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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

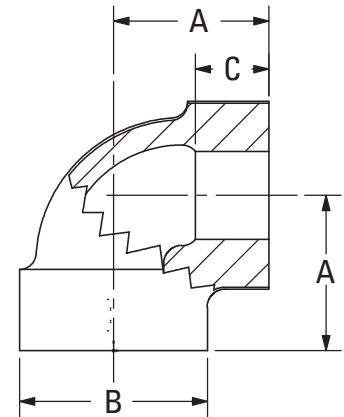
These dimensions apply to all standard malleable banded fittings, both straight and reducing. Length of thread also applies to plain fittings. For center-to-face dimensions, see fittings tables.

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

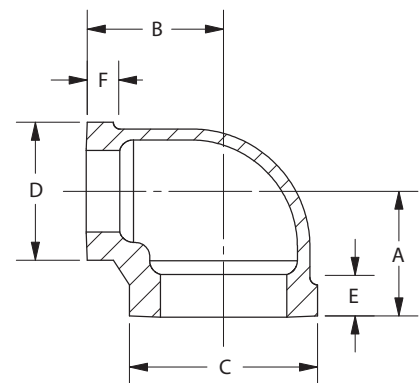
MALLEABLE IRON 90° STRAIGHT ELL CLASS 150

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

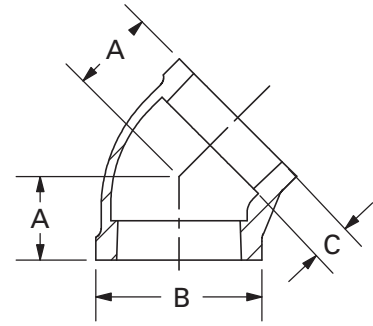
NPS	Center to End A	Center to End B	Outside Dia. of Band C (min)	Outside Dia. of Band D (min)	Length of Threads E (min)	Length of Threads F (min)	Take Out	Take Out
1/4 x 1/8	0.74	0.76	0.84	0.69	0.32	0.25	0.33	0.49
3/8 x 1/4	0.88	0.90	1.01	0.84	0.36	0.32	0.47	0.49
3/8 x 1/8	—	—	—	—	—	—	—	—
1/2 x 3/8	1.04	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

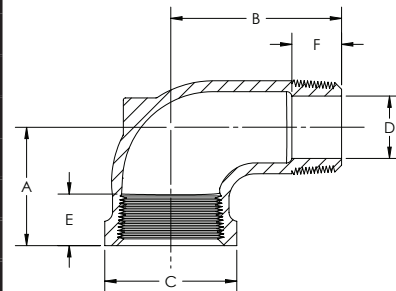
MALLEABLE IRON 45° ELL CLASS 150

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

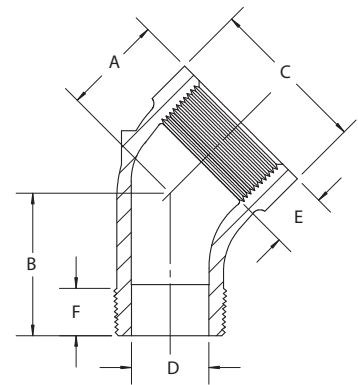
NPS	Center to End A	Center to Male B	Outside Dia. of Band C (min)	Port Dia. Male End D (max)	Length of Internal Threads E (min)	Length of External Threads F (min)	Take Out Male End	Take-Out Female End
1/8	0.69	1.00	0.69	0.20	0.25	0.26	0.73	0.42
1/4	0.81	1.19	0.84	0.26	0.32	0.40	0.78	0.40
3/8	0.95	1.44	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

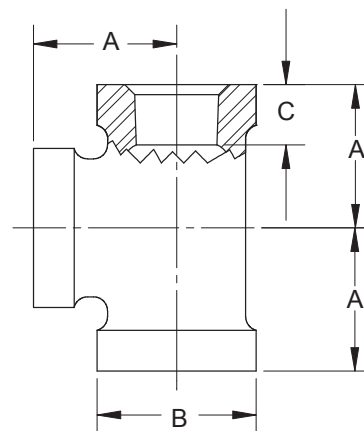
MALLEABLE IRON STREET 45° ELL CLASS 150

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	—	—	—	—



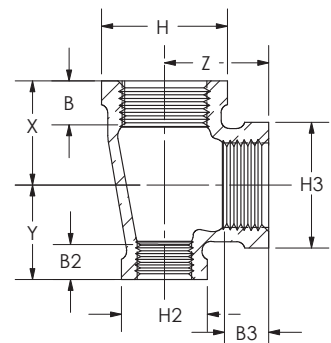
MALLEABLE IRON REDUCING TEES CLASS 150

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

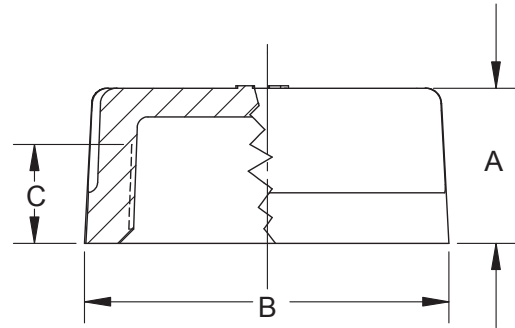


MALLEABLE IRON PIPE CAPS CLASS 150

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	—	—	—

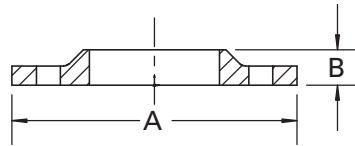
+ Made in Malleable Iron and Steel

* 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

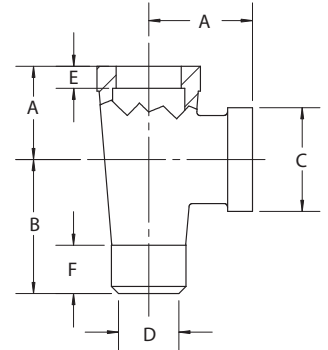


* Manufactured to WARD specifications

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

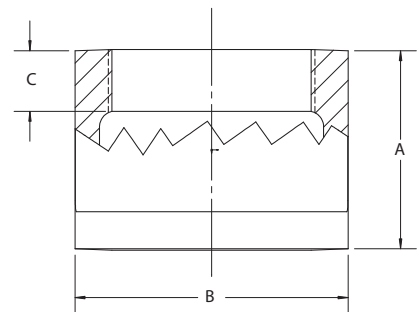
STRAIGHT COUPLING

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

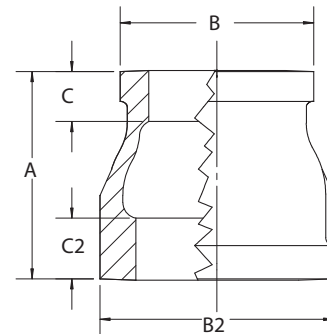
RIGHT & LEFT THREAD COUPLING

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



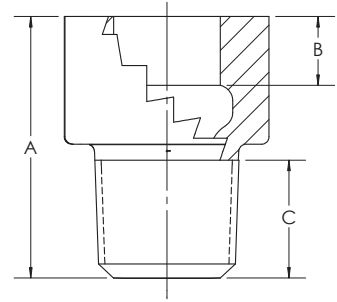
MALLEABLE IRON REDUCING COUPLING CLASS 150

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

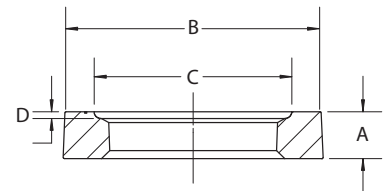
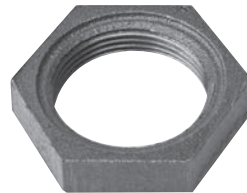
NPS	Overall Length A	Length of Internal Threads B (min)	Length of External Threads C (min)	Take Out Female End	Take Out Male End
*3/8	1.50	0.36	0.40	1.09	1.09
*1/2	1.95	0.43	0.53	1.41	1.41
*3/4	2.06	0.50	0.54	1.51	1.51
*1	2.23	0.58	0.68	1.54	1.54
*1 1/4	2.56	0.67	0.63	1.85	1.85
*2	—	—	—	—	—



* Manufactured to WARD specifications

MALLEABLE IRON LOCKNUTS CLASS 150

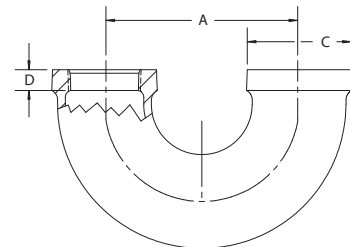
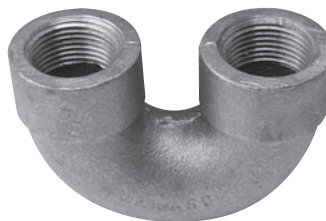
NPS	Overall Height A	Length-Across Flat B (min)	Packing Groove Width C	Packing Groove Depth D
+1/8	0.19	0.69	0.50	0.04
+1/4	0.25	0.84	0.66	0.06
3/8	0.28	1.00	0.77	0.06
1/2	0.31	1.18	0.97	0.06
3/4	0.34	1.43	1.23	0.06
1	0.38	1.75	1.50	0.06
1 1/4	0.42	2.10	1.86	0.06
1 1/2	0.47	2.35	2.12	0.06
2	0.53	2.88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



+STEEL
Made to ASME B16.14

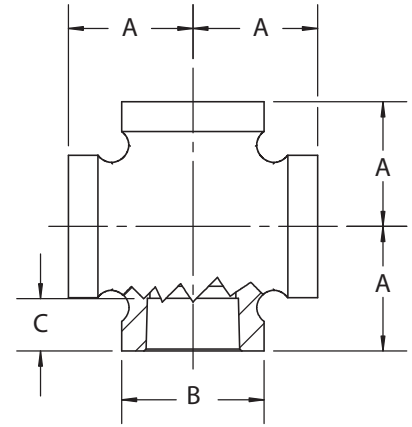
MALLEABLE IRON RETURN BEND OPEN CLASS 150

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



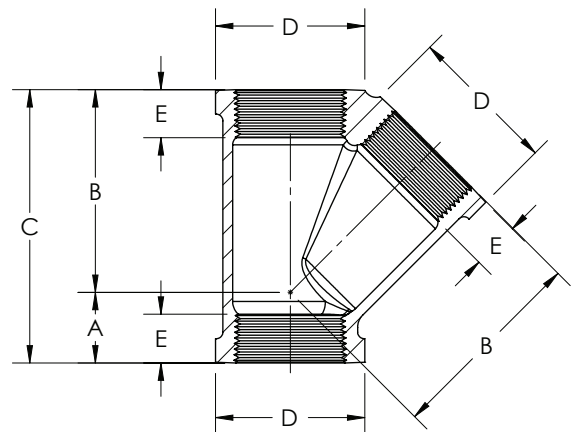
MALLEABLE IRON CROSS CLASS 150

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.

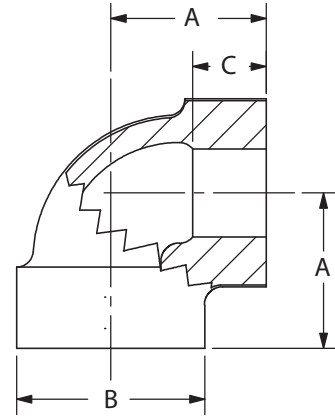
NPS	O.D. of Bands	Thread Length (min)
1/4	0.93	0.43
3/8	1.12	0.48
1/2	1.34	0.56
3/4	1.62	0.62
1	1.93	0.75
1 1/4	2.37	0.84
1 1/2	2.68	0.87
2	3.28	1.00
3	4.62	1.93

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

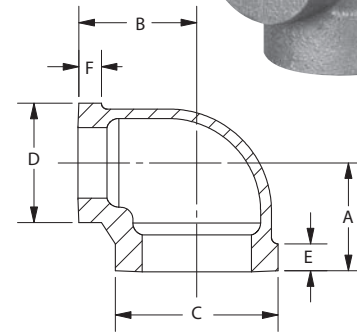
MALLEABLE IRON 90° STRAIGHT ELL CLASS 300

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	—	—	—	—



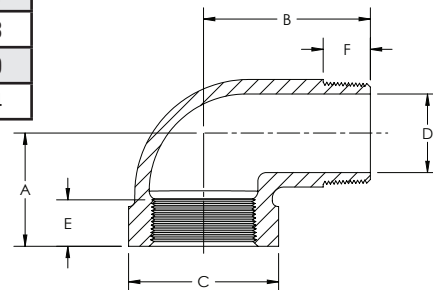
MALLEABLE IRON REDUCING 90° ELL CLASS 300

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	—	—	—	—	—	—	—	—



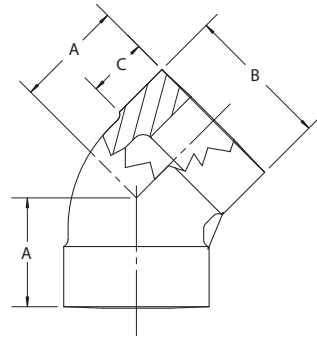
MALLEABLE IRON 90° STREET ELL CLASS 300

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



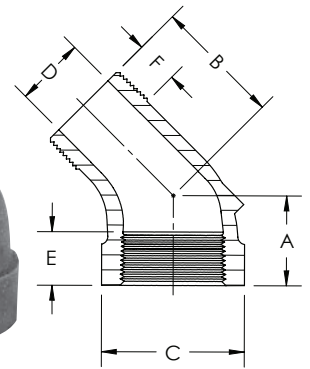
MALLEABLE IRON 45° ELL CLASS 300

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	—	—	—	—



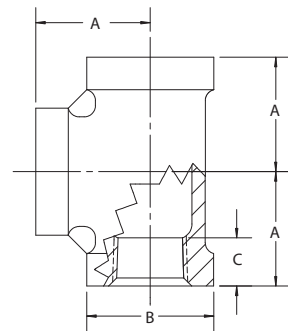
MALLEABLE IRON 45° STREET ELL CLASS 300

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	—	—	—	—	—	—	—	—



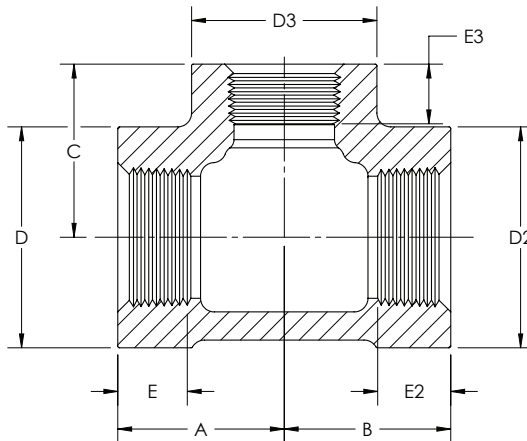
MALLEABLE IRON STRAIGHT TEE CLASS 300

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	—	—	—	—



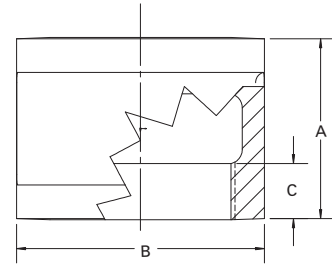
MALLEABLE IRON REDUCING TEES CLASS 300

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



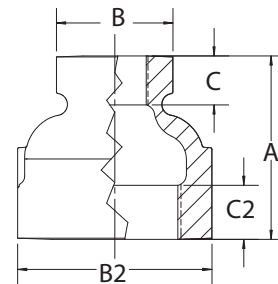
MALLEABLE IRON STRAIGHT COUPLING CLASS 300

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	—	—	—	—



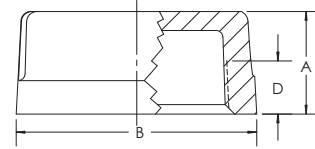
MALLEABLE IRON REDUCING COUPLING CLASS 300

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	—	—	—	—	—	—	—



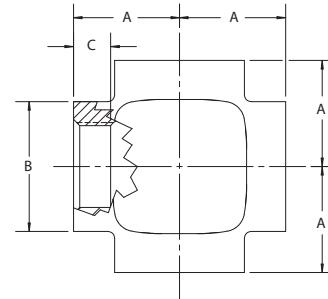
MALLEABLE IRON PIPE CAPS CLASS 300

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	—	—	—



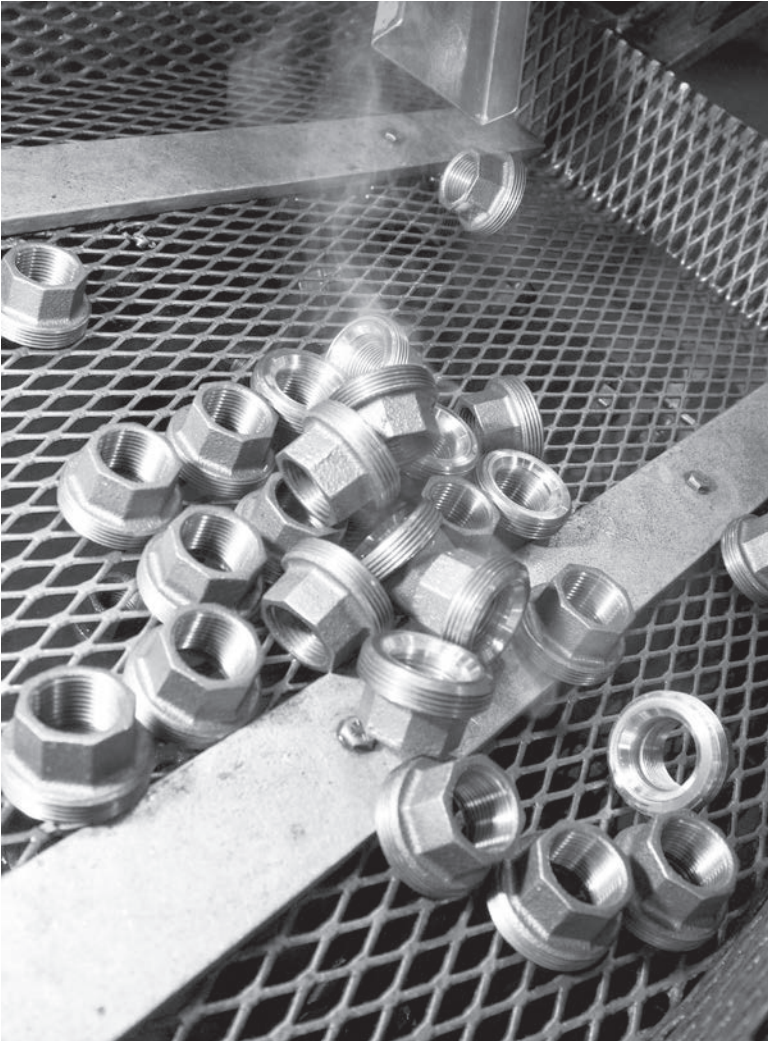
MALLEABLE IRON CROSS CLASS 300

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)

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.

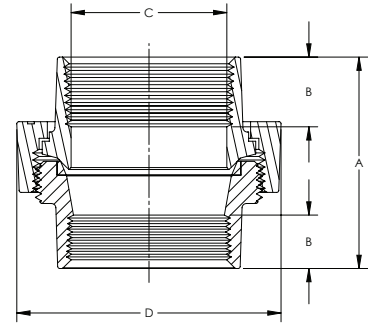


Temp.F	PSI		
	Class 150	Class 250	Class 300
-20 to 150	300	500	600
200	265	455	550
250	225	405	505
300	185	460	460
350	150	315	415
400	110	270	370
450	75	225	325
500	*	180	280
550	*	130	230

- 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

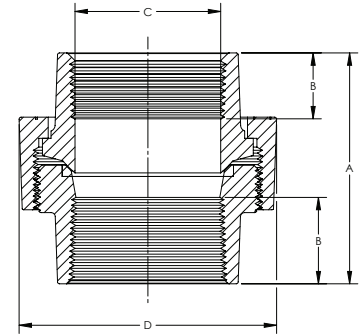
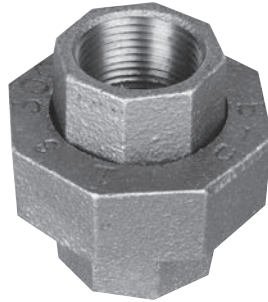
NPS	Overall Length A (min)	Length of Threads B (min)	Thru Hole C (min)	Width of Nut D (min)
1/8	1.26	0.30	0.21	0.93
1/4	1.44	0.32	0.36	1.10
3/8	1.61	0.36	0.52	1.26
1/2	1.72	0.43	0.61	1.45
3/4	1.94	0.50	0.80	1.71
3/4 X 1/2	1.94	0.50	0.80	1.71
1	2.06	0.58	1.00	2.07
1 1/4	2.26	0.67	1.31	2.50
1 1/2	2.41	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

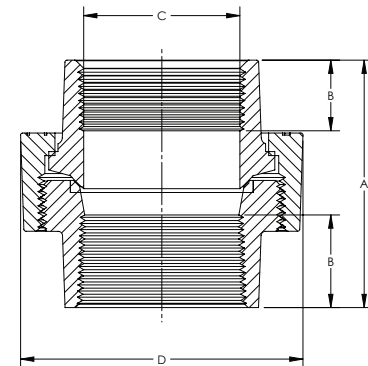
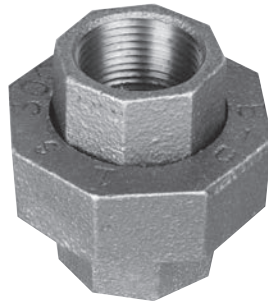
NPS	Overall Length A (min)	Length of Threads B (min)	Thru Hole C (min)	Width of Nut D (min)
1/8	1.26	0.30	0.21	0.93
1/4	1.55	0.43	0.30	1.11
3/8	1.71	0.47	0.42	1.26
1/2	1.18	0.57	0.54	1.45
3/4	2.07	0.64	0.74	1.71
1	2.31	0.75	0.95	2.07
1 1/4	2.62	0.84	1.27	2.57
1 1/2	2.78	0.87	1.50	2.89
2	3.31	1.00	1.93	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

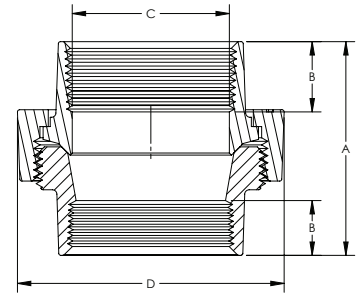
WARD UNION BRASS TO IRON SEAT CLASS 300

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	—	—	—	—



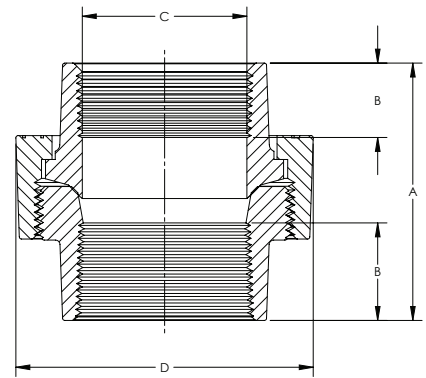
WARD UNION IRON TO IRON SEAT CLASS 150

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



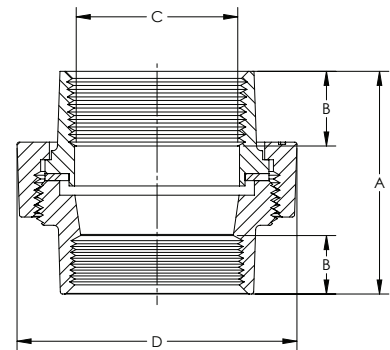
WARD UNION IRON TO IRON SEAT CLASS 300

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

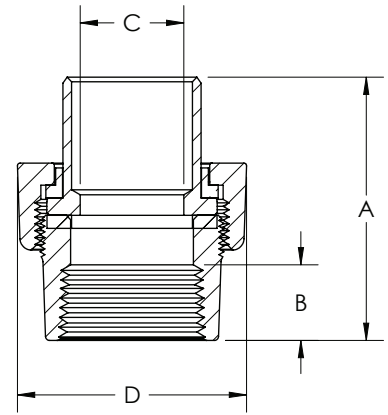
NPS	Overall Length A (min)	Length of Threads B (min)	Thru Hole C (min)	Width of Nut D (min)
3/8	1.61	0.36	0.52	1.26
1/2	1.72	0.43	0.61	1.45
3/4	1.94	0.50	0.80	1.71
1	2.06	0.58	1.00	2.07
1 1/4	2.26	0.67	1.31	2.50
1 1/2	2.41	0.70	1.55	2.82
2	2.75	0.75	2.03	3.41



WARD DI-ELECTRIC UNION IRON TO BRASS

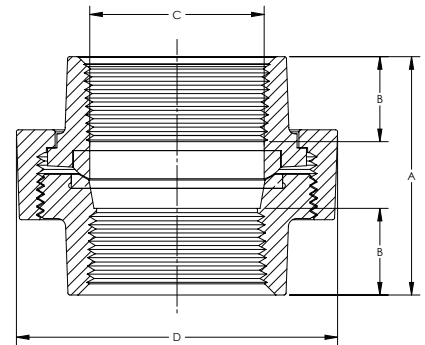
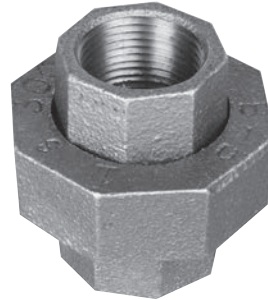
NPS	Overall Length A (min)	Length of Threads B (min)	Thru Hole C (min)	Width of Nut D (min)
*1/2 x 1/2	1.87	0.57	0.54	1.68
*3/4 x 1/2	1.87	0.64	0.74	1.68
*3/4 x 3/4	1.31	0.64	0.74	1.68

* 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

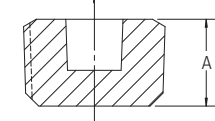
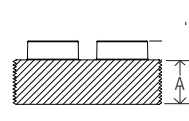
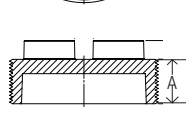
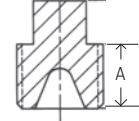
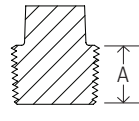
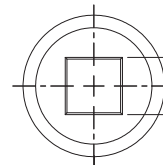
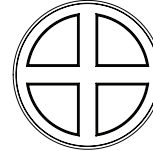
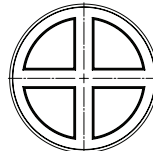
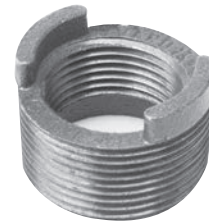
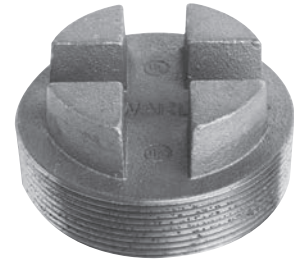
PLUGS

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.



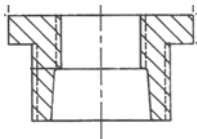
SOLID PLUG

CORED PLUG

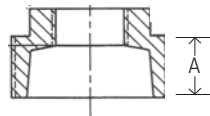
CORED BAR HEAD

SOLID BAR HEAD

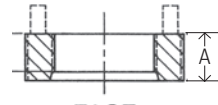
COUNTERSUNK



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

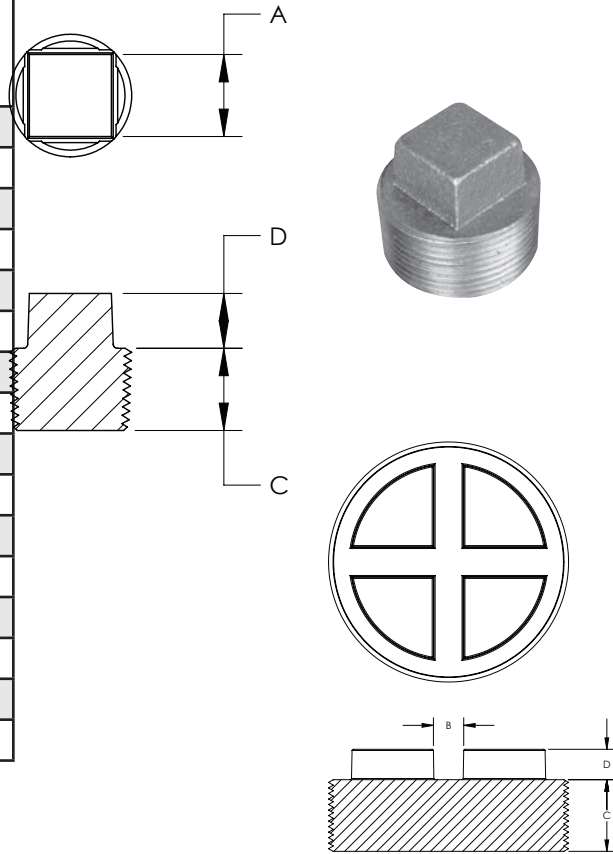
Pressure Ratings: ASME B16.3 for malleable iron
ASME B16.4 for cast iron

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	—	—	—	—

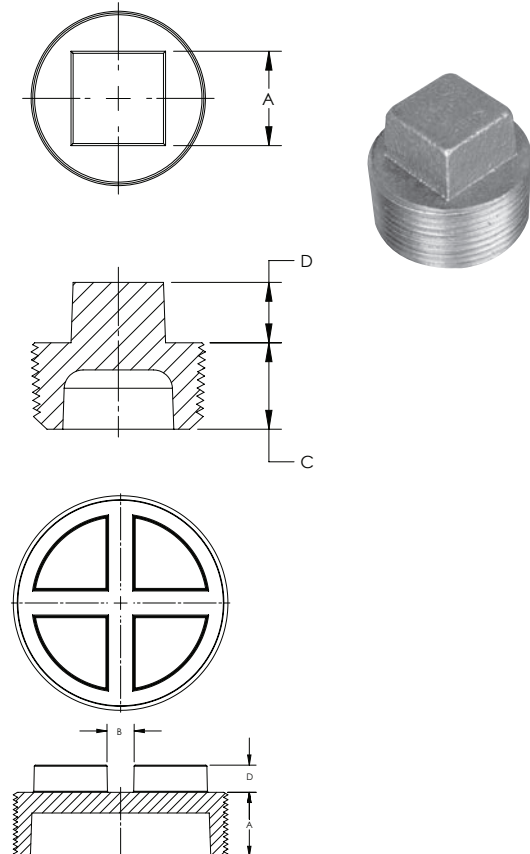


*Made from Cast Iron or Steel

+ Bar Head

CAST IRON CORED PLUGS CLASS 125

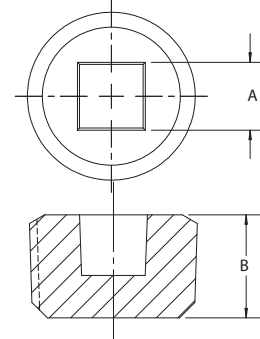
NPS	Nominal Width Across Flats A	Distance Between Lugs B (min)	Length of Threads C (min)	Height of Square D (min)
1/2	9/16	---	0.56	0.28
3/4	5/8	---	0.63	0.44
1	13/16	---	0.75	0.50
1 1/4	15/16	---	0.80	0.56
1 1/2	1 1/8	---	0.83	0.62
2	1 5/16	---	0.88	0.68
2 1/2	1 1/2	---	1.07	0.74
3	1 11/16	---	1.13	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

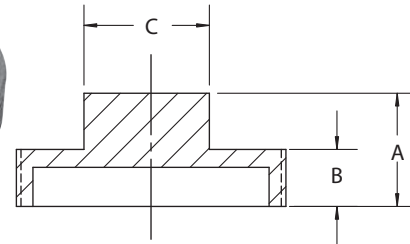
NPS	Nominal Size of Square A	Length of Threads B (min)
+1/4	1/4	0.44
+3/8	5/16	0.48
1/2	3/8	0.56
3/4	1/2	0.63
1	1/2	0.75
1 1/4	3/4	0.80
1 1/2	3/4	0.83
2	7/8	0.88
2 1/2	1 1/8	1.07
3	1 3/8	1.13
3 1/2	1 1/2	1.18



+Steel

CAST IRON HEX HEAD CLEANOUT PLUGS CLASS 125

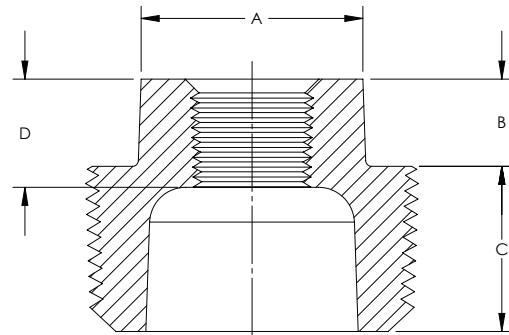
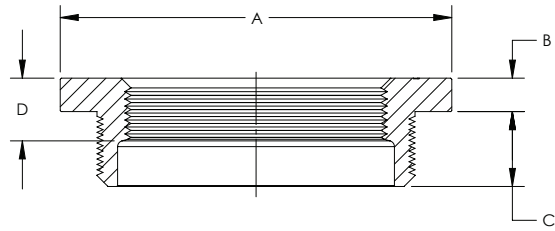
NPS	Overall Height A	Length of Threads B (min)	Nominal Width Across Flats C
1 1/4	1.03	0.53	1.01
1 1/2	1.02	0.52	1.01
2 1/2	1.25	0.62	1.20
3	1.37	0.68	1.40
4	1.40	0.77	1.54



* 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

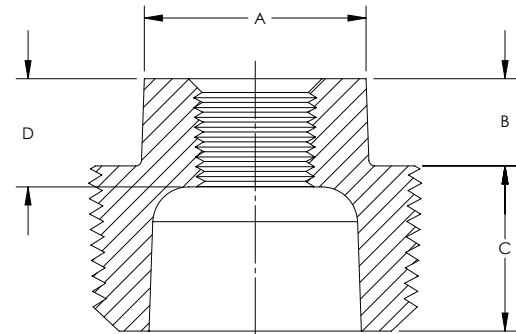
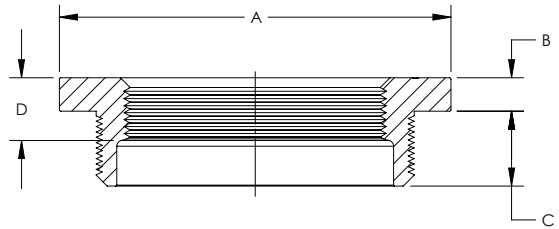


Continued on next page

* 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

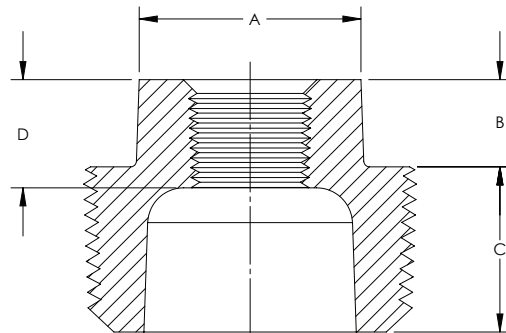
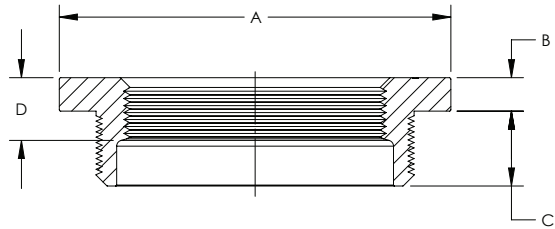


* Manufactured to WARD specifications

MALLEABLE IRON HEXAGON BUSHINGS CLASS 150

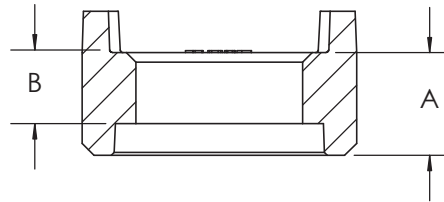
NPS	Width of Head A	Height of Head B	Length of External Threads C (min)	Length of Internal Threads D (min)	Inside or Outside Head
*1/4 x 1/8	0.64	0.14	0.44	0.26	Outside
*3/8 x 1/4	0.68	0.160	0.48	0.40	Outside
*3/8 x 1/8	0.68	0.16	0.48	0.25	Outside
*1/2 x 3/8	0.87	0.19	0.56	0.36	Outside
*1/2 x 1/4	0.87	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



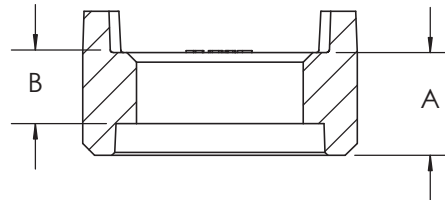
CAST IRON FLUSH BUSHINGS CLASS 125

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

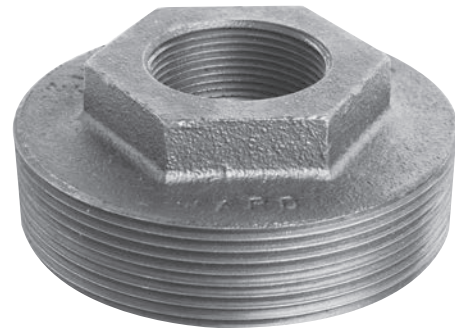
STEEL HEX SOCKET PLUGS

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

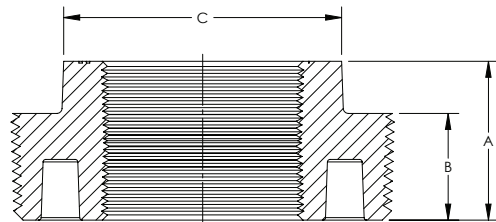
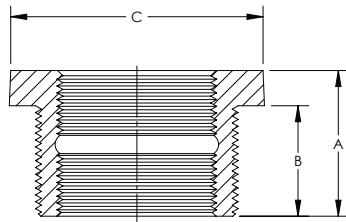
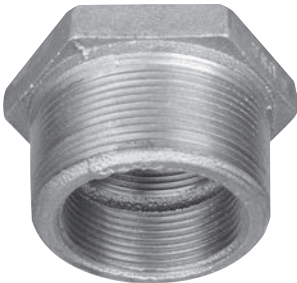


CAST IRON DOUBLE TAP TANK BUSHINGS (Heavy Type Only)

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.

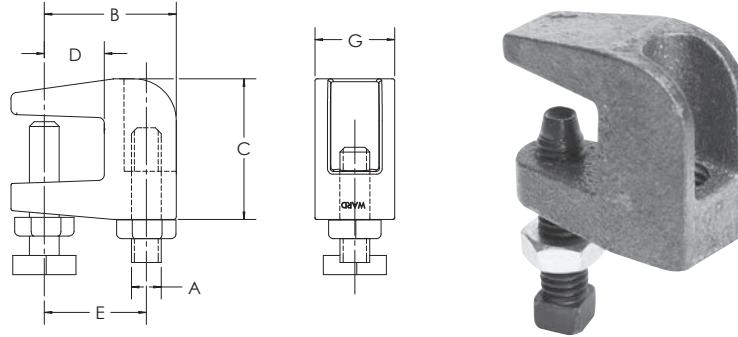
Material: ASTM A197

Coatings: ASTM A153
ASTM B633

Additional Specifications: UL, ULC AND FM where applicable

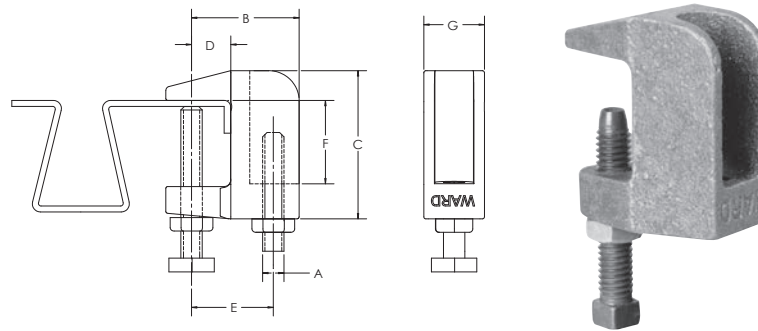
MALLEABLE IRON SMALL MOUTH TOP BEAM CLAMP

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



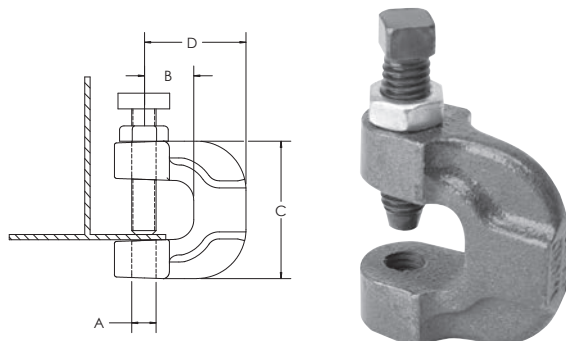
MALLEABLE IRON LARGE MOUTH TOP BEAM CLAMP

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:

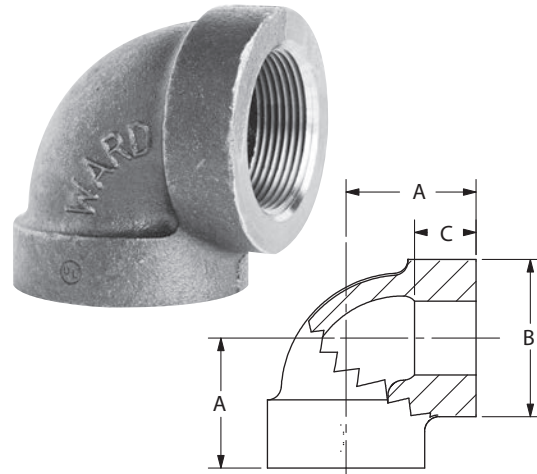
1) Permissible for service temperature up to 360° F reflecting temperature of saturated steam at 125 psi.

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

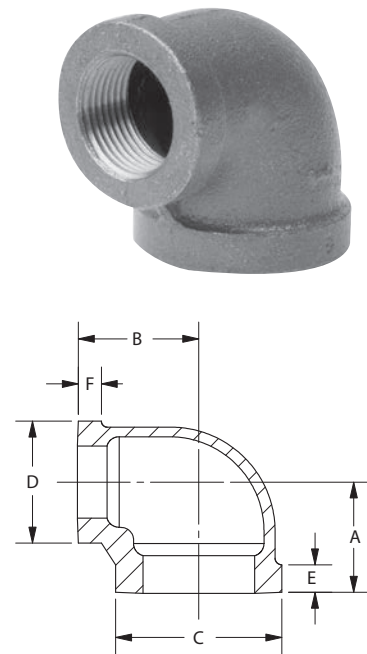
CAST IRON 90° STRAIGHT ELL CLASS 125

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	—	—	—	—



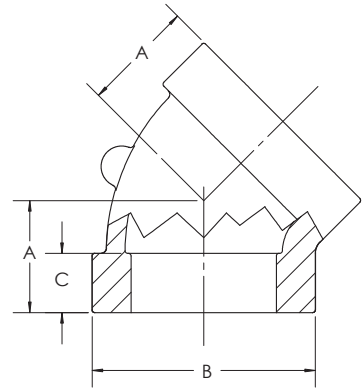
CAST IRON 90° REDUCING ELL CLASS 125

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	—	—	—	—	—	—	—	—



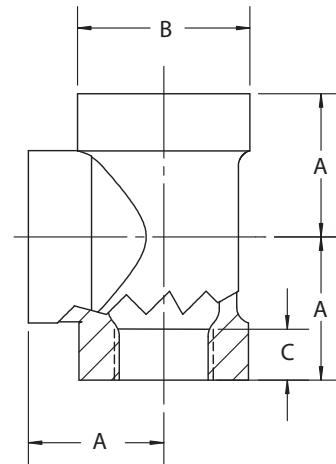
CAST IRON 45° ELL CLASS 125

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	—	—	—	—

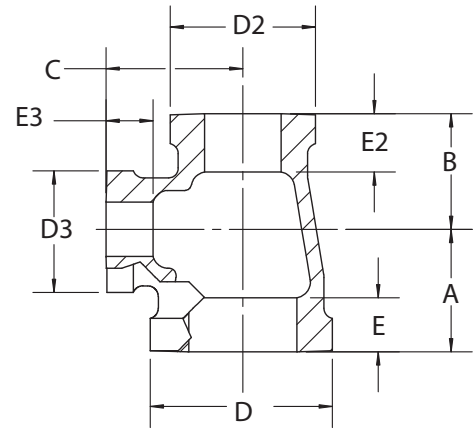


CAST IRON STRAIGHT TEE CLASS 125

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

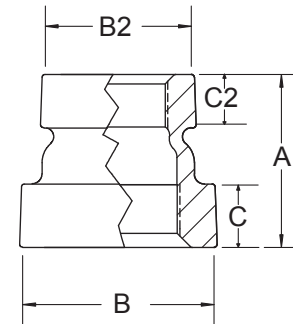
CAST IRON REDUCING TEE CLASS 125

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

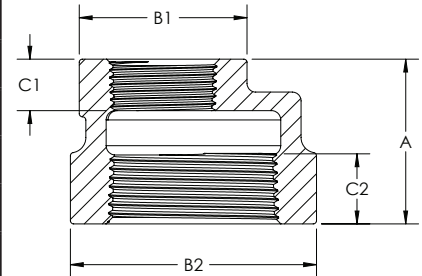
CAST IRON CONCENTRIC REDUCING COUPLING CLASS 125

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	—	—	—	—	—	—	—



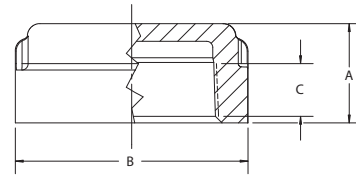
CAST IRON ECCENTRIC REDUCING COUPLING CLASS 125

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

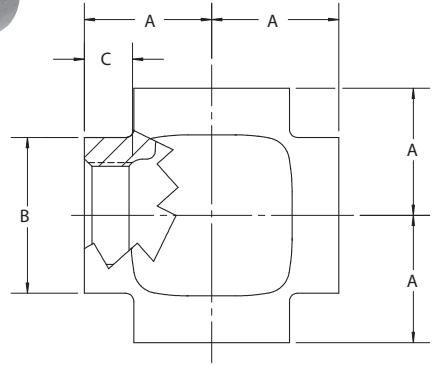


CAST IRON HEXAGON COUPLING

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

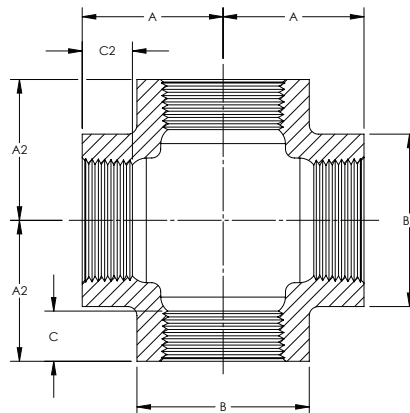
CAST IRON STRAIGHT CROSS CLASS 125

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

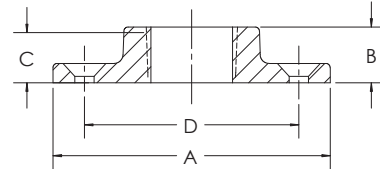
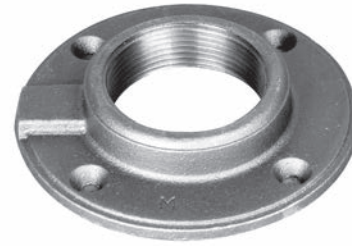
NPS
1 1/4 x 1 1/4 x 3/4
1 1/2 x 1 1/2 x 3/4
2 x 2 x 3/4
2 x 2 x 1 1/2



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

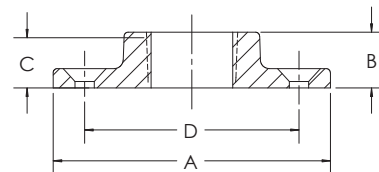
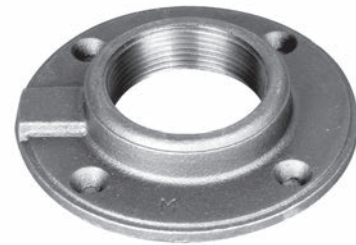
* Manufactured to WARD specifications



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

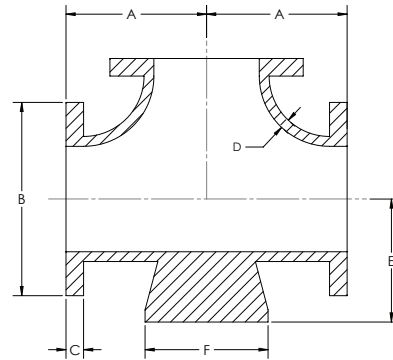
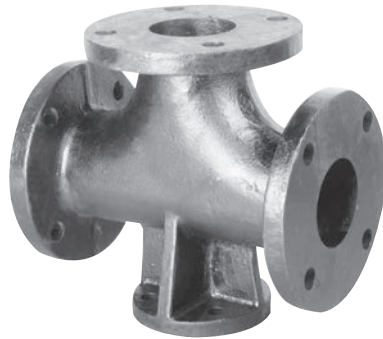
* Manufactured to WARD specifications



CAST IRON 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

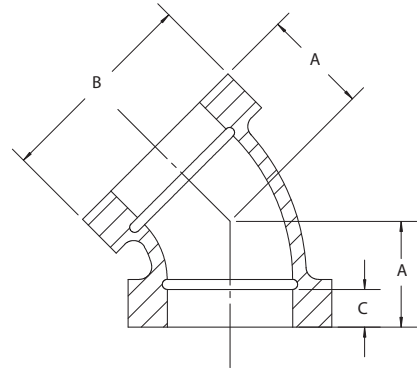
Be sure to specify the type of finish desired. As with the rest of the WARD line of fittings, drainage can be supplied in black or galvanized.

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

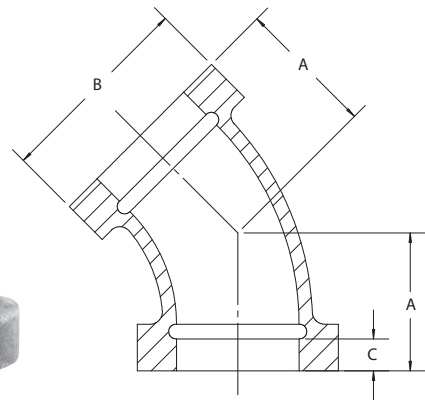
CAST IRON DRAINAGE 45° ELL SHORT TURN

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



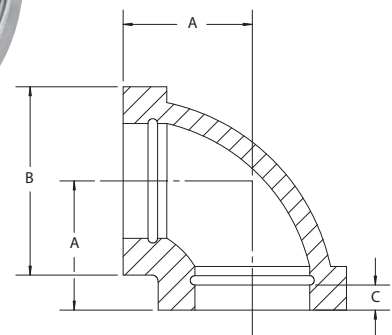
CAST IRON DRAINAGE 45° ELL LONG TURN

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



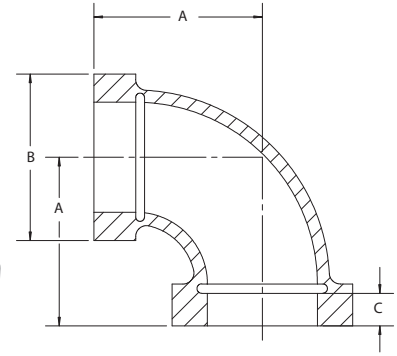
CAST IRON DRAINAGE 90° STRAIGHT ELL SHORT TURN

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



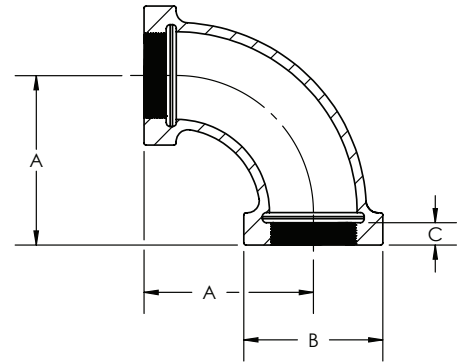
CAST IRON DRAINAGE 90° STRAIGHT ELL LONG TURN

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



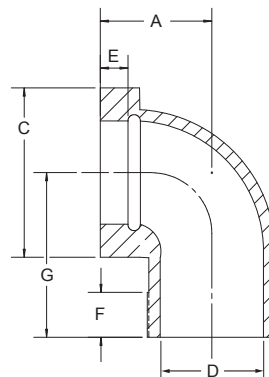
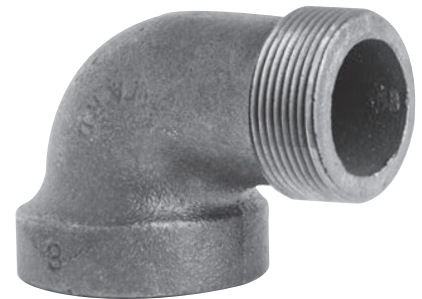
CAST IRON DRAINAGE 90° STRAIGHT ELL EXTRA LONG TURN

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



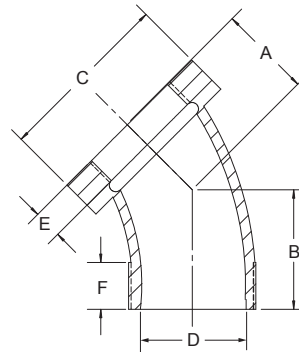
CAST IRON DRAINAGE 90° STREET ELL

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	—	—	—	—	—	—	—	—



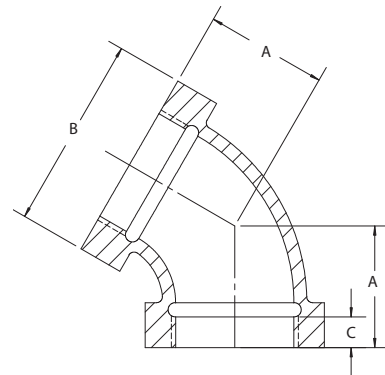
CAST IRON DRAINAGE 45° STREET ELL

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



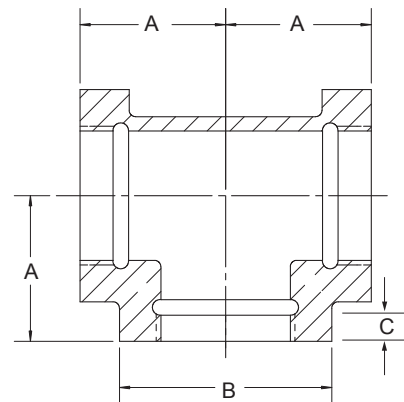
CAST IRON DRAINAGE 60° STREET ELL SHORT TURN

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



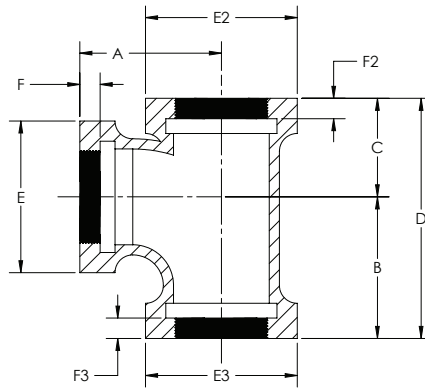
CAST IRON DRAINAGE STRAIGHT TEE

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



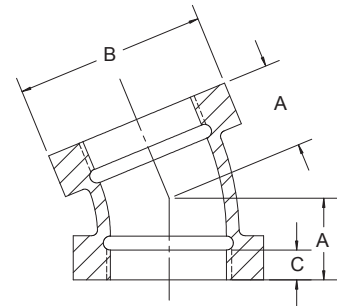
CAST IRON DRAINAGE 90° "TY" SHORT TURN

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

