









TSP®

HIGH QUALITY

MALLEABLE IRON PIPE FITTINGS

TSE

DIN DVGW CERT

Pb lead-free

CERTIFIED ISO 9001:2008 COMPANY




HATI-HATI
COR
MAYUNG









GENERAL INFORMATION

1. PRODUCT STANDARD AND APPLICATION RANGE

Galvanized / Black Malleable Iron Pipe Fittings Standard Specification :

STANDARD	
Design	EN 10242
Material	EN 1562
Threads	ISO 7-1 ISO 288-1
Zinc Coating	EN 10242
Reinforcement	Beaded

Mechanical Properties of Blackheart Malleable Cast Iron (Grade A)

Tensile Strength (min)	Elongation (min)	Hardness (max)
350 N/mm²	10 %	150 HB

Hydrostatic Design Test Pressure (Design Strength) :

Size	Pressure
1/8 to 4”	100 bar
5 and 6”	64 bar

Permissible Working Pressure and Temperature :

Service Temperature (ºC)	Maximum Permissible Working Pressure (bar)
-20 to 120	25
Between 120 and 300	Interpolated values
>300	20

Coating :

Galvanized	Hot Dip Zinc Coating (min) 70 µm / 500 gr / m².

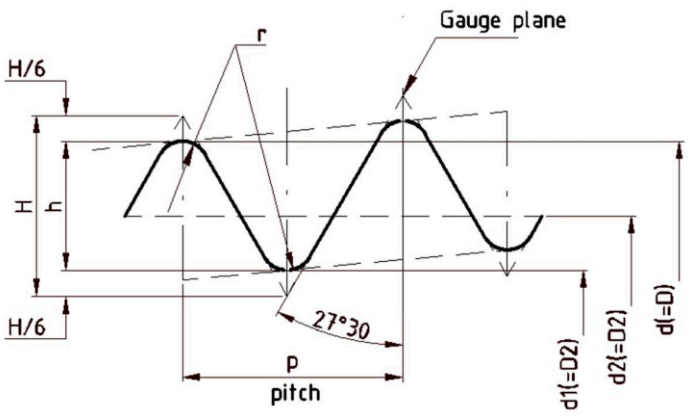




2. BASIC DIMENSIONS FOR EUROPEAN STANDARD THREADS

This information is selected from the ISO 7-1.

Parallel Thread



H = 0.960491 P h = 0.640327 P r = 0.137329 P

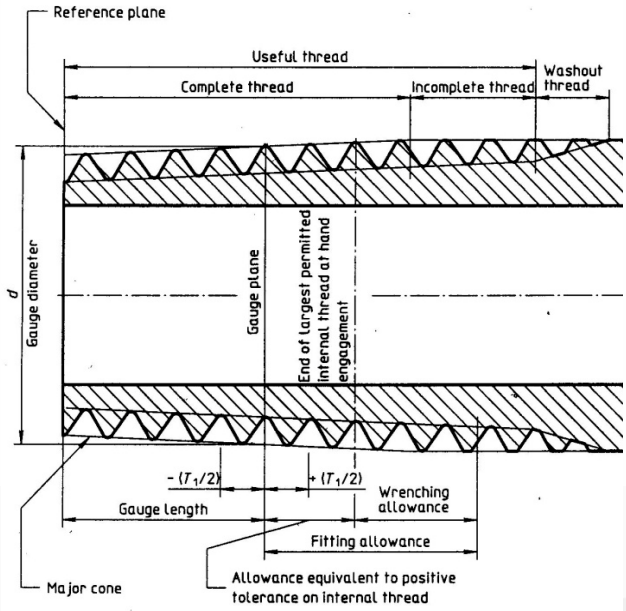


Figure 3 — Terms relating to external threads

Dimension in millimeters

Designation of threads size		Number of thread In 25.4 mm	Pitch	Height (depth) Of thread	Diameters at gauge plane			Length of useful thread			Gauge Length			Tolerance on position of gauge plane	
					Major	Pitch	Minor	Max	Nominal	Min	Max	Nominal	Min	On External thread	On Internal thread
Inch	mm		P	h	d	d2	d1							Turns of thread	
1/8	4	28	0.907	0.581	9.728	9.147	8.566	7.4	6.5	5.6	4.9	4	3.1	± 1	± 1 ¼
1/4	8	19	1.337	0.856	13.157	12.301	11.445	11.0	9.7	8.4	7.3	6	4.7	± 1	± 1 ¼
3/8	10	19	1.337	0.856	16.662	15.806	14.950	11.4	10.1	8.8	7.7	6.4	5.1	± 1	± 1 ¼
1/2	15	14	1.814	1.162	20.955	19.793	18.631	15.0	13.2	11.4	10.0	8.2	6.4	± 1	± 1 ¼
3/4	20	14	1.814	1.162	26.441	25.279	24.117	16.3	14.5	12.7	11.3	9.5	7.7	± 1	± 1 ¼
1	25	11	2.309	1.479	33.249	31.770	30.291	19.1	16.8	14.5	12.7	10.4	8.1	± 1	± 1 ¼
1 ¼	32	11	2.309	1.479	41.910	40.431	38.952	21.4	19.1	16.8	15.0	12.7	10.4	± 1	± 1 ¼
1 ½	40	11	2.309	1.479	47.803	46.324	44.845	21.4	19.1	16.8	15.0	12.7	10.4	± 1	± 1 ¼
2	50	11	2.309	1.479	59.614	58.135	56.656	25.7	23.4	21.1	18.2	15.9	13.6	± 1	± 1 ¼
2 ½	65	11	2.309	1.479	75.184	73.705	72.226	30.2	26.7	23.2	21.0	17.5	14.0	± 1 ½	± 1 ½
3	80	11	2.309	1.479	87.884	86.405	84.926	33.3	29.8	26.3	24.1	20.6	17.1	± 1 ½	± 1 ½
4	100	11	2.309	1.479	113.030	111.551	110.072	39.3	35.8	32.3	28.9	25.4	21.9	± 1 ½	± 1 ½
5	125	11	2.309	1.479	138.430	136.951	135.472	43.6	40.1	36.6	32.1	28.6	25.1	± 1 ½	± 1 ½
6	150	11	2.309	1.479	163.830	162.351	160.872	43.6	40.1	36.6	32.1	28.6	25.1	± 1 ½	± 1 ½

MALLEABLE IRON PIPE FITTINGS



FIG NO. 1
(Bends long MF 90)
Page. 5



FIG NO. 1A
(Bends short MF)
Page. 5



FIG NO. 2
(Bends long FF)
Page. 5&6



FIG NO. 40
(Bends MF 45)
Page. 6



FIG NO. 41
(Bends FF 45)
Page. 6&7

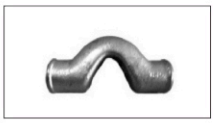


FIG NO. 85
(Cross Over)
Page. 7



FIG NO. 90
(Elbows 90)
Page. 7



FIG NO. 90R
(Red Elbows 90)
Page. 8



FIG NO. 92
(Street Elbows 90)
Page. 8



FIG NO. 92R
(Red Street Elbow 90)
Page.9



FIG NO. 96 (Union Elbow FF Conical)
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FIG NO. 97 (Union Elbow MF-Flat seat)
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FIG NO. 98 (Union Elbow MF Conical)
Page. 10



FIG NO. 120
(Elbows 45)
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FIG NO. 121
(Street Elbows 45)
Page. 10&11



FIG NO. 130
(Tees)
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FIG NO. 130R
(Red Tees)
Page. 12 - 14

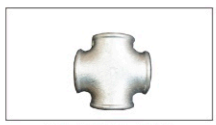


FIG NO. 180
(Crosses)
Page. 14



FIG NO. 221
(Side Outlet Elbows)
Page. 15



FIG NO. 240
(Red Sockets)
Page. 15&16



FIG NO. 241
(Bushings)
Page. 16&17



FIG NO. 245
(Red Nipples)
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FIG NO. 246R
(Red Sockets MF)
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FIG NO. 270
(Sockets)
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FIG NO. 280
(Nipples)
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FIG NO. 290
(Plugs Beaded)
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FIG NO. 291
(Plugs Plain)
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FIG NO. 300
(Hex Caps)
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FIG NO. 310
(Backnuts)
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FIG NO. 330
(Union FF Flat seat)
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FIG NO. 331
(Union MF Flat seat)
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FIG NO. 340
(Union FF Conical)
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FIG NO. 341
(Union MF Conical)
Page. 23l



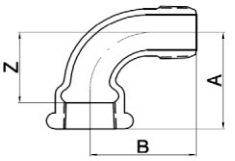
FIG NO. 529A
(Ext Pieces)
Page. 24



FIG NO. 531
(Niplle Plain)
Page. 24

Fig No. 1 - BENDS LONG M&F 90⁰ BEADED (MF 90L)

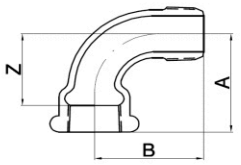




SIZE		CONTENT/CTN (pcs)	WEIGHT/PC (gr)		DIMENSION (mm)		
INCH	METRIC		GALV	BLACK	A	B	Z
1/4"	8	400	56	55	40	36	30
3/8"	10	240	80	77	48	42	38
1/2"	15	160	120	117	55	48	42
3/4"	20	80	220	215	69	60	54
1"	25	40	376	360	85	75	68
1 ¼"	32	28	600	580	105	95	86
1 ½"	40	18	930	900	116	106	97
2"	50	10	1430	1400	140	130	116
2 ½"	65	6	2620	2560	176	165	149
3"	80	3	3670	3600	205	190	175
4"	100	2	7100	6923	260	245	224

Fig No. 1A - BENDS SHORT M&F 90⁰ BEADED (MF 90S)

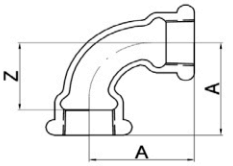




SIZE		CONTENT/CTN (pcs)	WEIGHT/PC (gr)		DIMENSION (mm)		
INCH	METRIC		GALV	BLACK	A	B	Z
1"	25	60	293	286	63	63	46

Fig No. 2 - BENDS LONG FEMALE 90⁰ BEADED (FF 90L)

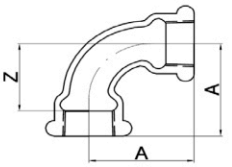




SIZE		CONTENT/CTN (pcs)	WEIGHT/PC (gr)		DIMENSION (mm)	
INCH	METRIC		GALV	BLACK	A	B
3/8"	10	240	100	92	48	38
1/2"	15	140	157	153	55	42
3/4"	20	80	276	265	69	54
1"	25	40	421	400	85	68
1 ¼"	32	24	650	634	105	86

Fig No. 2 - BENDS LONG FEMALE 90⁰ BEADED (FF 90L)

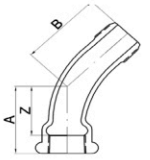




SIZE		CONTENT/CTN (pcs)	WEIGHT/PC (gr)		DIMENSION (mm)	
INCH	METRIC		GALV	BLACK	A	B
1 ½"	40	18	934	900	116	97
2"	50	10	1650	1600	140	116
2 ½"	65	4	2876	2804	176	149
3"	80	3	4718	4600	205	175
4"	100	2	7700	7508	260	224

Fig No. 40 - BENDS M&F 45⁰ BEADED (MF 45)

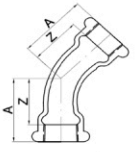




SIZE		CONTENT/CTN (pcs)	WEIGHT/PC (gr)		DIMENSION (mm)		
INCH	METRIC		GALV	BLACK	A	B	Z
3/8"	10	320	59	58	30	24	20
1/2"	15	160	102	98	36	30	23
3/4"	20	80	165	161	43	36	28
1"	25	60	250	240	51	42	34
1 ¼"	32	30	428	416	64	54	45
1 ½"	40	24	568	545	68	58	49
2"	50	12	990	980	81	70	57
2½"	65	6	1500	1463	99	86	72
3"	80	4	2300	2243	113	100	83
4"	100	2	4350	4241	142	125	-

Fig No. 41 - BENDS FEMALE 45⁰ BEADED (FF 45)

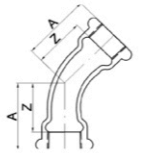




SIZE		CONTENT/CTN (pcs)	WEIGHT/PC (gr)		DIMENSION (mm)	
INCH	METRIC		GALV	BLACK	A	B
1/2"	15	160	130	124	36	23
3/4"	20	80	203	196	43	28
1"	25	60	300	293	51	34

Fig No. 41 - BENDS FEMALE 45⁰ BEADED (FF 45)

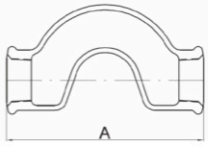




SIZE		CONTENT/CTN (pcs)	WEIGHT/PC (gr)		DIMENSION (mm)	
INCH	METRIC		GALV	BLACK	A	B
1 ¼"	32	30	576	560	64	45
1 ½"	40	24	670	653	68	49
2"	50	12	1190	1160	81	57
2 ½"	65	6	1810	1765	99	72
3"	80	4	2650	2584	113	83
4"	100	2	5050	4924	142	-

Fig No. 85 - CROSS OVER BEADED (CO)

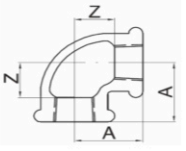




SIZE		CONTENT/CTN (pcs)	WEIGHT/PC (gr)		DIMENSION (mm)
INCH	METRIC		GALV	BLACK	A
1/2"	15	100	200	190	90
3/4"	20	60	323	324	106

Fig No. 90 - ELBOWS 90⁰ BEADED (BL 90)

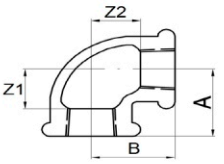




SIZE		CONTENT/CTN (pcs)	WEIGHT/PC (gr)		DIMENSION (mm)	
INCH	METRIC		GALV	BLACK	A	Z
1/4"	8	400	48	45	21	11
3/8"	10	320	66	66	25	15
1/2"	15	200	97	95	28	15
3/4"	20	120	157	146	33	18
1"	25	60	230	225	38	21
1 ¼"	32	40	383	364	45	26
1½"	40	30	490	480	50	31
2"	50	16	780	750	58	34
2½"	65	12	1330	1300	69	42
3"	80	8	1794	1760	78	48
4"	100	3	3436	3350	96	60

Fig No. 90R - REDUCING ELBOWS 90⁰ BEADED (BRL)

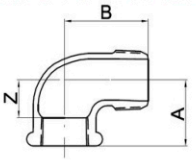




SIZE		CONTENT/CTN (pcs)	WEIGHT/PC (gr)		DIMENSION (mm)			
INCH	METRIC		GALV	BLACK	A	B	Z1	Z2
1/2 X 1/4"	15 X 8	240	80	78	-	-	-	-
1/2 X 3/8"	15 X 10	240	85	82	26	26	13	16
3/4 X 1/2"	20 X 15	160	135	131	30	31	15	18
1 X 1/2"	25 X 15	100	185	177	32	34	15	21
1 X 3/4"	25 X 20	100	205	200	35	36	18	21
1 ¼ X 1/2"	32 X 15	80	230	224	33	37	16	24.5
1¼X 3/4"	32 X 20	60	260	254	36	41	17	26
1¼ X 1"	32 X 25	40	344	335	40	42	21	25
1 ½ X 3/4"	40 X 20	40	330	322	37	41	17	28
1 ½X 1"	40 X 25	40	390	370	42	46	23	29
1 ½X 1 ¼"	40 X 32	30	460	449	46	48	27	29
2 X 1 ½"	50 X 40	20	700	683	52	55	28	36
2 ½ X 2"	65 X 50	12	960	936	61	66	34	42
3 X 2"	80 X 50	8	1200	1170	61	71	35	48
3 X 2 1/2"	80 X 65	8	1550	1511	70	72	43	48

Fig No. 92 - STREET ELBOWS 90⁰ BEADED (BSL 90)

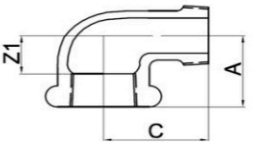




SIZE		CONTENT/CTN (pcs)	WEIGHT/PC (gr)		DIMENSION (mm)		
INCH	METRIC		GALV	BLACK	A	B	Z
1/4"	8	400	41	40	21	28	11
3/8"	10	240	62	60	25	32	15
1/2"	15	180	98	88	28	37	15
3/4"	20	100	150	146	33	43	18
1"	25	80	238	237	38	52	21
1 ¼"	32	50	385	367	45	60	26
1 ½"	40	30	480	467	50	65	31
2"	50	16	814	790	58	74	34
2 ½"	65	10	1296	1300	69	88	42
3"	80	8	1772	1720	78	98	48
4"	100	4	3400	3170	96	118	60

Fig No. 92R - REDUCING STREET ELBOW 90⁰ BEADED (BRSL)

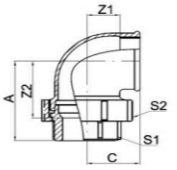




SIZE		CONTENT/CTN (pcs)	WEIGHT/PC (gr)		DIMENSION (mm)		
INCH	METRIC		GALV	BLACK	A	C	Z1
1 X 3/4"	25 X 20	80	192	187	35	46	18

Fig No. 96 - UNION ELBOW F&F CONICAL JOINT IRON TO IRON (CU ANGEL 96)

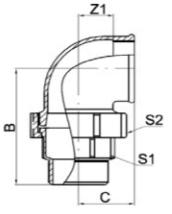




SIZE		CONTENT/ CTN (pcs)	WEIGHT/PC (gr)		DIMENSION (mm)					
INCH	METRIC		GALV	BLACK	A	C	Z1	Z2	S1	S2
1/2"	15	80	300	296	58	28	15	45	27.0	45.5
3/4"	20	60	375	366	62	33	18	47	32.0	50.0
1"	25	40	530	518	72	38	21	55	38.5	55.0
1 ¼"	32	24	889	886	82	45	26	63	47.5	69.0
1 ½"	40	16	1140	1118	90	50	31	71	55.0	76.0
2"	50	8	1685	1690	100	58	34	76	67.5	92.0
2 1/2"	65	4	2590	2530	122	70	-	-	-	-
3"	80	4	3700	3608	135	78	-	-	-	-
4"	100	2	6700	6533	165	142	-	-	-	-

Fig No. 97 - UNION ELBOW M&F FLAT SEAT WITH GASKET (CU ANGLE 97)

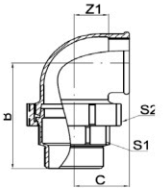




SIZE		CONTENT/ CTN (pcs)	WEIGHT/PC (gr)		DIMENSION (mm)				
INCH	METRIC		GALV	BLACK	B	C	Z1	S1	S2
1/2"	15	80	320	312	76	28	15	27.0	45.5
3/4"	20	60	410	400	82	33	18	32.0	50.0
1"	25	30	600	585	94	38	21	38.5	55.0
1 ¼"	32	24	920	897	107	45	26	47.5	69.0
1 ½"	40	16	1200	1170	115	50	31	54.0	75.5
2"	50	8	1905	1857	128	58	34	67.5	92.0

Fig No. 98 - UNION ELBOW M&F CONICAL JOINT IRON TO IRON (CU ANGLE 98)

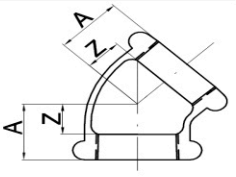




SIZE		CONTENT/ CTN (pcs)	WEIGHT/PC (gr)		DIMENSION (mm)				
INCH	METRIC		GALV	BLACK	B	C	Z1	S1	S2
1/2"	15	80	300	296	76	28	15	27.0	45.0
3/4"	20	60	400	390	82	33	18	32.0	50.0
1"	25	30	576	567	94	38	21	39.0	55.0
1 ¼"	32	24	960	950	107	45	26	46.0	68.0
1 ½"	40	16	1245	1198	115	50	31	54.0	75.5
2"	50	8	1905	1800	128	58	34	67.0	92.0
2 1/2"	65	4	2850	2779	152	70	-	-	-
3"	80	4	3900	3803	168	78	-	-	-
4"	100	2	7250	7069	214	142	-	-	-

Fig No. 120 - ELBOWS 45⁰ BEADED (BL 45)

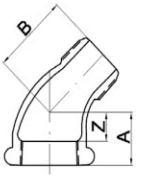




SIZE		CONTENT/CTN (pcs)	WEIGHT/PC (gr)		DIMENSION (mm)	
INCH	METRIC		GALV	BLACK	A	Z
1/2"	15	200	97	95	22	9
3/4"	20	120	132	127	25	10
1"	25	60	210	200	28	11
1 ¼"	32	40	316	308	33	14
1½"	40	30	430	419	36	17
2"	50	24	650	634	43	19

Fig No. 121 - STREET ELBOWS 45⁰ BEADED (BSL 45)

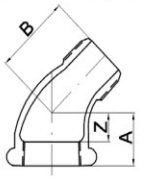




SIZE		CONTENT/CTN (pcs)	WEIGHT/PC (gr)		DIMENSION (mm)		
INCH	METRIC		GALV	BLACK	A	B	Z
1/2"	15	220	81	79	22	28	9
3/4"	20	120	130	127	25	32	10

Fig No. 121 - STREET ELBOWS 45⁰ BEADED (BSL 45)

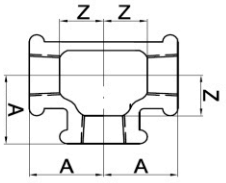




SIZE		CONTENT/CTN (pcs)	WEIGHT/PC (gr)		DIMENSION (mm)		
INCH	METRIC		GALV	BLACK	A	B	Z
1"	25	80	190	185	28	37	11
1 ½"	40	30	370	361	36	46	17
2"	50	24	588	573	43	55	19

Fig No. 130 - TEES BEADED (BT)

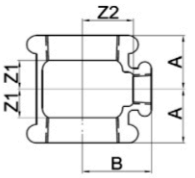




SIZE		CONTENT/CTN (pcs)	WEIGHT/PC (gr)		DIMENSION (mm)	
INCH	METRIC		GALV	BLACK	A	Z
1/4"	8	320	73	68	21	11
3/8"	10	200	89	86	25	15
1/2"	15	120	123	120	28	15
3/4"	20	80	200	190	33	18
1"	25	40	305	292	38	21
1¼"	32	28	464	458	45	26
1½"	40	24	649	634	50	31
2"	50	16	1024	990	58	34
2½"	65	8	1488	1516	69	42
3"	80	6	2150	2053	78	48
4"	100	2	4150	3800	96	60
6"	150	3	11000	10725	131	91

Fig No. 130R - REDUCING TEES BEADED (BRT)

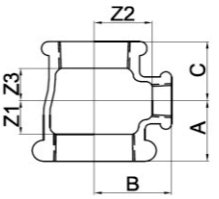




SIZE		CONTENT/CTN (pcs)	WEIGHT/PC (gr)		DIMENSION (mm)			
INCH	METRIC		GALV	BLACK	A	B	Z1	Z2
1/2 X 3/8"	15 X 10	160	113	110	26	26	13	16
3/4 X 3/8"	20 X 10	100	160	156	28	28	13	18
3/4 X 1/2"	20 X 15	80	170	166	30	31	15	18
1 X 3/8"	25 X 10	60	215	210	30	32	13	22
1 X 1/2"	25 X 15	60	222	216	32	34	15	21
1 X 3/4"	25 X 20	48	261	254	35	36	18	21
1 ¼ X 1/2"	32 X 10	40	309	305	34	38	15	25
1 ¼ X 3/8"	32 X 15	40	309	301	34	38	15	25
1 ¼ X 3/4"	32 X 20	40	327	319	36	41	17	26
1 ¼ X 1"	32 X 25	40	424	413	40	42	21	25
1 ½ X 3/8"	40 X 10	36	394	384	36	40	-	-
1 ½ X 1/2"	40 X 15	36	420	410	36	42	17	29
1 ½ X 3/4"	40 X 20	30	455	444	38	44	19	29
1 ½ X 1"	40 X 25	30	515	502	42	46	23	29
1 ½X 1¼"	40 X 32	24	578	564	46	48	27	29
2 X 1/2"	50 X 15	20	621	605	38	48	14	35
2 X 3/4"	50 X 20	20	630	614	40	50	16	35
2 X 1"	50 X 25	20	755	736	44	52	20	35
2 X 1¼"	50 X 32	16	750	731	48	54	24	35
2 X 1½"	50 X 40	16	899	877	52	55	28	36
2 ½ X 1"	65 X 25	10	1045	1019	47	60	20	43
2 ½ X 1¼"	65 X 32	10	1120	1092	52	62	25	43
2 ½ X 1½"	65 X 40	10	1207	1177	55	63	28	44
2 ½ X 2"	65 X 50	8	1482	1445	61	66	34	42
3 X 1"	80 X 25	6	1450	1414	51	67	21	50
3 X 1¼"	80 X 32	6	1594	1554	55	70	25	51
3 X 1 ½"	80 X 40	6	1610	1570	58	71	28	52
3 X 2"	80 X 50	6	1870	1823	64	73	34	49
3 X 2½"	80 X 65	6	2050	1999	72	76	42	49
4 X 2"	100 X 50	4	2800	2730	70	86	34	62
4 X 2 1/2"	100 X 65	4	2900	2828	75	86	43	53
4 X 3"	100 X 80	2	3200	3120	84	92	48	62

Fig No. 130R - REDUCING TEES BEADED (BRT)

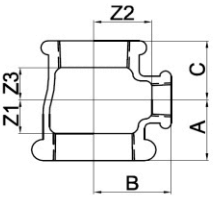




SIZE		CONTENT/ CTN (pcs)	WEIGHT/PC (gr)		DIMENSION (mm)					
INCH	METRIC		GALV	BLACK	A	B	C	Z1	Z2	Z3
3/8 X 1/2 X 3/8"	10 X 15 X 10	160	105	102	26	26	26	16	13	16
1/2 X 3/8 X 3/8"	15 X 10 X 10	160	108	105	26	26	25	13	16	15
1/2 X 1/2 X 3/8"	15 X 15 X 10	160	122	119	28	28	26	15	15	16
1/2 X 3/4 X 1/2"	15 X 20 X 15	120	154	150	31	30	31	18	15	18
3/4 X 3/8 X 1/2"	20 X 10 X 15	140	154	150	28	28	26	13	18	13
3/4 X 1/2 X 3/8"	20 X 15 X 10	140	154	150	30	31	26	15	18	16
3/4 X 1/2 X 1/2"	20 X 15 X 15	100	160	156	30	31	28	15	18	15
3/4 X 3/4 X 3/8"	20 X 20 X 10	120	169	165	33	33	28	18	18	18
3/4 X 3/4 X 1/2"	20 X 20 X 15	80	193	188	33	33	31	18	18	18
3/4 X 1 X 3/4"	20 X 25 X 20	70	251	240	36	35	36	21	18	21
1 X 1/2 X 1/2"	25 X 15 X 15	80	205	200	32	34	28	15	21	15
1 X 1/2 X 3/4"	25 X 15 X 20	80	205	200	32	34	30	15	21	15
1 X 3/4 X 1/2"	25 X 20 X 15	80	230	224	35	36	31	18	21	18
1 X 3/4 X 3/4"	25 X 20 X 20	60	256	250	35	36	33	18	21	18
1 X 1 X 3/8"	25 X 25 X 10	60	231	225	38	38	32	21	21	22
1 X 1 X 1/2"	25 X 25 X 15	60	270	263	38	38	34	21	21	21
1 X 1 X 3/4"	25 X 15 X 20	60	275	268	38	38	36	21	21	21
1 X 1 ¼X 1"	25 X 32 X 25	40	370	361	42	40	42	25	21	25
1 X 1 ½ X 1"	25 X 40 X 25	30	470	458	46	42	46	29	23	29
1 ¼ X 1/2 X 1"	32 X 15 X 25	40	291	284	34	38	32	15	25	15
1 ¼X 3/4 X 3/4"	32 X 20 X 20	40	300	293	36	41	33	17	26	18
1 ¼ X 3/4 X 1"	32 X 20 X 25	40	338	330	36	41	35	17	26	18
1 ¼ X 1 X 3/4"	32 X 25 X 20	40	364	355	40	42	36	21	25	21
1 ¼ X 1 X 1"	32 X 25 X 25	40	387	377	40	42	38	21	25	21
1 ¼ X 1 ¼ X 1/2"	32 X 32 X 15	40	390	380	45	45	38	26	26	25
1 ¼ X 1 ¼ X 3/4"	32 X 32 X 20	40	410	400	45	45	41	26	26	26
1 ¼ X 1 ¼ X 1"	32 X 32 X 25	30	460	449	45	45	42	26	26	25
1 ¼ X 1 ½ X 1 ¼"	32 X 40 X 32	24	530	520	48	46	48	29	27	29
1 ¼ X 2 X 1 ¼"	32 X 50 X 32	16	700	683	54	48	54	35	24	35
1 ½ X 1/2 X 1/2"	40 X 15 X 15	36	312	304	38	-	28	-	-	-
1 ½ X 1/2 X 1 ¼"	40 X 15 X 32	30	376	367	36	42	34	17	29	15
1 ½ X 3/4 X 1 ¼"	40 X 20 X 32	24	435	424	38	44	36	19	29	17
1 ½X 1 X 1"	40 X 25 X 25	30	455	444	42	46	38	23	29	21

Fig No. 130R - REDUCING TEES BEADED (BRT)

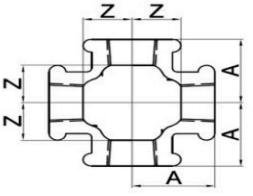




SIZE		CONTENT/ CTN (pcs)	WEIGHT/PC (gr)		DIMENSION (mm)					
INCH	METRIC		GALV	BLACK	A	B	C	Z1	Z2	Z3
1 ½X 1 X 1 ¼"	40 X 15 X 32	24	500	488	42	46	40	23	29	21
1 ½ X 1¼ X 1"	40 X 32 X 25	24	350	341	46	48	42	27	29	25
1 ½ X 1¼ X 1 ¼"	40 X 32 X 32	24	570	556	46	48	46	27	29	26
1 ½ X 1 ½ X 1/2"	40 X 40 X 15	24	550	536	50	50	42	31	31	29
1 ½ X 1 ½ X 3/4"	40 X 40 X 20	24	560	546	50	50	44	31	31	29
1 ½X 1 ½ X 1"	40 X 40 X 25	24	580	566	50	50	46	31	31	29
1 ½X 1 ½X 1 ¼"	40 X 40 X 32	24	660	644	50	50	48	31	31	29
1 ½ X 2 X 1 ½"	40 X 50 X 40	16	840	819	55	52	55	36	28	36
2 X 3/4 X 1 ½"	50 X 30 X 40	20	600	585	40	50	38	16	35	19
2 X 1 ¼ X 1 ¼"	50 X 32 X 32	16	750	731	48	54	45	24	35	26
2 X 1 ¼ X 1 ½"	50 X 32 X 40	16	718	700	48	54	46	24	35	27
2 X 1 ½ X 1 ¼"	50 X 40 X 32	16	720	700	52	55	48	23	36	29
2 X 1½ X 1 ½"	50 X 40 X 40	16	850	829	52	55	50	28	36	31
2 X 2 X 1 ½"	50 X 50 X 40	16	960	936	58	58	55	34	34	36

Fig No. 180 - CROSSES BEADED (BCR)

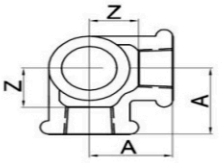




SIZE		CONTENT/ CTN (pcs)	WEIGHT/PC (gr)		DIMENSION (mm)	
INCH	METRIC		GALV	BLACK	A	B
3/8"	10	160	120	110	25	15
1/2"	15	80	154	151	28	15
3/4"	20	60	242	229	33	18
1"	25	40	390	370	38	21
1 ¼"	32	20	560	559	45	26
1 ½"	40	16	854	817	50	31
2"	50	10	1300	1217	58	34
2 ½"	65	6	1925	1877	69	42
3"	80	4	2800	2730	78	48
4"	100	2	4680	4563	96	60

Fig No. 221 - SIDE OUTLET ELBOWS BEADED (SOE)

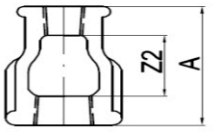




SIZE		CONTENT/CTN (pcs)	WEIGHT/PC (gr)		DIMENSION (mm)	
INCH	METRIC		GALV	BLACK	A	Z
1/2"	15	140	125	122	28	15
3/4"	20	80	220	215	33	18
1"	25	40	285	278	38	21
1 1/4"	32	30	430	419	45	26
1 1/2"	40	24	620	605	50	31
2"	50	10	988	963	58	34

Fig No.240 - REDUCING SOCKETS BEADED (BRS)

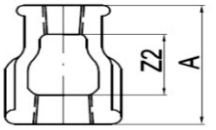




SIZE		CONTENT/CTN (pcs)	WEIGHT/PC (gr)		DIMENSION (mm)	
INCH	METRIC		GALV	BLACK	A	Z2
1/2 X 1/4"	15 X 8	320	67	65	36	13
1/2 X 3/8"	15 X 10	240	73	72	36	13
3/4 X 3/8"	20 X 10	180	93	89	39	14
3/4 X 1/2"	20 X 15	180	98	92	39	11
1 X 3/8"	25 X 10	120	128	125	45	18
1 X 1/2"	25 X 15	120	133	127	45	15
1 X 3/4"	25 X 20	100	134	132	45	13
1 ¼ X 1/2"	32 X 15	80	190	180	50	18
1 ¼ X 3/4"	32 X 20	80	196	190	50	16
1 ¼ X 1"	32 X 25	60	245	239	50	14
1 ½ X 1/2"	40 X 15	60	259	250	55	23
1 ½X 3/4"	40 X 20	60	250	245	55	23
1 ½ X 1"	40 X 25	50	287	280	55	19
1 ½ X 1 ¼"	40 X 32	50	312	305	55	17
2 X 1/2"	50 X 15	36	440	429	65	28
2 X 3/4"	50 X 20	36	390	380	65	26
2 X 1"	50 X 25	36	446	430	65	24
2 X 1 ¼"	50 X 32	30	460	452	65	22
2 X 1 ½"	50 X 40	30	460	450	65	22
2 ½ X 1"	65 X 25	20	580	566	74	-

Fig No. 240 - REDUCING SOCKETS BEADED (BRS)

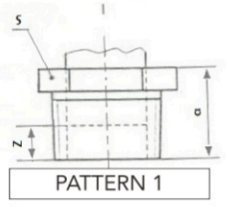




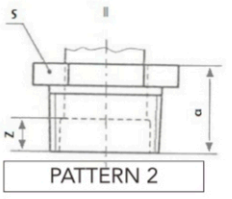
SIZE		CONTENT/CTN (pcs)	WEIGHT/PC (gr)		DIMENSION (mm)	
INCH	METRIC		GALV	BLACK	A	Z2
2 ½X 1 ¼"	65 X 32	20	660	644	74	28
2 ½ X 1 ½"	65 X 40	16	730	712	74	28
2 ½ X 2"	65 X 50	16	770	746	74	23
3 X 1"	80 X 25	12	760	741	80	-
3 X 1 ¼"	80 X 32	12	830	809	80	-
3 X 1 ½"	80 X 40	12	850	829	80	31
3 X 2"	80 X 50	12	1015	990	80	26
3 X 2 ½"	80 X 65	12	1070	1043	80	23
4 X 2"	100 X 50	6	1785	1740	94	34
4 X 2 ½"	100 X 65	6	1735	1692	94	31
4 X 3"	100 X 80	6	1788	1743	94	28

Fig No. 241 - BUSHINGS (HB)

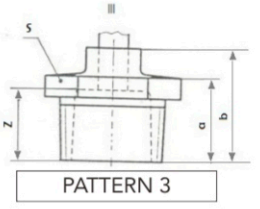




PATTERN 1



PATTERN 2

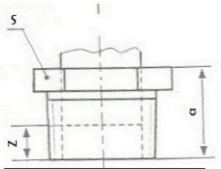


PATTERN 3

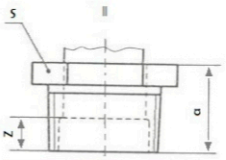
SIZE		CONTENT/ CTN (pcs)	WEIGHT/PC (gr)		DIMENSION (mm)				
INCH	METRIC		GALV	BLACK	PATTERN	a	b	Z	S
3/8 X 1/4"	10 X 8	800	19	19	1	20	-	10	19
1/2 X 1/4"	15 X 8	600	37	35	2	24	-	14	22
1/2 X 3/8"	15 X 10	600	30	30	2	24	-	14	22
3/4 X 3/8"	20 X 10	300	65	65	2	26	-	18	30
3/4 X 1/4"	20 X 8	300	66	64	2	26	-	16	30
3/4 X 1/2"	20 X 15	320	57	55	1	26	-	13	30
1 X 3/8"	25 X 10	180	124	120	2	29	-	19	36
1 X 1/2"	25 X 15	180	108	105	2	29	-	16	36
1 X 3/4"	25 X 20	180	81	80	1	29	-	14	36
1 ¼ X 3/8"	32 X 10	150	200	195	2	31	-	21	46
1 ¼ X 1/2"	32 X 15	120	178	177	2	31	-	18	46
1 ¼ X 3/4"	32 X 20	120	169	165	2	31	-	16	46
1 ¼ X 1"	32 X 25	120	150	146	1	31	-	14	46
1 ½ X 3/8"	40 X 10	60	255	249	2	31	-	21	54
1 ½X 1/2"	40 X 15	60	237	231	2	31	-	18	54

Fig No. 241 - BUSHINGS (HB)

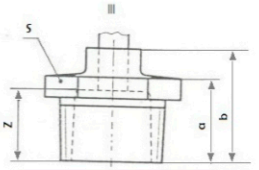




PATTERN 1



PATTERN 2

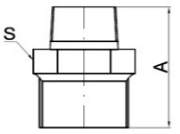


PATTERN 3

SIZE		CONTENT/ CTN (pcs)	WEIGHT/PC (gr)		DIMENSION (mm)				
INCH	METRIC		GALV	BLACK	PATTERN	a	b	Z	S
1 ½ X 3/4"	40 X 20	60	246	225	2	31	-	16	54
1 ½ X 1"	40 X 25	80	214	200	2	31	-	14	54
1 ½ X 1 ¼"	40 X 32	80	159	155	1	31	-	12	54
2 X 1/2"	50 X 15	50	420	410	3	35	48	35	68
2 X 3/4"	50 X 20	50	417	386	3	35	48	33	68
2 X 1"	50 X 25	50	400	386	2	35	-	18	68
2 X 1 ¼"	50 X 32	50	331	322	2	35	-	16	64
2 X 1½"	50 X 40	50	280	273	2	35	-	16	64
2 ½ X 1"	65 X 25	30	528	516	3	40	-	37	80
2 ½X 1 ¼"	65 X 32	30	562	550	3	40	54	35	80
2 ½ X 1 ½"	65 X 40	30	630	590	2	40	54	21	80
2 ½ X 2"	65 X 50	30	487	476	2	40	-	16	80
3 X 1"	80 X 25	20	806	790	3	44	59	42	95
3 X 1 ¼"	80 X 32	20	789	760	3	44	59	40	95
3 X 1 ½"	80 X 40	20	798	780	3	44	59	40	95
3 X 2"	80 X 50	20	901	895	2	44	-	20	95
3 X 2 ½"	80 X 65	20	628	600	2	44	-	17	95
4 X 2"	100 X 50	10	1328	1300	3	51	69	46	120
4 X 2 ½"	100 X 65	10	1333	1300	3	51	69	42	120
4 X 3"	100 X 80	10	1330	1300	2	51	-	21	120

Fig No.245 - REDUCING NIPPLES (RN)

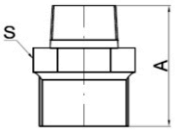




SIZE		CONTENT/CTN (pcs)	WEIGHT/PC (gr)		DIMENSION (mm)	
INCH	METRIC		GALV	BLACK	A	S
3/8 X 1/4"	10 X 8	400	36	35	38	22
1/2 X 1/4"	15 X 8	280	50	49	44	27
1/2 X 3/8"	15 X 10	280	64	64	44	27
3/4 X 3/8"	20 X 10	200	104	100	47	32
3/4 X 1/2"	20 X 15	160	109	106	47	32
1 X 1/2"	25 X 15	120	146	141	53	38

Fig No. 245 - REDUCING NIPPLES (RN)

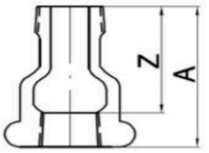




SIZE		CONTENT/CTN (pcs)	WEIGHT/PC (gr)		DIMENSION (mm)	
INCH	METRIC		GALV	BLACK	A	S
1 X 3/4"	25 X 20	120	162	152	53	38
1 ¼ X 1/2"	32 X 15	80	220	215	57	46
1 ¼ X 3/4"	32 X 20	80	223	220	57	46
1 ¼ X 1"	32 X 25	80	224	220	57	46
1 ½ X 3/4"	40 X 20	60	240	234	59	54
1 ½ X 1"	40 X 25	50	341	330	59	54
1 ½ X 1 ¼"	40 X 32	50	310	290	59	54
2 X 1"	50 X 25	40	496	484	68	64
2 X 1 ¼"	50 X 32	40	477	460	68	64
2 X 1 ½"	50 X 40	36	461	440	68	64
2 ½ X 1 ½"	65 X 40	20	730	712	71	-
2 ½ X 2"	65 X 50	30	743	730	75	80
3 X 2"	80 X 50	12	1000	975	83	96
3 X 2 ½"	80 X 65	12	947	923	83	96

Fig No.246R - REDUCING SOCKETS M&F BEADED (RSMF)

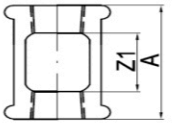




SIZE		CONTENT/CTN (pcs)	WEIGHT/PC (gr)		DIMENSION (mm)	
INCH	METRIC		GALV	BLACK	A	Z
3/8 X 1/4"	10 X 8	480	-	-	35	25
1/2 X 1/4"	15 X 18	300	64	62	43	30
1/2 X 3/8"	15 X 10	300	71	70	43	30
3/4 X 1/2"	20 X 15	200	96	96	48	33
1 X 1/2"	25 X 15	120	147	143	55	38
1 X 3/4"	25 X 20	120	147	140	55	38
1 ¼X 3/4"	32 X 20	70	223	219	60	41
1 ¼ X 1"	32 X 25	70	216	210	60	41
1 ½X 1"	40 X 25	50	283	279	63	44
1 ½ X 1 ¼"	40 X 32	50	292	285	63	44
2 X 1 ¼"	50 X 32	40	456	432	70	46
2 X 1 ½"	50 X 40	40	460	444	70	46

Fig No. 270 - SOCKETS PARALEL THREAD WITH RIBS BEADED (BS)

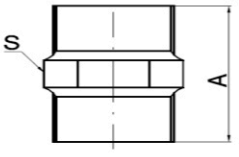




SIZE		CONTENT/CTN (pcs)	WEIGHT/PC (gr)		DIMENSION (mm)	
INCH	METRIC		GALV	BLACK	A	Z1
1/4"	8	480	38	35	27	7
3/8"	10	400	48	46	30	10
1/2"	15	240	77	72	36	10
3/4"	20	160	111	110	39	9
1"	25	100	166	160	45	11
1 1/4"	32	64	249	252	50	12
1 1/2"	40	36	330	320	55	17
2"	50	24	546	523	65	17
2 1/2"	65	16	820	810	74	20
3"	80	12	1138	1080	80	20
4"	100	6	2205	2150	94	22

Fig No.280 - NIPPLES (N)

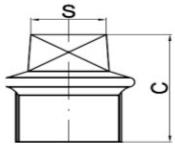




SIZE		CONTENT/CTN (pcs)	WEIGHT/PC (gr)		DIMENSION (mm)	
INCH	METRIC		GALV	BLACK	A	S
1/4"	8	600	31	30	36	19
3/8"	10	400	45	44	38	22
1/2"	15	280	77	75	44	27
3/4"	20	180	102	99	47	32
1"	25	120	150	147	53	38
1 ¼"	32	80	200	192	57	46
1 ½"	40	50	283	277	59	54
2"	50	36	438	415	68	64
2 ½"	65	20	681	673	75	80
3"	80	12	893	871	83	96
4"	100	6	1646	1605	95	122

Fig No. 290 - PLUGS BEADED (P)

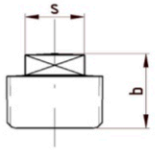




SIZE		CONTENT/CTN (pcs)	WEIGHT/PC (gr)		DIMENSION (mm)	
INCH	METRIC		GALV	BLACK	C	S
1/4"	8	800	18	17	22	9
3/8"	10	600	28	27	24	10
1/2"	15	360	41	40	26	12
3/4"	20	200	71	64	32	17
1"	25	120	109	106	36	20
1 ¼"	32	80	156	153	39	22
1 ½"	40	70	192	183	41	22
2"	50	40	342	339	48	27
2 ½"	65	32	541	530	54	32
3"	80	20	750	732	60	36
4"	100	12	1460	1400	70	41

Fig No. 291 - PLUGS PLAIN (P)

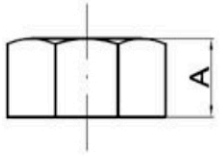




SIZE		CONTENT/CTN (pcs)	WEIGHT/PC (gr)		DIMENSION (mm)	
INCH	METRIC		GALV	BLACK	B	S
1/4"	8	800	18	17	14	9
3/8"	10	600	28	27	15	10
1/2"	15	360	41	40	18	12
3/4"	20	200	71	64	20	17
1"	25	120	109	106	23	20
1 ¼"	32	80	156	153	29	22
1 ½"	40	70	192	183	30	22
2"	50	40	342	339	36	27
2 ½"	65	32	541	530	39	32
3"	80	20	750	732	44	36
4"	100	12	1460	1400	58	41

Fig No.300 - HEXAGON CAPS BEADED (BC)

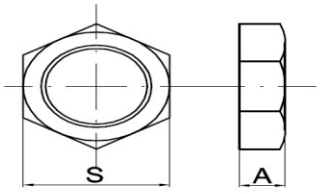




SIZE		CONTENT/CTN (pcs)	WEIGHT/PC (gr)		DIMENSION (mm)
INCH	METRIC		GALV	BLACK	A
1/4"	8	800	18	17	15
3/8"	10	720	28	27	17
1/2"	15	400	41	40	19
3/4"	20	200	71	64	22
1"	25	160	109	106	24
1 ¼"	32	120	156	153	27
1 ½"	40	80	192	183	27
2"	50	60	342	339	32
2 ½"	65	30	541	530	35
3"	80	20	750	732	38
4"	100	12	1460	1400	45

Fig No.310 - BACKNUTS (BN)

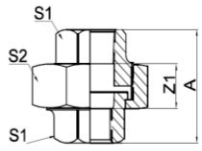




SIZE		CONTENT/CTN (pcs)	WEIGHT/PC (gr)		DIMENSION (mm)	
INCH	METRIC		GALV	BLACK	A (min)	S
1/2"	15	600	34	33	8	62
3/4"	20	360	40	36	9	38
1"	25	240	67	65	10	45
1 ¼"	32	180	97	95	11	54
1 ½"	40	140	140	137	12	63
2"	50	80	210	205	13	78
2 ½"	65	40	489	477	16	101
3"	80	40	722	704	19	116

Fig No. 330 - UNION FEMALE FLAT SEAT IRON TO IRON SEAT WITH GASKET (FU 330)

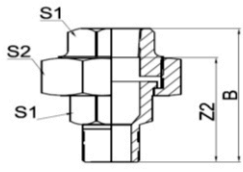




SIZE		CONTENT/CTN (pcs)	WEIGHT/PC (gr)		DIMENSION (mm)			
INCH	METRIC		GALV	BLACK	A	Z1	S1	S2
1/2"	15	100	226	220	48	22	27.0	45.5
3/4"	20	60	270	263	52	22	32.0	50.0
1"	25	40	340	332	58	24	38.5	55.0
1 ¼"	32	30	550	536	65	27	47.5	69.0
1 ½"	40	20	780	761	70	32	54.0	75.5
2"	50	12	1150	1121	78	30	67.5	92.0
2 ½"	65	8	1760	1716	85	31	84.0	111.5
3"	80	8	2400	2340	95	36	97.0	127.0

Fig No.331 - UNION M&F FLAT SEAT IRON TO IRON SEAT (FU 331)

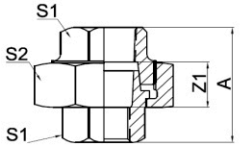




SIZE		CONTENT/CTN (pcs)	WEIGHT/PC (gr)		DIMENSION (mm)			
INCH	METRIC		GALV	BLACK	B	Z2	S1	S2
1/2"	15	80	250	244	66	53	55.0	76.0
3/4"	20	60	320	312	72	57	32.0	50.0
1"	25	40	430	419	80	63	38.5	55.0
1 ¼"	32	30	660	644	90	71	47.5	69.0
1 ½"	40	20	880	858	95	76	54.0	75.5
2"	50	12	1380	1346	106	82	67.5	92.0
2 1/2"	65	8	2050	1999	118	-	-	-
3"	80	8	2600	2535	130	-	-	-

Fig No. 340 - UNIONS FEMALE CONICAL JOINT IRON TO IRON SEAT (CU 340)

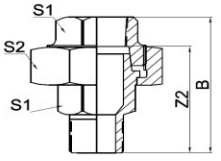




SIZE		CONTENT/CTN (pcs)	WEIGHT/PC (gr)		DIMENSION (mm)			
INCH	METRIC		GALV	BLACK	A	Z1	S1	S2
1/4"	8	240	102	99	42	22	18.0	32.0
3/8"	10	140	138	136	45	25	21.1	37.5
1/2"	15	80	237	230	48	22	27.0	45.5
3/4"	20	60	282	280	52	22	32.0	50.0
1"	25	40	380	366	58	24	38.0	55.0
1 ¼"	32	30	598	585	65	27	47.5	69.0
1 ½"	40	20	805	790	70	32	54.0	75.5
2"	50	12	1210	1184	78	30	67.5	92.0
2 ½"	65	8	1783	1765	85	31	84.0	111.5

Fig No.341 - UNION M&F CONICAL JOINT IRON TO IRON SEAT (CU 341)

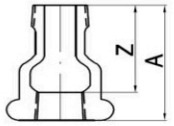




SIZE		CONTENT/CTN (pcs)	WEIGHT/PC (gr)		DIMENSION (mm)			
INCH	METRIC		GALV	BLACK	B	Z2	S1	S2
1/4"	8	240	103	100	55	45	18.0	32.0
3/8"	10	140	150	150	58	48	21.0	37.5
1/2"	15	80	261	250	66	53	27.0	45.5
3/4"	20	60	320	312	72	57	32.0	50.0
1"	25	40	428	417	80	63	38.5	55.0
1 1/4"	32	30	690	670	90	71	47.5	69.0
1 1/2"	40	20	907	890	95	76	54.0	75.5
2"	50	12	1392	1356	106	82	67.5	92.0
2 1/2"	65	6	2040	1975	118	91	84.0	111.5
3"	80	6	2630	2615	130	100	97.0	127.0

Fig No. 529A - EXTENSION PIECES (B EXT)

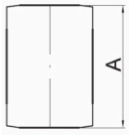




SIZE		CONTENT/CTN (pcs)	WEIGHT/PC (gr)		DIMENSION (mm)	
INCH	METRIC		GALV	BLACK	A	Z
3/8"	10	480	40	39	35	25
1/2"	15	280	63	60	43	30
3/4"	20	160	109	109	48	33
1"	25	100	155	151	55	38
1 ¼"	32	60	230	224	60	41
1 1/2"	40	40	300	293	62	42
2"	50	30	499	487	69	47

Fig No.531 - NIPPLE PLAIN (N PLAIN)





SIZE		CONTENT/CTN (pcs)	WEIGHT/PC (gr)		DIMENSION (mm)
INCH	METRIC		GALV	BLACK	A
1/2"	15	300	32	32	25
3/4"	20	200	52	52	36
1"	25	150	84	83	36
1 1/4"	32	100	133	132	39
1 1/2"	40	50	180	176	40
2"	50	35	340	340	43
2 1/2"	65	16	394	394	56
3"	80	12	552	552	69

NOTE :



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