2 x 3 x 1 1/2	2.39	2.29	3.05	5.20	4.62	2.68	1.03	0.98	0.70	1.14	1.09	2.32
*3 1/2 x 3 x 1 1/4	2.39	2.29	3.05	5.20	4.62	2.39	1.03	0.98	0.67	1.14	1.09	2.34
*3 1/2 x 2 1/2 x 2	—	—	—	—	—	—	—	—	—	—	—	—
3 1/2 x 1 1/4 x 3 1/2	3.42	2.99	3.42	5.20	2.39	5.20	1.03	0.67	1.03	2.17	2.28	2.17
3 1/2 x 1 x 3 1/2	3.42	2.91	3.42	5.20	1.95	5.20	1.03	0.58	1.03	2.17	2.22	2.17
3 x 3 x 3 1/2	3.33	3.33	3.18	4.62	4.62	5.20	0.98	0.98	1.03	2.13	2.13	1.93
4 x 4 x 3 1/2	3.54	3.54	3.69	5.79	5.79	5.20	1.08	1.08	1.03	2.24	2.24	2.44
4 x 4 x 3	3.30	3.30	3.60	5.79	5.79	4.62	1.08	1.08	0.98	2.00	2.00	2.40

* Manufactured to WARD specifications

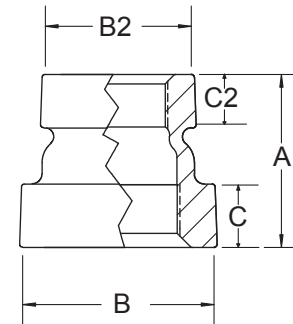
CAST IRON REDUCING TEE CLASS 125

NPS	Center to End A	Center to End B	Center to End C	Outside Dia. of Band D (min)	Outside Dia. of Band D2 (Min)	Outside Dia. of Band D3 (min)	Length of Threads E (min)	Length of Threads E2 (min)	Length of Threads E3 (min)	Take Out	Take Out	Take Out
4 x 4 x 2 1/2	3.05	3.05	3.51	5.79	5.79	3.86	1.08	1.08	0.92	1.75	1.75	2.37
4 x 4 x 2	2.74	2.74	3.41	5.79	5.79	3.28	1.08	1.08	0.75	1.44	1.44	2.65
4 x 4 x 1 1/2	2.51	2.51	3.32	5.79	5.79	2.68	1.08	1.08	0.70	1.21	1.21	2.59
4 x 4 x 1 1/4	—	—	—	—	—	—	—	—	—	—	—	—
4 x 4 x 1	—	—	—	—	—	—	—	—	—	—	—	—
4 x 4 x 3/4	—	—	—	—	—	—	—	—	—	—	—	—
4 x 3 1/2 x 4	3.79	3.69	3.79	5.79	5.20	5.79	1.08	1.03	1.08	2.49	2.44	2.49
4 x 3 1/2 x 3 1/2	3.54	3.42	3.69	5.79	5.20	5.20	1.08	1.03	1.03	2.24	2.17	2.44
4 x 3 1/2 x 3	3.30	3.18	3.60	5.79	5.20	4.62	1.08	1.03	0.98	2.00	1.93	2.40
4 x 3 1/2 x 2 1/2	3.05	2.93	3.51	5.79	5.20	3.86	1.08	1.03	0.92	1.75	1.68	2.37
4 x 3 1/2 x 2	2.74	2.62	3.41	5.79	5.20	3.28	1.08	1.03	0.75	1.44	1.37	2.65
4 x 3 1/2 x 1 1/2	2.51	2.39	3.32	5.79	5.20	2.68	1.08	1.03	0.70	1.21	1.14	2.59
4 x 3 x 4	3.79	3.60	3.79	5.79	4.62	5.79	1.08	0.98	1.08	2.49	2.40	2.49
*4 x 3 x 3 1/2	3.79	3.69	3.79	5.79	4.62	5.20	1.08	0.98	1.03	2.49	2.49	2.54
4 x 3 x 3	3.30	3.08	3.60	5.79	4.62	4.62	1.08	0.98	0.98	2.00	1.88	2.40
4 x 3 x 2 1/2	3.05	2.83	3.51	5.79	4.62	3.86	1.08	0.98	0.92	1.75	1.63	2.37
4 x 3 x 2	2.74	2.52	3.41	5.79	4.62	3.28	1.08	0.98	0.75	1.44	1.32	2.65
*4 x 3 x 1 1/2	2.51	2.39	3.32	5.79	4.62	2.68	1.08	0.98	0.70	1.21	1.19	2.59
4 x 2 1/2 x 4	3.79	3.51	3.79	5.79	3.86	5.79	1.08	0.92	1.08	2.49	2.37	2.49
4 x 2 1/2 x 3	3.30	2.99	3.60	5.79	3.86	4.62	1.08	0.92	0.98	2.00	1.85	2.40
4 x 2 1/2 x 2 1/2	3.05	2.70	3.51	5.79	3.86	3.86	1.08	0.92	0.92	1.75	1.56	2.37
*4 x 2 1/2 x 2	3.05	2.70	3.51	5.79	3.86	3.28	1.08	0.92	0.75	1.75	1.56	2.75
4 x 2 x 4	3.79	3.41	3.79	5.79	3.28	5.79	1.08	0.75	1.08	2.49	2.65	2.49
*4 x 2 x 2 1/2	3.05	2.70	3.51	5.79	3.28	3.86	1.08	0.75	0.92	1.75	1.94	2.37
4 x 2 x 2	2.74	2.25	3.41	5.79	3.28	3.28	1.08	0.75	0.75	1.44	1.49	2.65
*4 x 2 x 1 1/2	2.74	2.25	3.41	5.79	3.28	2.68	1.08	0.75	0.70	1.44	1.49	2.68
4 x 1 1/2 x 4	3.79	3.32	3.79	5.79	2.68	5.79	1.08	0.70	1.08	2.49	2.59	2.49
*4 x 1 1/2 x 2	2.74	2.25	3.41	5.79	2.68	3.28	1.08	0.70	0.75	1.44	1.52	2.65
*4 x 1 1/2 x 1 1/2	2.74	2.25	3.41	5.79	2.68	2.68	1.08	0.70	0.70	1.44	1.52	2.68
4 x 1 1/4 x 4	3.79	3.26	3.79	5.79	2.39	5.79	1.08	0.67	1.08	2.49	2.55	2.49
4 x 1 x 4	3.79	3.18	3.79	5.79	1.95	5.79	1.08	0.58	1.08	2.49	2.49	2.49
3 1/2 x 3 1/2 x 4	3.69	3.69	3.54	5.20	5.20	5.79	1.03	1.03	1.08	2.44	2.44	2.24
3 x 3 x 4	—	—	—	—	—	—	—	—	—	—	—	—
5 x 5 x 4	—	—	—	—	—	—	—	—	—	—	—	—
5 x 5 x 3	—	—	—	—	—	—	—	—	—	—	—	—
5 x 5 x 2 1/2	—	—	—	—	—	—	—	—	—	—	—	—
5 x 5 x 2	—	—	—	—	—	—	—	—	—	—	—	—
6 x 6 x 5	—	—	—	—	—	—	—	—	—	—	—	—
6 x 6 x 4	—	—	—	—	—	—	—	—	—	—	—	—
6 x 6 x 3	—	—	—	—	—	—	—	—	—	—	—	—

* Manufactured to WARD specifications

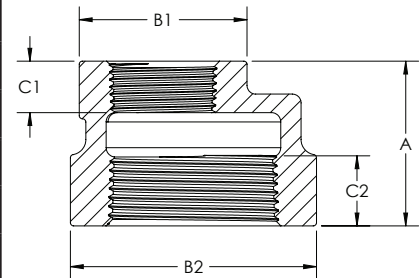
CAST IRON CONCENTRIC REDUCING COUPLING CLASS 125

NPS	Length of Coupling A	Outside Dia. of Band Small End B (min)	Outside Dia. of Large End B2 (min)	Length of Threads Small End C (min)	Length of Threads Large End C2 (min)	Take Out	Take Out
3/4 x 1/2	1.50	1.31	1.62	0.43	0.50	0.20	0.22
1 x 1/2	1.70	1.31	1.99	0.43	0.58	0.85	0.85
1 x 3/4	1.70	1.63	1.99	0.50	0.58	0.85	0.85
1 1/4 x 1	2.130	1.95	2.39	0.58	0.67	0.17	0.30
1 1/4 x 3/4	2.13	1.95	2.39	0.50	0.67	0.17	0.32
1 1/4 x 1/2	—	—	—	—	—	—	—
1 1/2 x 1 1/4	2.25	2.39	2.68	0.67	0.70	0.36	0.52
1 1/2 x 1	2.25	2.39	2.68	0.58	0.70		
1 1/2 x 3/4	—	—	—	—	—	—	—
1 1/2 x 1/2	—	—	—	—	—	—	—
2 x 1 1/2	2.32	2.68	3.28	0.70	0.75	0.40	0.44
2 x 1 1/4	2.32	2.39	3.28	0.67	0.75	0.40	0.45
2 x 1	2.32	1.95	3.28	0.58	0.75	0.40	0.44
2 x 3/4	2.32	1.63	3.28	0.50	0.75	0.40	0.45
2 x 1/2	2.32	1.63	3.28	0.43	0.75	0.40	0.48
2 1/2 x 2	2.63	3.28	3.86	0.75	0.92	0.18	0.56
2 1/2 x 1 1/2	2.63	3.28	3.86	0.70	0.92	0.18	0.59
3 x 2 1/2	—	—	—	—	—	—	—
3 x 2	2.88	3.28	4.62	0.75	0.98	0.29	0.68
3 x 1 1/2	2.88	3.28	4.62	0.70	0.98	0.24	0.72
4 x 3	—	—	—	—	—	—	—
4 x 2 1/2	—	—	—	—	—	—	—
4 x 2	—	—	—	—	—	—	—
6 x 4	—	—	—	—	—	—	—



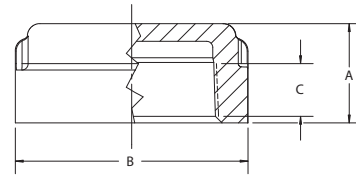
CAST IRON ECCENTRIC REDUCING COUPLING CLASS 125

NPS	Length of Coupling A	Outside Dia. of Band Small End B1 (min)	Outside Dia. of Large End B2 (min)	Length of Threads Small End C1 (min)	Length of Threads Large End C2 (min)	Take Out	Take Out
3/4 x 1/2	1.52	1.34	1.63	0.43	0.58	0.21	0.23
1 x 3/4	1.60	1.63	1.95	0.50	0.58	0.12	0.25
1 x 1/2	1.59	1.34	1.95	0.43	0.58	0.11	0.26
1 1/4 x 1	1.75	1.95	2.39	0.58	0.67	0.17	0.19
1 1/4 x 3/4	1.65	1.63	2.39	0.50	0.67	0.12	0.28
1 1/4 x 1/2	1.58	1.34	2.39	0.43	0.67	0.08	0.26
1 1/2 x 1 1/4	1.85	2.39	2.68	0.67	0.70	0.20	0.22
1 1/2 x 1	1.78	1.95	2.68	0.58	0.70	0.17	0.21
1 1/2 x 3/4	1.68	1.63	2.68	0.50	0.70	0.12	0.29
1 1/2 x 1/2	2.12	2.68	3.28	0.70	0.75	0.09	0.28
2 x 1 1/2	2.12	2.39	3.28	0.67	0.75	0.30	0.34
2 x 1 1/4	1.99	1.95	3.28	0.58	0.75	0.30	0.35
2 x 1	1.79	1.63	3.28	0.50	0.75	0.24	0.31
2 x 3/4	—	—	—	—	—	—	—
2 x 1/2	—	—	—	—	—	—	—
2 1/2 x 2	—	—	—	—	—	—	—
2 1/2 x 1 1/2	—	—	—	—	—	—	—
2 1/2 x 1 1/4	—	—	—	—	—	—	—
2 1/2 x 1	—	—	—	—	—	—	—
3 x 2 1/2	—	—	—	—	—	—	—
3 x 2	—	—	—	—	—	—	—
3 x 1 1/2	—	—	—	—	—	—	—
3 x 1 1/4	—	—	—	—	—	—	—
3 x 1	—	—	—	—	—	—	—
4 x 2 1/2	—	—	—	—	—	—	—
4 x 2	—	—	—	—	—	—	—
4 x 1 1/2	—	—	—	—	—	—	—
4 x 1 1/4	—	—	—	—	—	—	—



CAST IRON PIPE CAP CLASS 125

NPS	Overall Height A	Outside Dia. of Band B (min)	Length of Threads C (min)
2 1/2	1.810	3.860	0.920
3	1.910	4.620	0.980
3 1/2	2.030	5.200	1.030
4	2.220	5.790	1.080
5	2.380	7.050	1.180
6	2.630	8.280	1.280
8	2.880	10.630	1.470

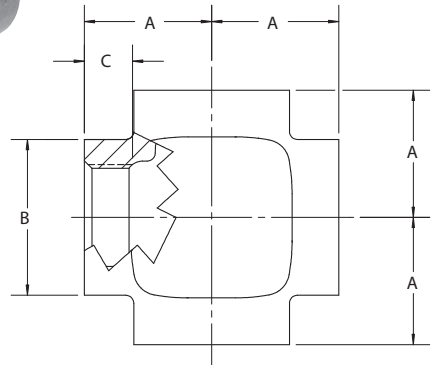


CAST IRON HEXAGON COUPLING

NPS	Width Across Flats A HEX.	Overall Length B	Thread Length C	Take Out	Take Out
1	1.94	1.69	0.58	0.16	0.16

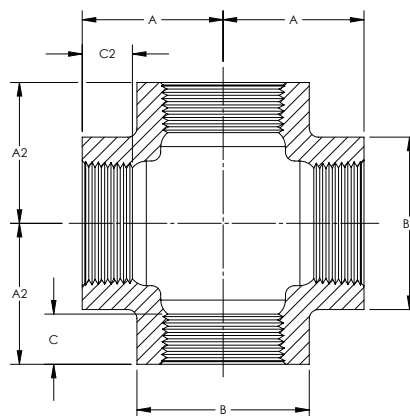
CAST IRON STRAIGHT CROSS CLASS 125

NPS	Center to End A	Outside Dia. Band B (min)	Length of Threads C (min)	Take Out
1/2	1.25	1.34	0.43	0.71
3/4	1.44	1.63	0.50	0.89
1	1.63	1.95	0.58	0.94
1 1/4	1.94	2.39	0.67	1.23
1 1/2	2.13	2.68	0.70	1.40
2	—	—	—	—
4	—	—	—	—



CAST IRON REDUCING CROSS CLASS 125

NPS	Center to End A	Center to End A2	Outside Dia. Band B (min)	Outside Dia. Band B2 (min)	Length of Threads C (min)	Length of Threads C2 (min)	Take Out	Take Out
1 1/4 x 1	1.67	1.58	2.39	1.95	0.67	0.58	0.96	0.89
1 1/2 x 1 1/4	—	—	—	—	—	—	—	—
1 1/2 x 1 1/4 x 1	—	—	—	—	—	—	—	—
1 1/2 x 1 1/4 x 1 x 1	—	—	—	—	—	—	—	—
1 1/2 x 1	1.80	1.65	2.68	1.95	0.70	0.58	1.07	0.96
1 1/2 x 1 x 1 x 1	—	—	—	—	—	—	—	—
2 x 1 1/2	—	—	—	—	—	—	—	—
2 x 1 1/4	—	—	—	—	—	—	—	—
2 x 1 1/2 x 1 x 1	—	—	—	—	—	—	—	—
2 x 1	2.02	1.73	3.28	1.95	0.75	0.58	1.26	1.04



CAST IRON 90° STRAIGHT ELL CLASS 250

NPS
1/2
3/4
1
1 1/4
1 1/2
2
2 1/2



CAST IRON 45° STRAIGHT ELL CLASS 250

NPS
1/2
3/4
1
1 1/4
1 1/2
2
2 1/2



CAST IRON STRAIGHT TEE CLASS 250

NPS
3/8
1/2
3/4
1
1 1/4
1 1/2
2
2 1/2



CAST IRON REDUCING TEE CLASS 250

NPS
1 1/4 x 1 1/4 x 3/4
1 1/2 x 1 1/2 x 3/4
2 x 2 x 3/4
2 x 2 x 1 1/2



SECTION 7

FLANGES, FLANGE UNIONS, COMPANION FLANGES, FLANGED FITTINGS



WARD flange components are made with high quality iron and are designed to handle the tough service that flange components normally experience. Precision machining and thread chamfering allow WARD flange components to be easily installed. Most importantly, quality is built into the design, material and manufacturing of each of WARD's flange components.

Cast Iron flanges may have either a black or galvanized finish.

	FLANGES		HUB	BLIND FLANGES		BOLT HOLES		BOLTING			
NPS	Dia. of Flange	Thickness of Flange (min)	Dia. of Hub (min)	Length of Hub and Threads (min)	Dia. of Port	Wall Thickness	Dia. of Bolt Circle	Dia. of Bolt Holes	Number of Bolts	Dia. of Bolts	Length of Bolts
1	4.25	0.44	1.94	0.69	1.00	0.38	3.12	0.62	4	0.50	2.00
1 1/4	4.62	0.50	2.31	0.81	1.25	0.44	3.50	0.62	4	0.50	2.00
1 1/2	5.00	0.56	2.56	0.88	1.50	0.50	3.88	0.62	4	0.50	2.00
2	6.00	0.62	3.06	1.00	2.00	0.56	4.75	0.75	4	0.62	2.50
2 1/2	7.00	0.69	3.56	1.12	2.50	0.63	5.50	0.75	4	0.62	2.50
3	7.50	0.75	4.25	1.19	3.00	0.69	6.00	0.75	4	0.62	2.50
3 1/2	8.50	0.81	4.81	1.25	3.50	0.75	7.00	0.75	8	0.62	3.00
4	9.00	0.94	5.31	1.31	4.00	0.88	7.50	0.75	8	0.62	3.00
5	10.00	0.94	6.44	1.44	5.00	0.88	8.50	0.88	8	0.75	3.00
6	11.00	1.00	7.56	1.56	6.00	0.94	9.50	0.88	8	0.75	3.50
8	13.50	1.12	9.96	1.75	8.00	1.06	11.75	0.88	8	0.75	3.50
10	16.00	1.19	11.94	1.94	10.00	1.12	14.25	1.00	12	0.88	4.00
12	19.00	1.25	14.06	2.19	12.00	0.81	17.00	1.00	12	0.88	4.00

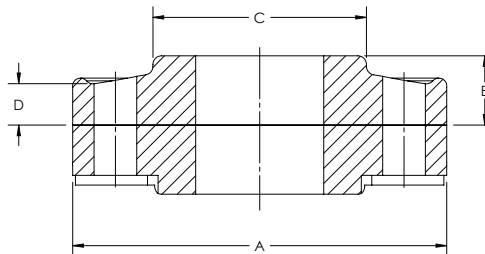
Material: ASTM A126
Dimensions: ANSI / ASME B16.1
 ANSI / ASME B1.20.1
Pressure Ratings: ANSI/ASME B16.1
Coatings: ASTM A153
 ASTM B633
Additional Specifications: UL, ULC AND FM, where applicable

Metalfit flanged fitting made in North America.

CAST IRON FLANGE UNION CLASS 125 *WORKING PRESSURE 175 PSI

NPS	Outside Flange Dia. A	Overall Height B (min)	Dia. of Hub C (min)	Thickness of Flange D (min)	Number of Bolt Holes	Bolt Hole Size	Bolt Circle Dia.	Dia. of Bolts	Length of Bolts
*1/2	2.81	0.62	1.31	0.43	3	0.44	1.69	0.44	1.75
*3/4	3.43	0.75	1.75	0.43	3	0.50	2.31	0.44	1.75
*1	3.50	0.75	1.88	0.43	3	0.50	2.50	0.44	1.75
*1 1/4	4.06	0.75	2.25	0.43	4	0.50	3.00	0.44	1.75
*1 1/2	4.37	0.81	2.5	0.43	4	0.50	3.38	0.44	1.75
*2	5.12	1.00	3.13	0.50	4	0.56	4.06	0.50	2.25
*2 1/2	6.62	1.25	3.56	0.62	4	0.69	4.63	0.63	2.75
*3	6.68	1.25	4.25	0.62	4	0.69	5.38	0.63	2.50
*3 1/2	7.25	1.25	4.75	0.62	4	0.69	5.88	0.63	2.50
*4	7.81	1.37	4.94	0.68	5	0.69	6.56	0.63	2.50
*5	9.43	1.43	6.69	0.75	5	0.69	8.06	0.63	2.75
*6	10.56	1.50	7.31	1.00	6	0.69	9.06	0.63	2.75
*8	13.50	1.75	9.25	1.18	7	0.88	11.88	0.75	3.75

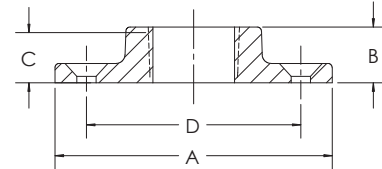
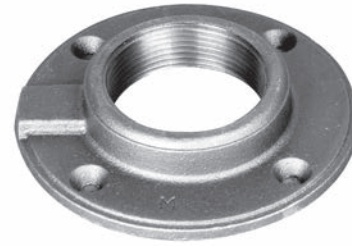
* Manufactured to WARD specifications



MALLEABLE IRON FLOOR FLANGE

NPS	Outside Flange Dia. A	Overall Height B (min)	Length of Threads C (min)	Number of Bolt Holes	Bolt Hole Size	Bolt Circle Dia. D
*1/4	2.37	0.46	0.32	3	0.27	1.86
*3/8	2.93	0.52	0.36	4	0.27	1.93
*1/2	3.00	0.65	0.43	4	0.24	2.10
*3/4	3.25	0.65	0.50	4	0.25	2.31
*1	3.87	0.77	0.58	4	0.27	3.00
*1 1/4	3.87	0.77	0.67	4	0.27	3.00
*1 1/2	4.50	0.99	0.70	4	0.30	3.60
*2	5.50	1.00	0.75	4	0.39	4.25
*2 1/2	5.81	1.06	0.92	4	0.33	4.79
*3	6.37	1.10	0.98	6	0.31	5.18
*4	7.93	1.10	1.05	5	0.38	6.70

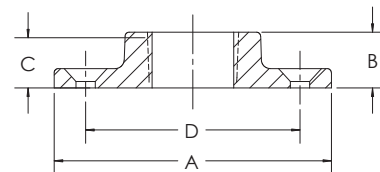
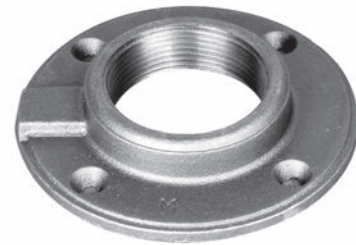
* Manufactured to WARD specifications



CAST IRON FLOOR FLANGE

NPS	Outside Flange Dia. A	Overall Height B (min)	Length of Threads C (min)	Number of Bolt Holes	Bolt Hole Size	Bolt Circle Dia. D
*1/4	2.37	0.46	0.32	3	0.27	1.60
*3/8	2.93	0.52	0.36	4	0.27	1.93
*1/2	3.00	0.65	0.43	4	0.24	2.10
*3/4	3.25	0.65	0.50	4	0.25	2.31
*1	3.87	0.77	0.58	4	0.27	3.00
*1 1/4	3.87	0.77	0.67	4	0.27	3.00
*1 1/2	4.50	0.99	0.70	4	0.30	3.60
*2	5.50	1.00	0.75	4	0.39	4.25
*2 1/2	5.81	1.06	0.92	4	0.33	4.79
*3	6.37	1.10	0.98	6	0.31	5.18
*4	7.93	1.10	1.05	5	0.38	6.70

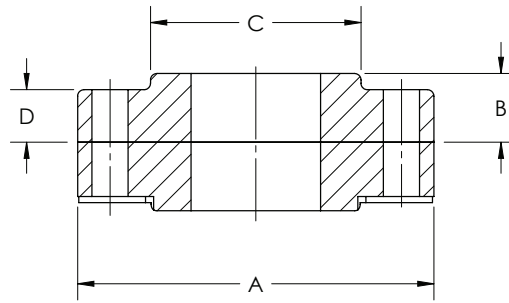
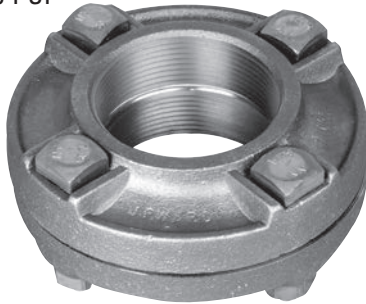
* Manufactured to WARD specifications



CAST IRON EXTRA HEAVY FLANGE UNION CLASS 250

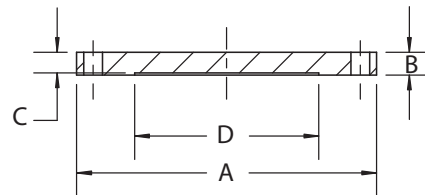
NPS	Outside Flange Dia. A	Overall Height B (min)	Dia. of Hub C (min)	Thickness of Flange D (min)	Number of Bolt Holes	Bolt Hole Size	Bolt Circle Dia.	Dia. of Bolts	Length of Bolts
*2	5.50	1.06	3.25	0.81	5	0.56	4.50	0.50	2.50
*2 1/2	6.00	1.06	3.81	0.81	5	0.66	4.75	0.63	2.75
*3	6.81	1.18	4.38	0.81	6	0.69	5.35	0.63	2.75
*4	8.18	1.25	5.44	0.75	7	0.69	6.38	0.63	3.00

*Working Pressure 400 PSI



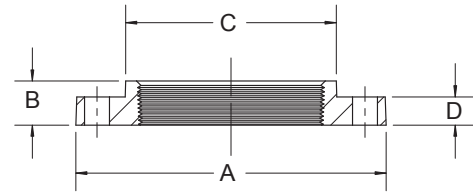
CAST IRON BLIND FLANGE

NPS	Outside Flange Dia. A	Thickness of Flange D (min)	Number of Bolt Holes	Bolt Hole Size	Bolt Circle Dia.	Dia. of Port D
1	4.25	0.44	4	0.62	3.12	1.00
1 1/4	4.62	0.50	4	0.62	3.50	1.25
1 1/2	5.00	0.56	4	0.62	3.88	1.50
2	6.00	0.62	4	0.75	4.75	2.00
2 1/2	7.00	0.69	4	0.75	5.50	2.50
3	7.50	0.75	4	0.75	6.00	3.00
3 1/2	8.50	0.81	8	0.75	7.00	3.50
4	9.00	0.94	8	0.75	7.50	4.00
5	10.0	0.94	8	0.88	8.50	5.00
6	11.0	1.00	8	0.88	9.50	6.00
8	13.5	1.12	8	0.88	11.75	8.00
10	16.0	1.19	12	1.00	14.25	10.00



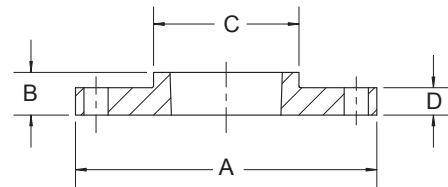
CAST IRON STRAIGHT COMPANION FLANGE

NPS	Outside Flange Dia. A	Overall Length B (min)	Dia. of Hub C (min)	Thickness of Flange D (min)	Number of Bolt Holes	Bolt Hole Size	Bolt Circle Dia.
3/4	—	—	—	—	—	—	—
1	4.250	0.690	1.940	0.440	4	0.620	3.120
1 1/4	4.620	0.810	2.310	0.500	4	0.620	3.500
1 1/2	5.000	0.880	2.560	0.560	4	0.620	3.880
2	6.000	1.000	3.060	0.620	4	0.750	4.750
2 1/2	7.000	1.120	3.560	0.690	4	0.750	5.500
3	7.500	1.190	4.250	0.750	4	0.750	6.000
3 1/2	8.500	1.250	4.810	0.810	8	0.750	7.000
4	9.000	1.310	5.310	0.940	8	0.750	7.500
5	10.000	1.440	6.440	0.940	8	0.880	8.500
6	11.000	1.560	7.560	1.000	8	0.880	9.500
8	13.500	1.750	9.690	1.120	8	0.880	11.750
10	16.000	1.940	11.940	1.190	12	1.000	14.250



CAST IRON REDUCING COMPANION FLANGE

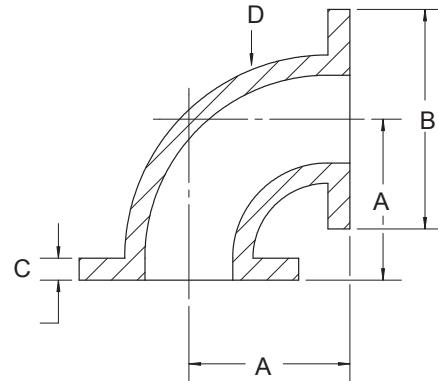
NPS	Outside Flange Dia. A	Overall Height B (min)	Dia. of Hub C (min)	Thickness of Flange D (min)	Number of Bolt Holes	Bolt Hole Size	Bolt Circle Dia.
3/4 x 1 1/2	5.00	0.69	1.94	0.56	4	0.62	3.88
1 x 1 1/2	5.00	0.69	1.94	0.56	4	0.62	3.88
1 x 2	6.00	0.69	1.94	0.62	4	0.75	4.75
1 x 3	7.50	0.69	1.93	0.75	4	0.75	6.00
1 1/4 x 2	6.00	0.81	2.31	0.62	4	0.75	4.75
1 1/4 x 3	7.50	0.81	2.31	0.75	4	0.75	6.00
1 1/2 x 2	6.00	0.88	2.56	0.62	4	0.75	4.75
1 1/2 x 2 1/2	7.00	0.88	2.56	0.69	4	0.75	5.50
1 1/2 x 3	7.50	0.88	2.56	0.75	4	0.75	6.00
1 1/2 x 4	9.00	0.88	2.56	0.94	8	0.75	7.50
1 1/2 x 6	11.00	0.88	2.56	1.00	8	0.88	9.50
2 x 2 1/2	7.00	1.00	3.06	0.69	4	0.75	5.50
2 x 3	7.50	1.00	3.06	0.75	4	0.75	6.00
2 x 4	9.00	1.00	3.06	0.94	8	0.75	7.50
2 x 5	10.00	1.00	3.06	0.94	8	0.88	8.50
2 x 6	11.00	1.00	3.06	1.00	8	0.88	9.50
2 x 8	13.50	1.00	3.06	1.12	8	0.88	11.75
2 1/2 x 3	7.50	1.12	3.56	0.75	4	0.75	6.00
2 1/2 x 4	9.00	1.12	3.56	0.94	8	0.75	7.50
2 1/2 x 5	10.00	1.12	3.56	0.94	8	0.88	8.50
2 1/2 x 6	11.00	1.12	3.56	1.00	8	0.88	9.50
3 x 3 1/2	8.50	1.19	4.25	0.81	8	0.75	7.00
3 x 4	9.00	1.19	4.25	0.94	8	0.75	7.50
3 x 5	10.00	1.19	4.25	0.94	8	0.88	8.50
3 x 6	11.00	1.19	4.25	1.00	8	0.88	9.50
3 x 8	13.50	1.19	4.25	1.12	8	0.88	11.75
3 1/2 x 4	9.00	1.25	4.81	0.94	8	0.75	7.50
4 x 5	10.00	1.31	5.31	0.94	8	0.88	8.50
5 x 6	11.00	1.44	6.44	1.00	8	0.88	9.50
5 x 8	13.50	1.44	6.44	1.12	8	0.88	11.75
6 x 8	13.50	1.56	7.56	1.12	8	0.88	11.75



CAST IRON FLANGED STRAIGHT 90° ELL CLASS 125

NPS	Center to Face A	Outside Flange Dia. B	Thickness of Flange C (min)	Wall Thickness D	Number of Bolt Holes	Bolt Hole Size	Bolt Circle Dia.	Dia. of Bolts	Length of Bolts
2	4.500	6.000	0.620	0.310	4	0.75	4.75	5/8	2 1/4
2 1/2	5.000	7.000	0.690	0.310	4	0.75	5.50	5/8	2 1/2
3	5.500	7.500	0.750	0.380	4	0.75	6.00	5/8	2 1/2
4	6.500	9.000	0.940	0.500	8	0.75	7.50	5/8	3
5	7.500	10.000	0.940	0.500	8	0.88	8.50	3/4	3
6	8.000	11.000	1.000	0.560	8	0.88	9.50	3/4	3 1/4
8	9.000	13.500	1.120	0.620	8	0.88	11.75	3/4	3 1/2
10	11.000	16.000	1.190	0.750	12	1.00	14.25	7/8	3 3/4
12	12.000	19.000	1.250	0.810	12	1.00	17.00	7/8	3 3/4

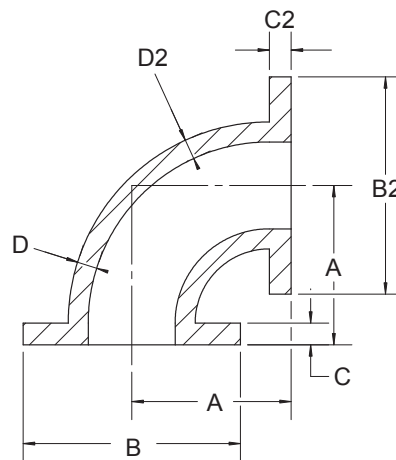
Metalfit flanged straight ell made in North America.



CAST IRON FLANGED REDUCING 90° ELL CLASS 125

NPS	Center to Face A	Outside Flange Dia. B	Outside Flange Dia. B2	Thickness of Flange C (min)	Thickness of Flange C2 (min)	Wall Thickness D	Wall Thickness D2
3 x 2 1/2	5.500	7.500	7.000	0.750	0.690	0.380	0.310
3 x 2	5.500	7.500	6.000	0.750	0.620	0.380	0.310
4 x 3	6.500	9.000	7.500	0.940	0.750	0.500	0.380
4 x 2 1/2	6.500	9.000	7.000	0.940	0.690	0.500	0.310
4 x 2	6.500	9.000	6.000	0.940	0.620	0.500	0.310
5 x 4	8.000	10.000	9.000	0.940	0.940	0.500	0.500
6 x 5	8.000	11.000	10.000	1.000	0.940	0.560	0.500
6 x 4	8.000	11.000	9.000	1.000	0.940	0.560	0.500
6 x 3	8.000	11.000	7.500	1.000	0.750	0.560	0.380
6 x 2 1/2	8.000	11.000	7.000	1.000	0.690	0.560	0.310
8 x 6	9.000	13.500	11.000	1.120	1.000	0.620	0.560
8 x 5	9.000	13.500	10.000	1.120	0.940	0.620	0.500
8 x 4	9.000	13.500	9.000	1.120	0.940	0.620	0.500
10 x 8	11.000	16.000	13.500	1.190	1.120	0.750	0.620
10 x 6	11.000	16.000	11.000	1.190	1.000	0.750	0.560
12 x 10	12.000	19.000	16.000	1.250	1.190	0.810	0.750
12 x 8	12.000	19.000	13.500	1.250	1.120	0.810	0.620
12 x 6	12.000	19.000	11.000	1.250	1.000	0.810	0.560

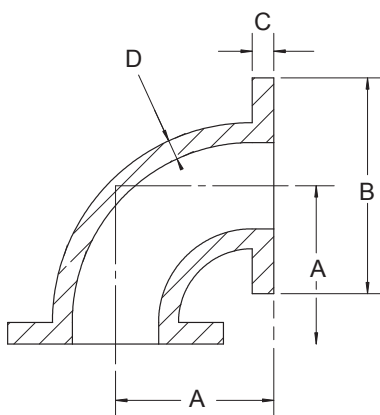
Metalfit flanged reducing ell made in North America.



CAST IRON FLANGED 90° STRAIGHT ELL LONG RADIUS CLASS 125

NPS	Center to Face A	Outside Flange Dia. B	Thickness of Flange C (min)	Wall Thickness D	Number of Bolt Holes	Bolt Hole Size	Bolt Circle Dia.	Dia. of Bolts	Length of Bolts
2	6.500	6.000	0.620	0.310	4	0.75	4.75	5/8	2 1/4
2 1/2	7.000	7.000	0.690	0.310	4	0.75	5.50	5/8	2 1/2
3	7.750	7.500	0.750	0.380	4	0.75	6.00	5/8	2 1/2
4	9.000	9.000	0.940	0.500	8	0.75	7.50	5/8	3
6	11.500	11.000	1.000	0.560	8	0.88	9.50	3/4	3 1/3
8	14.000	13.500	1.120	0.620	8	0.88	11.75	3/4	3 1/2
10	16.500	16.000	1.190	0.750	12	1.00	14.25	7/8	3 3/4
12	19.000	19.000	1.250	0.810	12	1.00	17.00	7/8	3 3/4

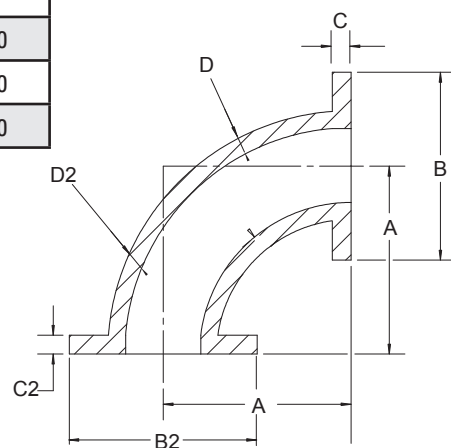
Metalfit flanged straight ell made in North America.



CAST IRON FLANGED 90° REDUCING ELL LONG RADIUS CLASS 125

NPS	Center to Face A	Outside Flange Dia. B	Outside Flange Dia. B2	Thickness of Flange C (min)	Thickness of Flange C2 (min)	Wall Thickness D	Wall Thickness D2
4 x 3	9.000	9.000	7.500	0.940	0.750	0.500	0.380
6 x 4	11.500	11.000	9.000	1.000	0.940	0.560	0.500
8 x 6	14.000	13.500	11.000	1.120	1.000	0.620	0.560

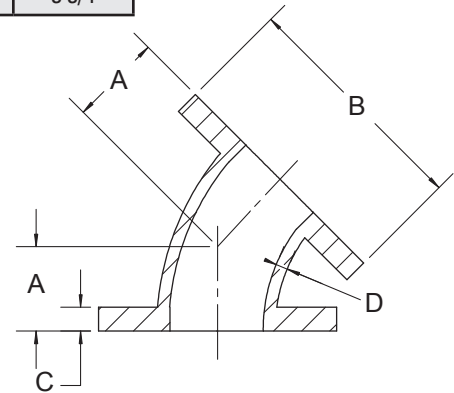
Metalfit flanged reducing ell made in North America.



CAST IRON FLANGED 45° STRAIGHT ELL CLASS 125

NPS	Center to Face A	Outside Flange Dia. B	Thickness of Flange C (min)	Wall Thickness D	Number of Bolt Holes	Bolt Hole Size	Bolt Circle Dia.	Dia. of Bolts	Length of Bolts
2	2.500	6.000	0.620	0.310	4	0.75	4.75	5/8	2 1/4
2 1/2	3.000	7.000	0.690	0.310	4	0.75	5.50	5/8	2 1/2
3	3.000	7.500	0.750	0.380	4	0.75	6.00	5/8	2 1/2
4	4.000	9.000	0.940	0.500	8	0.75	7.50	5/8	3
5	4.500	10.000	0.940	0.500	8	0.88	8.50	3/4	3
6	5.000	11.000	1.000	0.560	8	0.88	9.50	3/4	3 1/4
8	5.500	13.500	1.120	0.620	8	0.88	11.75	3/4	3 1/2
10	6.500	16.000	1.190	0.750	12	1.00	14.25	7/8	3 3/4
12	7.500	19.000	1.250	0.810	12	1.00	17.00	7/8	3 3/4

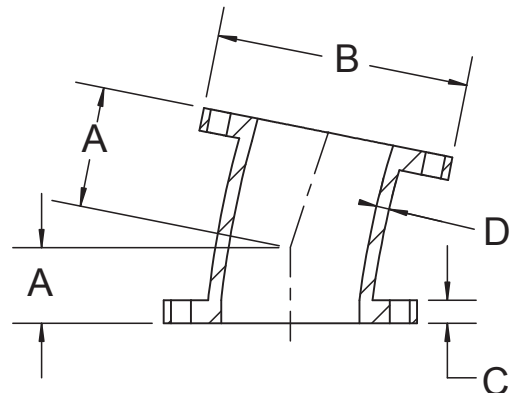
Metalfit flanged straight ell made in North America.



CAST IRON FLANGED 11 1/4° STRAIGHT ELL CLASS 125

NPS	Center to Face A	Outside Flange Dia. B	Thickness of Flange C (min)	Wall Thickness D	Number of Bolt Holes	Bolt Hole Size	Bolt Circle Dia.	Dia. of Bolts	Length of Bolts
2	2.500	6.000	0.620	0.310	4	0.75	4.75	5/8	2 1/4
2 1/2	3.000	7.000	0.690	0.310	4	0.75	5.50	5/8	2 1/2
3	3.000	7.500	0.750	0.380	4	0.75	6.00	5/8	2 1/2
4	4.000	9.000	0.940	0.500	8	0.75	7.50	5/8	3
6	5.000	11.000	1.000	0.560	8	0.88	9.50	3/4	3 1/4
8	5.500	13.500	1.120	0.620	8	0.88	11.50	3/4	3 1/2
10	6.500	16.000	1.190	0.750	12	1.00	14.75	7/8	3 3/4
12	7.500	19.000	1.250	0.810	12	1.00	17.00	7/8	3 3/4

Metalfit flanged straight ell made in North America.

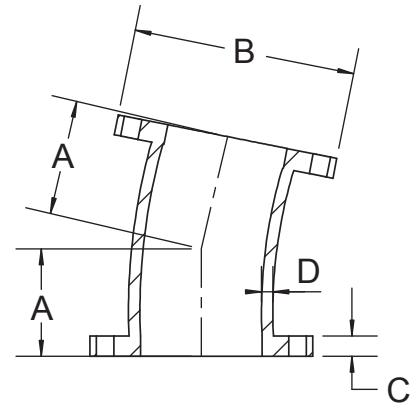


CAST IRON FLANGED 22 1/2° STRAIGHT ELL CLASS 125

NPS	Center to Face A	Outside Flange Dia. B	Thickness of Flange C (min)	Wall Thickness D	Number of Bolt Holes	Bolt Hole Size	Bolt Circle Dia.	Dia. of Bolts	Length of Bolts
2	2.500	6.000	0.620	0.310	4	0.75	4.75	5/8	2 1/4
2 1/2	3.000	7.000	0.690	0.310	4	0.75	5.50	5/8	2 1/2
3	3.000	7.500	0.750	0.380	4	0.75	6.00	5/8	2 1/2
4	4.000	9.000	0.940	0.500	8	0.75	7.50	5/8	3
6	5.000	11.000	1.000	0.560	8	0.88	9.50	3/4	3 1/4
8	5.500	13.500	1.120	0.620	8	0.88	11.75	3/4	3 1/2
10	6.500	16.000	1.190	0.750	12	1.00	14.25	7/8	3 3/4
12	7.500	19.000	1.250	0.810	12	1.00	17.00	7/8	3 3/4



Metalfit flanged straight ell made in North America.

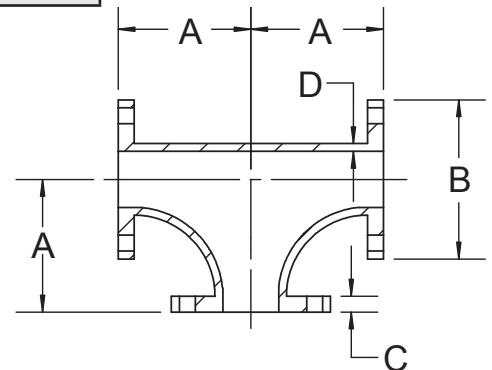


CAST IRON FLANGED STRAIGHT TEE CLASS 125

NPS	Center to Face A	Outside Flange Dia. B	Thickness of Flange C (min)	Wall Thickness D	Number of Bolt Holes	Bolt Hole Size	Bolt Circle Dia.	Dia of Bolts	Length of Bolts
2	4.500	6.000	0.620	0.310	4	0.75	4.75	5/8	2 1/4
2 1/2	5.000	7.000	0.690	0.310	4	0.75	5.50	5/8	2 1/2
3	5.500	7.500	0.750	0.380	4	0.75	6.00	5/8	2 1/2
4	6.500	9.000	0.940	0.500	8	0.75	7.50	5/8	3
5	7.500	10.000	0.940	0.500	8	0.88	8.50	3/4	3
6	8.000	11.000	1.000	0.560	8	0.88	9.50	3/4	3 1/4
8	9.000	13.500	1.120	0.620	8	0.88	11.75	3/4	3 1/2
10	11.000	16.000	1.190	0.750	12	1.00	14.25	7/8	3 3/4
12	12.000	19.000	1.250	0.810	12	1.00	17.00	7/8	3 3/4

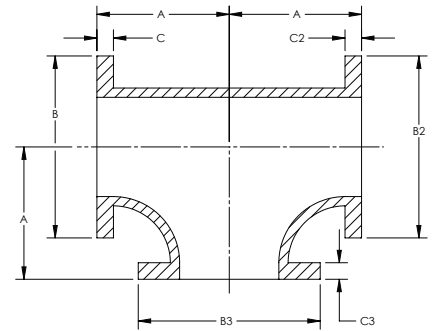


Metalfit flanged straight tee made in North America.



CAST IRON FLANGED REDUCING TEE CLASS 125

NPS	Center to Face A	Outside Flange Dia. B	Outside Flange Dia. B2	Outside Flange Dia. B3	Thickness of Flange C (min)	Thickness of Flange C2 (min)	Thickness of Flange C3 (min)
3 x 3 x 4	5.500	7.500	7.500	9.000	0.750	0.750	0.940
3 x 3 x 2 1/2	5.500	7.500	7.500	7.000	0.750	0.750	0.690
3 x 3 x 2	5.500	7.500	7.500	6.000	0.750	0.750	0.620
4 x 3 x 4	6.500	9.000	7.500	9.000	0.940	0.750	0.940
4 x 3 x 3	6.500	9.000	7.500	7.500	0.940	0.750	0.750
4 x 2 x 4	6.500	9.000	6.000	9.000	0.940	0.620	0.940
4 x 4 x 6	8.000	9.000	9.000	11.000	0.940	0.940	1.000
4 x 4 x 3	6.500	9.000	9.000	7.000	0.940	0.940	0.750
4 x 4 x 2 1/2	6.500	9.000	9.000	7.000	0.940	0.940	0.690
4 x 4 x 2	6.500	9.000	9.000	6.000	0.940	0.940	0.620
6 x 4 x 6	8.000	11.000	9.000	11.000	1.000	0.940	1.000
6 x 4 x 4	8.000	11.000	9.000	9.000	1.000	0.940	0.940
6 x 4 x 3	8.000	11.000	9.000	7.000	1.000	0.940	0.750
6 X 3 X 6	8.000	11.000	7.000	11.000	1.000	0.750	1.000
6 x 6 x 8	9.000	11.000	11.000	13.500	1.000	1.000	1.120
6 x 6 x 4	8.000	11.000	11.000	9.000	1.000	1.000	0.940
6 x 6 x 3	8.000	11.000	11.000	7.500	1.000	1.000	0.750
6 x 6 x 2 1/2	8.000	11.000	11.000	7.000	1.000	1.000	0.690
6 x 6 x 2	8.000	11.000	11.000	6.000	1.000	1.000	0.620
8 x 6 x 8	9.000	13.500	11.000	13.500	1.120	1.000	1.120
8 x 6 x 6	9.000	13.500	11.000	11.000	1.120	1.000	1.000
8 x 6 x 4	9.000	13.500	11.000	9.000	1.120	1.000	0.940
8 x 4 x 8	9.000	13.500	9.000	13.500	1.120	0.940	1.120
8 x 8 x 10	11.000	13.500	13.500	16.000	1.120	1.120	1.190
8 x 8 x 6	9.000	13.500	13.500	11.000	1.120	1.120	1.000
8 x 8 x 4	9.000	13.500	13.500	9.000	1.120	1.120	0.940
8 x 8 x 3	9.000	13.500	13.500	7.500	1.120	1.120	0.750
10 x 8 x 10	11.000	16.000	13.500	16.000	1.190	1.120	1.190
10 x 8 x 8	11.000	16.000	13.500	13.500	1.190	1.120	1.120
10 x 8 x 6	11.000	16.000	13.500	11.000	1.190	1.120	1.000
10 x 6 x 10	11.000	16.000	11.000	19.000	1.190	1.000	1.190
10 x 10 x 12	12.000	16.000	16.000	19.000	1.190	1.190	1.250
10 x 10 x 8	11.000	16.000	16.000	13.500	1.190	1.190	1.120
10 x 10 x 6	11.000	16.000	16.000	11.000	1.190	1.190	1.000
10 x 10 x 4	11.000	16.000	16.000	9.000	1.190	1.190	0.940
10 x 10 x 3	11.000	16.000	16.000	7.000	1.190	1.190	0.750
10 x 10 x 2 1/2	11.000	16.000	16.000	7.000	1.190	1.190	0.690
12 x 10 x 12	12.000	19.000	16.000	19.000	1.250	1.190	1.250
12 x 10 x 10	12.000	19.000	16.000	16.000	1.250	1.190	1.190
12 x 12 x 10	12.000	19.000	19.000	16.000	1.250	1.250	1.190
12 x 12 x 8	12.000	19.000	19.000	13.500	1.250	1.250	1.120
12 x 12 x 6	12.000	19.000	19.000	11.000	1.250	1.250	1.000
12 x 12 x 4	12.000	19.000	19.000	9.000	1.250	1.250	0.940
12 x 12 x 3	12.000	19.000	19.000	7.000	1.250	1.250	0.750

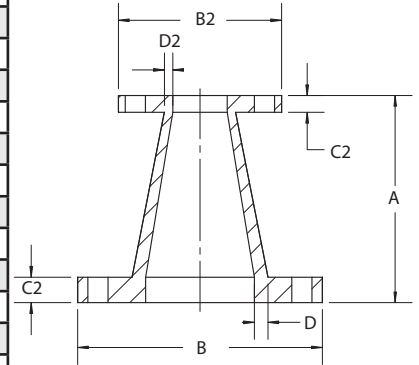


Metalfit flanged reducing tee made in North America.

CAST IRON FLANGED CONCENTRIC REDUCING COUPLING CLASS 125

NPS	Center to Face A	Outside Flange Dia. B	Outside Flange Dia. B2	Thickness of Flange C (min)	Thickness of Flange C2 (min)	Wall Thickness D	Wall Thickness D2
2 1/2 x 2	5.500	7.000	6.000	0.690	0.620	0.310	0.310
3 x 2 1/2	6.000	7.500	7.000	0.750	0.690	0.380	0.310
3 x 2	6.000	7.500	6.000	0.750	0.620	0.380	0.310
4 x 3	7.000	9.000	7.500	0.940	0.750	0.500	0.380
4 x 2 1/2	7.000	9.000	7.000	0.940	0.690	0.500	0.310
4 x 2	7.000	9.000	6.000	0.940	0.620	0.500	0.310
5 x 4	8.000	10.000	9.000	0.940	0.940	0.500	0.500
5 x 3	8.000	10.000	7.500	0.940	0.750	0.500	0.380
6 x 5	9.000	11.000	10.000	1.000	0.940	0.560	0.500
6 x 4	9.000	11.000	9.000	1.000	0.940	0.560	0.500
6 x 3	9.000	11.000	7.500	1.000	0.750	0.560	0.380
6 x 2 1/2	9.000	11.000	7.000	1.000	0.690	0.560	0.310
6 x 2	9.000	11.000	6.000	1.000	0.620	0.560	0.310
8 x 6	11.000	13.500	11.000	1.120	1.000	0.620	0.560
8 x 5	11.000	13.500	10.000	1.120	0.940	0.620	0.500
8 x 4	11.000	13.500	9.000	1.120	0.940	0.620	0.500
8 x 3	11.000	13.500	7.500	1.120	0.750	0.620	0.380
10 x 8	12.000	16.000	13.500	1.190	1.120	0.750	0.620
10 x 6	12.000	16.000	11.000	1.190	1.000	0.750	0.560
10 x 4	12.000	16.000	9.000	1.190	0.940	0.750	0.500
12 x 10	12.000	19.000	16.000	1.250	1.190	0.810	0.750
12 x 8	12.000	19.000	13.500	1.250	1.120	0.810	0.620
12 x 6	12.000	19.000	11.000	1.250	1.000	0.810	0.560
12 x 4	12.000	19.000	9.000	1.250	0.940	0.810	0.500

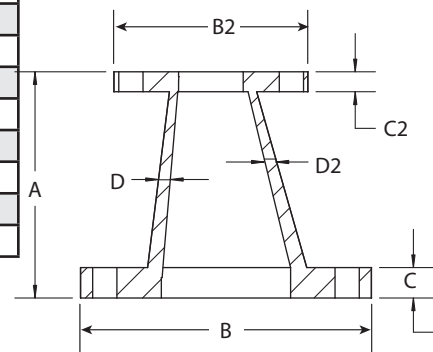
Metalfit flanged concentric reducing coupling made in North America.



CAST IRON FLANGED ECCENTRIC REDUCING COUPLING CLASS 125

NPS	Center to Face A	Outside Flange Dia. B	Outside Flange Dia. B2	Thickness of Flange C (min)	Thickness of Flange C2 (min)	Wall Thickness D	Wall Thickness D2
3 x 2 1/2	6.000	7.500	7.000	0.750	0.690	0.380	0.310
3 x 2	6.000	7.500	6.000	0.750	0.620	0.380	0.310
4 x 3	7.000	9.000	7.500	0.940	0.750	0.500	0.380
4 x 2 1/2	7.000	9.000	7.000	0.940	0.690	0.500	0.310
4 x 2	7.000	9.000	6.000	0.940	0.620	0.500	0.310
6 x 5	9.000	11.000	10.000	1.000	0.940	0.560	0.500
6 x 4	9.000	11.000	9.000	1.000	0.940	0.560	0.500
6 x 3	9.000	11.000	7.500	1.000	0.750	0.560	0.380
8 x 6	11.000	13.500	11.000	1.120	1.000	0.620	0.560
8 x 5	11.000	13.500	10.000	1.120	0.940	0.620	0.500
8 x 4	11.000	13.500	9.000	1.120	0.940	0.620	0.500
10 x 8	12.000	16.000	13.500	1.190	1.120	0.750	0.620
10 x 6	12.000	16.000	11.000	1.190	1.000	0.750	0.560
12 x 10	14.000	19.000	16.000	1.250	1.190	0.810	0.750
12 x 8	14.000	19.000	13.500	1.250	1.120	0.810	0.620
12 x 6	12.000	19.000	11.000	1.250	1.000	0.810	0.560

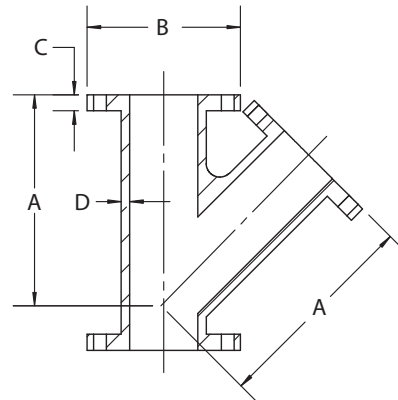
Metalfit flanged eccentric reducing coupling made in North America.



CAST IRON FLANGED 45° LATERAL CLASS 125

NPS	Center to Face A	Outside Flange Dia. B	Thickness of Flange C (min)	Wall Thickness D	Number of Bolt Holes	Bolt Hole Size	Bolt Circle Dia.	Dia. of Bolts	Length of Bolts
2 1/2	9.500	7.000	0.690	0.310	4	0.75	5.50	5/8	2 1/2
3	10.000	7.500	0.750	0.380	4	0.75	6.00	5/8	2 1/2
4	12.000	9.000	0.940	0.500	8	0.75	7.50	5/8	3
6	14.500	11.000	1.000	0.560	8	0.88	9.50	3/4	3 1/4
8	17.500	13.500	1.120	0.620	8	0.88	11.75	3/4	3 1/2
10	11.000	16.000	1.190	0.750	12	1.00	14.25	7/8	3 3/4
12	12.000	19.000	1.250	0.810	12	1.00	17.00	7/8	3 3/4

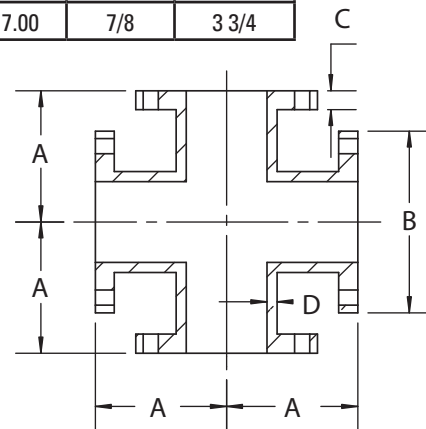
Metalfit flanged lateral class made in North America.



CAST IRON FLANGED CROSS CLASS 125

NPS	Center to Face A	Outside Flange Dia. B	Thickness of Flange C (min)	Wall Thickness D	Number of Bolt Holes	Bolt Hole Size	Bolt Circle Dia.	Dia. of Bolts	Length of Bolts
2	4.500	6.000	0.620	0.310	4	0.75	4.75	5/8	2 1/4
2 1/2	5.000	7.000	0.690	0.310	4	0.75	5.50	5/8	2 1/2
3	5.500	7.500	0.750	0.380	4	0.75	6.00	5/8	2 1/2
4	6.500	9.000	0.940	0.500	8	0.75	7.50	5/8	3
6	8.000	11.000	1.000	0.560	8	0.88	9.50	3/4	3 1/4
8	9.000	13.500	1.120	0.620	8	0.88	11.75	3/4	3 1/2
10	11.000	16.000	1.190	0.750	12	1.00	14.25	7/8	3 3/4
12	12.000	19.000	1.250	0.810	12	1.00	17.00	7/8	3 3/4

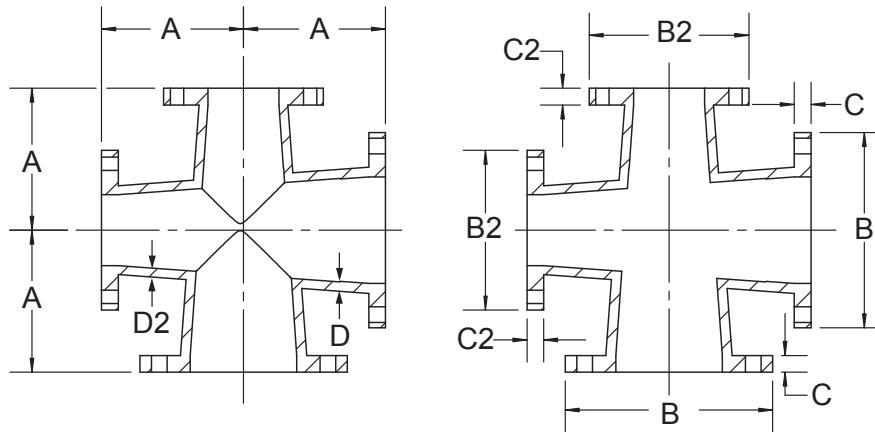
Metalfit flanged cross class made in North America.



CAST IRON FLANGED REDUCING CROSS CLASS 125

NPS	Center to Face A	Outside Flange Dia. B	Outside Flange Dia. B2	Thickness of Flange C (min)	Thickness of Flange C2 (min)	Wall Thickness D	Wall Thickness D2
6 x 2 x 2	8.000	11.000	6.000	1.000	0.620	0.560	0.310
6 x 4	8.000	11.000	9.000	1.000	0.940	0.560	0.500
8 x 6	9.000	13.500	11.000	1.120	1.000	0.620	0.560
12 x 10 x 10	12.000	19.000	16.000	1.250	1.190	0.810	0.750
12 x 8 x 8	12.000	19.000	13.500	1.250	1.120	0.810	0.620
12 x 3 x 3	12.000	19.000	7.500	1.250	0.750	0.810	0.380

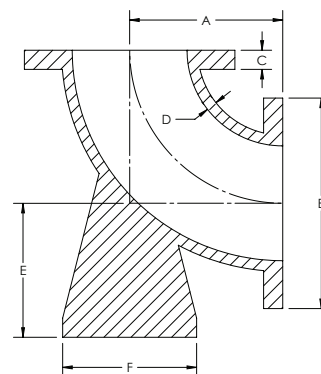
Metalfit flanged reducing cross class made in North America.



CAST IRON FLANGED STRAIGHT STANDARD BASE 90° ELL CLASS 125

NPS	Center to Face A	Outside Flange Dia. B	Thickness of Flange C (min)	Wall Thickness D	Height of Base E	Round and Square Base F	Number of Bolt Holes	Bolt Hole Size	Bolt Circle Dia.	Dia. of Bolts	Length of Bolts
3	5.500	7.500	0.750	0.380	4.875	5.000	4	0.75	6.00	5/8	2 1/2
4	6.500	9.000	0.940	0.500	5.500	6.000	8	0.75	7.50	5/8	3
6	8.000	11.000	1.000	0.560	7.000	7.000	8	0.88	9.50	3/4	3 1/4
8	9.000	13.500	1.120	0.620	8.375	9.000	8	0.88	11.75	3/4	3 1/2
10	11.000	16.000	1.190	0.750	9.750	9.000	12	1.00	14.25	7/8	3 3/4
12	12.000	19.000	1.250	0.810	11.250	11.000	12	1.00	17.00	7/8	3 3/4

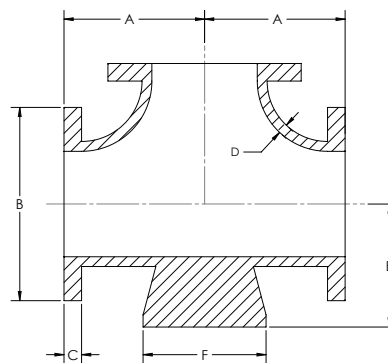
Metalfit flanged straight standard base ell class made in North America.



CAST IRON FLANGED STRAIGHT STANDARD BASE TEES CLASS 125

NPS	Center to Face A	Outside Flange Dia. B	Thickness of Flange C (min)	Wall Thickness D	Height of Base E	Round and Square Base F	Number of Bolt Holes	Bolt Hole Size	Bolt Circle Dia.	Dia. of Bolt	Length of Bolts
3	5.500	7.500	0.750	0.380	4.875	5.000	4	3/4	6	5/8	2 1/2
4	6.500	9.000	0.940	0.500	5.500	6.000	8	3/4	7 1/2	5/8	3
5	7.500	10.000	0.940	0.500	7.000	7.000	8	7/8	8 1/2	3/4	3
6	8.000	11.000	1.000	0.560	7.000	7.000	8	7/8	9 1/2	3/4	3 1/4
8	9.000	13.500	1.120	0.620	8.375	9.000	8	7/8	11 3/4	3/4	3 1/2
10	11.000	16.000	1.190	0.750	9.750	9.000	12	1	14 1/4	7/8	3 3/4
12	12.000	19.000	1.250	0.810	11.250	11.000	12	1	17	7/8	3 3/4

Metalfit flanged straight standard base tee class made in North America.



SECTION 8

CAST IRON DRAINAGE FITTINGS



WARD cast iron drainage fittings, shown on the following pages, are designed especially for drainage systems using wrought pipe. The inside diameter of the fitting is the same as that of wrought pipe.

WARD drainage fittings are made with an interior shoulder, so that when the joint is made the end of the pipe practically meets the shoulder. This forms a continuous unobstructed surface providing smooth flow of the pipe contents.

WARD 90 degree ells, except for the street ells, are pitched 1/4 inch per foot. WARD drainage fittings meet existing requirements for the sanitary codes and are manufactured in strict accordance with an American National Standard.

IMPORTANT

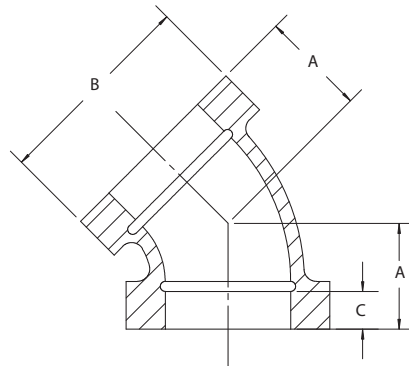
Be sure to specify the type of finish desired. As with the rest of the WARD line of fittings, drainage can be supplied in black or galvanized.

NPS	Thread Length (min)	Total Length of Chamber to Shoulder	I.D. of Fittings	Wall Thickness (min)	O.D. of Band (min)
1 1/4	0.42	0.71	1.38	0.18	2.39
1 1/2	0.42	0.72	1.61	0.20	2.68
2	0.44	0.76	2.07	0.22	3.28
2 1/2	0.68	1.14	2.47	0.24	3.86
3	0.77	1.20	3.07	0.26	4.62
4	0.84	1.30	4.03	0.31	5.79

Material:	ASTM A 126 Class A Minimum
Dimensions:	ASME B16.12 ANSI/ASME B.1.20.1
Pressure Rating:	ASME B16.12
Coatings:	ASTM A153
Additional Specifications:	UL, ULC AND FM, where applicable

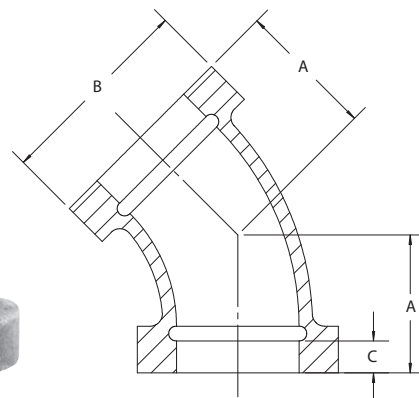
CAST IRON DRAINAGE 45° ELL SHORT TURN

NPS	Center to End A	Outside Dia. of Band B (min)	Length of Threads C (min)	Take Out
1 1/4	1.31	2.39	0.42	0.60
1 1/2	1.44	2.68	0.42	0.71
2	1.69	3.28	0.44	0.93
3	2.19	4.62	0.77	0.99
4	2.63	5.79	0.84	1.33



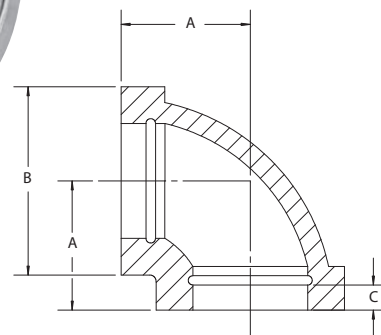
CAST IRON DRAINAGE 45° ELL LONG TURN

NPS	Center to End A	Outside Dia. of Band B (min)	Length of Threads C (min)	Take Out
1 1/2	—	—	—	—
2	2.25	3.28	0.44	1.49



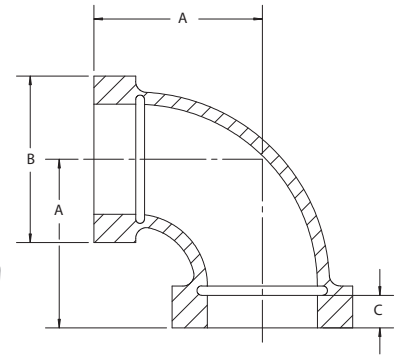
CAST IRON DRAINAGE 90° STRAIGHT ELL SHORT TURN

NPS	Center to End A	Outside Dia. of Band B (min)	Length of Threads C (min)	Take Out
1 1/4	1.75	2.39	0.42	1.04
1 1/2	1.94	2.68	0.42	1.21
2	2.25	3.28	0.44	1.49
3	3.06	4.62	0.77	1.86
4	3.81	5.79	0.84	2.51
1 1/2 x 1 1/4	—	—	—	—
2 x 1 1/2	2.25	3.28	0.44	1.49/1.21



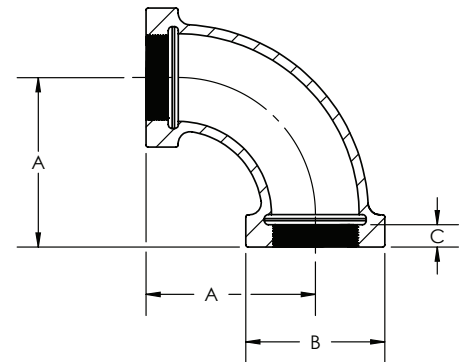
CAST IRON DRAINAGE 90° STRAIGHT ELL LONG TURN

NPS	Center to End A	Outside Dia. of Band B (min)	Length of Threads C (min)	Take Out
1 1/2	2.50	2.68	0.42	1.77
2	3.06	3.28	0.44	2.30
3	4.25	4.62	0.77	3.00



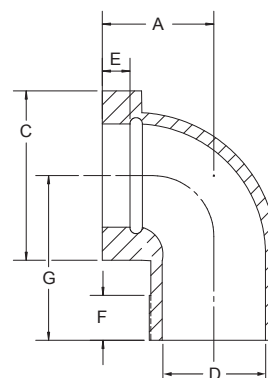
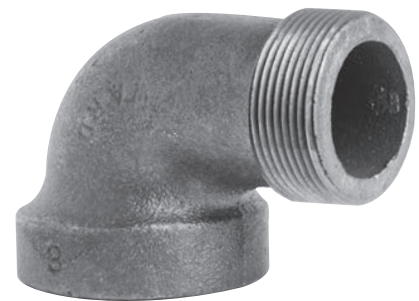
CAST IRON DRAINAGE 90° STRAIGHT ELL EXTRA LONG TURN

NPS	Center to End A	Outside Dia. of Band B (min)	Length of Threads C (min)	Take Out
1 1/2	3.50	2.68	0.42	2.77
2	4.00	3.28	0.44	3.24



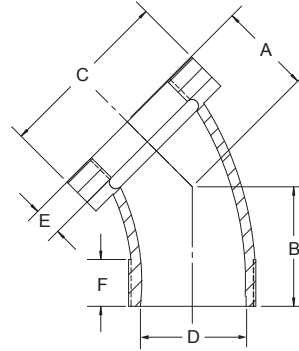
CAST IRON DRAINAGE 90° STREET ELL

NPS	Center to End A	Center to Male B	Outside Dia. of Band C (min)	Port Dia. Male End D (max)	Length of Internal Threads E (min)	Length of External Threads F (min)	Take Out Male End	Take Out Female End
1 1/2	1.98	2.86	2.68	1.35	0.42	0.85	2.13	1.25
2	—	—	—	—	—	—	—	—



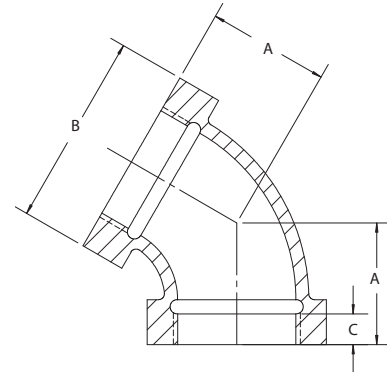
CAST IRON DRAINAGE 45° STREET ELL

NPS	Center to End A	Center to Male B	Outside Dia. of Band C (min)	Port Dia. Male End D (max)	Length of Internal Threads E (min)	Length of External Threads F (min)	Take Out Male End	Take Out Female End
1 1/2	1.50	1.87	2.68	1.35	0.42	0.85	1.15	0.77
2	1.65	2.30	3.28	1.75	0.44	0.87	1.54	0.89



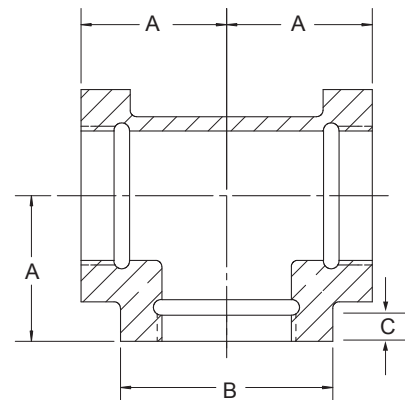
CAST IRON DRAINAGE 60° STREET ELL SHORT TURN

NPS	Center to End A	Outside Dia. of Band B (min)	Length of Threads C (min)	Take Out
1 1/2	1.75	2.68	0.42	1.02
2	2.06	3.28	0.44	1.30



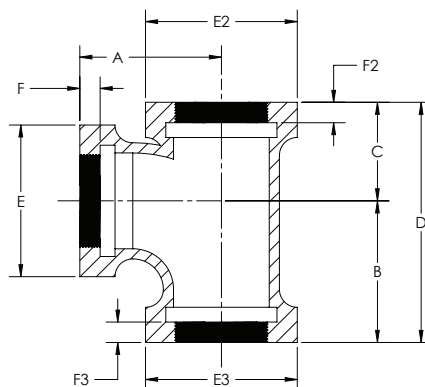
CAST IRON DRAINAGE STRAIGHT TEE

NPS	Center to End A	Outside Dia. of Band B (min)	Length of Threads C (min)	Take Out
1 1/2	1.94	2.68	0.42	1.21
2	2.25	3.28	0.44	1.49
2 X 1/2	2.25	3.28	0.44	1.49



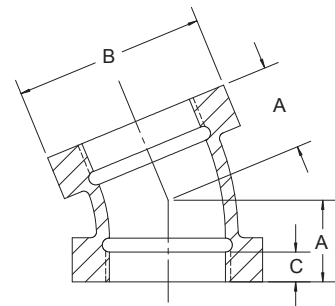
CAST IRON DRAINAGE 90° "TY" SHORT TURN

NPS	Center to End Inlet A	Center to End Outlet B	Center to End C	End to End D	Outside Dia. of Band E (min)	Outside Dia. of Band E2 (min)	Outside Dia. of Band E3 (min)	Length of Threads F (min)	Length of Threads F2 (min)	Length of Threads F3 (min)	Take Out	Take Out
1 1/2	2.50	2.50	1.75	4.25	2.68	2.68	2.68	0.42	0.42	0.42	1.78	1.78
2	3.06	3.06	2.13	5.19	3.28	3.28	3.28	0.44	0.44	0.44	2.30	2.30
4	5.19	5.19	3.56	8.75	5.79	5.79	5.79	0.84	0.84	0.84	3.89	3.89
2 x 1 1/2	2.94	2.69	1.94	4.63	3.28	3.28	2.68	0.44	0.44	0.42	2.18	1.93
2 x 1 1/2 x 1 1/2	2.94	2.69	1.94	4.63	3.28	2.68	2.68	0.44	0.420	0.42	2.18	1.93
2 x 1 1/2 x 2	3.06	3.06	2.13	5.19	3.28	2.68	3.28	0.44	0.42	0.44	2.30	2.30



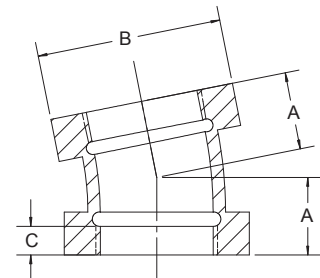
CAST IRON DRAINAGE 22 1/2° ELLS SHORT TURN

NPS	Center to End A	Outside Dia. of Band B (min)	Length of Threads C (min)	Take Out
1 1/2	1.25	2.68	0.42	0.52
2	1.44	3.28	0.44	0.68



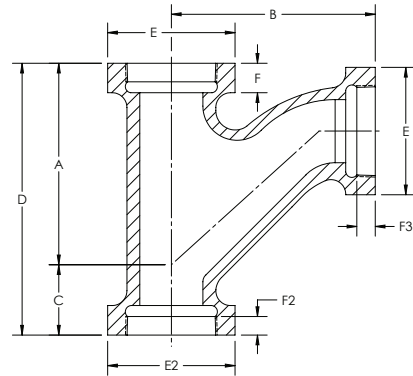
CAST IRON DRAINAGE 11 1/4° ELLS SHORT TURN

NPS	Center To End A	Outside Dia. of Band B (min)	Length of Threads C (min)	Take Out
1 1/2	1.25	2.68	0.42	0.52
2	1.38	3.28	0.44	0.62



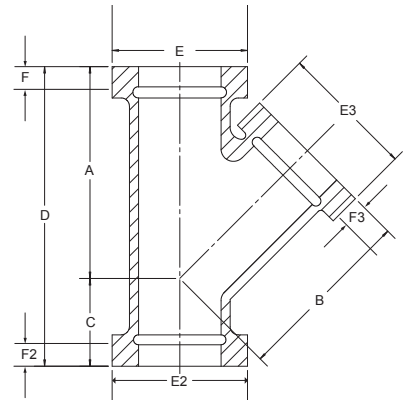
CAST IRON DRAINAGE 90° "TY" LONG TURN

NPS	Center to End Inlet A	Center to End Outlet B	Center to End C	End to End D	Outside Dia. of Band E (min)	Outside Dia. of Band E2 (min)	Outside Dia. of Band E3 (min)	Length of Threads F (min)	Length of Threads F1 (min)	Length of Threads F2 (min)	Take Out	Take Out
1 1/2	4.13	4.13	1.25	5.38	2.68	2.68	2.68	0.42	0.42	0.42	3.4	3.41
2	5.25	5.25	1.75	7.00	3.28	3.28	3.28	0.44	0.44	0.44	4.49	4.49
2 x 1 1/2	4.38	4.44	1.31	5.75	3.28	3.28	2.68	0.44	0.44	0.42	3.62	3.68
2 x 1 1/2 x 1 1/2	4.38	4.44	1.31	5.75	3.28	2.68	2.68	0.44	0.42	0.42	3.62	3.68
2 x 1 1/2 x 2	5.25	5.25	1.75	7.00	3.28	2.68	3.28	0.44	0.42	0.44	4.49	4.49



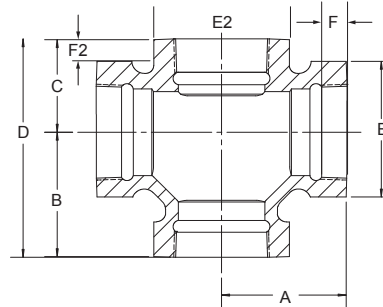
CAST IRON DRAINAGE 45° "Y" SHORT TURN

NPS	Center to End Inlet A	Center to End Outlet B	Center to End C	End to End D	Outside Dia. of Band E (min)	Outside Dia. of Band E2 (min)	Outside Dia. of Band E3 (min)	Length of Threads F (min)	Length of Threads F2 (min)	Length of Threads F3 (min)	Take Out	Take Out
1 1/4	3.25	3.25	1.75	5.00	2.39	2.39	2.39	0.42	0.42	0.42	2.54	2.54
1 1/2	3.63	3.63	1.88	5.50	2.68	2.68	2.68	0.42	0.42	0.42	2.91	2.91
2	4.38	4.38	2.13	6.50	3.28	3.28	3.28	0.44	0.44	0.440	3.62	3.62
3	—	—	—	—	—	—	—	—	—	—	—	—
4	7.69	7.69	3.19	10.88	5.79	5.79	5.79	0.84	0.84	0.84	6.39	6.39
2 x 1 1/2	4.13	4.06	1.81	5.88	3.28	3.28	2.68	0.44	0.44	0.42	3.37	3.30
2 x 1 1/2 x 1 1/2	4.13	4.06	1.81	5.88	3.28	2.68	2.68	0.44	0.42	0.42	3.37	3.30
2 x 1 1/2 x 2	4.38	4.38	2.13	6.50	3.28	2.68	3.28	0.44	0.42	0.440	3.62	3.62
4 x 3	7.19	6.88	2.38	9.25	5.79	5.79	4.62	0.84	0.84	0.77	5.89	5.58
4 x 2	6.31	6.00	1.69	7.69	5.79	5.79	3.28	0.84	0.84	0.44	5.01	4.70



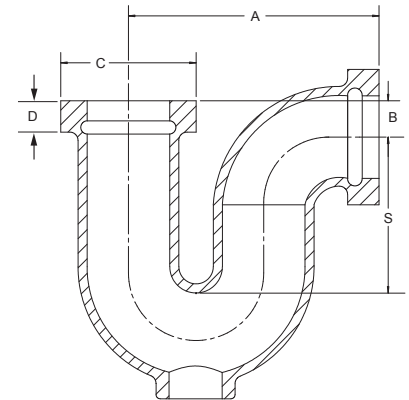
CAST IRON DRAINAGE 90° DOUBLE "TY" SHORT TURN

NPS	Center to End Inlet A	Center to End Outlet B	Center to End C	End to End D	Outside Dia. of Band E (min)	Outside Dia. of Band E2 (min)	Length of Threads F (min)	Length of Threads F2 (min)
1 1/2	2.50	2.50	1.75	4.25	2.68	2.68	0.42	0.42
2	3.06	3.06	2.13	5.19	3.28	3.28	0.44	0.44
2 x 1 1/2	2.90	2.69	1.94	4.63	3.28	2.68	0.44	0.42



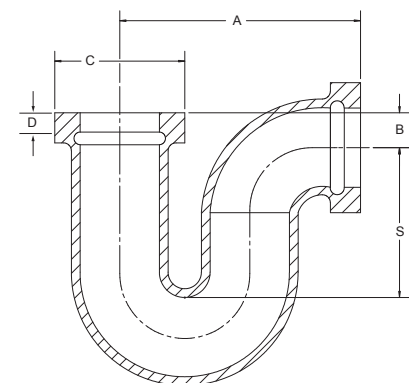
CAST IRON DRAINAGE P TRAP WITH CLEANOUT

NPS	Center to Center A	Center to End B	Outside Dia. of Band C (min)	Length of Threads D (min)	Water Seal S (min)
1 1/2	4.38	0.88	2.68	0.42	2.00
2	5.31	0.88	3.28	0.44	2.00



CAST IRON DRAINAGE P TRAP WITHOUT CLEANOUT

NPS	Center to Center A	Center to End B	Outside Dia. of Band C (min)	Length of Threads D (min)	Water Seal S (min)
*1 1/2	4.38	0.25	2.68	0.42	2.00
*2	5.31	0.00	3.28	0.44	2.00



* Manufactured to WARD specifications



Introduced in 1983, the WARDLOX sprinkler connect system is a fast, safe and effective way to join schedule 10 and 40 plain end pipe without threading or welding.

In addition to the performance benefits of threadless sprinkler connect systems, the WARDLOX system is 100% factory tested to prevent leaks and recalls.

WARDLOX has also been thoroughly field tested in a variety of installations and is ideal for new construction and retrofit. Designed to reduce the number of hands required to install a total fire protection system, WARDLOX features:

- Self-locking screws for quick and easy installation.
- Uniform 1/2 inch "take out" dimensions for accurate onsite.

measurement and set screw placement engineered forward of the gasket to eliminate risk of leakage

WARDLOX fittings and set screws are engineered to provide a more positive locking action when the set screw is tightened down to the boss on the fitting. Providing maximum contact in the pipe, the bottom of the set screw is convex and tapered. The 3/8 inch square head set screw can be tightened with the same tool used for affixing beam clamps.

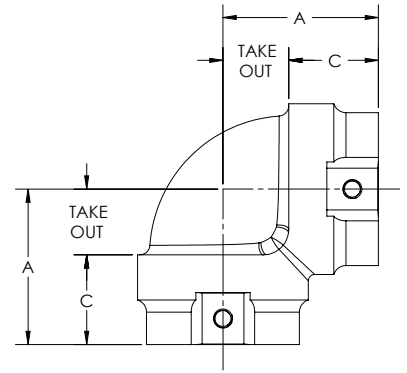
The exclusive nylon "lock patch" on the cadmium plated set screw prevents screw loosening caused by vibration after fabrication and installation. Your sprinkler system components can be fabricated in the shop; the fittings will not shake loose during transport. Set screws are pre-set at the factory so that field assembly requires only one turn to tighten the head securely against the casting. Installation in confined areas is fast and easy.

Material Specifications Housing: Cast Iron to ASTM A126 Class A minimum. Galvanized finish also available for special applications or high corrosion areas. Set Screws: Carbon Steel, Cadmium Plated, Self-Locking Gaskets: E.P.D.M. to ASTM D-2000 With Temperature Range of -30 to 230 Threaded Outlets: Conform to ANSI B1.20.1 Specifications Pressure Ratings: 175 psig

Material:	ASTM A126 Class A Minimum
Dimensions:	ANSI/ASME B1.20.1
Coatings:	ASTM A153 ASTM B633
Pressure Ratings:	175 psig
Additional Specifications:	UL, ULC and FM where applicable

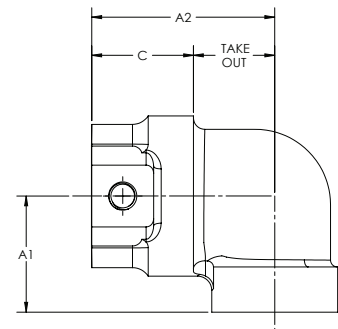
WARDLOX 90° ELBOW (SLIP X SLIP)

NPS	Center to End A	Pipe Engagement	Take Out	Schedule Pipe Approved
1	2.37	1.62	0.75	40, 10, XL, DT, D
1 1/4	2.56	1.62	0.94	40, 10, XL, DT, D
1 1/2	2.68	1.62	0.69	40, 10
2	3.06	1.75	0.94	40, 10



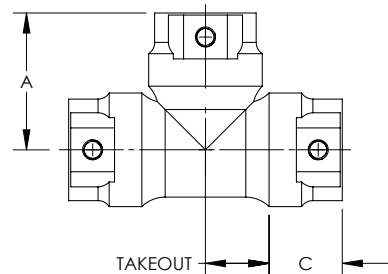
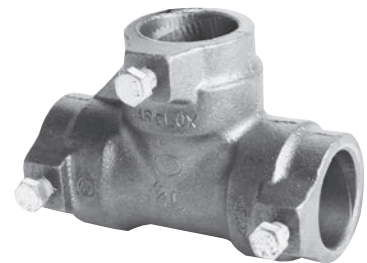
WARDLOX ADAPTER ELBOW (SLIP X THREAD)

NPS	Center to End A1	Center to End A2	Pipe Engagement	Take Out	Schedule Pipe Approved
1 x 1	1.56	2.56	1.62	0.93	40, 10, XL, DT, DF
1 x 3/4	1.56	2.44	1.62	0.81	40, 10, XL, DT, DF
1 x 1/2	1.56	2.44	1.62	0.81	40, 10, XL, DT, DF
1 1/4 x 1	1.81	2.56	1.62	0.81	40, 10, XL, DT, DF
1 1/4 x 3/4	1.81	2.56	1.62	0.81	40, 10, XL, DT, DF
1 1/4 x 1/2	1.81	2.56	1.62	0.81	40, 10, XL, DT, DF
1 1/2 x 1	1.93	2.56	1.62	0.81	40, 10
1 1/2 x 3/4	1.93	2.56	1.62	0.81	40, 10
1 1/2 x 1/2	1.93	2.56	1.62	0.81	40, 10
2 x 1	2.62	2.69	2.75	0.81	40, 10
2 x 3/4	2.62	2.69	2.75	0.81	40, 10
2 x 1/2	2.62	2.69	2.75	0.81	40, 10



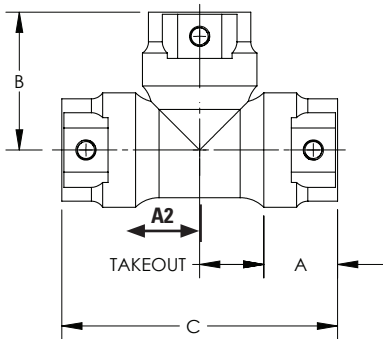
WARDLOX SLIP TEES (SLIP X SLIP X SLIP)

NPS	Center to End A	Pipe Engagement C	Take Out	Schedule Pipe Approved
1 x 1 x 1	2.56	1.62	0.93	40, 10, XL, DT, DF
1 1/4 x 1 1/4 x 1 1/4	2.75	1.62	1.13	40, 10, XL, DT, DF
1 1/2 x 1 1/2 x 1 1/2	2.87	1.62	1.25	40, 10
2 x 2 x 2	3.22	1.75	1.56	40, 10



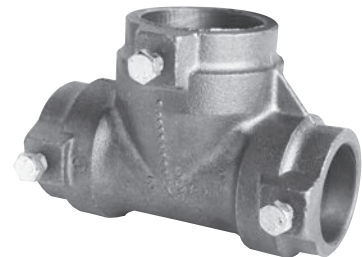
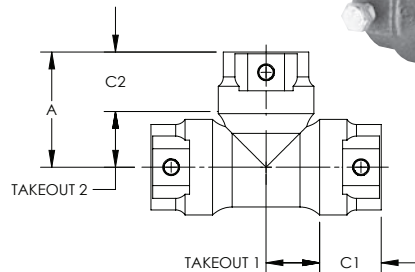
WARDLOX REDUCING SLIP TEES (SLIP X SLIP X SLIP)

NPS	Pipe Engagement A	Pipe Engagement A2	Center to Outlet B	Overall Length C	Take Out	Take Out 2	Schedule Pipe Approved
2 x 2 x 1	1.79	1.64	3.09	5.38	1.30	1.45	40, 10
2 x 2 x 1 1/4	1.79	1.63	3.13	5.38	1.34	1.50	40, 10
2 x 2 x 1 1/2	1.79	1.63	3.13	5.97	1.34	1.50	40, 10



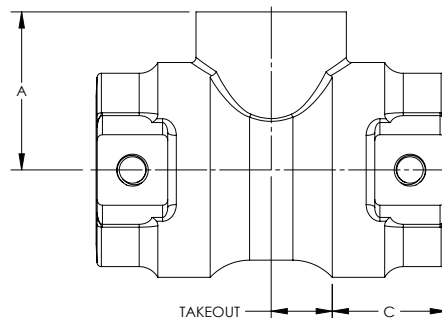
WARDLOX BULLHEAD TEES (SLIP X SLIP X SLIP)

NPS	Center to End A	Pipe Engagement C1	Center to Outlet C2	Take Out 1	Take Out 2	Schedule Pipe Approved
1 1/2 x 1 1/2 x 2	3.00	1.62	1.75	1.43	1.12	40, 10



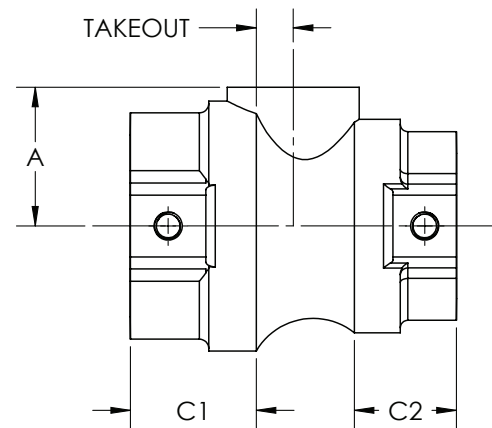
WARDLOX OUTLET TEES (SLIP X SLIP X THREAD)

NPS	Center to End A	Pipe Engagement	Take Out	Schedule Pipe Approved
1 x 1 x 1	1.56	1.62	0.50	40, 10, XL, DT, D
1 x 1 x 3/4	1.56	1.62	0.50	40, 10, XL, DT, D
1 x 1 x 1/2	1.56	1.62	0.50	40, 10, XL, DT, D
1 1/4 x 1 1/4 x 1	1.84	1.62	0.50	40, 10, XL, DT, D
1 1/4 x 1 1/4 x 3/4	1.84	1.62	0.50	40, 10, XL, DT, D
1 1/4 x 1 1/4 x 1/2	1.84	1.62	0.50	40, 10, XL, DT, D
1 1/2 x 1 1/2 x 1	1.96	1.62	0.50	40, 10
1 1/2 x 1 1/2 x 3/4	1.96	1.62	0.50	40, 10
1 1/2 x 1 1/2 x 1/2	1.96	1.62	0.50	40, 10
2 x 2 x 1	2.06	1.75	0.50	40, 10
2 x 2 x 3/4	2.06	1.75	0.50	40, 10
2 x 2 x 1/2	2.06	1.75	0.50	40, 10



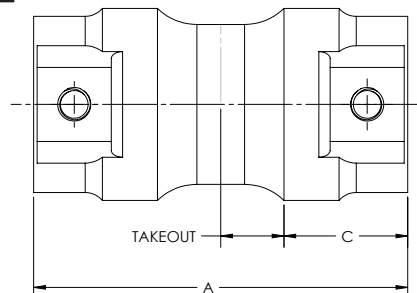
WARDLOX REDUCING OUTLET TEES (SLIP X SLIP X THREAD)

NPS	Center to End A	Pipe Engagement C1	Pipe Engagement C2	Take Out	Schedule Pipe Approved
1 1/4 x 1 x 1	1.84	1.62	1.62	0.50	40, 10, XL, DT, D
1 1/4 x 1 x 3/4	1.84	1.62	1.62	0.50	40, 10, XL, DT, D
1 1/4 x 1 x 1/2	1.84	1.62	1.62	0.50	40, 10, XL, DT, D
1 1/2 x 1 1/4 x 1	1.96	1.62	1.62	0.50	40, 10
1 1/2 x 1 1/4 x 3/4	1.96	1.62	1.62	0.50	40, 10
1 1/2 x 1 1/4 x 1/2	1.96	1.62	1.62	0.50	40, 10
2 x 1 1/2 x 1	2.16	1.75	1.62	0.50	40, 10
2 x 1 1/2 x 3/4	2.16	1.75	1.75	0.50	40, 10
2 X 1 1/2 x 1/2	2.16	1.75	1.62	0.50	40, 10
2 x 2 x 1	2.16	1.75	1.75	0.50	40, 10
2 x 2 x 3/4	2.16	1.75	1.75	0.50	40, 10
2 x 2 x 1/2	2.16	1.75	1.62	0.50	40, 10



WARDLOX COUPLINGS (SLIP X SLIP)

NPS	Length A	Pipe Engagement C	Take Out	Schedule Pipe Approved
1 x 1	4.25	1.62	0.50	40, 10, XL, DT, D
1 1/4 x 1 1/4	4.25	1.62	0.50	40, 10, XL, DT, D
1 1/2 x 1 1/2	4.25	1.62	0.50	40, 10
2 x 2	4.25	1.75	0.50	40, 10



SECTION 10

TEELOX™ MECHANICAL BRANCH CONNECTOR

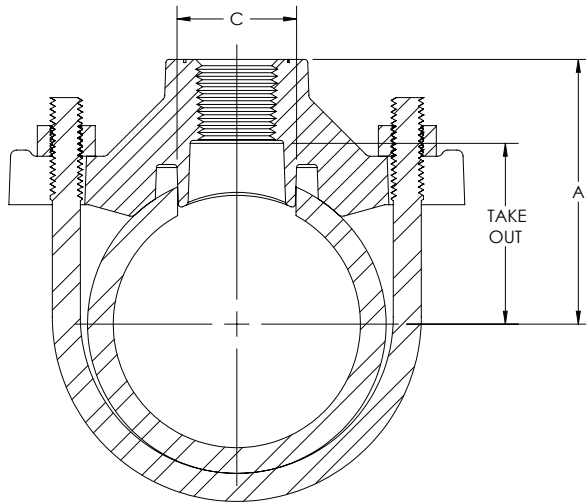


Designed for fast installation of bolted branch outlets, Teelox™ mechanical branch connectors are practical alternatives to existing branch connect systems. Made from high quality cast iron, Teelox™ are known for long-lasting, maintenance-free performance.

Key Features:

- A high grade EPDM rubber gasket surrounds the locating collar for accurate, permanent installation and the best seal in the industry.
- The locating collar is an integral part of the casting.
- A zinc-plated high-tensile steel U-bolt ensures rust-free attachment.
- Teelox™ is approved for conventional and arm-over installations.

NPS	Pipe Center to Outlet A	Hole Dia. B	Take Out
1 1/4 x 1/2	1.98	1.19	1.19
1 1/4 x 3/4	2.05	1.19	1.19
1 1/4 x 1	2.13	1.19	1.19
1 1/2 x 1/2	1.98	1.19	1.19
1 1/2 x 3/4	2.05	1.19	1.19
1 1/2 x 1	2.13	1.19	1.19
2 x 1/2	2.26	1.19	1.47
2 x 3/4	2.33	1.19	1.47
2 x 1	2.41	1.19	1.47
2 1/2 x 1/2	2.57	1.19	1.78
2 1/2 x 3/4	2.64	1.19	1.78
2 1/2 x 1	2.72	1.19	1.78



Material: Cast Iron ASTM A126 Class A Minimum

Gasket: E.P.D.M. Rubber ASTM D-2000

U Bolt: Zinc Plated High-Tensile Steel

Dimensions: ANSI/ASME B1.20.1

Pressure Ratings: 175 psi

Coatings: ASTM B633, ASTM A153

Additional Specifications: UL, ULC and FM where applicable

Torque Requirement: 20 ft.-lbs. max.

SECTION 11

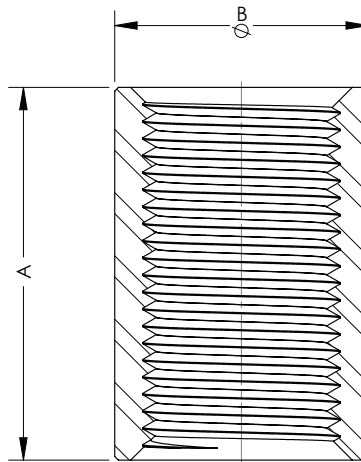
STANDARD MERCHANT COUPLINGS



For general purpose, low-pressure piping, such as water, air, gas and oil lines. Material and dimensions conform to the requirements of ASTM A865.

FULL STEEL

NPS	Length of Coupling A	Outside Dia. B (min)
1/2	1 9/16	1.063
3/4	1 5/8	1.313
1	2	1.576
1 1/4	2 1/16	1.900
1 1/2	2 1/16	2.200
2	2 1/8	2.750
2 1/2	3 1/8	3.250
3	3 1/4	4.000
4	3 1/2	5.000
5	3 3/4	6.296
6	4	7.390



HALF STEEL

NPS	Length of Coupling A	Outside Dia. B (min)
1/2	0.750	1.063
3/4	0.781	1.313
1	0.969	1.576
1 1/4	1.000	1.900
1 1/2	1.000	2.200
2	1.063	2.750
2 1/2	1.563	3.250
3	1.594	4.000
4	1.719	5.000
5	1.844	6.396
6	1.969	7.390

Couplings in sizes 1/2 -2 NPS are supplied straight tapped.
Couplings 2 NPS and larger are taper tapped.



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