

tupyfittings.com

TECHNICAL Catalog

TUPY.
YOUR
RELIABLE
BRAND



FITTINGS

- ▼ BSP
- ▼ NPT Medium Pressure Class 150
- ▼ N PT High Pressure Class 300
- ▼ TUPYPRE



Your reliable brand





Your reliable brand

TUPY is Latin America's premier cast iron foundry and a leader in the production of engine blocks and headers. Tupy serves customers in more than 40 countries within the market global, as well as across sales structures, customer service centers, and logistics networks strategically located throughout North America and Europe.

TUPY Hydraulics, relies on more than 3,000 resellers located in over 600 different Brazilian cities and is the leader in malleable iron fittings and continuous cast iron within the domestic market, offering high quality and reliable products.



TUPY Fittings

Products that make life much easier for those looking for high-quality, easy-to-built, safer, and more resistant facilities that require less maintenance.





ENVIRONMENTAL MANAGEMENT

TUPY consistently monitors air quality, collects rainwater for industrial use, treats water for reuse, invests in projects aimed at reusing foundry sand and treats waste for the production of concrete items and road paving.

TUPY has held ISO 14001 certification since 2001.

SOCIAL RESPONSIBILITY

TUPY invests in initiatives and projects that are focused on education, culture, sport and the environment, both among its employees and the communities in which it operates.



CLIENT SERVICES

TUPY supports the application of its products by making specialized engineers available who, in addition to offering technical guidance, lead workshops and courses, answer questions, and assist with purchasing processes.

MARKETING SUPPORT

TUPY supports its resellers, developing trade initiatives using specialized materials to assist customers, from purchase up to the installation of products at resellers' establishments.

TUPY CERTIFICATIONS AND WARRANTY *

All TUPY fittings are manufactured in accordance with specifications established under national and international technical standards, and are protected by a 5-year warranty, as well as industry's most important certifications. Imported parts are tested and approved on two separate occasions in national and international laboratories before receiving the TUPY brand name.

TUPY has signed a committed with the multinational company EuReciclo ('I Recycle'), which focuses on the circular economy. The company assists TUPY in performing reverse logistics on its packaging through means of a post-consumer technology platform. The equivalent of non-recycled packaging is recycled through packaging of the same weight and material.

*A list of Tupy's certifications and warranties can be found at the end of the catalog (p. 76)



A BRAND BUILT ON TRUST **TUPY QUALITY.**

TUPY technology is comparable to that used within the world's largest industries and our approach to innovation has made us a company that is truly ahead of its time. TUPY products have received the industry's most important certifications and are exported to more than 40 countries. Tupy fittings are highly ductile and durable and highly resistant to temperature changes and corrosion. We offer the ideal part for a wide range of applications.

TUPY FITTINGS

TECHNICAL DATA

MALLEABLE IRON

DEFINITION

Malleable Cast Iron's microstructure, in its raw casting state, contains carbon in a completely combined form, that after the heat treatment applied during malleabilization forms graphite during annealing processes (compact), ferrite, perlite or develops a quenching and tempering microstructure without the significant presence of eutectic carbides.

APPLICATIONS

Malleable iron is used in practically all industrial contexts. The use of malleable iron is essential to the manufacturing of parts of complex shapes used in a range of applications, offering a consistent performance throughout the service life of the machines or equipment in which it is used. With proven noble properties, malleable iron is used in parts in the automotive, electrical/technical, and railway industries, etc., in which they are subjected to extremely severe conditions of use. TUPY is one of the world's largest suppliers of malleable iron parts and uses the same materials to manufacture its line of fittings.

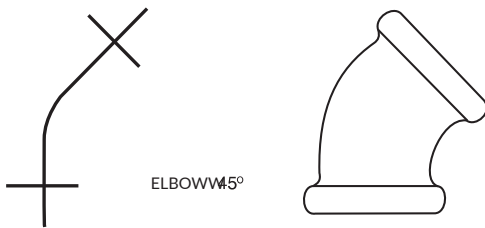
PROPERTIES

The main properties of the materials used in TUPY fitting are specified by the Brazilian Technical Standards Association (ABNT), from among which the following may be highlighted:

- Mechanical Strength
- Corrosion Resistance
- Wear Resistance

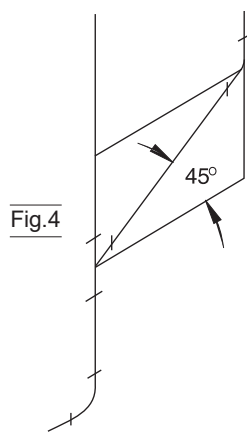
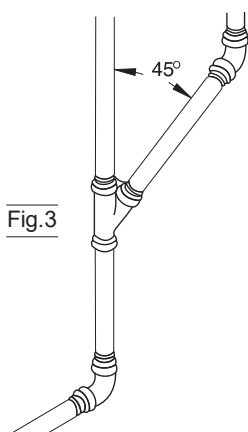
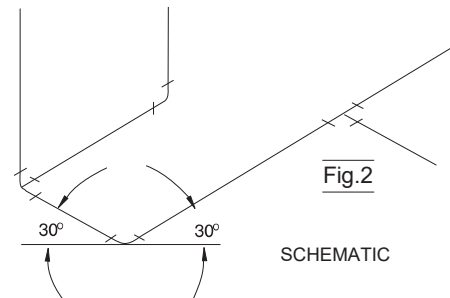
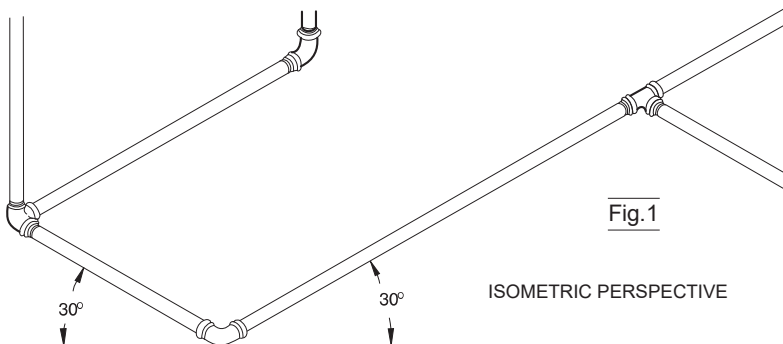


SCHEMATIC LAYOUTS AND SYMBOLS



To facilitate and offer a quick representation and reading of hydraulic systems, symbols are used to represent fittings' various components.

The isometric perspective is a means of representing piping that allows the necessary parts, pipe dimensions, and the quantities of materials needed to be determined in advance. In isometric drawings, vertical pipes are represented by vertical lines, and horizontal pipes are represented by lines drawn at a 30° incline over a horizontal plane, as shown in figures 1 and 2.



Pipes that extend beyond the horizontal or vertical plane are represented by lines at an incline other than 30°, and the pipe's actual angle of incline must be marked on the drawing (Figures 3 and 4).

It is not possible to represent and locate all the fittings and splices (threads, welds, flanges, etc.) in piping in isometric drawings. Pre-assembly is an installation technique that allows pipes to be cut and threaded and fitting and other accessories to be identified. It is recommended that a circuit's parts be assembled in the shop, where there are more resources available before being brought to the installation site. This process is facilitated by preparing an isometric plan.

GRAPHIC SYMBOLS

HYDRAULIC DIAGRAMS

DENOMINATION	SYMBOL	STANDARD
Reducing Bush		ANSI
Plain Plug		ANSI
Elbow		ANSI
Elbow (facing down)		ANSI
Elbow (facing up)		ANSI
Reducing elbow (the numbers indicate the gauges)		ANSI
45° elbow		ANSI
Elbow		ANSI
Side outlet elbow (downward outlet)		ANSI
Side outlet elbow (top outlet)		ANSI
Cross		ANSI
Reducing cross (the numbers indicate the gauges)		ANSI
Long sweep bend		ANSI
Long sweep bend		RECOM. TUPY
Long sweep bend		RECOM. TUPY
45° Long sweep bend		RECOM. TUPY
Crossover		ANSI
Return bend		RECOM. TUPY
Socket		RECOM. TUPY
Reducing socket		ANSI
Eccentric Reducing Sleeve		ANSI
Hexagon Nipple		RECOM. TUPY
Cap, Round		ANSI
Tee		ANSI

DENOMINATION	SYMBOL	STANDARD
Tee (with downward outlet)		ANSI
Tee (with outlet at top)		ANSI
45° tee		RECOM. TUPY
Reducing Tee (the numbers indicate the gauge)		ANSI
Twin Elbow		ANSI
Union flat Seat		DIN
Union Iron Seat		RECOM. TUPY
Union brass Seat		RECOM. TUPY
Union Iron Seat		RECOM. TUPY
Expansion joint		ANSI
Pipe fitting		ANSI
Anglevalve		DIN
Angle valve with float		DIN
Angle check valve		ANSI
Angle Gate Valve (lifting)		ANSI
Angle Gate Valve (plant)		ANSI
Globe Angle Valve (lifting)		ANSI
Globe Angle Valve (plant)		ANSI
Angle Valve for Hose Connection		ANSI
Gate valve		ANSI
Check Gate Valve		DIN
Gate valve for hose connection		ANSI
Globe valve		ANSI
Motor-operated Globe Valve		ANSI

GRAPHIC SYMBOLS

HYDRAULIC DIAGRAMS

DENOMINATION	SYMBOL	STANDARD
Hose Fitting Globe Valve		ANSI
Safety Valve		ANSI
Safety Valve w/ Diaph. and Load w/ Spring		DIN
Safety Valve with Counterweight		DIN
Check Valve		ANSI
Foot Check Valve		DIN
Straight Check Valve		ANSI
Diaphragm Valve		ANSI
Control Valve w/ Pressure Open.		ANSI
Control Valve w/ Pressure Clos.		ANSI
Gate Valve		DIN
Foot Gate Valve		DIN
Motor Operated Gate Valve		ANSI
Motor Operated Valve		ANSI
Hydraulic Valve		ANSI
Electric Valve		ANSI
Pneumatic Valve		ANSI
Solenoid Operated Valve		ANSI
Float Valve		DIN
Float Operated Valve		ANSI
Needle Valve		ISA
Relief or Safety Valve		ISA
Plunger Operated Valve		ISA
ISA 3-way valve		ISA

DENOMINATION	SYMBOL	STANDARD
Auxiliary valve		ANSI
Auxiliary Pressure Valve		ANSI
Block valve		ANSI
Control Valve		ANSI
Discharge valve		DIN
Instant Opening Valve		ANSI
Valve with Male		ANSI
Changeover valve		DIN
Normally Closed Valve		ISA
Test and Discharge Valve		DIN
Pressure Reducing Valve		DIN
Quick-closing valve		ANSI
Drain valve with hose connection		DIN
Chain Operated Handwheel Valve		ISA
Y" or Line Filter		DIN
Torneira		DIN
Tap		DIN
3-way tap		DIN
Male register		ANSI
Gas meter		DIN
Hydrometer		DIN

GRAPHIC SYMBOLS

HYDRAULIC DIAGRAMS

DENOMINATION	SYMBOL	STANDARD
Filter		DIN
Drain		ANSI
Ejector		ISA
Siphon		ANSI
Discharge funnel (exhaust)		DIN
Passage with inspection porthole		DIN
Watering hose		DIN
Condensing Water Collector		DIN
Condensing water pipe		DIN
Pressure vessel (boiler)		DIN
Open reservoir		DIN
Fixed Point		DIN
PneumaticFlowDirection		ANSI
Hydraulic Flow Direction		ANSI
Lines in Transposition		ANSI
Joining line		ANSI
Flexible Line		ANSI

DENOMINATION	SYMBOL	STANDARD
Piping		DIN
Underground piping		DIN
Insulated piping		DIN
Hydrant		DIN
Underground Hydrant Over the Pipe		DIN
Underground Fire Hydrant		DIN
Underground Hydrant Next to the Pipe		DIN
Hydrant Above Ground On Pipe		DIN
Hydrant Above Ground Leaning on Pipe		DIN
Aboveground hydrant next to the pipe		DIN
Garden Hydrant Over the Pipe		DIN
Garden Hydrant Leaning on Pipe		DIN
Garden Hydrant Next to the Pipe		DIN
Pressure gauge		DIN
Thermometer		DIN
Counterweight		DIN
Buoy		DIN

GRAPHIC SYMBOLS

HYDRAULIC DIAGRAMS

DENOMINATION	SYMBOL	STANDARD
Hose Fitting		ISA
Fountain		DIN
Start of Process or System		ISA
End of Process or System		ISA
Liquid Flow Rate		ISA
Gas Flow Rate		ISA
Temperature		ISA
Pressure		ISA
Steam Traps		ISA
Trap		ISA
Earthing		DIN
Hydraulic Injector		DIN

DENOMINATION	SYMBOL	STANDARD
Vent		DIN
Discharge with Hatch		DIN
Filter Box		DIN
Sand Trap		DIN
Sieve		ISA
Exhaust		DIN
Gas-Discharge Lamp		DIN
Centrifugal Pump		ISA
Reciprocating Pump		ISA
Compressor		ISA
Furnace		ISA

SPECIAL CONVENTIONS

DENOMINATION	REPRESENTATION
Piping used to vary levels	
Piping used to vary levels	
Downwards Vertical Junction	
Upwards Vertical Junction	
Upwards Horizontal Junction	

DENOMINATION	REPRESENTATION
Horizontal Junction with Downward Flow	
Vertical Pipe with Upward Flow	
Vertical Pipe with Downward Flow	
Anchor	

EQUIVALENT DROP IN PRESSURE

TUPYBSP FITTINGS IN METERS OF STEEL PIPE

NOMINAL PIPE SIZE	¼	⅝	½	¾	1	1¼	1½	2	2½	3	4	5	6
	0.23	0.35	0.47	0.70	0.94	1.17	1.41	1.88	2.35	2.82	3.76	4.70	5.64
	0.22	0.33	0.44	0.67	0.89	1.11	1.33	1.78	2.23	2.68			
		0.16	0.22	0.32	0.43	0.54	0.65	0.86	1.08	1.30	1.73	2.16	2.59
		0.61	0.81	1.22	1.63	2.03	2.44	3.25					
			0.27	0.41	0.55	0.68	0.82	1.04	1.37	1.64	2.18		
	0.16	0.24	0.32	0.48	0.64	0.79	0.95	1.27	1.59	1.91	2.54		
		0.25	0.34	0.50	0.67	0.84	1.01	1.35	1.68	2.02	2.69		4.04
	0.10	0.15	0.20	0.30	0.41	0.51	0.61	0.81	1.02	1.22			
			0.43	0.65	0.86	1.08	1.30	1.73					
	0.04	0.06	0.08	0.12	0.17	0.21	0.25	0.33	0.41	0.50	0.66	0.83	0.99
	0.34	0.51	0.69	1.03	1.37	1.71	2.06	2.74	3.43	4.11	5.49	6.86	8.23
	0.42	0.62	0.83	1.25	1.66	2.08	2.50	3.33	4.16	4.99	6.65	8.32	9.98
			0.09	0.13	0.18	0.22	0.27	0.36	0.44	0.55	0.73		
			0.44	0.66	0.88	1.10	1.31	1.75	2.19	2.70	3.51		
	0.05	0.08	0.10	0.15	0.20	0.25	0.30	0.41	0.49	0.59			
	0.34	0.50	0.67	1.01	1.35	1.68	2.02	2.69	3.36	4.02			
			0.28										
			0.30										
	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.03
	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01		

NOMINAL PIPE SIZE	½ . ½	½ 1	½ 1½	¾ ¾	¾ 1	¾ 1½	1 1½
	1.17	0.96	0.93	1.06	1.03	1.23	1.57

Values based on tests carried out by the Department of Hydraulics and Sanitation at São Carlos School of Engineering (SP).

Note: valid only when conducting water at room temperature.

EQUIVALENT DROP IN PRESSURE

TUPYBSP FITTINGS IN METERS OF STEEL PIPE

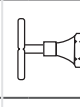
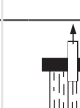
NOMINAL PIPE SIZE	$\frac{3}{8} \times \frac{1}{4}$ 2x $\frac{1}{2}$	$\frac{1}{2} \times \frac{1}{4}$ 2x $\frac{3}{4}$	$\frac{1}{2} \times \frac{3}{8}$ 2x1	$\frac{3}{4} \times \frac{1}{4}$ 2x1 $\frac{1}{4}$	$\frac{3}{4} \times \frac{3}{8}$ 2x1 $\frac{1}{2}$	$\frac{3}{4} \times \frac{1}{2}$ 2 $\frac{1}{2}$ x1	1x $\frac{3}{8}$ 2 $\frac{1}{2}$ x1 $\frac{1}{4}$	1x $\frac{1}{2}$ 2 $\frac{1}{2}$ x1 $\frac{1}{2}$	1x $\frac{3}{4}$ 2 $\frac{1}{2}$ x2	1 $\frac{1}{4}$ x $\frac{1}{2}$ 3x1	1 $\frac{1}{2}$ x $\frac{3}{4}$ 3x1 $\frac{1}{4}$	1 $\frac{1}{4}$ x1 3x1 $\frac{1}{2}$	1 $\frac{1}{2}$ x $\frac{1}{2}$ 3x2	1 $\frac{1}{2}$ x $\frac{3}{4}$ 3x2 $\frac{1}{2}$	1 $\frac{1}{2}$ x1 4x2	1 $\frac{1}{2}$ x1 $\frac{1}{4}$ 4x3
	0.05	0.06	0.07		0.09	0.10		0.11	0.14	0.13	0.14	0.17		0.15	0.17	0.21
			0.20	0.23	0.28		0.25	0.29	0.35			0.30	0.34	0.42	0.46	0.56
	0.31	0.30	0.49		0.49	0.59	0.44	0.68	0.95	0.40	0.56	0.71	0.31	0.53	0.79	1.22
	0.19	0.31	0.46	0.78	1.00	0.42	0.71	1.02	1.98	0.34	0.62	0.84	1.29	2.16		
	0.10	0.16	0.14	0.22	0.23	0.24		0.24	0.24	0.24	0.22	0.19	0.29	0.26	0.24	0.20
	0.34		0.36	0.40	0.43	0.28	0.33	0.36	0.39		0.65	0.69	0.75			
	0.24		0.45		0.45	0.59		0.49	0.84		0.50	0.55		0.65	0.73	0.86
					0.85				1.63							
	0.32	0.20	0.21		0.20	0.27		0.23	0.19		0.32	0.34			0.36	0.29
	0.11	0.18	0.18		0.26	0.32	0.30	0.32	0.29	0.33	0.43	0.16		0.53	0.27	0.12
			0.30	0.35	0.38		0.44	0.48	0.64			0.71	0.70	0.71		
	0.26	0.24	0.30		0.24	0.44		0.41	0.41	0.28	0.34	0.41		0.37	0.34	0.27
			0.52	0.60	0.64		0.51	0.65	0.89			0.64	0.77	0.86		

Values based on tests carried out by the Department of Hydraulics and Sanitation at São Carlos School of Engineering (SP). Note: valid only when conducting water at room temperature.

EQUIVALENT DROP

in galvanized steel pipes

1/2		3/4		1		1 1/4		1 1/2		2		2 1/2		3		4		5		6		liter/h	l gal./min.
SPEED	DROP	SPEED	DROP	SPEED	DROP	SPEED	DROP	SPEED	DROP	SPEED	DROP	SPEED	DROP	SPEED	DROP	SPEED	DROP	SPEED	DROP	SPEED	DROP		
0.321	2.10																					227	1
0.641	7.40	0.366	1.90																			454	2
0.964	15.80	0.549	4.10	0.342	1.26																	681	3
1.248	27.00	0.735	7.00	0.454	2.14	0.262	0.57	0.192	0.26													908	4
1.604	41.00	0.918	10.50	0.567	3.25	0.326	0.84	0.241	0.40													1135	5
3.209	147.00	1.836	38.00	1.134	11.70	0.653	3.05	0.479	1.43	0.311	0.50	0.198	0.17	0.137	0.07							2270	10
		2.751	80.00	1.708	25.00	0.976	6.50	0.720	3.00	0.467	1.08	0.299	0.36	0.207	0.15							3405	15
		3.669	136.00	2.269	42.00	1.308	11.10	0.961	5.20	0.622	1.82	0.399	0.61	0.277	0.25							4540	20
				2.837	64.00	1.635	16.60	1.202	7.80	0.778	2.73	0.497	0.92	0.344	0.38							5675	25
				3.400	89.00	1.961	23.50	1.440	11.00	0.933	3.84	0.598	1.29	0.414	0.54							6810	30
				3.971	119.00	2.290	31.20	1.681	14.70	1.089	5.10	0.698	1.72	0.485	0.71							7945	35
				4.538	152.00	2.617	40.00	1.922	18.80	1.244	6.60	0.796	2.20	0.555	0.91							9080	40
				0.22		2.943	50.00	2.159	23.20	1.403	8.20	0.896	2.80	0.625	1.15	0.311						10215	45
						3.269	60.00	2.400	28.40	1.560	9.90	0.997	3.32	0.692	1.38	0.357	0.28					11350	50
						4.578	113.00	3.361	53.00	2.181	18.40	1.396	6.21	0.970	2.57	0.546	0.63	0.347	0.21			15890	70
								3.560	60.00	2.336	20.90	1.527	7.10	1.036	3.05	0.585	0.73	0.372	0.24			17025	75
								4.800	102.00	3.114	35.80	1.994	12.00	1.384	4.96	0.777	1.22	0.497	0.41	0.347	0.14	22700	100
								5.761	143.00	3.736	50.00	2.390	16.80	1.661	7.00	0.933	1.71	0.597	0.58	0.433	0.25	27240	120
										3.889	54.00	2.487	18.20	1.728	7.60	0.972	1.86	0.622	0.64	0.451	0.28	28375	125
										4.673	76.00	2.988	25.50	2.073	10.50	1.170	2.55	0.740	0.88	0.521	0.32	34050	150
										5.444	102.00	3.445	38.80	2.420	14.00	1.356	3.44	0.872	1.18	0.610	0.48	39725	175
										6.222	129.00	3.985	43.10	2.768	17.80	1.558	4.40	0.997	1.48	0.695	0.62	45400	200
												4.485	54.30	3.109	22.30	1.759	5.45	1.119	1.86	0.783	0.74	51075	225
												4.469	66.00	3.451	27.20	1.951	6.72	1.244	2.24	0.853	0.92	56750	250
														3.735	31.30	2.103	7.70	1.347	2.60	0.924	1.13	61290	270
														3.811	32.50	2.143	7.99	1.372	2.72	0.933	1.15	62425	275
														4.153	38.00	2.335	9.30	1.494	3.14	1.036	1.29	68100	300
																2.713	2.32	1.743	4.19	1.213	1.75	79450	350
																3.112	16.00	1.993	5.40	1.384	2.21	90800	400
																3.505	19.80	2.240	6.70	1.561	2.65	102150	450
																3.688	22.40	2.347	7.22	1.673	2.90	106690	470
																3.719	22.96	2.365	7.42	1.692	2.95	107825	475
																3.892	24.00	2.490	8.12	1.707	3.30	113500	500
																		2.740	9.60	1.878	3.93	124850	550
																		2.987	11.30	2.048	4.70	136200	600
1/2	0.4	0.2	0.4	0.4	0.1	4.9	0.1	2.6	3.6	1.1	1.1	1.6						3.237	13.20	2.219	5.40	147550	650
3/4	0.5	0.2	0.5	0.1	6.7	6.7	0.1	3.6	5.6	1.6	1.6	2.4						3.489	15.10	2.390	6.20	158900	700
1	0.7	0.3	0.7	0.2	8.2	8.2	0.2	4.6	7.3	2.1	2.1	3.2						3.737	17.20	2.591	7.00	170250	750
1 1/4	0.9	0.4	0.9	0.2	11.3	11.3	0.2	5.6	10.0	2.7	2.7	4.0											800
1 1/2	1.0	0.5	1.0	0.3	13.4	13.4	0.3	6.7	11.6	3.2	3.2	4.8											800
2	1.5	0.7	1.5	0.4	17.4	17.4	0.4	8.5	14.0	4.2	4.2	6.4											850
2 1/2	1.9	0.9	1.9	0.4	21.0	21.0	0.4	10.0	17.0	5.2	5.2	8.1											900
3	2.2	1.1	2.2	0.5	26.0	26.0	0.5	13.0	20.0	6.3	6.3	9.7											950
4	3.2	1.6	3.2	0.7	34.0	34.0	0.7	17.0	23.0	8.4	8.4	12.9											1000
5	4.0	2.0	4.0	0.9	43.0	43.0	0.9	21.0	30.0	10.4	10.4	16.1											1050
6	5.0	2.5	5.0	1.1	51.0	51.0	1.1	26.0	39.0	12.5	12.5	19.3											1100
																							1150

Nominal Pipe Size	Pipe Outlet	Standard Inlet	Inlet Edge	Gate Valves	Open Globe Valves	Open Angle Valves	Foot Valves and Open Strainer	Check Valve	
								Horizontal 	Vertical 

EQUIVALENT LENGTHS IN NOZZLES AND VALVES IN METERS

Nominal Pipe Size	Pipe Outlet	Standard Inlet	Inlet Edge	Gate Valves	Open Globe Valves	Open Angle Valves	Foot Valves and Open Strainer	Check Valve	
								Horizontal	Vertical
1/2	0.4	0.2	0.4	0.1	4.9	2.6	3.6	1.1	1.6
3/4	0.5	0.2	0.5	0.1	6.7	3.6	5.6	1.6	2.4
1	0.7	0.3	0.7	0.2	8.2	4.6	7.3	2.1	3.2
1 1/4	0.9	0.4	0.9	0.2	11.3	6.7	10.0	2.7	4.0
1 1/2	1.0	0.5	1.0	0.3	13.4	6.7	11.6	3.2	4.8
2	1.5	0.7	1.5	0.4	17.4	8.5	14.0	4.2	6.4
2 1/2	1.9	0.9	1.9	0.4	21.0	10.0	17.0	5.2	8.1
3	2.2	1.1	2.2	0.5	26.0	13.0	20.0	6.3	9.7
4	3.2	1.6	3.2	0.7	34.0	17.0	23.0	8.4	12.9
5	4.0	2.0	4.0	0.9	43.0	21.0	30.0	10.4	16.1
6	5.0	2.5	5.0	1.1	51.0	26.0	39.0	12.5	19.3

EQUIVALENCE

BETWEEN NOMINAL PIPE SIZES

IMPERIAL (IN.)	¼	⅜	½	¾	1	1¼	1½	2	2½	3	4	5	6
METRIC SYSTEM (mm)	8	10	15	20	25	32	40	50	65	80	100	125	150

CONVERSIONS

TO CONVERT FROM	TO	MULTIPLY BY
kgf/cm ²	lbf/in. ²	14.223197
kgf/cm ²	bar	0.980665
kgf/cm ²	MPa	0.0980665
kgf/cm ²	atm	0.967842
kgf/cm ²	mH2O	10.0
kgf/cm ²	N/mm ²	0.0980665
lbf/in. ²	kgf/cm ²	0.07030768
lbf/in. ²	bar	0.06894414
lbf/in. ²	MPa	0.00689441
lbf/in. ²	atm	0.0680492
lbf/in. ²	mH2O	0.7030768
lbf/in. ²	N/mm ²	0.00689441
bar	kgf/cm ²	1.0197162
bar	lbf/in. ²	14.5044963
bar	MPa	0.1
bar	atm	0.9869304
bar	mH2O	10.197162
bar	N/mm ²	0.1
MPa	kgf/cm ²	10.197162
MPa	lbf/in. ²	145.044963
MPa	bar	10.0
MPa	atm	9.869304
MPa	mH2O	101.97162
MPa	N/mm ²	1.0

TO CONVERT FROM	TO	MULTIPLY BY
atm	kgf/cm ²	1.033226
atm	lbf/in. ²	14.695257
atm	bar	1.0132427
atm	MPa	0.10132427
atm	mH2O	10.33226
atm	mmHg	760.0
atm	N/mm ²	0.10132427
mH2O	kgf/cm ²	0.1
mH2O	lbf/in. ²	1.4223197
mH2O	bar	0.0980665
mH2O	MPa	0.00980665
mH2O	atm N/	0.0967842
mH2O	mm ²	0.00980665
mmHg	atm	0.00131579
N/mm ²	kgf/cm ²	10.197162
N/mm ²	lbf/in. ²	145.044963
N/mm ²	bar	10.0
N/mm ²	MPa	1.0
N/mm ²	atm	9.869304
N/mm ²	mH2O	101.97162

Note: values provided are an estimate only

mH2O. = meter of water column

atm = Atmosphere

Mpa= Mega Pascal

N/mm² = Newtons per square millimeter

lbf/in.² = psi = pound force per square inch

mmHg = millimeter of mercury (torr)

kgf/cm² = kilogram force per square centimeter



TUPY BSP

FITTINGS

Technical Catalog
BSP Fittings



Your reliable brand

FITTINGS

BSP

APPLICATION AND REGULATORY REFERENCES

TUPYBSP fittings are produced according to ABNT NBR 6943, ISO 49 and EN 10242 standards for general use in transporting fluids such as hot and cold water, steam, liquid and gaseous fuels, hydraulic oils in general, compressed air, gases in general, etc., up to the pressure and temperature limits specified in the above-mentioned standards.

Fittings are provided for use in connections of threaded elements according to NBR NM-ISO 7-1, where a pressurized sealing gasket is formed through the thread at rated dimensions of 1/4" up to 6".

Note: In cases in which fittings are used outside specified pressure and temperature conditions, consult TUPY's Application Engineering for assistance.

MATERIAL

Materials used to produce fittings must be made from malleable cast iron in accordance with ABNT NBR 6590, ISO 5922 and EN 1562 standards, and may have a WHITE or BLACK core, according to Table 1.

Methods used in manufacturing of both malleable irons, in terms of chemical composition and heat treatment, must be left to the discretion of the manufacturer, who is responsible for ensuring compliance with the requirements mentioned in the previous standards.

TUPYBSP fittings are produced in JMB 350-10 class BLACKHEART malleable cast iron.

Table 1 - Malleable Cast Iron Standards

CORE	MATERIAL DESIGNATION	SPECIMEN DIAMETER "d" (MM)	MINIMUM LR SHEAR STRENGTH (MPA)	YIELD STRENGTH (0.2%) MINIMUM LE 0.2 (MPA)	ELONGATION AT 3.D MINIMUM A (%)	BRINELL HARDNESS (HB) GUIDELINES.
WHITEHEART	JMW 350-4	15	360	-	3	-
	JMW 400-5	15	420	230	4	220
	ASTM A 197	16	275	200	5	-
BLACKHEART	JMB 275-5	12 or 15	275	-	5	150
	JMB 300-6	12 or 15	300	-	6	150
	JMB 350-10	12 or 15	350	200	10	150

JMW - Whiteheart Malleable Iron - ISO/TR 15931:2004

JMB - Blackheart Malleable Iron - ISO/TR 15931:2004

Important note: according to ISO 5922, JMB 300-6 black malleable cast iron must not be used in applications in which pressure is more important than combined strength and ductility.

COATING OR FINISHING

TUPYBSP fittings are produced with a black finish (exclusive use of oil) and hot dip galvanized according to ABNT NBR 6323 and ISO 1461. Both types of fittings are protected using non-toxic oil.

Potability: malleable cast iron fittings can be used in the drinking water network since the substances applied adhere to the parameters contained in the Ministry of Health's Consolidation Ordinance No. 5, of 10/03/17.

Other special coatings, such as Epoxy, Cathaphoresis coating and Hybrid paint, Double Galvanization, etc., may be supplied on request.

PROJECT

All TUPYBSP fittings are projected in accordance with ABNT NBR 6943, ISO 49 and EN 1 242 standards. Part types are defined in the table on pages 24 and 25, and dimensions are described in pages 26 to 34.

For convenience during the manufacturing process, standards allow manufacturers to incorporate ribs at their own initiative. Ribs must not protrude beyond the height of the part's edge and may also be cylindrical, hexagonal, octagonal or decagonal.

Dimensions in flat faces for application with wrenches depend on fittings' designs at the manufacturer's discretion, also according to manufacturing standards.

Fittings must operate at the maximum working pressure and temperature shown in Tables 2 and 3.

Table 2 - Service Pressure in TUPYBSP Fittings.

TEMPERATURE °C	PRESSURE (BAR) *
Between -20 and +120	25
Between +120 and +300	interpolated values
>300	20

* 1 bar = 1.02 kgf /cm² or 14.5 PSI.

Table 3 - Calculation of Interpolation between Temperature X Pressure

FORMULA		EXAMPLE 1: CALCULATING KNOWN TEMPERATURE PRESSURE		EXAMPLE 2: CALCULATING KNOWN TEMPERATURE PRESSURE	
Known Magnitude	Calculated Quantity	Temperature (°C)	Pressure (bar)	Pressure (bar)	Temperature (°C)
A	X (?)	180	X (?)	22	X (?)
B	D	120	25	25	120
C	E	300	20	20	300
$X = D + (A-B) \cdot (E-D) / (C-B)$		Result (X):	23.33	Result (X):	228.00

It is important to remember that fittings' designs must provide a minimum factor of 4X the maximum working pressure, as shown below:

Table 4 - Maximum Project Pressures (Hydrostatic Test)

TYPE	DIAMETERS BETWEEN 1/4" AND 4"	5" AND 6" DIAMETERS
Other Fittings	100 bar	64 bar
Joints	37.5 bar	

THREAD

Sealing threads in TUPYBSP fittings are produced in accordance with the specifications contained in ABNT NBR NM ISO 7-1 standards. Coupling threads are produced according to ABNT NBR 8133 and ISO 228-1. Other types of threads can be produced on request.

TUPYBSP fittings are fitted with parallel internal (Rp) and conical external sealing threads (R).

Fitting sealing threads are controlled according to ISO 7-2, using No. 1 and No. 3 gages and usable thread length must be verified using a caliper or ISO 7-2 No. 2 and No. 4 gages. See the control method described on pages 45 and 46.

Fittings that use fastening threads are controlled in accordance with ISO 228-2, under the Go - No Go system. See the control method described on page 46.

QUALITY ASSURANCE SYSTEM *

TUPY fittings are therefore monitored and certified under ISO 9001 and ISO 14000 for quality systems; Inmetro Ordinance No. 160 (of May 9, 2007), via ABNT's certifying body for product manufacturing; and by UL - UNDERWRITERS LABORATORIES, FM Approvals LLC and DVGW - Deutsche Verein des Gas- und Wasserfaches, in accordance with the above-mentioned standards.

*A list of Tupy's certifications and warranties can be found at the end of the catalog (p. 76)

QUALITY TESTS

TUPY laboratories are capable of performing metallurgical, mechanical, chemical, dimensional and metrological testing according to the specifications contained in the above-mentioned standards.

TUPY's laboratory is accredited under ABNT NBR ISO/IEC 17025 - TESTS. The scope of the laboratory's work can be found at:

<http://www.inmetro.gov.br/laboratorios/rble/>. Accreditation number CRL 1543.



INSPECTIONS

Tupy's entire manufacturing process is monitored and subject to planning in order to guarantee the manufacturing of high-quality products.

This system is based on procedures contained in ISO 2859, ISO 3951, ABNT NBR 5426 and ABNT NBR 5429. Additionally, processes are analyzed through a statistical study of each process/equipment seeking to provide monitoring over time.

PRODUCT MARKINGS

According to product standards, parts must be marked with at a minimum the following information through the casting process while respecting the following hierarchy:

- a) manufacturer name or brand;
- b) fitting gauge;
- c) project symbol.

Note: fastening thread according to NBR 8133 and/or ISO 228.

Due to space limitations, one or both of the markings requested in items a., b., and c. above may be omitted in certain fittings. However, omitted markings are included on the product's packaging (label).

It is important to observe the following citations under ABNT NBR 6943:

"Note: The process of cleaning fittings through means of shot blasting and the type of surface coating used may reduce the visibility of markings, particularly in gauges less than or equal to 3/8" and reduction gauges less than 1/2".

"Manufacturers that present a single design model are exempt from including project symbol markings. Designs must be identified on the product packaging, purchase order, and product catalog".

It is important to note that the following design symbols must be included on fitting packaging informed as determined under existing standards:

Table 5 - Project Symbols

PROJECT SYMBOL	THREAD TYPE (ABNT NBR NM ISO 7-1)		DESIGNAÇÃO DO MATERIAL SÍMBOLO
	EXTERNAL	INTERNAL	
A	T	Tp	JMW 400-5 or JMB 350-10
B	T	Tp	JMW 350-4 or JMB 300-6

NOTE: T - conical thread Tp - parallel thread

BRANDS

Whenever dimensions allow, the TUPY® or ® brand and/or identification of the rated diameter are engraved in TUPYBSP fittings. UL Monogram (Underwriters Laboratories Inc.). FM Monogram - (FM APPROVALS LLC).

FITTING DESIGNATION

Fittings are given the following denominations:

- a) fitting type;
- b) title of reference standard (ABNT NBR 6943; ISO 7-1 or EN 10242);
- c) model (see table on pages 24 and 25);
- d) nominal pipe size - NPS (see pages 26 to 34);
- e) surface finish - unfinished (black surface) (FE symbol) or hot dip galvanized (ZN symbol) or designation for other finishes defined by the manufacturer;
- f) design symbol (see Table 5).

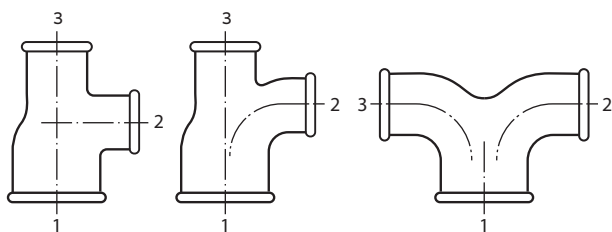
Sample designation:

1. Female elbow joint with two orifices of equal size, black finish, provided with design symbol A.
Elbow ABNT NBR 6943 - A1 - 2 - Fe - A.

2. Single-branch reducing tee joint with 1 1/4 passage with hot-dip galvanized finish, design symbol A.
Reducing tee ABNT NBR 6943 - B1 - 1 1/2 x 1 x 1 1/2 - Zn - A.

3. Single-branch reducing tee with 1 1/2 x 3/4 passage with hot-dip galvanized finish, design symbol A.
Reducing tee ABNT NBR 6943 - B1 - 1 1/2 x 1 x 3/4 - Zn - A.

Reduction gauge reading sequence:



FITTING DELIVERY CONDITIONS

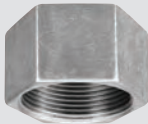
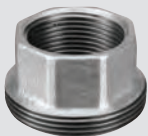
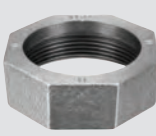
TUPY reserves the right to introduce any changes to its product lines it deems appropriate in accordance with ABNT NBR 6943, ISO 49 and EN 10242 standards.

Weights in this catalog are subject to change without notice.

For safety reasons, purchased fittings must comply with the above-mentioned standards and watertightness tests be carried out before final use in installed networks.

TYPE OF BSP LINE FITTING BY FIGURE AND STANDARD NUMBER

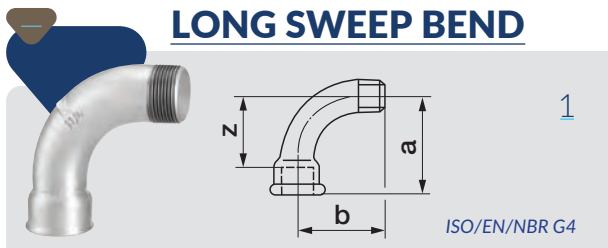
1 - G4	1a - D4	2- G1	2a - D1	3 - G8
40 - G4 45°	41 - G1 45°	60 - KB1	85 - KB2	90 - A1
90R - A1	92 - A4	96 - UA11	98 - UA12	120 - A1/45°
121 - A4/45°	130 - B1	130R - B1	130R - B1	132 - E2
138 - B1/H	165 - B1/45°	180 - C1	221 - Za1	240 - M2

241 - N4	245 - N8	246 - M4	250 - M5	250 ^a - M5
				
270 - M2	271 - M2 R-L	280 - N8	290 - T9	291 - T8
				
300 - T1	301 - T1	312 - P4	321 P4	330 - U1
				
391 - U2	340 - U11	341 - U12	342 - UC1	350 - F1
				
370 - CU1	371 - CU3	372 - CU2	374 - CU4	526 - M3
				
529a - M4				
				

NOTES

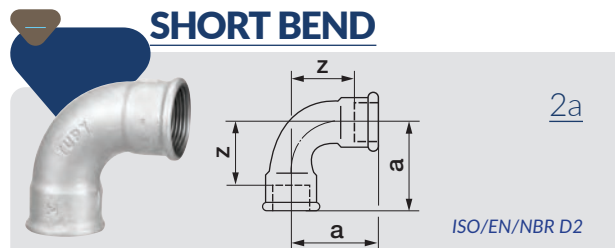
TUPY reserves the right to make any changes to its product lines as it deems appropriate. Weights (g) in this catalog are subject to change without notice. For safety reasons, purchased fittings must comply with the above-mentioned standards and watertightness tests be carried out before final use in installed networks. In cases in which fittings are used outside specified pressure and temperature conditions, consult TUPY's Application Engineering for assistance.

LONG SWEEP BEND



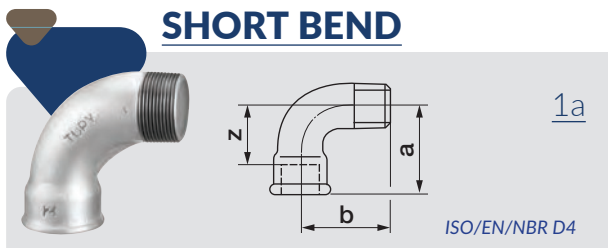
Nominal Pipe Size (NPS)		Code	Dimensions (mm)			Unit Weight (kg)	
Inch	mm		a	b	z	Galv.	Black
1/4	8	1224002	40	36	30	0.050	0.045
3/8	10	1224003	48	42	38	0.075	0.069
1/2	15	1224004	55	48	42	0.128	0.120
3/4	20	1224006	69	60	54	0.211	0.199
1	25	1224007	85	75	68	0.364	0.349
1 1/4	32	1224008	105	95	86	0.671	0.647
1 1/2	40	1224009	116	105	97	0.796	0.772
2	50	1224010	140	130	116	1.302	1.296
2 1/2	65	1224011	176	165	149	2.268	2.193
3	80	1224012	205	190	175	3.408	3.059
4	100	1224014	260	245	224	5.530	5.730

SHORT BEND



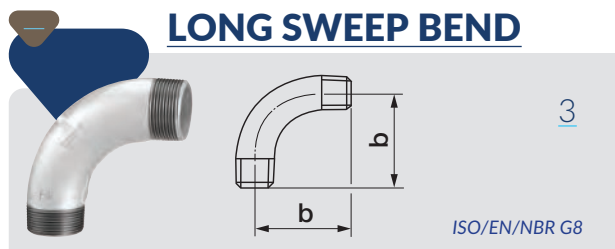
Nominal Pipe Size (NPS)		Code	Dimensions (mm)		Unit Weight (kg)	
Inch	mm		a	z	Galv.	Black
1/2	15	1221004	45	32	0.132	0.128
3/4	20	1221006	50	35	0.190	0.185
1	25	1221007	63	46	0.325	0.320
1 1/4	32	1221008	76	57	0.512	0.472
1 1/2	40	1221009	85	66	0.681	0.653
2	50	1221010	102	78	1.114	1.060

SHORT BEND



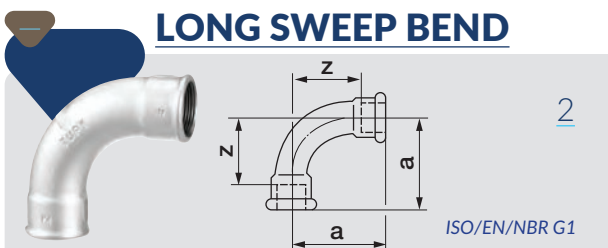
Nominal Pipe Size (NPS)		Code	Dimensions (mm)			Unit Weight (kg)	
Inch	mm		a	b	z	Galv.	Black
1/2	15	1222004	45	45	32	0.103	0.099
3/4	20	1222006	50	50	35	0.165	0.160
1	25	1222007	63	63	46	0.295	0.275
1 1/4	32	1222008	76	76	57	0.420	0.415
1 1/2	40	1222009	85	85	66	0.666	0.586
2	50	1222010	102	102	78	1.005	0.965

LONG SWEEP BEND



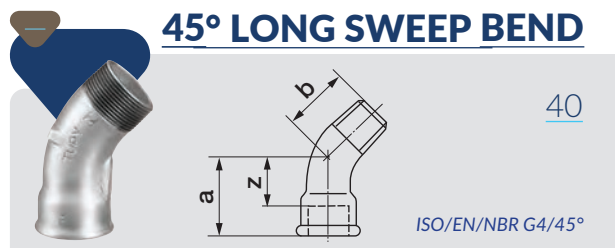
Nominal Pipe Size (NPS)		Code	Dimensions (mm)		Unit Weight (kg)	
Inch	mm		b	z	Galv.	Black
3/8	10	1225003	42	30	0.059	0.057
1/2	15	1225004	48	35	0.104	0.098
3/4	20	1225006	60	42	0.178	0.170
1	25	1225007	75	50	0.323	0.346
1 1/4	32	1225008	95	60	0.581	0.553
1 1/2	40	1225009	105	70	0.714	0.692
2	50	1225010	130	80	1.260	1.220
2 1/2	65	1225011	165	100	2.028	1.955
3	80	1225012	190	120	2.852	2.841
4	100	1225014	245	150	5.829	5.626
6	150	1225016	278	200	12.802	12.547

LONG SWEEP BEND



Nominal Pipe Size (NPS)		Code	Dimensions (mm)		Unit Weight (kg)	
Inch	mm		a	z	Galv.	Black
3/8	10	1223003	48	38	0.100	0.095
1/2	15	1223004	55	42	0.156	0.141
3/4	20	1223006	69	54	0.264	0.245
1	25	1223007	85	68	0.453	0.435
1 1/4	32	1223008	105	86	0.715	0.695
1 1/2	40	1223009	116	97	0.912	0.889
2	50	1223010	140	116	1.610	1.431
2 1/2	65	1223011	176	149	2.477	2.388
3	80	1223012	205	175	4.028	3.750
4	100	1223014	260	224	6.418	6.348

45° LONG SWEEP BEND



Nominal Pipe Size (NPS)		Code	Dimensions (mm)			Unit Weight (kg)	
Inch	mm		a	b	z	Galv.	Black
3/8	10	1227003	30	24	20	0.054	0.051
1/2	15	1227004	36	30	23	0.088	0.085
3/4	20	1227006	43	36	28	0.152	0.146
1	25	1227007	51	42	34	0.245	0.230
1 1/4	32	1227008	64	54	45	0.440	0.420
1 1/2	40	1227009	68	58	49	0.520	0.506
2	50	1227010	81	70	57	0.832	0.790
2 1/2	65	1227011	99	86	72	1.324	1.277
3	80	1227012	113	100	83	1.988	1.946

*See available finishes.

TUPYBSP fittings are available in a Black (include 31 at the end of the product code) or Galvanized (include 33 at the end of the product code) finish.

45° LONG SWEEP BEND

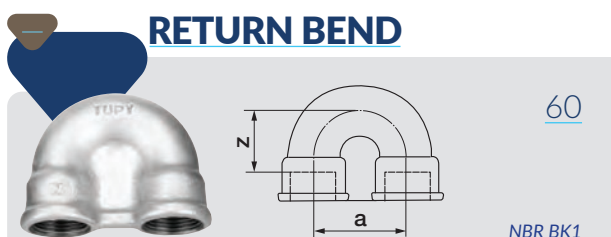


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ISO/EN/NBR G1/45°

Nominal Pipe Size (NPS)		Code	Dimensions (mm)		Unit Weight (kg)	
Inch	mm		a	z	Galv.	Black
½"	15	1226004	36	23	0.105	0.100
¾"	20	1226006	43	28	0.175	0.165
1"	25	1226007	51	34	0.298	0.288
1¼"	32	1226008	64	45	0.500	0.472
1½"	40	1226009	68	49	0.692	0.675
2"	50	1226010	81	57	1.251	1.216

RETURN BEND

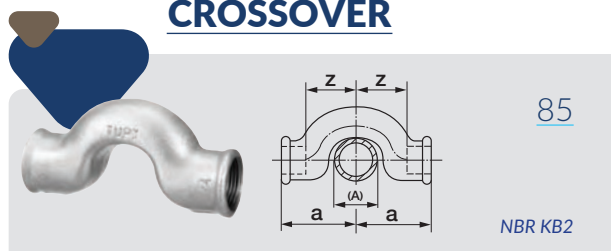


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NBR BK1

Nominal Pipe Size (NPS)		Code	Dimensions (mm)		Unit Weight (kg)	
Inch	mm		a	z	Galv.	Black
½"	15	1229004	38	30	0.155	0.155
¾"	20	1229006	50	36	0.280	0.257
1"	25	1229007	64	45	0.465	0.455
1¼"	32	1229008	76	53	0.741	0.707
1½"	40	1229009	89	60	1.292	1.243
2"	50	1229010	102	70	1.499	1.419

CROSSOVER

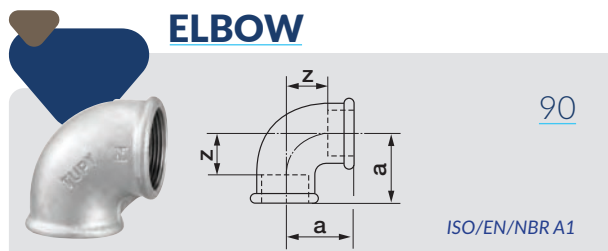


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NBR KB2

Nominal Pipe Size (NPS)		Code	Dimensions (mm)			Unit Weight (kg)	
Inch	mm		a	b	z	Galv.	Black
½ - ½"	15 - 15	1228076	10	46	33	0.174	0.168
½ - 1"	15 - 25	1228078	15	54	41	0.204	0.193
¾ - ¾"	20 - 20	1228079	20	56	41	0.299	0.286
¾ - 1"	20 - 25	1228080	25	59	44	0.285	-

ELBOW

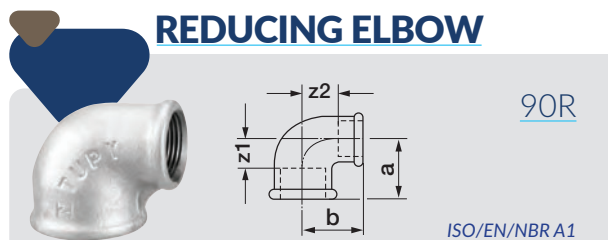


90

ISO/EN/NBR A1

Nominal Pipe Size (NPS)		Code	Dimensions (mm)		Unit Weight (kg)	
Inch	mm		a	z	Galv.	Black
¼"	8	1207002	21	11	0.038	0.034
⅜"	10	1207003	25	15	0.070	0.067
½"	15	1207004	28	15	0.089	0.089
¾"	20	1207006	33	18	0.144	0.137
1"	25	1207007	38	21	0.210	0.202
1¼"	32	1207008	45	26	0.330	0.318
1½"	40	1207009	50	31	0.438	0.418
2"	50	1207010	58	34	0.663	0.663
2½"	65	1207011	69	42	1.217	1.183
3"	80	1207012	78	48	1.524	1.496
4"	100	1207014	96	60	2.938	2.847
5"	125	1207015	115	75	4.630	4.306
6"	150	1207016	131	91	8.829	8.724

REDUCING ELBOW



90R

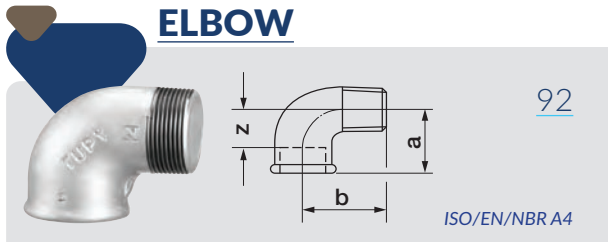
ISO/EN/NBR A1

Nominal Pipe Size (NPS)		Code	Dimensions (mm)				Unit Weight (kg)	
Inch	mm		a	b	z1	z2	Galv.	Black
¾" x ½"	10 x 8	1208023	23	23	13	13	0.045	0.042
½" x ¼"	15 x 8	1208025	25	25	12	15	0.063	0.060
½" x ¾"	15 x 10	1208026	26	26	13	16	0.067	0.065
¾" x ¾"	20 x 10	1208028	28	28	13	18	0.093	0.091
¾" x ½"	20 x 15	1208029	30	31	15	18	0.113	0.108
1" x ½"	25 x 15	1208032	32	34	15	21	0.139	0.134
1" x ¾"	25 x 20	1208033	35	36	18	21	0.182	0.170
1¼" x ¾"	32 x 20	1208036	34	39	15	26	0.224	0.215
1¼" x 1"	32 x 25	1208037	36	41	17	26	0.289	0.277
1½" x ¾"	40 x 20	1208040	40	42	21	25	0.294	0.282
1½" x 1"	40 x 25	1208041	39	44	20	29	0.340	0.330
1½" x 1¼"	40 x 32	1208042	42	46	23	29	0.405	0.390
2" x 1½"	50 x 40	1208047	46	48	27	29	0.531	0.513
2½" x 2"	65 x 50	1208051	52	56	28	36	0.922	0.912

*See available finishes.

TUPYBSP fittings are available in a Black (include 31 at the end of the product code) or Galvanized (include 33 at the end of the product code) finish.

ELBOW

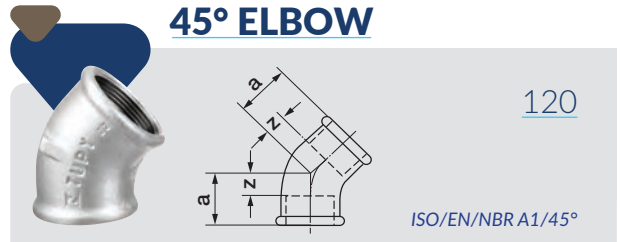


92

ISO/EN/NBR A4

Nominal Pipe Size (NPS)		Code	Dimensions (mm)			Unit Weight (kg)	
Inch	mm		a	b	z	Galv.	Black
¼"	8	1211002	21	28	11	0.034	0.032
⅜"	10	1211003	25	32	15	0.061	0.057
½"	15	1211004	28	37	15	0.082	0.082
¾"	20	1211006	33	43	18	0.154	0.136
1"	25	1211007	38	52	21	0.237	0.227
1¼"	32	1211008	45	60	26	0.351	0.340
1½"	40	1211009	50	65	31	0.497	0.478
2"	50	1211010	58	74	34	0.710	0.684
2½"	65	1211011	69	88	42	1.050	1.036
3"	80	1211012	78	98	48	1.551	1.530
4"	100	1211014	96	118	60	2.849	2.761

45° ELBOW

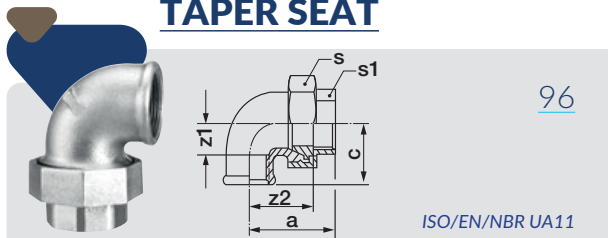


120

ISO/EN/NBR A1/45°

Nominal Pipe Size (NPS)		Code	Dimensions (mm)		Unit Weight (kg)	
Inch	mm		a	z	Galv.	Black
⅜"	10	1209003	20	10	0.052	0.049
½"	15	1209004	22	9	0.071	0.068
¾"	20	1209006	25	10	0.108	0.105
1"	25	1209007	28	11	0.176	0.171
1¼"	32	1209008	33	14	0.268	0.256
1½"	40	1209009	36	17	0.392	0.378
2"	50	1209010	43	19	0.534	0.530
2½"	65	1209011	50	23	0.905	0.870
3"	80	1209012	55	25	1.255	1.219
4"	100	1209014	66	30	1.966	2.082
5"	125	1209015	80	40	3.908	3.810
6"	150	1209016	85	45	5.715	5.788

UNION ELBOW, TAPER SEAT

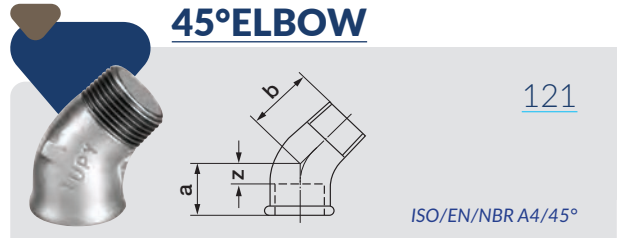


96

ISO/EN/NBR UA11

Nominal Pipe Size (NPS)		Code	Dimensions (mm)				Reference wrench size (mm)		G Thread	Unit Weight (kg)	
Inch	mm		a	c	z1	z2	s	s1	In.	Galv.	Black
½	15	1268004	58	28	15	45	36	25	1	0.233	0.228
¾	20	1268006	62	33	18	47	40	31	1¼	0.363	0.354
1	25	1268007	72	38	21	55	49	38	1½	0.534	0.496
1¼	32	1268008	82	45	26	63	55	48	2	0.820	0.792
1½	40	1268009	90	50	31	71	69	54	2¼	1.016	0.959
2	50	1268010	100	58	34	76	74	68	2½	1.470	1.454
2½	65	1268011	128	69	42	101	90	84	3½	2.488	2.046
3	80	1268012	144	78	48	114	109	97	4	3.652	3.515

45° ELBOW

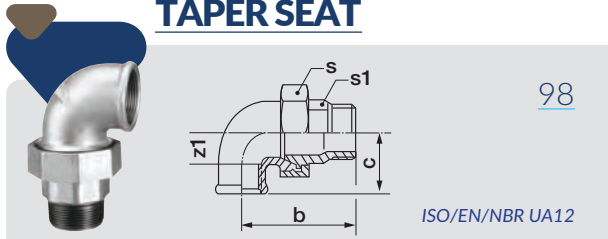


121

ISO/EN/NBR A4/45°

Nominal Pipe Size (NPS)		Code	Dimensions (mm)			Unit Weight (kg)	
Inch	mm		a	b	z	Galv.	Black
⅜"	10	1210003	20	25	10	0.043	0.041
½"	15	1210004	22	28	9	0.065	0.062
¾"	20	1210006	25	32	10	0.106	0.101
1"	25	1210007	28	37	11	0.167	0.161

UNION ELBOW, TAPER SEAT

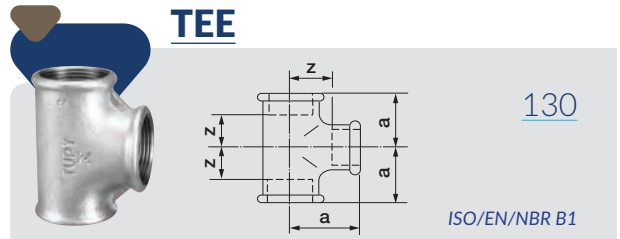


98

ISO/EN/NBR UA12

Nominal Pipe Size (NPS)		Code	Dimensions (mm)			Reference wrench size (mm)		G Thread	Unit Weight (kg)	
Inch	mm		a	c	z1	s	s1	In.	Galv.	Black
½"	15	1269004	76	28	15	36	25	1.	0.274	0.248
¾"	20	1269006	82	33	18	40	31	1¼	0.405	0.397
1	25	1269007	94	38	21	49	38	1½	0.603	0.585
1¼	32	1269008	107	45	26	55	48	2	0.910	0.966
1½	40	1269009	115	50	31	69	54	2¼	1.218	1.177
2	50	1269010	128	58	34	74	68	2½	1.788	1.769
2½	65	1269011	160	69	42	90	84	3½	2.892	2.853
3	80	1269012	179	78	48	109	97	4	4.380	4.213

TEE



130

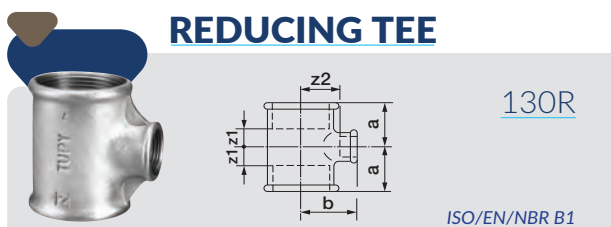
ISO/EN/NBR B1

Nominal Pipe Size (NPS)		Code	Dimensions (mm)		Unit Weight (kg)	
Inch	mm		a	z	Galv.	Black
¼"	8	1244002	21	11	0.052	0.066
⅜"	10	1244003	25	15	0.082	0.080
½"	15	1244004	28	15	0.153	0.138
¾"	20	1244006	33	18	0.234	0.220
1"	25	1244007	38	21	0.316	0.305
1¼"	32	1244008	45	26	0.463	0.449
1½"	40	1244009	50	31	0.582	0.569
2"	50	1244010	58	34	0.881	0.855
2½"	65	1244011	69	42	1.373	1.344
3"	80	1244012	78	48	2.032	1.969
4"	100	1244014	96	60	3.670	3.760
5"	125	1244015	115	75	6.051	5.770
6"	150	1244016	131	91	10.740	10.435

*See available finishes.

TUPYBSP fittings are available in a Black (include 31 at the end of the product code) or Galvanized (include 33 at the end of the product code) finish.

REDUCING TEE

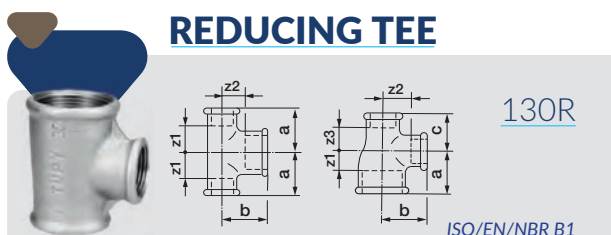


130R

ISO/EN/NBR B1

Nominal Pipe Size (NPS)		Code	Dimensions (mm)				Unit Weight (kg)	
Inch	mm		a	b	z1	z2	Galv.	Black
3/8 x 1/4	10 x 8	1245023	23	23	13	13	0.065	0.064
1/2 x 1/4	15 x 8	1245025	24	24	11	14	0.087	0.083
1/2 x 3/8	15 x 10	1245026	26	26	13	16	0.100	0.095
3/4 x 3/8	20 x 10	1245028	28	28	13	18	0.080	0.077
3/4 x 1/2	20 x 15	1245029	30	31	15	18	0.181	0.168
1 x 3/8	25 x 10	1245031	30	32	13	22	0.196	0.189
1 x 1/2	25 x 15	1245032	32	34	15	21	0.288	0.282
1 x 3/4	25 x 20	1245033	35	36	18	21	0.246	0.236
1 1/4 x 1/2	32 x 15	1245035	34	38	15	25	0.307	0.287
1 1/4 x 3/4	32 x 20	1245036	36	41	17	26	0.334	0.327
1 1/4 x 1	32 x 25	1245037	40	42	21	25	0.372	0.346
1 1/2 x 1/2	40 x 15	1245039	36	42	17	29	0.369	0.355
1 1/2 x 3/4	40 x 20	1245040	38	44	19	29	0.503	0.481
1 1/2 x 1	40 x 25	1245041	42	46	23	29	0.449	0.429
1 1/2 x 1 1/4	40 x 32	1245042	46	48	27	29	0.555	0.512
2 x 1/2	50 x 15	1245043	38	48	14	35	0.536	0.522
2 x 3/4	50 x 20	1245044	40	50	16	35	0.587	0.565
2 x 1	50 x 25	1245045	44	52	20	35	0.680	0.635
2 x 1 1/4	50 x 32	1245046	48	54	24	35	0.729	0.681
2 x 1 1/2	50 x 40	1245047	52	55	28	36	0.772	0.751
2 1/2 x 1	65 x 25	1245048	47	60	20	43	0.832	0.812
2 1/2 x 1 1/4	65 x 32	1245049	52	62	25	43	0.927	0.915
2 1/2 x 1 1/2	65 x 40	1245050	55	63	28	44	1.032	0.947
2 1/2 x 2	65 x 50	1245051	61	66	34	42	1.173	1.081
3 x 1	80 x 25	1245052	51	67	21	50	1.199	1.246
3 x 1 1/4	80 x 32	1245053	55	70	25	51	1.303	1.261
3 x 1 1/2	80 x 40	1245054	58	71	28	52	1.509	1.468
3 x 2	80 x 50	1245055	64	73	34	49	1.716	1.418
3 x 2 1/2	80 x 65	1245056	72	76	42	49	1.725	1.864
4 x 2	100 x 50	1245058	70	86	34	62	2.454	2.404
4 x 2 1/2	100 x 65	1245059	78	90	36	62	2.692	2.642
4 x 3	100 x 80	1245060	84	92	48	62	3.107	3.017

REDUCING TEE

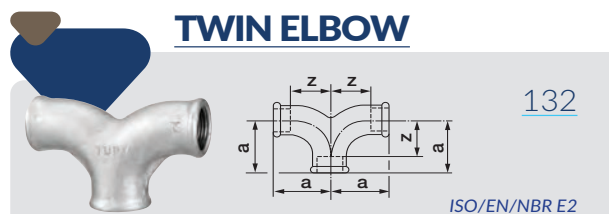


130R

ISO/EN/NBR B1

Nominal Pipe Size (NPS)		Code	Dimensions (mm)						Unit Weight (kg)	
Inch	mm		a	b	c	z1	z2	z3	Galv.	Black
3/4 x 1 x 3/4	20 x 25 x 20	1246233	36	35	-	21	18	-	0.225	0.220
3/4 x 1/2 x 1/2	25 x 20 x 20	1247129	30	31	28	15	18	15	0.140	0.135
1 1/4 x 1/2 x 1	32 x 15 x 25	1247135	34	38	32	15	25	15	0.265	0.255
1 1/4 x 1 x 1	32 x 25 x 25	1247137	40	42	38	21	25	21	0.338	0.329
1 1/2 x 1/2 x 1 1/4	40 x 15 x 32	1247139	36	42	34	17	29	15	0.337	0.327
1 1/2 x 1 x 1 1/4	40 x 25 x 32	1247141	42	46	40	23	29	21	0.425	0.407
2 x 1 x 1 1/2	50 x 25 x 40	1247146	44	52	42	20	35	23	0.536	0.520
1 1/4 x 1 1/4 x 1	32 x 32 x 25	1248137	45	45	42	26	26	25	0.399	0.155

TWIN ELBOW

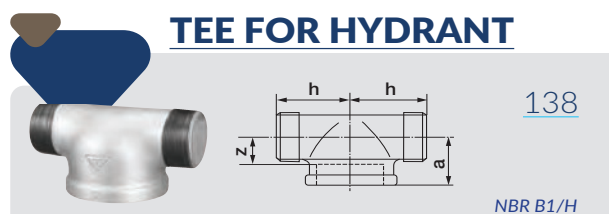


132

ISO/EN/NBR E2

Nominal Pipe Size (NPS)		Code	Dimensions (mm)		Unit Weight (kg)	
Inch	mm		a	z	Galv.	Black
1/2*	15	1255004	45	32	0.176	0.164
3/4*	20	1255006	50	35	0.284	0.275

TEE FOR HYDRANT

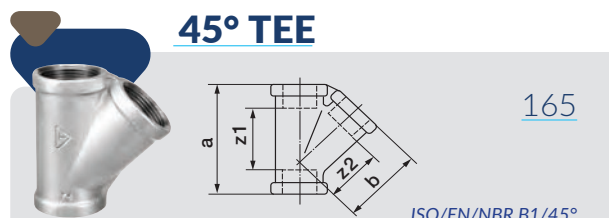


138

NBR B1/H

Nominal Pipe Size (NPS)		Code	Dimensions (mm)			Unit Weight (kg)	
Inch	mm		a	h	z	Galv.	Preta
4 x 2 1/2	100 x 65	1249059	78	105	51	2.436	2.365

45° TEE

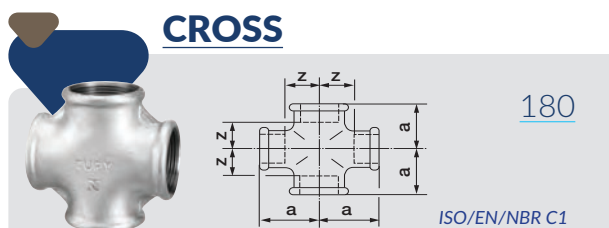


165

ISO/EN/NBR B1/45°

Nominal Pipe Size (NPS)		Code	Dimensions (mm)				Unit Weight (kg)	
Inch	mm		a	b	z1	z2	Galv.	Black
1/2*	15	1254004	59	43	33	30	0.131	0.128
3/4*	20	1254006	70	52	40	37	0.239	0.228
1*	25	1254007	83	61	49	44	0.330	0.325
1 1/4	32	1254008	100	74	62	55	0.523	0.497
1 1/2*	40	1254009	111	83	72	64	0.720	0.710
2*	50	1254010	131	100	83	76	1.280	1.250
2 1/2	65	1254011	161	123	107	96	1.751	1.700
3*	80	1254012	184	145	124	115	2.791	2.822
4	100	1254014	228	182	156	146	5.020	4.812

CROSS



180

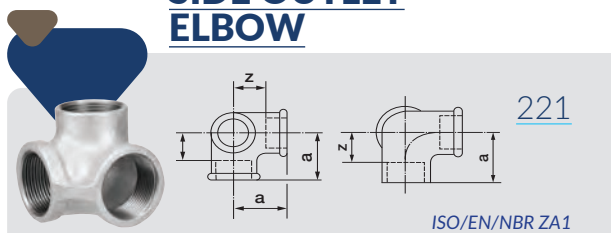
ISO/EN/NBR C1

Nominal Pipe Size (NPS)		Code	Dimensions (mm)		Unit Weight (kg)	
Inch	mm		a	z	Galv.	Black
3/4	8	1218002	21	11	0.068	0.063
3/8	10	1218003	25	15	0.106	0.101
1/2*	15	1218004	28	15	0.136	0.126
3/4*	20	1218006	33	18	0.223	0.216
1*	25	1218007	38	21	0.378	0.340
1 1/4	32	1218008	45	26	0.550	0.530
1 1/2	40	1218009	50	31	0.707	0.695
2*	50	1218010	58	34	1.084	1.056
2 1/2	65	1218011	69	42	1.577	1.528
3*	80	1218012	78	48	2.356	2.325
4	100	1218014	96	60	4.308	4.300

*See available finishes.

TUPYBSP fittings are available in a Black (include 31 at the end of the product code) or Galvanized (include 33 at the end of the product code) finish.

SIDE OUTLET ELBOW

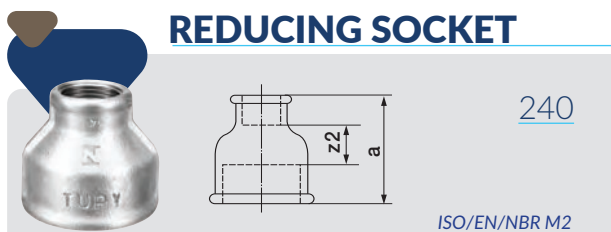


221

ISO/EN/NBR ZA1

Nominal Pipe Size (NPS)		Code	Dimensions (mm)		Unit Weight (kg)	
Inch	mm		a	z	Galv.	Black
½"	15	1215004	28	15	0.110	0.106
¾"	20	1215006	33	18	0.208	0.183
1"	25	1215007	38	21	0.309	0.295
1½"	32	1215008	45	26	0.427	0.412
2"	40	1215009	50	31	0.607	0.609
2½"	50	1215010	58	34	0.983	0.963

REDUCING SOCKET

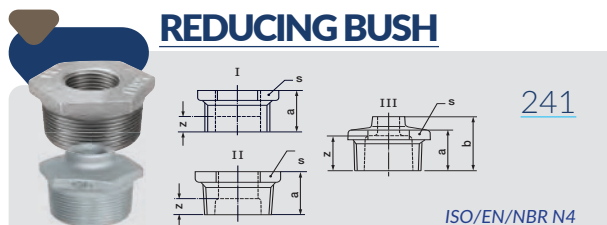


240

ISO/EN/NBR M2

Nominal Pipe Size (NPS)		Code	Dimensions (mm)		Unit Weight (kg)	
Inch	mm		a	z2	Galv.	Black
¾" x ½"	10 x 8	1232023	30	10	0.034	0.033
½" x ¼"	15 x 8	1232025	36	13	0.052	0.049
½" x ⅜"	15 x 10	1232026	36	13	0.056	0.054
¾" x ½"	20 x 10	1232028	39	14	0.076	0.074
¾" x ⅝"	20 x 15	1232029	39	11	0.093	0.090
1" x ¾"	25 x 10	1232031	45	18	0.120	0.115
1" x ½"	25 x 15	1232032	45	15	0.134	0.127
1" x ¾"	25 x 20	1232033	45	13	0.143	0.152
1½" x ½"	32 x 15	1232035	50	18	0.237	0.208
1½" x ¾"	32 x 20	1232036	50	16	0.198	0.186
1½" x 1"	32 x 25	1232037	50	14	0.218	0.216
1½" x ¾"	40 x 20	1232040	55	21	0.248	0.239
1½" x 1"	40 x 25	1232041	55	19	0.256	0.252
1½" x 1½"	40 x 32	1232042	55	17	0.260	0.253
2" x 1"	50 x 25	1232045	65	24	0.369	0.359
2" x 1½"	50 x 32	1232046	65	22	0.383	0.372
2" x 1½"	50 x 40	1232047	65	22	0.390	0.374
2½" x 1½"	65 x 32	1232049	74	28	0.551	0.537
2½" x 1½"	65 x 40	1232050	74	28	0.581	0.554
2½" x 2"	65 x 50	1232051	74	23	0.608	0.592
3" x 1½"	80 x 40	1232054	80	31	0.795	0.763
3" x 2"	80 x 50	1232055	80	26	0.912	0.885
3" x 2½"	80 x 65	1232056	80	23	0.875	0.815
4" x 2"	100 x 50	1232058	94	34	1.344	1.330
4" x 2½"	100 x 65	1232059	94	31	1.434	1.448
4" x 3"	100 x 80	1232060	94	28	1.611	1.570

REDUCING BUSH

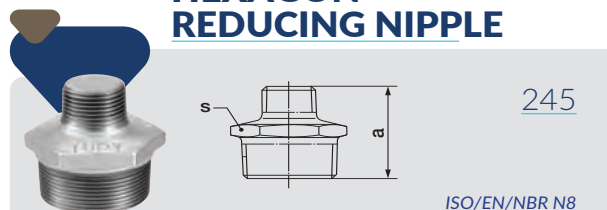


241

ISO/EN/NBR N4

Nominal Pipe Size (NPS)		Code	Dimensions (mm)					Unit Weight (kg)	
Inch	mm		Model	a	b	z	s	Galv.	Black
¾ x ¼*	10 x 8	1201023	I	20	-	10	19	0.017	0.016
½ x ¼*	15 x 8	1201025	II	24	-	14	22	0.034	0.034
½ x ¾*	15 x 10	1201026	I	24	-	14	22	0.026	0.025
¾ x ¼	20 x 8	1201027	II	26	-	16	30	0.072	0.069
¾ x ¾	20 x 10	1201028	II	26	-	16	30	0.060	0.061
¾ x ½*	20 x 15	1201029	I	26	-	13	30	0.051	0.050
1 x ¾	25 x 10	1201031	II	29	-	19	36	0.112	0.106
1 x ½*	25 x 15	1201032	II	29	-	16	36	0.099	0.097
1 x ¾*	25 x 20	1201033	I	29	-	14	36	0.085	0.084
1½ x ½*	32 x 15	1201035	II	31	-	18	46	0.200	0.193
1½ x ¾*	32 x 20	1201036	II	31	-	16	46	0.178	0.177
1½ x 1*	32 x 25	1201037	I	31	-	14	46	0.145	0.142
1½ x ½*	40 x 15	1201039	II	31	-	18	50	0.255	0.249
1½ x ¾*	40 x 20	1201040	II	31	-	16	50	0.236	0.232
1½ x 1*	40 x 25	1201041	II	31	-	14	50	0.208	0.203
1½ x 1½*	40 x 32	1201042	I	31	-	12	50	0.133	0.129
2 x ½*	50 x 15	1201043	III	35	48	35	65	0.412	0.390
2 x ¾*	50 x 20	1201044	III	35	48	33	65	0.389	0.381
2 x 1*	50 x 25	1201045	II	35	-	18	65	0.417	0.412
2 x 1½*	50 x 32	1201046	II	35	-	16	65	0.349	0.343
2 x 1½*	50 x 40	1201047	II	35	-	16	65	0.298	0.288
2½ x 1*	65 x 25	1201048	III	40	54	37	80	0.622	0.609
2½ x 1½*	65 x 32	1201049	III	40	54	35	80	0.644	0.638
2½ x 1½*	65 x 40	1201050	II	40	-	21	80	0.589	0.580
2½ x 2*	65 x 50	1201051	II	40	-	16	80	0.478	0.479
3 x 1½*	80 x 40	1201054	III	44	59	40	95	0.921	0.876
3 x 2*	80 x 50	1201055	II	44	-	20	95	0.938	0.955
3 x 2½*	80 x 65	1201056	II	44	-	17	95	0.626	0.581
4 x 2*	100 x 50	1201058	III	51	69	45	120	1.711	1.670
4 x 2½*	100 x 65	1201059	III	51	69	42	120	1.629	1.575
4 x 3*	100 x 80	1201060	II	51	-	21	120	1.328	1.448
5 x 4*	125 x 100	1201066	II	57	-	18	145	2.080	2.063
6 x 4*	150 x 100	1201071	III	58	87	47	175	3.748	3.794
6 x 5*	150 x 125	1201072	II	58	-	15	175	2.749	2.737

HEXAGON REDUCING NIPPLE



245

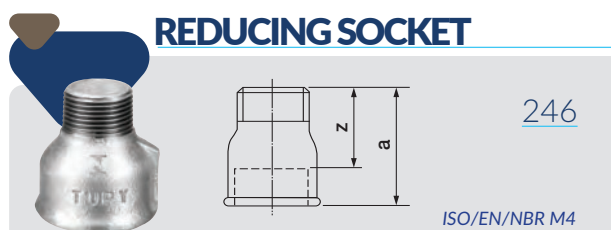
ISO/EN/NBR N8

Nominal Pipe Size (NPS)		Code	Dimensions (mm)		Unit Weight (kg)	
Inch	mm		a	s	Galv.	Black
¾" x ¼"	10 x 8	1239023	38	19	0.037	0.036
½" x ¼"	15 x 8	1239025	44	22	0.057	0.056
½" x ⅜"	15 x 10	1239026	44	22	0.061	0.059
¾" x ¼"	20 x 10	1239028	47	30	0.083	0.080
¾" x ½"	20 x 15	1239029	47	30	0.087	0.084
1" x ½"	25 x 15	1239032	56	36	0.127	0.123
1" x ¾"	25 x 20	1239033	53	36	0.153	0.148
1½" x ¾"	32 x 20	1239036	57	46	0.191	0.188
1½" x 1"	32 x 25	1239037	57	46	0.203	0.202
1½" x ¾"	40 x 20	1239040	59	50	0.249	0.236
1½" x 1"	40 x 25	1239041	59	50	0.250	0.243
1½" x 1½"	40 x 32	1239042	59	50	0.256	0.246
2" x 1"	50 x 25	1239045	68	65	0.434	0.428
2" x 1½"	50 x 32	1239046	68	65	0.368	0.364
2" x 1½"	50 x 40	1239047	68	65	0.422	0.414
2½" x 2"	65 x 50	1239051	75	80	0.661	0.665
3" x 2"	80 x 50	1239055	83	95	0.972	0.946
3" x 2½"	80 x 65	1239056	83	95	0.926	0.898

*See available finishes.

TUPYBSP fittings are available in a Black (include 31 at the end of the product code) or Galvanized (include 33 at the end of the product code) finish.

REDUCING SOCKET

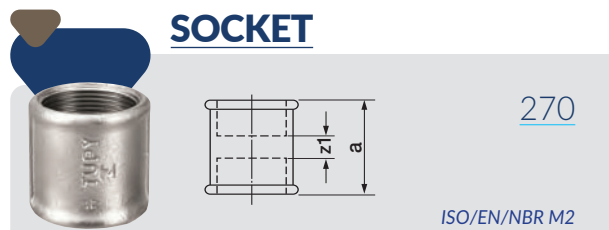


246

ISO/EN/NBR M4

Nominal Pipe Size (NPS)		Code	Dimensions (mm)		Unit Weight (kg)	
Inch	mm		a	z	Galv.	Black
3/8 x 1/4	10 x 8	1235023	35	25	0.036	0.032
1/2 x 3/8	15 x 8	1235025	43	30	0.054	0.052
3/4 x 1/2	20 x 10	1235026	43	30	0.060	0.056
1 x 3/4	25 x 15	1235028	48	33	0.091	0.087
1 1/4 x 1	32 x 25	1235029	48	33	0.085	0.080
1 1/2 x 1	40 x 25	1235032	55	38	0.124	0.118
2 x 1 1/2	50 x 32	1235033	55	38	0.132	0.146
2 1/2 x 1 1/2	65 x 32	1235036	60	41	0.220	0.183
3 x 2 1/2	75 x 32	1235037	60	41	0.205	0.197
4 x 2 1/2	100 x 32	1235041	63	44	0.247	0.238
5 x 2 1/2	125 x 32	1235042	63	44	0.266	0.254
6 x 2 1/2	150 x 32	1235045	70	46	0.364	0.360
8 x 2 1/2	200 x 32	1235046	70	46	0.395	0.382
10 x 2 1/2	250 x 32	1235047	70	46	0.395	0.391

SOCKET

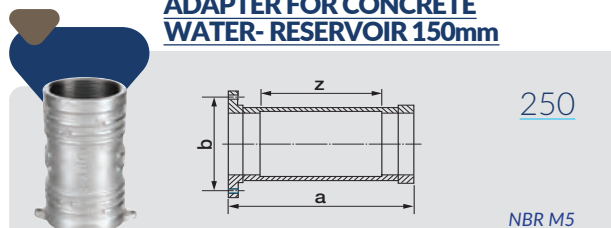


270

ISO/EN/NBR M2

Nominal Pipe Size (NPS)		Code	Dimensions (mm)		Unit Weight (kg)	
Inch	mm		a	z1	Galv.	Black
3/8	8	1231002	27	7	0.032	0.030
1/2	10	1231003	30	10	0.041	0.039
3/4	15	1231004	36	10	0.061	0.061
1	20	1231006	39	9	0.100	0.100
1 1/4	25	1231007	45	11	0.159	0.159
1 1/2	32	1231008	50	12	0.262	0.262
2	40	1231009	55	17	0.346	0.342
2 1/2	50	1231010	65	17	0.453	0.453
3	65	1231011	74	20	0.703	0.703
4	80	1231012	80	20	1.157	1.157
5	100	1231014	94	22	1.942	1.911
6	125	1231015	109	29	2.910	2.875
8	150	1231016	120	40	4.433	4.357

ADAPTER FOR CONCRETE WATER- RESERVOIR 150mm

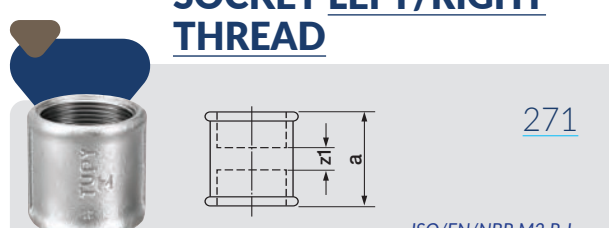


250

NBR M5

Nominal Pipe Size (NPS)		Code	Dimensions (mm)			Unit Weight (kg)	
Inch	mm		a	b	z	Galv.	Black
2	50	1291010	150	85	98	1.086	-
2 1/2	65	1291011	150	101.5	89	1.461	-
3	80	1291012	150	116	83	1.891	-
4	100	1291014	150	144	71	3.165	-

SOCKET LEFT/RIGHT THREAD

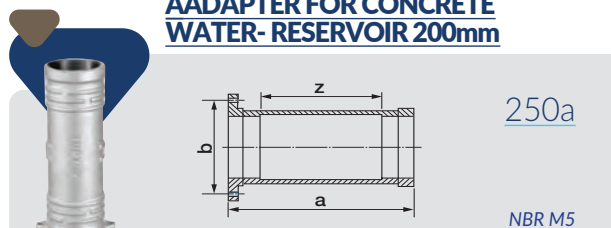


271

ISO/EN/NBR M2 R-L

Nominal Pipe Size (NPS)		Code	Dimensions (mm)		Unit Weight (kg)	
Inch	mm		a	z1	Galv.	Black
3/8	10	1236003	30	10	0.043	0.040
1/2	15	1236004	36	10	0.065	0.058
3/4	20	1236006	39	9	0.104	0.099
1	25	1236007	45	11	0.176	0.171
1 1/4	32	1236008	50	12	0.231	0.224
1 1/2	40	1236009	55	17	0.346	0.264
2	50	1236010	65	17	0.430	0.420

AADAPTER FOR CONCRETE WATER- RESERVOIR 200mm

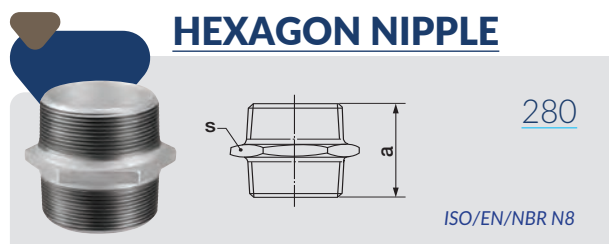


250a

NBR M5

Nominal Pipe Size (NPS)		Code	Dimensions (mm)			Unit Weight (kg)	
Inch	mm		a	b	z	Galv.	Black
2	50	1292010	200	85	148	1.371	-
2 1/2	65	1292011	200	101.5	139	1.790	-
3	80	1292012	200	116	133	2.425	-
4	100	1292014	200	144	121	4.007	-

HEXAGON NIPPLE



280

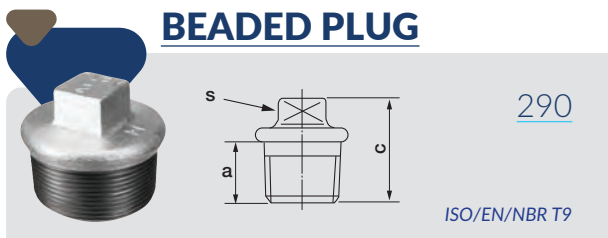
ISO/EN/NBR N8

Nominal Pipe Size (NPS)		Code	Dimensions (mm)		Unit Weight (kg)	
Inch	mm		a	s	Galv.	Black
3/8	8	1238002	36	19	0.031	0.030
1/2	10	1238003	38	22	0.039	0.038
3/4	15	1238004	47	27	0.060	0.060
1	20	1238006	49	32	0.081	0.079
1 1/4	25	1238007	53	41	0.145	0.140
1 1/2	32	1238008	57	50	0.231	0.227
2	40	1238009	59	55	0.272	0.272
2 1/2	50	1238010	68	70	0.505	0.491
3	65	1238011	75	85	0.923	0.905
4	80	1238012	83	100	1.173	1.150
5	100	1238014	95	130	1.980	1.869
6	125	1238015	114	150	3.068	3.028
8	150	1238016	110	180	3.870	3.870

*See available finishes.

TUPYBSP fittings are available in a Black (include 31 at the end of the product code) or Galvanized (include 33 at the end of the product code) finish.

BEADED PLUG

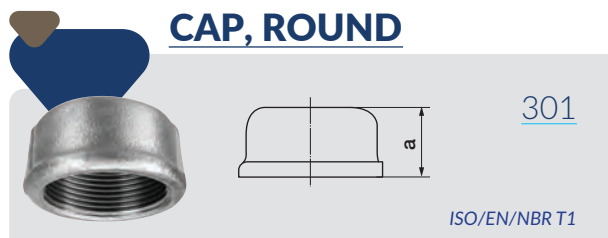


290

ISO/EN/NBR T9

Nominal Pipe Size (NPS)		Code	Dimensions (mm)			Unit Weight (kg)	
Inch	mm		c - Min.	a - Min.	s - Max	Galv.	Black
¼	8	1203002	27	11	8	0.023	0.021
⅜	10	1203003	28	11	10	0.037	0.036
½*	15	1203004	33	15	11	0.051	0.049
¾*	20	1203006	36	17	17	0.088	0.086
1*	25	1203007	41	19	19	0.152	0.140
1¼*	32	1203008	46	22	22	0.212	0.207
1½*	40	1203009	48	22	22	0.268	0.259
2*	50	1203010	56	26	27	0.436	0.422
2½*	65	1203011	63	29	32	0.710	0.694
3*	80	1203012	68	33	36	1.059	1.012

CAP, ROUND

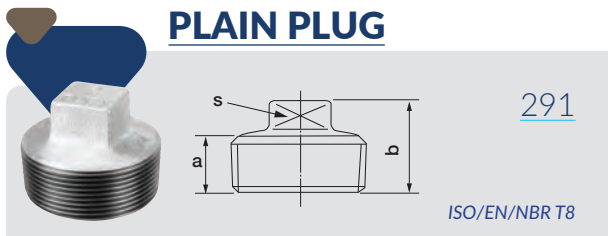


301

ISO/EN/NBR T1

Nominal Pipe Size (NPS)		Code	Dimensions (mm)		Unit Weight (kg)	
Inch	mm		a		Galv.	Black
¼	8	1242002	18		0.019	0.017
⅜	10	1242003	18		0.028	0.027
½*	15	1242004	23		0.054	0.050
¾	20	1242006	25		0.088	0.083
1*	25	1242007	29		0.107	0.105
1¼	32	1242008	31		0.169	0.158
1½	40	1242009	31		0.221	0.211
2	50	1242010	38		0.325	0.310
2½	65	1242011	42		0.557	0.548
3	80	1242012	46		0.812	0.738
4	100	1242014	56		1.458	1.389

PLAIN PLUG

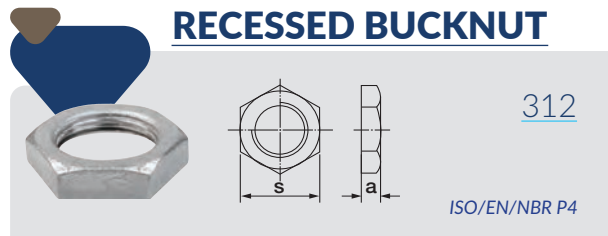


291

ISO/EN/NBR T8

Nominal Pipe Size (NPS)		Code	Dimensions (mm)			Unit Weight (kg)	
Inch	mm		b - Min.	a - Min.	s - Max	Galv.	Black
¼*	8	1202002	22	11	8	0.015	0.014
⅜*	10	1202003	23	11	10	0.026	0.025
½*	15	1202004	24	15	11	0.035	0.034
¾*	20	1202006	27	17	17	0.053	0.051
1*	25	1202007	30	19	19	0.094	0.081
1¼*	32	1202008	36	22	22	0.152	0.137
1½	40	1202009	36	22	22	0.163	0.159
2*	50	1202010	45	26	27	0.303	0.295
2½	65	1202011	51	29	32	0.538	0.517
3	80	1202012	57	33	36	0.776	0.771
4	100	1202014	71	40	41	1.356	1.528

RECESSED BUCKNUT



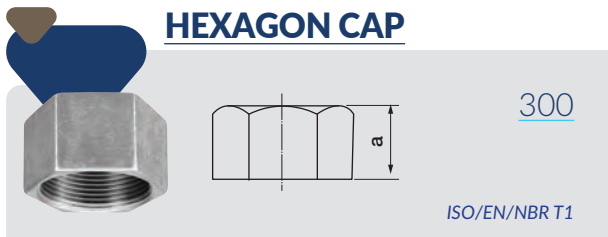
312

ISO/EN/NBR P4

Nominal Pipe Size (NPS)		Code	Dimensions (mm)		Unit Weight (kg)	
Inch	mm		a	s	Galv.	Black
⅜*	10	1206003	8	27	0.023	0.021
½*	15	1206004	9	32	0.031	0.029
¾*	20	1206006	10	36	0.036	0.035
1*	25	1206007	11	46	0.065	0.062
1¼*	32	1206008	12	55	0.099	0.094
1½*	40	1206009	13	60	0.110	0.104
2*	50	1206010	14	75	0.174	0.165
2½*	65	1206011	17	95	0.355	0.348
3*	80	1206012	20	105	0.413	0.399

* Rosca de fixação conforme norma NBR 8133 e/ou ISO 228.

HEXAGON CAP

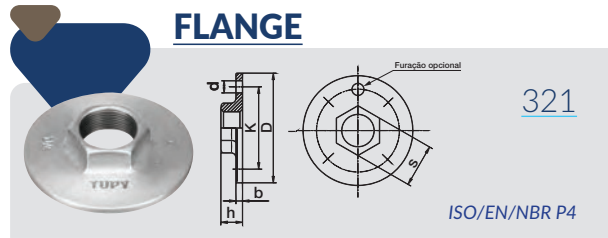


300

ISO/EN/NBR T1

Nominal Pipe Size (NPS)		Code	Dimensions (mm)		Unit Weight (kg)	
Inch	mm		a		Galv.	Black
½*	15	1241004	23		0.059	0.053
¾*	20	1241006	25		0.092	0.084
1*	25	1241007	29		0.154	0.140
1¼*	32	1241008	31		0.220	0.210
1½*	40	1241009	31		0.264	0.259
2*	50	1241010	38		0.436	0.416
2½*	65	1241011	42		0.779	0.779
3*	80	1241012	46		1.033	0.998
4*	100	1241014	56		1.862	1.822
6*	150	1241016	63		3.715	3.665

FLANGE



321

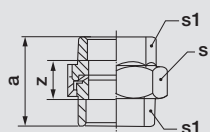
ISO/EN/NBR P4

Nominal Pipe Size (NPS)		Code	Dimensions (mm)							Nº. of drill holes	Bolts	Unit Weight (kg)	
In.	mm		e	b	h	s	k	d				Galv.	Black
¼*	8	1299002	70	5	11	20	45	11	4	M10		0.137	0.126
⅜	10	1299003	75	5	12	24	50	11	4	M10		0.161	0.156
½	15	1299004	80	5	15	28	55	11	4	M10		0.189	0.184
¾*	20	1299006	90	5.5	17	34	65	11	4	M10		0.262	0.246
1*	25	1299007	100	6	19	41	75	11	4	M12		0.352	0.333
1¼	32	1299008	120	6.5	22	51	90	14	4	M12		0.553	0.512
1½*	40	1299009	130	7	22	57	100	14	4	M12		0.674	0.675
2*	50	1299010	140	8	26	70	110	14	4	M12		0.940	0.904
2½*	65	1299011	160	9	31	85	130	14	4	M12		1.354	1.333
3	80	1299012	190	10	34	100	150	19	4	M16		2.014	2.011
4	100	1299014	210	11	40	130	170	19	4	M16		2.897	2.840
5*	125	1299015	240	12	44	155	200	19	8	M16		4.190	4.190
6*	150	1299016	265	13	44	180	225	19	8	M16		5.100	5.030

*See available finishes.

TUPYBSP fittings are available in a Black (include 31 at the end of the product code) or Galvanized (include 33 at the end of the product code) finish.

UNION FLAT SEAT

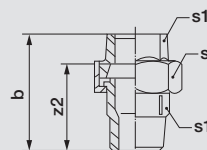


330

ISO/EN/NBR U1

Nominal Pipe Size (NPS)		Code	Dimensions (mm)		Reference wrench size (mm)		G Thread	Unit Weight (kg)	
Inch	mm		a	z	s	s1		Galv.	Black
¼"	8	1263002	42	22	31	16.50	¾	0.096	0.062
⅜"	10	1263003	45	25	36	20	¾	0.092	0.089
½"	15	1263004	48	22	40	25	1	0.187	0.173
¾"	20	1263006	52	22	49	31	1¼	0.286	0.282
1"	25	1263007	58	24	55	38	1½	0.375	0.364
1¼"	32	1263008	65	27	69	48	2	0.649	0.597
1½"	40	1263009	70	32	74	54	2¼	0.732	0.683
2"	50	1263010	78	30	90	68	2½	1.099	1.080
2½"	65	1263011	85	31	109	84	3½	1.754	1.714
3"	80	1263012	95	35	129	97	4	2.555	2.510
4"	100	1263014	110	38	149	121	5	3.325	3.237

UNION TAPER SEAT

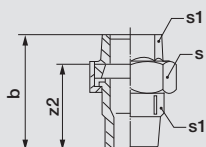


341

ISO/EN/NBR U12

Nominal Pipe Size (NPS)		Code	Dimensions (mm)		Reference wrench size (mm)		G Thread	Unit Weight (kg)	
Inch	mm		b	z2	s	s1		Galv.	Black
⅜"	10	1265003	45	25	36	20	¾	0.150	0.108
½"	15	1265004	48	22	40	25	1	0.215	0.205
¾"	20	1265006	52	22	49	31	1¼	0.335	0.324
1"	25	1265007	58	24	55	38	1½	0.465	0.529
1¼"	32	1265008	65	27	69	48	2	0.805	0.764
1½"	40	1265009	70	32	74	54	2¼	0.947	0.848
2"	50	1265010	78	30	90	68	2½	1.450	1.411
2½"	65	1265011	85	31	109	84	3½	2.581	2.500
3"	80	1265012	95	35	129	97	4	2.961	3.077
4"	100	1265014	110	38	149	121	5	4.160	4.039

UNION FLAT SEAT

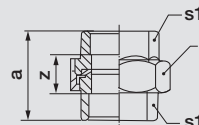


331

ISO/EN/NBR U2

Nominal Pipe Size (NPS)		Code	Dimensions (mm)		Reference wrench size (mm)		G Thread	Unit Weight (kg)	
Inch	mm		a	z	s	s1		Galv.	Black
⅜"	10	1267003	45	25	36	20	¾	0.104	0.099
½"	15	1267004	48	22	40	25	1	0.205	0.190
¾"	20	1267006	52	22	49	31	1¼	0.344	0.327
1"	25	1267007	58	24	55	38	1½	0.464	0.447
1¼"	32	1267008	65	27	69	48	2	0.761	0.745
1½"	40	1267009	70	32	74	54	2¼	0.888	0.854
2"	50	1267010	78	30	90	68	2½	1.372	1.349

UNION SINGLE BRASS SEAT



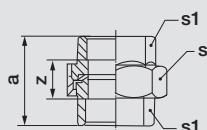
342

NBR UC1

Nominal Pipe Size (NPS)		Code	Dimensions (mm)		Reference wrench size (mm)		G Thread	Unit Weight (kg)	
Inch	mm		a	z	s	s1		Galv.	Black
¼"	8	1261002	42	22	31	16.5	¾	0.104	0.099
⅜"	10	1261003	45	25	36	20	¾	0.133	0.126
½"	15	1261004	48	22	40	25	1	0.190	0.185
¾"	20	1261006	52	22	49	31	1¼	0.271	0.285
1"	25	1261007	58	24	55	38	1½	0.392	0.357
1¼"	32	1261008	65	27	69	48	2	0.670	0.612
1½"	40	1261009	70	32	74	54	2¼	0.711	0.702
2"	50	1261010	78	30	90	68	2½	1.129	1.122
2½"	65	1261011	85	31	109	84	3½	1.806	1.738
3"	80	1261012	95	35	129	97	4	2.613	2.542
4"	100	1261014	110	38	149	121	5	3.323	3.265
5"	125	1261015	122	42	183	149	6	5.572	-
6"	150	1261016	132	52	226	178.5	**	9.794	-

** Diâmetro básico 207 mm, 279 mm e demais dimensões segue a Norma ABNT NBR 8133 bitola de 6".

UNION TAPER SEAT

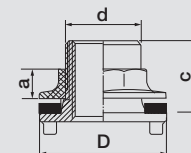


340

ISO/EN/NBR U11

Nominal Pipe Size (NPS)		Code	Dimensions (mm)		Reference wrench size (mm)		G Thread	Unit Weight (kg)	
Inch	mm		a	z	s	s1		Galv.	Black
¼"	8	1262002	42	22	31	16.50	¾	0.096	0.092
⅜"	10	1262003	45	25	36	20	1	0.125	0.115
½"	15	1262004	48	22	40	25	¾	0.180	0.181
¾"	20	1262006	52	22	49	31	1¼	0.282	0.277
1"	25	1262007	58	24	55	38	1½	0.389	0.383
1¼"	32	1262008	65	27	69	48	2	0.641	0.625
1½"	40	1262009	70	32	74	54	2¼	0.745	0.709
2"	50	1262010	78	30	90	68	2½	1.132	1.096
2½"	65	1262011	85	31	109	84	3½	1.782	1.703
3"	80	1262012	95	35	129	97	4	2.607	2.405
4"	100	1262014	110	38	149	121	5	3.275	3.187

FLANGE FOR WATER-RESERVOIR



350

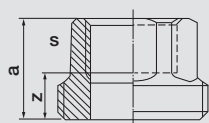
NBR F1

Nominal Pipe Size (NPS)		Code	Dimensions (mm)				Unit Weight (kg)
Inch	mm		a	c	e	d* - Ø	
½"	15	1264004	12	32	49	26.40 - ¾	0.162
¾"	20	1264006	15	34	60	33.20 - 1	0.283
1"	25	1264007	16	40	70	41.90 - 1 ¼	0.409
1 ¼"	32	1264008	19	45	82	50.80 - 1 ½	0.587
1 ½"	40	1264009	21	49	94	56.70 - 1 ¾	0.856
2"	50	1264010	24	58	117	70.50 - 2 ¾	1.450
2 ½"	65	1264011	27	66	134	87.90 - 3	2.060

*See available finishes.

TUPYBSP fittings are available in a Blackheart (include 31 at the end of the product code) or Galvanized (include 33 at the end of the product code) finish.

UNION BUSH

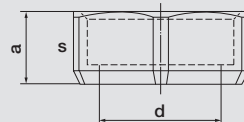


370

TUPY CU1

Nominal Pipe Size (NPS)		Code	Dimensions (mm)			Reference wrench size (mm)	G Thread	Unit Weight (kg)	
Inch	mm		a	d	e			Galv.	Black
¼	8	1277002	22	12		16.5	¾	0.034	-
⅜*	10	1277003	23	12.5		20		0.055	0.050
½	15	1277004	24	11		25	1	0.061	0.053
¾	20	1277006	26	11		25	1½	0.104	0.100
1	25	1277007	29	12		38	1½	0.135	0.130
1¼	32	1277008	32	13.5		48	2	0.230	0.218
1½	40	1277009	35	16		54	2½	0.244	0.241
2	50	1277010	40	15		68	2½	0.428	0.419
2½	65	1277011	44	15.5		84	3½	0.675	0.647
3*	80	1277012	48	17.5		97	4	0.910	0.878
4*	100	1277014	55	19		123	5	1.210	1.190

UNION NUT



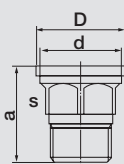
374

TUPY CU4

Nominal Pipe Size (NPS)		Code	Dimensions (mm)		Reference wrench size (mm)	G Thread	Unit Weight (kg)	
Inch	mm		a	d			Galv.	Black
¼	8	1285002	16	22.3	31	¾	0.041	0.021
⅜	10	1285003	17	24	36		0.056	0.056
½	15	1285004	18	27.6	40	1	0.082	0.077
¾	20	1285006	20	36.2	49	1½	0.118	0.114
1	25	1285007	22	42.2	55	1½	0.170	0.160
1¼	32	1285008	24	53	69	2	0.230	0.221
1½	40	1285009	25	58.8	74	2½	0.270	0.262
2	50	1285010	27	74	90	2½	0.303	0.292
2½	65	1285011	30	92.5	109	3½	0.470	0.462
3	80	1285012	31	105	129	4	0.878	0.878
4	100	1285014	34	130	149	5	0.880	0.880

* Fastening thread according to NBR 8133 and/or ISO 228.

UNION END

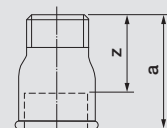


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TUPY CU3

Nominal Pipe Size (NPS)		Code	Dimensions (mm)			Reference wrench size (mm)	G Thread	Unit Weight (kg)	
In.	mm		a	d	e			Galv.	Black
¾*	10	1286003	34	23.5	27.4	20	1	0.047	0.047
½	15	1286004	41	27.1	29.8	25	¾	0.061	0.061
¾	20	1286006	44	35.7	28.5	31	1¼	0.118	0.118
1	25	1286007	49.5	41.7	44.6	38	1½	0.188	0.188
1¼	32	1286008	56	52.5	56	48	2	0.327	0.327
1½	40	1286009	59.5	58.3	62	54	2½	0.388	0.388
2	50	1286010	65.5	73.5	77.8	68	2½	0.630	0.630

EXTENSION TUBE

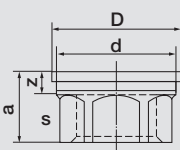


526

ISO/EN/NBR M3

Nominal Pipe Size (NPS)		Code	Dimensions (mm)		Unit Weight (kg)	
Inch	mm		a	z	Galv.	Black
½ - 60	15 x 60	1234104	60	47	0.079	0.079
¾ - 70*	20 x 70	1234206	70	55	0.130	0.125
¾ - 90*	20 x 90	1234106	90	75	0.160	0.152

UNION END

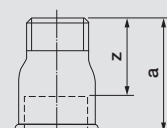


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TUPY CU2

Nominal Pipe Size (NPS)		Code	Dimensions (mm)				Reference wrench size (mm)	Unit Weight (kg)	
In.	mm		a	z	d	e		Galv.	Black
¼*	8	1283002	19.5	11	21.8	24	31	0.022	-
⅜*	10	1283003	21	12.5	23.5	27.4	20	0.033	0.033
½	15	1283004	22	11	27.1	29.8	25	0.043	0.042
¾	20	1283006	23.5	11	35.7	28.5	31	0.068	0.068
1*	25	1283007	27	12	41.7	44.6	38	0.099	0.094
1¼	32	1283008	30.5	13.5	52.5	56	48	0.181	0.184
1½*	40	1283009	33	16	58.3	62	54	0.228	0.226
2	50	1283010	36.5	15	73.5	77.8	68	0.414	0.402
2½*	65	1283011	39	15.5	92	96.5	84	0.577	-
3	80	1283012	44	17.5	104.5	109.2	97	0.849	-
4	100	1283014	52	19	129.5	134.6	121	0.914	-

EXTENSION SOCKET



529a

ISO/EN/NBR M4

Nominal Pipe Size (NPS)		Code	Dimensions (mm)		Unit Weight (kg)	
Inch	mm		a	z	Galv.	Black
½	15	1233004	43	30	0.065	0.063
¾	20	1233006	48	33	0.105	0.100
1	25	1233007	55	38	0.166	0.165
1¼	32	1233008	60	41	0.240	0.235

*See available finishes.

TUPYBSP fittings are available in a Blackheart (include 31 at the end of the product code) or Galvanized (include 33 at the end of the product code) finish.

THE TUPY UNION ADVANTAGE

PERFECT GEOMETRY

Sealing is provided through a perfectly-positioned spherical zone and an extra-wide taped seat.

BRONZE SEAT

High-quality bronze rings guarantee ideal contact.

DURABILITY

TUPY Unions may be installed and reinstalled again and again while offering complete protection against leaks. Guaranteed seal due to the seat's ideal shape and careful manufacture.



STIFFNESS

Tupy units, once assembled, are essentially unbreakable due to their components innovative design.

RESISTANCE

Each union component is produced using superior quality malleable iron and able to resist pipe stress, vibrations and the use of tools.

PERFORMANCE

Open passage free of pockets and recesses, allows for an even flow and prevents harmful deposits from forming.

In addition to its diverse line of fittings, TUPY also makes seven different types of joints available on the consumer market.

- UNION FLAT SEAT
- UNION TAPER SEAT
- UNION SINGLE BRASS SEAT
- ELBOW UNION TAPER SEAT

GENERAL INFORMATION ON ISO 7-1 THREAD FITTINGS LINE (BSP)

UNIONS

Unions are essential components of threaded pipes, as they allow networks to be closed when necessary (e.g. by-pass, inspection assemblies, grid networks, etc.), in addition to making it possible, once joints are installed, to carry out maintenance, assembly and reassembly of equipment (pumps and valves) and straight stretches of pipe.

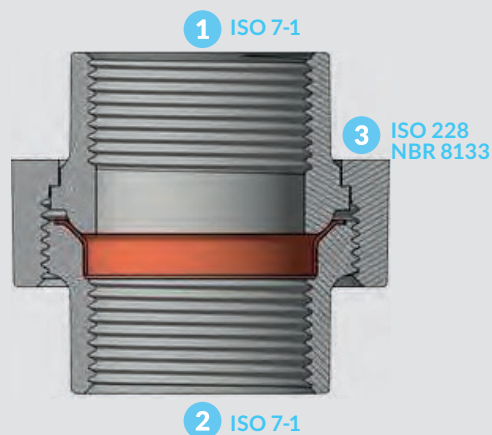
Unions comprise three components, as shown to the right: Nipple (1), Coupling (2) and Nut (3). The union and nut's threads are used as coupling (tightening only) and do not perform a sealing function.

TUPYBSP unions are manufactured with three types of "Seats", which refers to regions of contact between the nipple and the coupling. These regions are exclusively sealed by tightening parts using the nut. TUPYBSP offers the following types of unions:

1. Union w/Conical Copper/Iron Seat (or "Bronze Seat Union")
2. Union w/ Tapered Iron/Iron Seat (or "Iron Seat Union")
3. Flat Seat Union

Unions are difficult to be built and involving several machining points and with a need for careful alignment between parts. Since unions are fitted with have three sealing locations - on the two threads that receive the ends of the pipe, as well as the seat - the use of quality components becomes even more central.

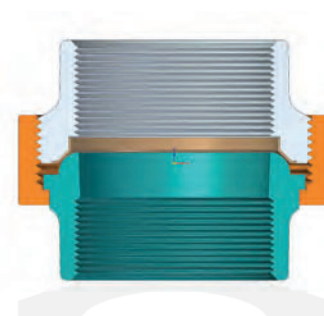
Like the company's remaining fittings, TUPY Unions are designed for application in a range of fluids, such as: water (hot and cold), steam, fuels (liquid and gaseous), hydraulic oils, compressed air and other applications. For working pressures and temperatures, see Tables 2 and 3 on page 22.



UNION CHARACTERISTICS:

1. UNION W/TAPERED COPPER/IRON SEAT (OR "UNION BRASS SEAT")

- This union's seat is made from copper (99.9%), which guarantees a consistent seal and is free of alloys that are harmful to human health, such as lead.
- Due to their spherical shape, Union Brass Seat allows for angular adjustment between the coupling seat (copper side) and the nipple spherical iron).
- This configuration allows for angular movements of up to 6° between the two ends.
- The components used in copper seat unions (as shown in the figure to the right) ARE NOT INTERCHANGEABLE between parts.
- If these union fittings are reused, their sealing is guaranteed as long as they are not scratched and/or cones are not warped



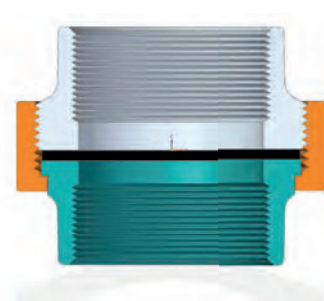
2. UNION W/TAPERED IRON/IRON SEAT (OR "UNION TAPER SEAT")

- Due to its advanced iron/iron conical shape, Tupy's Unions Taper Seat do not allow angular adjustments to be made between the coupling and the nipple.
- The components used in Unions Taper Seat ARE NOT INTERCHANGEABLE between parts.
- The reuse of these unions is not recommended by TUPY. Watertightness is therefore not guaranteed.
- Tupy's UnionsTaperSeat offers an attractive cost-benefit.



3. FLAT SEAT UNION

- The standard sealing gasket used in Tupy's Flat Seat Unions are produced using hydraulic cardboard, known as Nitripack.
- When applied to vibration systems, this sealing gasket helps dampen vibration, preventing future leaks.
- Due to its flat sealing format, Tupy's Flat Seat Unions do not allow angular adjustments to be made between the coupling and the nipple.
- Union components ARE INTERCHANGEABLE between parts.
- If flat unions are reused, TUPY recommends changing the sealing gasket to ensure a continued high level of performance.



NOTES

Tupy's Flat Seat Unions can be used with other sealing gaskets, such as those made from NBR rubber. If NBR rubber gaskets are used, the maximum torque does not need to be applied during sealing.

Please contact TUPY's Application and/or Product Engineering with questions and concerns regarding other types of seals.

GASKETS USED IN FLAT SEAT UNIONS

1. HYDRAULIC CARDBOARD GASKET

Description: hydraulic cardboard gasket containing aramid fiber, reinforcement filler and NBR rubber.

LIMITS OF USE:

Temperature during continuous use: up to 240°C

Pressure during continuous use: up to 50 bar

Service standard: ASTM F104 - F712120E22 -M5

2. NBR RUBBER GASKET (NITRILE OR BUNA-N)

Description: synthetic rubber gasket formed through polymerization of Butadiene with Acrylonitrile. The term Buna-N refers to Butadiene and Nitrium, the raw material and catalyst used in the original process, respectively. Buna-N may be vulcanized using organic sulfur or peroxides.

APPLICATIONS:

NBR Rubber offers excellent chemical resistance, particularly to oils and fuels derived from petroleum, vegetable and animal oils, water, gases and alcohols. It also presents excellent physical characteristics such as a low level of permanent deformation and high shear strength and abrasion resistance.

LIMITS OF USE:

Temperature during continuous use: -40 to +135°C

Hardness (Shore A): 40 to 90 points

Service standard: ANSI/ASTM D1418

LIMITATIONS:

NBR Rubber Must never come into contact with highly polarized solvents such as acetone and M.E.K. and chlorinated and nitro hydrocarbons. Direct contact with ozone and sunlight must also be avoided.

Minimum sealing torque in Unions Single Brass Seat and Union Taper Seat

NOMINAL PIPE SIZE (NPS)	MIN. TORQUE (N.M)
½" and ¾"	65
½" and 1"	125
1¼" and 1½"	185
2" and 3"	245
4"	300
5"	700
6"	800

Shear strength in Unions Single Brass Seat, Union Taper Seat and Union Flat Seat

NOMINAL PIPE SIZE (NPS)	SHEAR STRENGTH (KGF)
¼"	1.723
¾"	2.406
½"	3.487
¾"	4.802
1"	7.026
1¼"	9.657
1½"	11.706
2"	13.603
2½"	15.877
3"	18.141
4"	22.678
5"	28.347
6"	35.434

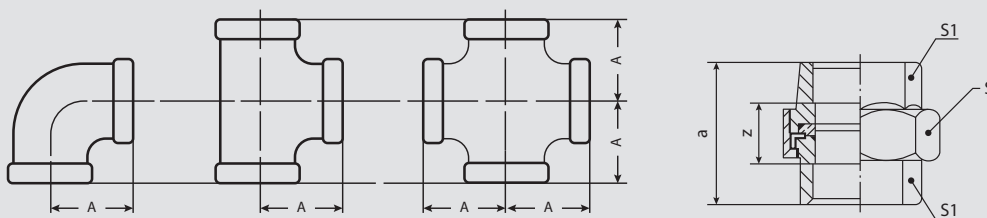
ASSEMBLY LENGTH FOR PIPING (FITTING X FITTING PIPE X FITTING) WITH TUPYBSP

MEASUREMENT "Z"

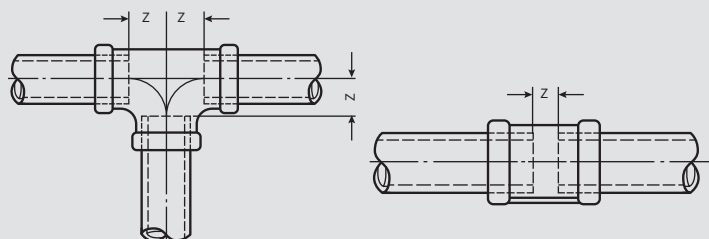
It is essential that installers and designers determine the exact lengths of pipes that comprise a hydraulic system since the accurate assembly of a given piece of equipment is nearly always required. In a pump room, for example, in which closed networks and a large number of fittings are installed along short stretches, determining the exact length of pipes prevents large-scale errors in assembly, both in terms of aesthetics, with angles that different from designs, and technical aspects, which can lead to increased mechanical forces being applied to parts and fittings.

The tables on pages 26 to 34 nearly always include two basic fitting measurements, measurement "A" (or "a") and "Z".

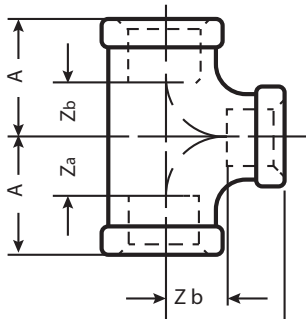
Measurement "A", which is referred to as a construction measurement, is taken between one of the fitting's faces and the axis of the opposing face, in the case of Elbows, Tees and Cross; or between the fitting's two faces in the case of Socket, Nipples and Unions.



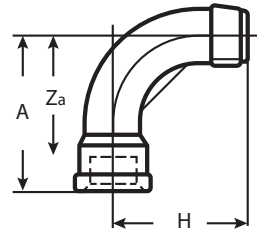
Measurement "Z" is the most specific taken during assembly, as it refers to the distance, in mm, between the pipe's (or fitting's) threaded end and the center of the fitting to be assembled. In certain cases, such as those involving the use of Socket and Unions, "Z" refers to the distance between the pipes' two threaded ends.



NOTES:

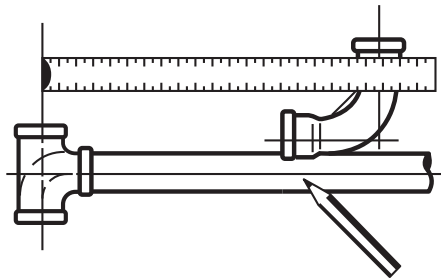
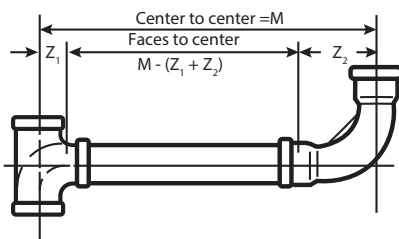


Whenever a part's basic dimensions differ from one another, in cases in which a Reducing Tee is used, for example, constructive dimensions are generally sequentially referred to as "A", "B" and "C", incorporating the letters "Z": "Za", "Zb" and "Zc" into dimensions.

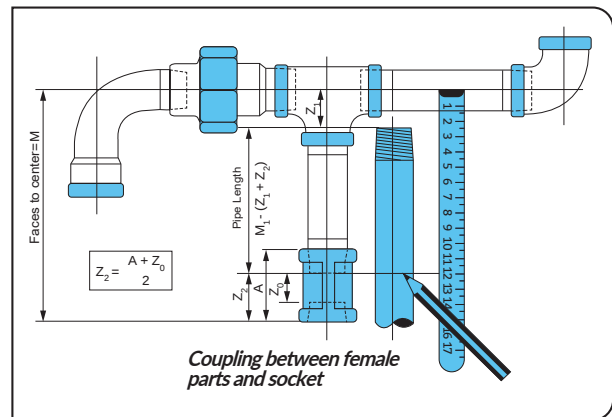
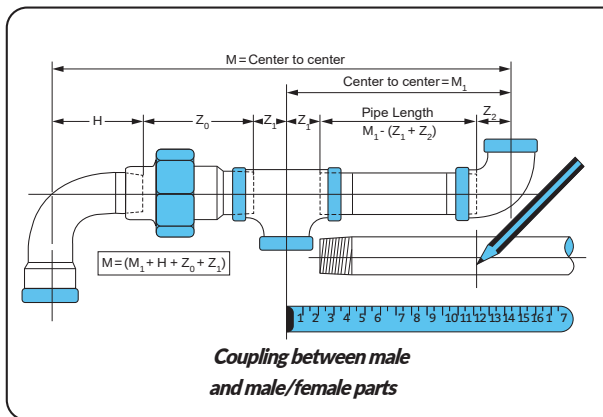


When one end of a fittings has an internal thread (female) and the other an external thread (male), this other basic dimension ceases to carry the letter "A" and is assigned the letter "H". This results in the following configuration: Measurement "H" refers to that taken between the external thread's face and the axis on the face fitted with an internal thread. Measurement "A" is taken between the internal thread's face and the axis on the face fitted with an external thread.

Method used to determine assembly length.



To determine a pipe's assembly length, subtract the "Z" measurements taken from the tables for each fitting from the center-to-center distances between fittings.



Example 1- Determine measurement M and the pipe length (Lp) in the above assembly, considering M1 = 300mm and a diameter of 1 1/2".

Tube length 1 (Lp1): $Lp1 = M1 - (Z1 + Z2)$
 $M = M1 + Z1 + Za + H$, in which,
 $Z1 = \text{Tee } 1\frac{1}{2}" \text{ measurement} = 31\text{mm}$
 $Z2 = \text{Elbow } 1\frac{1}{2}" \text{ measurement} = 31\text{mm}$
 $Za = \text{Union } 1\frac{1}{2}" \text{ measurement} = 32\text{mm}$
 $H = \text{Elbow } 1\frac{1}{2}" \text{ measurement} = 65\text{mm}$
 $Lp1 = 300 - (2 \times 31) \rightarrow \mathbf{Lp1 = 238\text{mm}}$
 $M = 300 + 31 + 32 + 65 \rightarrow \mathbf{M = 428\text{mm}}$

Example 2 - In the same assembly above, considering that a second pipe and a Socket will be added, calculate the length of this additional pipe. The Socket's lower face must be positioned 250mm from the horizontal axis (M1). See the above figure.

$M1 = Lp2 + Z1 + Z2$
 $Z2 = Za + (A - Za)/2 \wedge Z2 = (Za + A)/2$
 in which, $Z1 = \text{Tee measurement } 1\frac{1}{2}" = 31\text{mm}$
 $Za = \text{Coupling measurement } 1\frac{1}{2}" = 17\text{mm}$
 $A = \text{Coupling measurement } 1\frac{1}{2}" = 55\text{mm}$
 $Z2 = (17 + 55)/2 \rightarrow Z2 = 36\text{mm}$
 $250 = Lp2 + 31 + 36 \rightarrow \mathbf{Lp2 = 183\text{mm}}$

CVALUES

Another way of calculating pipe lengths involves the use of fittings' construction Assembly Lengths (C) based on their respective diameters. Such measurements merely refer to values for "A" being subtracted from values for "Z", and represent a constant in each diameter.

To calculate length using AL measurements, the distance between fittings' faces (and not between axes) must be added to the LA for each fitting's coupled to the pipe. See Table 6 below:

Table 6 - Assembly Lengths (C)

NOMINAL PIPE SIZE (NPS)	C (mm)
¼"	10
⅜"	10
½"	13
¾"	15
1"	17
1¼"	19
1½"	19
2"	24
2½"	27
3"	30
4"	36
5"	40
6"	40

Schematic drawing

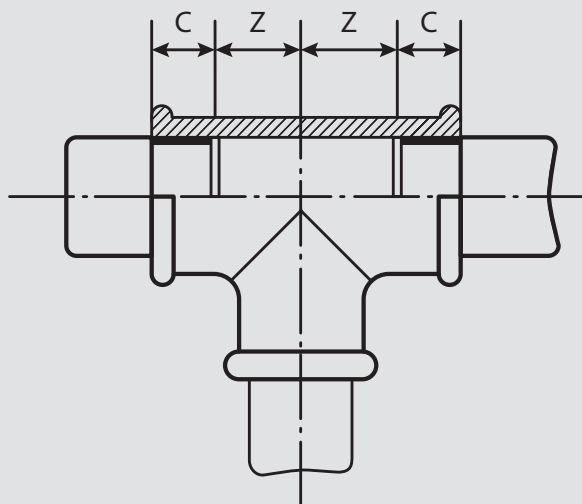


Table 7 - Fitting Structural Tolerances

NOMINAL PIPE SIZE (NPS)	Tolerance (mm)
≤ 30	± 1.5
> 30 ≤ 50	± 2.0
> 50 ≤ 75	± 2.5
> 75 ≤ 100	± 3.0
> 100 ≤ 150	± 3.5
> 150 ≤ 200	± 4.0
> 200	± 5.0

Fittings' face-to-face, face-to-center and center-to-center dimensions must comply with the recommendations presented in the figures on pages 26 to 34. Structural tolerance, however, must be established according to table 7 on the left side of the page.

Such tolerances will also take precedence when calculating pipe assembly lengths.

THREAD TURN IN TUPYBSP FITTINGS

BSP THREAD TORQUE			
NOMINAL SIZE	MINIMUM THREAD TURN (N° OF TURNS)	TIGHTENING MAXIMUM THREAD TURN (No OF TURNS)	PIPE WRENCH LENGTH
¼ to ¾	1½	2¾	6"
1 to 1¼	1½	2¾	8"
1½	1½	2¾	10"
2	2	3¾	12"
2½	2½	4	14"
3	2½	4	18"
4	3	4½	24"
5	3½	5	36"
6	3½	5	48"

Note: seal is not obtained through excessive tightening.

SAMPLE INSTALLATIONS

It is common that pipe installation professionals are not familiar with the complete line of types, models and accessories available on the fittings markets. For this reason, the cost of installation often increases with complex assemblies.

Examples of these assemblies are provided on the right side of the page, together with an indication of the respective correct solution. These charts serve as a guide for selecting the appropriate fitting for each case.

It is important to noted that in certain situations, assemblies that would initially be considered incorrect may be acceptable, such as cases in which diameter reducing bush are used. Under such conditions, including when it is necessary to position two or more parts, this may be the only allowable solution, as it is commercially impractical to manufacture special fittings for conditions that do not frequently occur. Preparing a special part, or a part that is not commonly used, is likely most costly than using of a greater number of parts that are normally produced.

PROJECT RECOMMENDATIONS

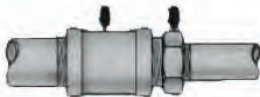
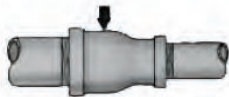
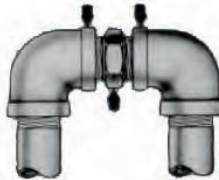
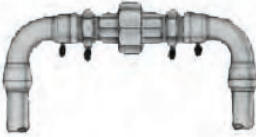
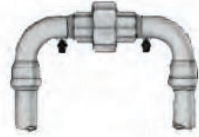
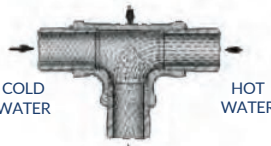
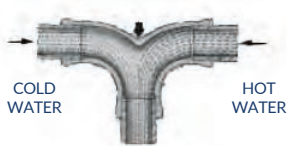
Metallic piping is widely used in the rapid and economical transport of fluids, both within industrial settings and residential areas, and in transporting fluids across large distances.

With the diverse range of available fittings and pipes, well executed piping can be used to transport any kind of fluid, pastes, and liquids, whether containing suspended solids or not and are capable of withstanding a series of pressure and temperature variations.

In order for the piping to fulfill its intended purpose, a number of factors must be considered that are capable of altering its performance. Given that it is usually more difficult to repair an error (for example, having to open a wall or ditch), it is essential that a complete study of the circumstances to which the project in question may be submitted be carried out, from an economic perspective.

As a result, whenever piping is designed, we must take the various aspects that can influence the preparation of works and that deserve special care into account, from among which the following may be highlighted:

1. When choosing specific piping, the temperature, pressure, fluid to be transported, corrosion, shocks, fatigue, etc. must be taken into account;
2. Piping elevation dimensions must be established and the height of the equipment to be transposed ordered;
3. Determine the appropriate distance between supports and racks;
4. Give preference to the positioning of bypasses, valves, traps and concentrated loads positioned near supports;
5. Account for the use of unions and closing valves, which are essential to repairs and line sectioning;
6. Provide unit with flexibility to ensure that forces generated by dilations are absorbed;
7. Use roller supports in cases involving excessive friction;
8. Vibrations may be prevented through the use of expansion joints, dampers or anchors;
9. Guides must be used to align piping;
10. Verify the appropriate depth of underground piping, ensuring that it is positioned at the appropriate depth, taking the weight of the surrounding earth and pavement, vehicle and passenger traffic, as well as other factors that may cause excessive loads into account;
11. When designing the piping, use the selected gauge in scale together with all elements necessary for its operation;
12. Carefully assemble piping to prevent residual stresses.

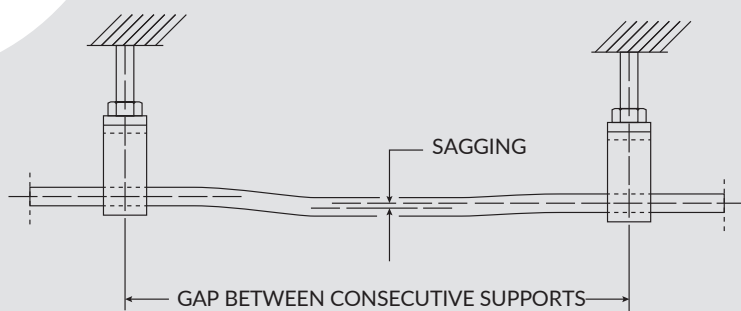
NOT RECOMMENDED	RECOMMENDED
 REDUCER WITH BUSH AND SOCKET	 REDUCING SOCKET
 RETURN WITH ELBOW AND NIPPLE	 RETURN CURVE
 RETURN WITH NIPPLES AND LONG SWEEP BENDS	 RETURN WITH LONG SWEEP BENDS
 TEE OF HYDRANT CONSISTING OF NIPPLES AND REDUCING BUSHES	 INDUSTRIAL TEE OF HYDRANT
 COLD WATER HOT WATER MIXTURE MIXTURE OF HOT AND COLD WATER WITH THE USE OF TEE	 COLD WATER HOT WATER MIXTURE MIXTURE OF HOT AND COLD WATER WITH THE USE OF TWIN ELBOW

PIPING SUPPORTS AND RACKS

A key factor in pipe installation involves sagging resulting from excessive distance between supports.

Excessive sagging results in technical and economic issues since, in addition to applying force to connections between pipes, whether threaded, flanged or welded, it causes leaks, interruptions and costly repairs. Sagging in pipes causes pockets of liquid to form that are impossible to drain, causing vibrations along the line, in addition to negatively affecting the unit's appearance.

The following figure below illustrates sagging in a pipe segment stretching between 2 supports.



Given the above-mentioned issues and considering the provided simplicity and consequent reduction in construction costs, it is recommended that installations be as straight as possible, allowing spans between supports to be standardized. In general terms, maximum allowable sagging is established depending on the area of use.

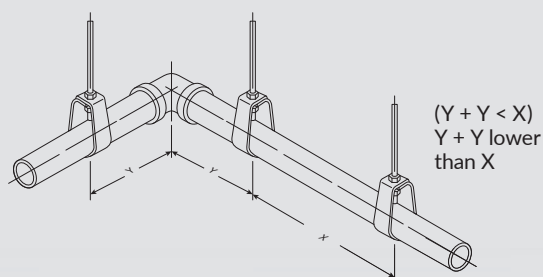
In practice, spans provided in tables prepared by several authors that have previously defined results by direct calculation or experimentation are generally adopted. For example, a table is provided corresponding to the spacing between spans installed in carbon steel pipes manufactured according to NBR 5580 - class M (previously DIN-2440) and with threads and sockets designed for use with gas or water, when installed in industrial areas.

NOMINAL PIPE SIZE	GAP IN METERS	WEIGHT OF PIPE WHEN FILLED WITH WATER km/m	SAGGING mm
¼	2.00	0.670	6.0
½	2.30	0.923	6.0
¾	2.60	1.445	6.0
1	3.00	1.985	8.0
1 ¼	3.50	2.993	8.0
1 ½	3.80	4.145	8.0
2	4.00	5.196	8.0
2 ½	4.80	7.365	10.0
3	5.00	10.218	10.0
4	5.50	13.368	10.0
	6.50	20.166	10.0

Outside industrial settings maximum sagging of 25 mm may be permitted. Maximum sagging of 35mm may be accepted for longer piping not installed in industrial settings.

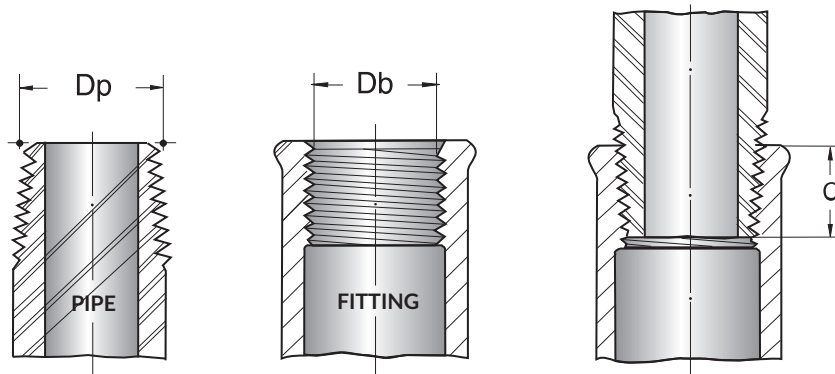
The above table does not consider valves, registers and other accessories other than the fittings themselves, which may represent large loads that are concentrated within piping. It is important to note that supports must be positioned near such loads to distribute forces in a uniform manner.

Additionally, whenever there is a change in direction of flow between two consecutive supports, the spacing between supports must be reduced to compensate for the effects of the resulting break in line continuity.



DETERMINING NOMINAL

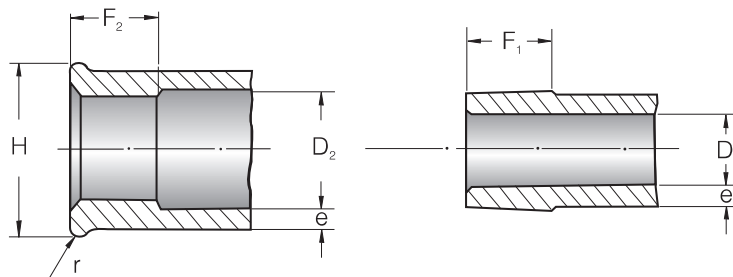
PIPE SIZE BASED ON EFFECTIVE DIAMETER D_p and D_b BSP THREAD



NOMINAL	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3	4	5	6
D_p	12.8	16.3	20.4	25.9	32.6	41.1	47.0	58.6	74.1	86.6	111.4	136.7	162.0	
D_b	11.5	15.0	18.6	24.1	30.3	39.0	44.9	56.7	72.2	84.9	110.1	135.1	160.9	
C	9.7	10.1	13.2	14.5	16.8	19.1	19.1	23.4	26.7	29.8	35.8	40.1	40.1	

Dimensions in mm | L = Usable Thread Length

DIMENSIONS OF BSP FITTINGS



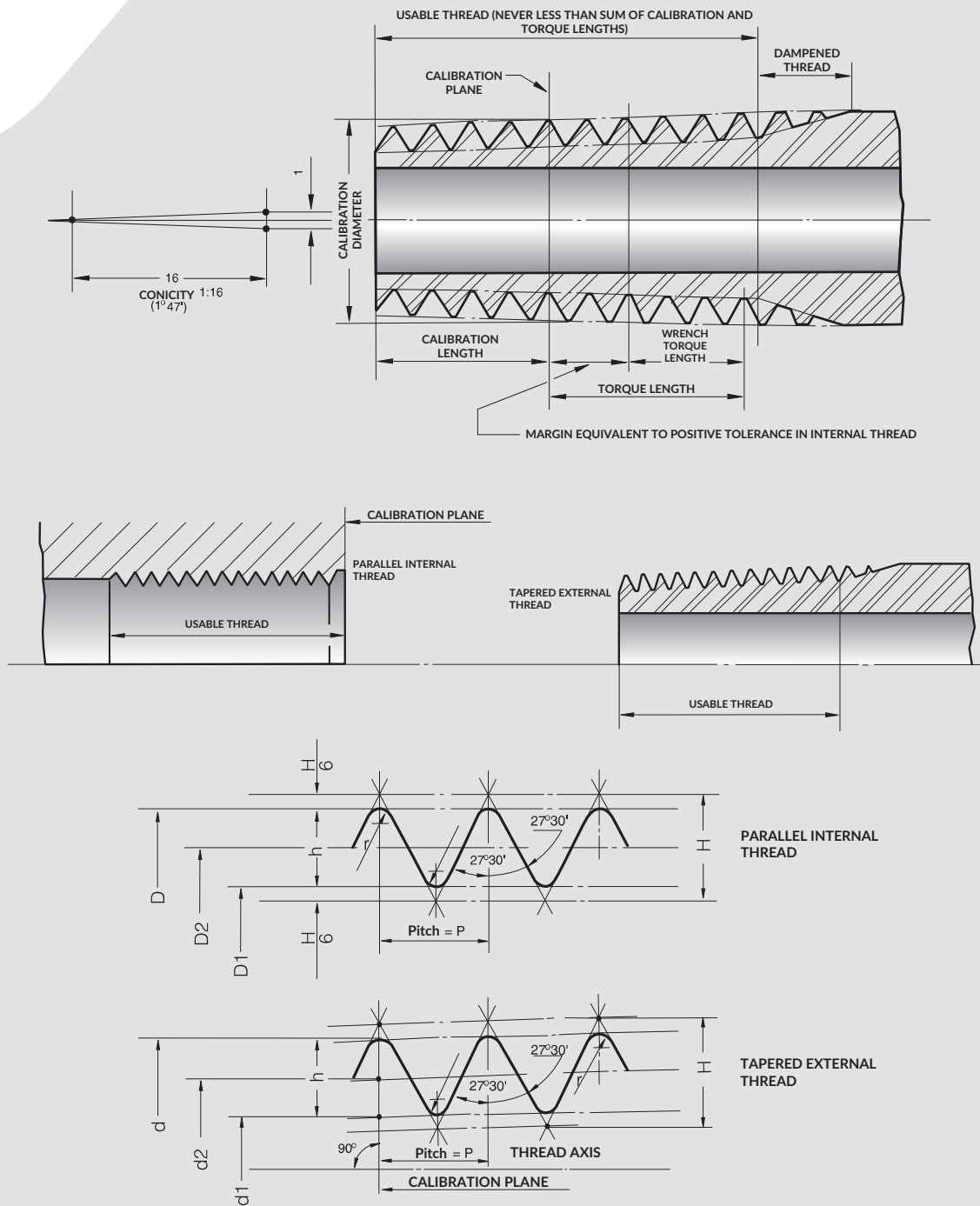
NOMINAL PIPE SIZE	F_1	F_2	D_1	D_2	e	r	H
8 ($\frac{1}{4}$)	11.0	9.7	7.6	11.6	2.0	2.0	19.8
10 ($\frac{3}{8}$)	11.5	10.1	10.9	15.4	2.0	2.0	23.8
15 ($\frac{1}{2}$)	15.0	13.2	14.8	19.6	2.0	2.5	28.6
20 ($\frac{3}{4}$)	16.5	14.5	19.4	25.0	2.2	2.5	34.8
25 (1)	19.0	16.8	25.4	31.4	2.4	3.0	42.6
32 (1 $\frac{1}{4}$)	21.5	19.1	33.5	40.4	2.8	3.0	52.0
40 (1 $\frac{1}{2}$)	21.5	19.1	39.0	46.2	3.0	3.5	58.6
50 (2)	26.0	23.4	50.2	58.2	3.2	3.5	71.6
65 (2 $\frac{1}{2}$)	30.5	26.7	65.3	73.8	3.4	4.0	88.0
80 (3)	33.5	29.8	76.8	86.6	3.8	4.0	102.4
100 (4)	39.5	35.8	99.6	111.8	4.4	4.5	130.6
125 (5)	43.5	40.1	122.8	137.2	5.2	4.5	160.0
150 (6)		40.1			6.0		

Note: Dimensions are provided merely as a reference. Dimensions in mm.

BSP PIPE THREADS

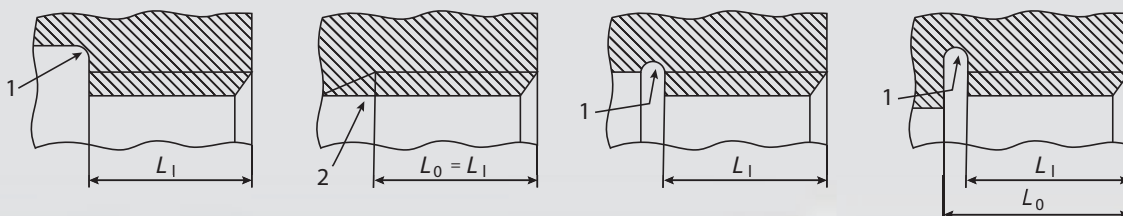
(WITHWORTH GAS)

ACCORDING TO ABNT NBR NM ISO 7-1



INTERNAL THREAD WITH OPEN OUTLET

In which, L_0 = usable thread length + damping thread and L_1 = usable thread length.



BSP THREAD TABLE

(WITHWORTH GAS)

ACCORDING TO ABNT NBR NM ISO 7 1

1	2	3	4	5	6	7	8	9	10	11 8 + 9	12 8 - 9	13	14	15 8 + 18	16 11 + 18	17 12 + 18	18	19	
Designa- tion (NPS)	Qty. of crests for each 25.4 (mm)	Pitch	Crest height	Calibration plane diameter (basic)			Length and calibration tolerance in external thread				Positioning of calibration plane along internal thread			Minimum usable thread length at pipe end (B)				Torque thread length	
				Largest diam. d = D (mm)	flank d ₂ = D ₂ (mm)	Smallest diam. d ₁ = D ₁ (mm)	Basic (mm)	Relief + or - T½	Maximum	Minimum	Relief + or - T½(A)		Basic (mm)	Calibration length					
											≡ (mm)	Turns		(mm)	Turns	≡ (mm)	Minimum (mm)	Turns	≡ (mm)
⅛	28	0.907	0.581	7.723	7.142	6.561	4.0	0.9	1	4.9	3.1	1.1	1¼	6.5	7.4	5.6	2.5	2¼	
⅜	28	0.907	0.581	9.728	9.147	8.566	4.0	0.9	1	4.9	3.1	1.1	1¼	6.5	7.4	5.6	2.5	2¼	
¼	19	1.337	0.856	13.157	12.301	11.445	6.0	1.3	1	7.3	4.7	1.7	1¼	9.7	11.0	8.4	3.7	2¼	
⅜	19	1.337	0.856	16.662	15.806	14.950	6.4	1.3	1	7.7	5.1	1.7	1¼	10.1	11.4	8.8	3.7	2¼	
½	14	1.814	1.162	20.955	19.793	18.631	8.2	1.8	1	10.0	6.4	2.3	1¼	13.2	15.0	11.4	5.0	2¼	
¾	14	1.814	1.162	26.441	25.279	24.117	9.5	1.8	1	11.3	7.7	2.3	1¼	14.5	16.3	12.7	5.0	2¼	
1	11	2.309	1.479	33.249	31.770	30.291	10.4	2.3	1	12.7	8.1	2.9	1¼	16.8	19.1	14.5	6.4	2¼	
1¼	11	2.309	1.479	41.910	40.431	38.952	12.5	2.3	1	15.0	10.4	2.9	1¼	19.1	21.4	16.8	6.4	2¼	
1½	11	2.309	1.479	47.803	46.324	44.845	12.7	2.3	1	15.0	10.4	2.9	1¼	19.1	21.4	16.8	6.4	2¼	
2	11	2.309	1.479	59.614	58.135	56.656	15.9	2.3	1	18.2	13.6	2.9	1¼	23.4	25.7	21.1	7.5	3¼	
2½	11	2.309	1.479	75.184	73.705	72.226	17.5	3.5	1½	21.0	14.0	3.5	1¼	26.7	30.2	23.2	9.2	4	
3	11	2.309	1.479	87.884	86.405	84.926	20.6	3.5	1½	24.1	17.1	3.5	1¼	29.8	33.3	26.3	9.2	4	
4	11	2.309	1.479	113.030	111.551	110.072	25.4	3.5	1½	28.9	21.9	3.5	1¼	35.8	39.3	32.3	10.4	4½	
5	11	2.309	1.479	138.430	136.951	135.472	28.6	3.5	1½	32.1	25.1	3.5	1¼	40.1	43.6	36.6	11.5	5	
6	11	2.309	1.479	163.830	162.351	160.872	28.6	3.5	1½	32.1	25.1	3.5	1¼	40.1	43.6	36.6	11.5	5	

A) Clearance in the parallel thread diameters must total 1/16 of the values presented in column 13.

B) The design of internally threaded parts must allow pipe ends to be adjusted to the lengths provided in column 16; the minimum usable thread length must not be less than 80% of the values included in column 17.

ISO 7-1 MEASUREMENT OF THREAD CALIBRATION PLANE (BSP)

INTERNAL THREAD (FEMALE THREAD)

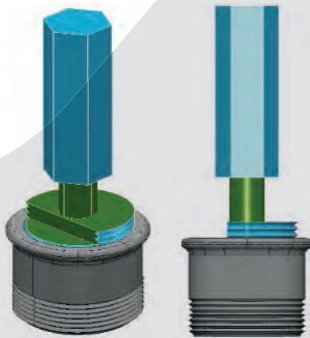


Figure 1 - Minimum CP

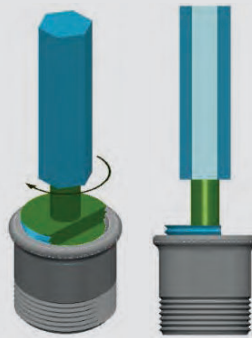


Figure 2 - Nominal CP

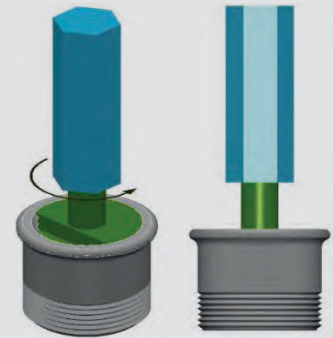


Figure 3 - Maximum CP

Verify calibration plane in INTERNAL THREAD using a PLUG GAUGE for gauges between 1/4" and 2". A tolerance of - 3/4 até +1 3/4 turns is provided.

1. **Establishing minimum calibration plane:** insert gage into the part until its groove is flush with the part's surface, through which a total -3/4 turn will be provided as shown in Figure 1.
2. **Establishing nominal calibration plane:** rotate the gage a +3/4 turn from the minimum plane, as shown in Figure 2.
3. **Establishing maximum calibration plane:** rotate the gage a +1 3/4 turn from the nominal plane, as shown in Figure 3.

Verifying INTERNAL THREAD's calibration plane using a PLUG GAUGE for gauges between 2 1/2" and 6". A tolerance of -1 to +2 turns is provided.

1. **Establishing minimum calibration plane:** insert gage into the part until its groove is flush with the part's surface, through which a total -1 turn will be provided as shown in Figure 1.
2. **Establishing nominal calibration plane:** rotate gage a +1 turn from the minimum plane, as shown in Figure 2.
3. **Establishing maximum calibration plane:** rotate gage +2 turns from the nominal plane, as shown in Figure 3.

Note: beginning with the maximum calibration plane it will no longer be possible to determine the total number of turns since they will become parallel in relation to the part's thread. This will indicate that the part's calibration plane exceeds the established maximum plane.

EXTERNAL THREAD (MALE THREAD)

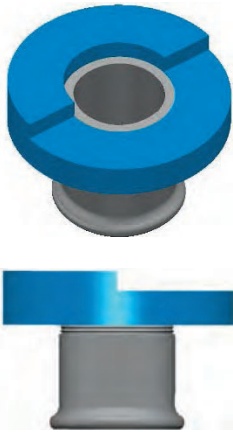


Figure 4 - Minimum CP

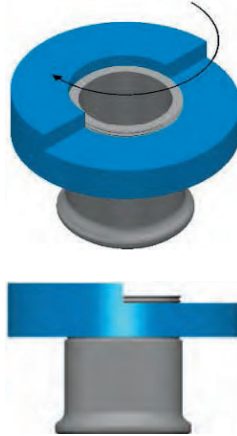


Figure 5 - Nominal CP

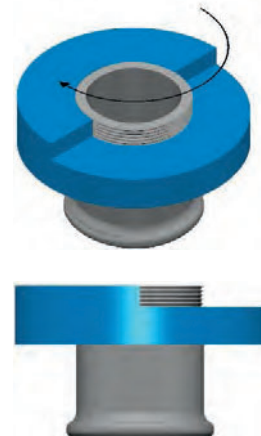


Figure 6 - Maximum CP

Verifying EXTERNAL THREAD's calibration plane using a PLUG GAUGE for gauges between 1/4" and 2". A tolerance of -1 to +1 turns is provided.

1. **Establishing minimum calibration plane:** insert gage into the part until the gage's groove is flush with the part's face, through which a total -1 turn will be provided as shown in Figure 4.
2. **Establishing nominal calibration plane:** rotate gage a +1 turn from the minimum plane, as shown in Figure 5.
3. **Establishing maximum calibration plane:** rotate gage a +1 turn from the nominal plane, as shown in Figure 6.

Verifying EXTERNAL THREAD's calibration plane using a PLUG GAUGE for gauges between 2 1/2" and 6". A tolerance of -1 1/2 to +1 1/2 turns is provided.

1. **Establishing minimum calibration plane:** insert gage into the part until the gage's groove is flush with the part's face, through which a total -1 1/2 turn will be provided as shown in Figure 4.
2. **Establishing nominal calibration plane:** rotate gage a +1 1/2 turn from the minimum plane, as shown in Figure 5.
3. **Establishing maximum calibration plane:** rotate gage a +1 1/2 turns from the nominal plane, as shown in Figure 6.

ISO 228-1 THREAD (BSP-P)

Parallel thread built for use in mechanical connections between threads, in which parts are sealed using a sealing gasket. Parallel threads are controlled under the GO - NOT GO gauge system, as follows:

"GO" SIDE

The GO thread gage must be threaded manually, without applying excessive force, throughout the entire length of the thread. If the gauge is not completely threaded, it will not meet specifications.

NOT "GO" SIDE

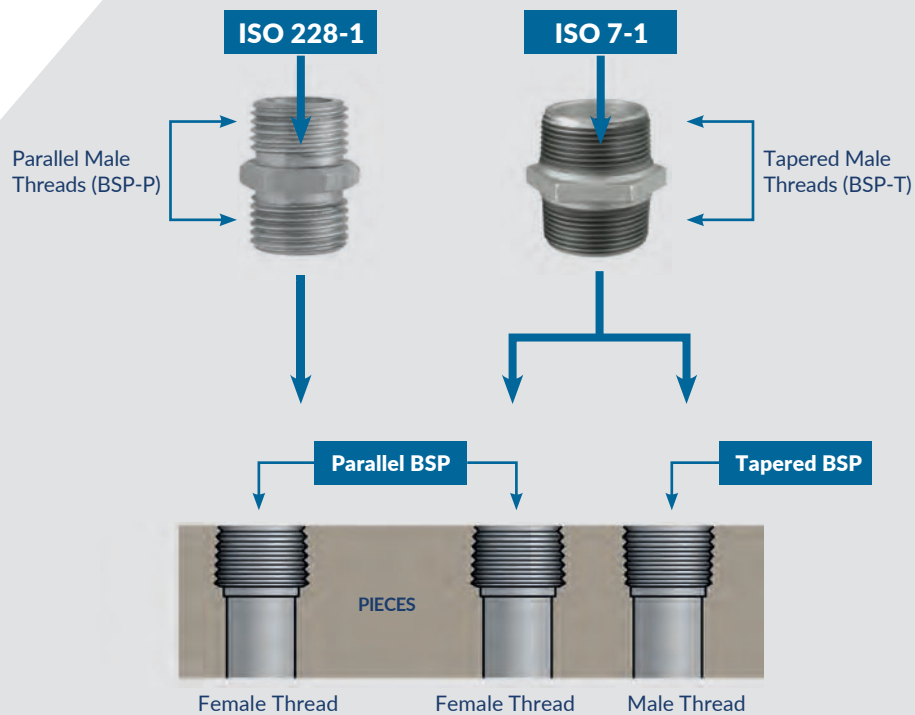
The NOT GO thread gage must be threaded manually, without applying excessive forcing onto the thread, thereby allowing the part to rotate a maximum of two turns. If the gauge is threaded through more than two threads, it will not meet specifications.



Important note for both thread types:

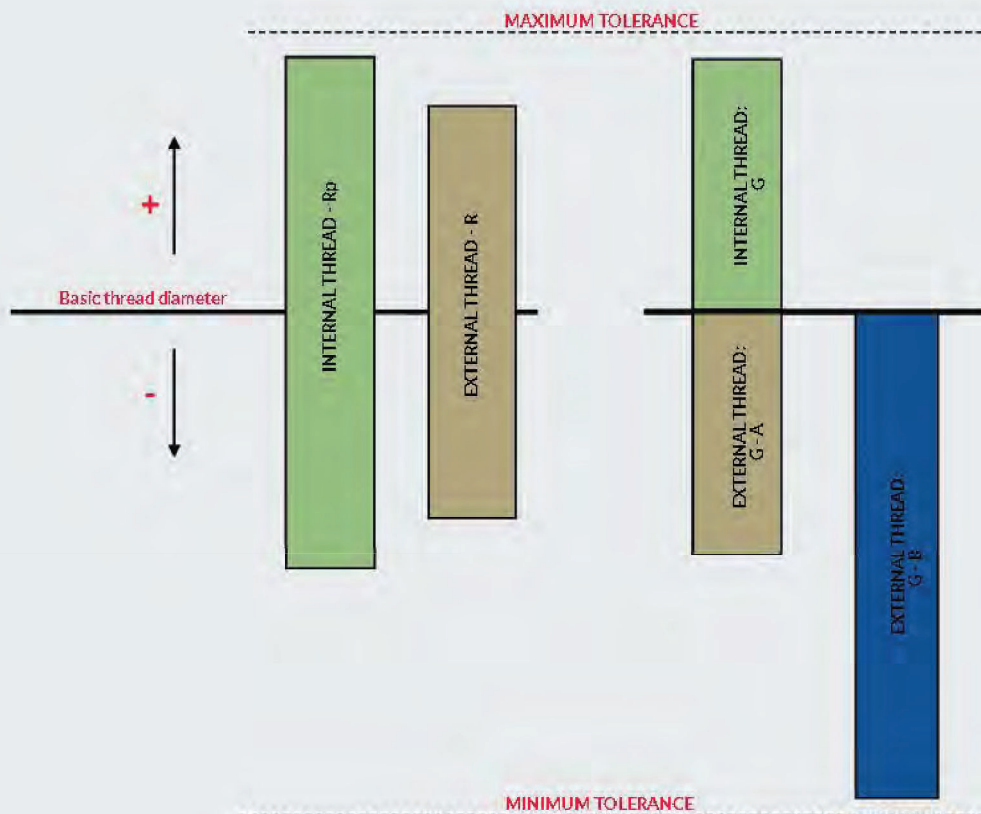
When calibrating the fitting's thread, a light tap is commonly used to ensure that the gage is properly seated in or on the thread. However, it is first necessary to clean both the product's gage and thread so that they are free of chips, burrs, abrasives or other foreign materials.

THREAD COMPARISON: ISO 228-1 (COUPLING) X ISO 7-1 (SEAL)



COMPARATIVE TOLERANCE CHART

ISO 7-1 X ISO 228-1



NOTES

TUPY manufactures ISO 228-1 G-B external threads.

CONDUCTION PIPES

WITH BSP THREAD

CARBON STEEL PIPES FITTED WITH WORTH GAS THREAD FOR USE IN FLUID CONDUCTION ABNT NBR 5580

Welded or Seamless - Zinc Plated or Blackheart

THREAD : BSP according to ABNT NBR NM ISO 7-1.

CLASS : Specifications provide for 3 classes:

- HEAVY (Q)
- MEDIUM (M)
- LIGHT (L).

MATERIAL : Carbon steel.

TEMPERATURE : Recommended temperature of up to 200°C.

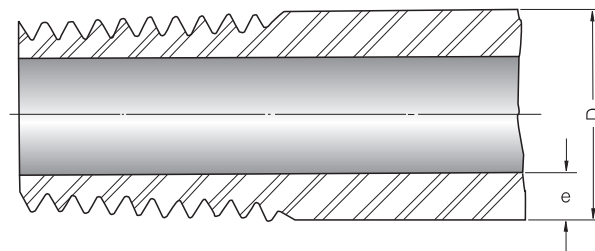
BENDS : Pipes may not be bent or used to form coils.

TOLERANCES : variations due to a lack of pipe (-) that do not exceed a total 12.5% are permitted in the thickness Light, Medium and Heavy class pipe walls.

ZINC LAYER : The weight of the pipe's zinc coating must be equal to or greater than 450g/m² (63 microns).

HYDROSTATIC PRESSURE : Hydrostatic pressure of 50kgf/cm² is expected. Pipes with a thickness of over 2" must be struck near its two ends using a hammer with a weight of approximately 1kg.

DIMENSIONS : See tables on following page.



NOTES

TUPY does not manufacture carbon steel pipes. Pipe data have been included in this catalog for information purposes only.

PIPE DIMENSIONS TABLE

ACCORDING TO ABNT NBR 5580

DIMENSIONS OF STEEL, HEAVY CLASS (P), WELDED AND SEAMLESS PIPES

Outside Diameter (mm)	Nominal Pipe Size		Outside Diameter D (mm)		Wall Thickness (mm)	Theoretical Mass of Blackheart Pipe (kg/m)
	(mm)	(in)	maximum	minimum		
10.2	6	$\frac{1}{8}$	10.6	9.8	2.65	0.49
13.5	8	$\frac{1}{4}$	14.0	13.2	3.00	0.77
17.2	10	$\frac{3}{8}$	17.5	16.7	3.00	1.05
21.3	15	$\frac{1}{2}$	21.8	21.0	3.00	1.35
26.9	20	$\frac{3}{4}$	27.3	26.5	3.00	1.76
33.7	25	1	34.2	33.3	3.75	2.77
42.4	32	$1\frac{1}{4}$	42.9	42.0	3.75	3.57
48.3	40	$1\frac{1}{2}$	48.8	47.9	3.75	4.12
60.3	50	2	60.8	59.7	4.50	6.19
76.1	65	$2\frac{1}{2}$	76.6	75.3	4.50	7.95
88.9	80	3	89.5	88.0	4.50	9.37
101.6	90	$3\frac{1}{2}$	102.1	100.4	5.00	11.91
114.3	100	4	115.0	113.1	5.60	15.01
139.7	125	5	140.8	138.5	5.60	18.52
165.1	150	6	166.5	163.9	5.60	22.03

DIMENSIONS OF STEEL, LIGHT CLASS (L), WELDED AND SEAMLESS PIPES

Outside Diameter (mm)	Nominal Pipe Size		Outside Diameter D (mm)		Wall Thickness (mm)	Theoretical Mass of Blackheart Pipe (kg/m)
	(mm)	(in)	maximum	minimum		
10.2	6	$\frac{1}{8}$	10.4	9.7	1.80	0.37
13.5	8	$\frac{1}{4}$	13.9	13.2	2.00	0.56
17.2	10	$\frac{3}{8}$	17.4	16.7	2.00	0.75
21.3	15	$\frac{1}{2}$	21.7	21.0	2.25	1.05
26.9	20	$\frac{3}{4}$	27.1	26.4	2.25	1.36
33.7	25	1	34.0	33.2	2.65	2.03
42.4	32	$1\frac{1}{4}$	42.7	41.9	2.65	2.63
48.3	40	$1\frac{1}{2}$	48.6	47.8	3.00	3.35
60.3	50	2	60.7	59.6	3.00	4.24
76.1	65	$2\frac{1}{2}$	76.3	75.2	3.35	6.01
88.9	80	3	89.4	87.9	3.35	7.07
101.6	90	$3\frac{1}{2}$	101.8	100.3	3.35	9.05
114.3	100	4	114.9	113.0	3.75	10.22

DIMENSIONS OF STEEL, MEDIUM CLASS (M), WELDED AND SEAMLESS PIPES

Outside Diameter (mm)	Nominal Pipe Size		Outside Diameter D (mm)		Wall Thickness (mm)	Theoretical Mass of Blackheart Pipe (kg/m)
	(mm)	(in)	maximum	minimum		
10.2	6	$\frac{1}{8}$	10.6	9.8	2.00	0.40
13.5	8	$\frac{1}{4}$	14.0	13.2	2.25	0.62
17.2	10	$\frac{3}{8}$	17.5	16.7	2.25	0.83
21.3	15	$\frac{1}{2}$	21.8	21.0	2.65	1.21
26.9	20	$\frac{3}{4}$	27.3	26.5	2.65	1.59
33.7	25	1	34.2	33.3	3.35	2.27
42.4	32	$1\frac{1}{4}$	42.9	42.0	3.35	2.92
48.3	40	$1\frac{1}{2}$	48.8	47.9	3.35	3.71
60.3	50	2	60.8	59.7	3.75	4.71
76.1	65	$2\frac{1}{2}$	76.6	75.3	3.75	6.69
88.9	80	3	89.5	88.0	4.05	7.87
101.6	90	$3\frac{1}{2}$	102.1	100.4	4.25	10.20
114.3	100	4	115.0	113.1	4.50	12.18
139.7	125	5	140.8	138.5	5.00	16.61
165.1	150	6	166.5	163.9	5.30	20.89



TUPY NPT

FITTINGS

Technical Catalog
NPT Line



Your reliable brand



FITTINGS

NPT

APPLICATION AND REGULATORY REFERENCES

TUPYNPT fittings are produced according to ABNT NBR 6925, ASME B16.3, ASME B16.14 and ASME B16.39 standards for general use in transporting fluids such as: hot and cold water, steam, liquid and gaseous fuels, hydraulic oils in general, compressed air, gases in general, etc., up to the pressure and temperature limits specified in the above-mentioned standards. Fittings are provided for use in connections of threaded elements according to NBR 12912 and ASME B1.20.1, in which a pressurized sealing gasket is formed through the thread at rated dimensions of 1/4" up to 6".

Note: In cases in which fittings are used outside specified pressure and temperature conditions, consult TUPY's Application Engineering for assistance.

MATERIAL

Materials used to produce fittings must be made from malleable cast iron in accordance with ABNT NBR 6590 and ASTM A197 standards, and may have a WHITE or BLACK core, according to Table 1 below. Methods used in manufacturing of both malleable irons, in terms of chemical composition and heat treatment, must be left to the discretion of the manufacturer, who is responsible for ensuring compliance with the requirements mentioned in the previous standards. TUPYNPT fittings are produced in class JMB 350-10 BLACK core malleable cast iron.

Table 1 - Malleable Cast Iron Standards

CORE	MATERIAL DESIGNATION	TEST SPECIMEN DIAMETER "D" (MM)	MINIMUM LR SHEAR STRENGTH LIMIT (MPA)	YIELD STRENGTH (0.2%) MINIMUM LE 0.2 (MPA)	MINIMUM ELONGATION IN 3.D AT (%)	BRINELL HARDNESS (HB) GUIDELINES.
White	JMW 350-4	15	360	-	3	-
	JMW 400-5	15	420	230	4	220
Black	ASTM A197	16	275	200	5	-
	JMB 275-5	12 or 15	275	-	5	150
	JMB 300-6	12 or 15	300	-	6	150
	JMB 350-10	12 or 15	350	200	10	150

JMB - Iron Malleable Blackheart - ISO/TR 15931:2004

COATING OR FINISHING

TUPYNPT fittings are produced with a black finish (exclusive use of oil) and hot dip galvanized according to ABNT NBR 6323 and ASTM A153. Both types of fittings are protected using non-toxic oil.

Potability: malleable cast iron fittings can be used in the drinking water network since the substances applied adhere to the parameters contained in the Ministry of Health's Consolidation Ordinance No. 5, of 10/03/17.

Other special coatings, such as Epoxy, Cathaphoresis coating and Hybrid paint, Double Galvanization, etc., may be supplied on request.

DESIGN

All TUPYNPT fittings are designed in accordance with ABNT NBR 6925, ASME B16.3, ASME B16.14 and ASME B16.39 standards. Available fitting types are presented in Table 4. Dimensions are described on pages 57 and 65, (medium and high pressure are shown on pages 58 to 63 and pages 66 to 70, respectively). Provided drawings are schematic, independent of means of manufacturing. TUPYNPT fittings are available in two different Classes, NPT150 (Medium Pressure) and NPT300 (High Pressure). Maximum working and temperature pressures are shown in the table below.

Table 2 - Working Pressures X Temperature in TUPYNPT fittings

TEMPERATURE (°C)	WORKING PRESSURE KGF/CM ² (PSI*)				
	CLASS 150	CLASS 300			
		DN ¼" TO 1"	DN 1¼" TO 2"	DN 2½" TO 6"	UNIONS ¼" TO 4"
-29 to 66	21.1 (300)	140.6 (2000)	105.5 (1500)	70.3 (1000)	42.2 (600)
93	18.6 (265)	125.5 (1785)	94.9 (1350)	64.0 (910)	38.7 (550)
121	15.8 (225)	110.7 (1575)	84.4 (1200)	58.0 (825)	35.5 (505)
149	13.0 (185)	95.6 (1360)	73.8 (1050)	51.6 (735)	32.6 (460)
177	10.5 (150)	80.8 (1150)	63.3 (900)	45.7 (650)	29.2 (415)
204	7.7 (110)	65.7 (935)	52.7 (750)	39.4 (560)	26.0 (370)
232	5.3 (75)	51.0 (725)	42.2 (600)	33.4 (475)	22.8 (325)
260	-	35.8 (510)	31.6 (450)	27.1 (385)	19.7 (280)
288	-	21.1 (300)	21.1 (300)	21.1 (300)	16.2 (230)

* 1 psi = 1 lb/in²

* 1 psi = 0.070307 kgf/cm² or 1 kgf/cm² = 14.2233 psi

Note: NPT Line Classes must not be confused with working pressures. "Class NPT150" or "Class 150" does not refer to a working pressure of 150 psi (lb/in²). The same reasoning may be applied to the "NPT300 Class". Working pressures are shown in the above table. It is important to note that fittings are designed to withstand a minimum factor of 4X the maximum working pressure, as follows:

Table 3 - Maximum Design Pressures (Hydrostatic Test)

TEMPERATURE (°C)	TEST PRESSURE KGF/CM ² (PSI*)				UNION TEST PRESSURE KGF/CM ² (PSI*)	
	CLASS 150	CLASS 300			CLASS 150	CLASS 300
		DN ¼" TO 1"	DN 1¼" TO 2"	DN 2½" TO 6"	DN ¼" TO 4"	DN ¼" TO 4"
-29 to 66	84.4 (1200)	562.4 (8000)	421.8 (6000)	281.2 (4000)	31.6 (450)	63.3 (900)

* 1 psi = 1 lb/in²

* 1 psi = 0.070307 kgf/cm² or 1 kgf/cm² = 14.2233 psi

Note: In order to facilitate the manufacturing process, standards allow manufacturers to incorporate ribs into fittings at their discretion. Ribs must not protrude beyond the edge height. They may also be cylindrical, hexagonal, octagonal or decagonal in shape. Dimensions of the flat faces used to apply wrenches depend on the fittings' design and are provided at the manufacturer's discretion according to manufacturing standards.

THREAD

Sealing threads in TUPYNPT fittings are produced in accordance with ABNT NBR 12912 and ASME B1.20.1 specifications, and coupling threads are manufactured in accordance with ABNT NBR 8133 and ISO 228-1. Other types of threads can be produced on request.

Fitting sealing threads are controlled according to ASME B1.20.1, using ring and plug gages. Usable thread length must be verified using a caliper. See the control method described on page 45.

Fittings that use a coupling thread are controlled according to the ISO 228-2 standard under the Go - No Go system. See the control method described on page 46.

QUALITY TESTS

TUPY's laboratories are capable of performing metallurgical, mechanical, chemical, dimensional, and metrological tests. Tests are performed in accordance with standard specifications, which allows watertightness tests to be carried out before final use in installed networks. TUPY laboratory is accredited under ABNT NBR ISO-IEC 17025 - TESTS. The scope of testing is available at: <http://www.inmetro.gov.br/laboratorios/rble/>. Accreditation number CRL 1543.



QUALITY ASSURANCE SYSTEM *

TUPY fittings are therefore monitored and certified under ISO 9001 and ISO 14000 for quality systems; Inmetro Ordinance No. 160 (of May 9, 2007), via ABNT's certifying body for product manufacturing; and by UL - UNDERWRITERS LABORATORIES, FM Approvals LLC and DVGW - Deutsche Verein des Gas- und Wasserfaches, in accordance with the above-mentioned standards.

*A list of certifications and warranties can be found at the end of this product catalog (page 150).

INSPECTIONS

TUPY's entire manufacturing process is monitored and subject to planning in order to guarantee the manufacturing of high-quality products.

This system is based on procedures contained in ISO 2859, ISO 3951, ABNT NBR 5426 and ABNT NBR 5429. Additionally, processes are analyzed through a statistical study of each process/equipment seeking to provide monitoring over time.

PRODUCT MARKINGS

According to product standards, parts must be marked with at a minimum the following information or an alternative means through the casting process while respecting the following hierarchy:

- Manufacturer - TUPY;
- Gauge - $\frac{1}{4}$ to 6;
- Class - 150 or 300;
- Malleable Iron - MI;
- Brand  ;
- Class 300 - WOG - 1000, WOG - 1500 and WOG - 2000 (WOG: Water, Oil, Gas) and
- Country of origin - BRAZIL

Due to space limitations in fittings, certain parts may omit one or more markings requested in items a. to g. above. However, omitted markings are included on the product's packaging (label).

The following citations under ABNT NBR 6925 standard must be included:

"Note: The process of cleaning fittings through means of shot blasting and the type of surface coating used may reduce the visibility of markings, particularly in gauges less than or equal to 3/8" and reduction gauges less than 1/2".

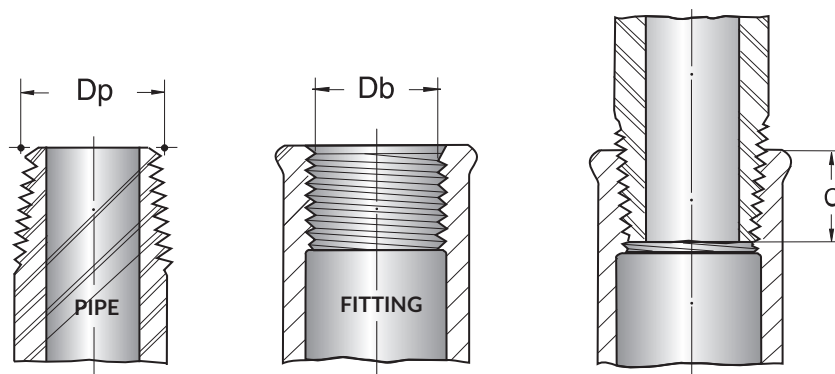
"Manufacturers that present a single design model are exempt from including project symbol markings. Designs must be identified on the product packaging, purchase order, and product catalog".

FITTING DELIVERY CONDITIONS

TUPY reserves the right to introduce any changes to its product lines it deems appropriate in accordance with ABNT NBR 6925, ASME B16.3, ASME B16.14 and ASME B16.39 standards. Weights (g) in this catalog are subject to change without notice. For safety reasons, purchased fittings must comply with the above-mentioned standards and watertightness tests be carried out before final use in installed networks.

DETERMINING NOMINAL

PIPE SIZE BASED ON EFFECTIVE DIAMETER D_p and D_b NPT THREAD



NOMINAL	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3	4	6
D_p	13.3	16.7	20.7	26.0	32.6	41.3	47.4	59.4	71.6	87.4	112.6	166.3
D_b	11.4	14.8	18.3	23.7	29.7	38.5	44.5	56.6	67.6	83.5	108.9	162.7
C	10.2	10.4	13.6	13.9	17.3	18.0	18.4	19.2	28.9	30.5	33.0	38.4

Dimensions in mm | L = Usable Thread Length

NPT PIPE THREADS

ACCORDING TO ANSI B 1.20.1

ANNOTATIONS

$H = 0.866025P = 60^\circ$ height of acute V crest

$h = 0.800000P$ = product crest height

$P = 1/n$ = pitch (measured parallel to axis)

n = number of crests along each 25.40 mm (inch)

$a = 30^\circ$ = crest flank angle

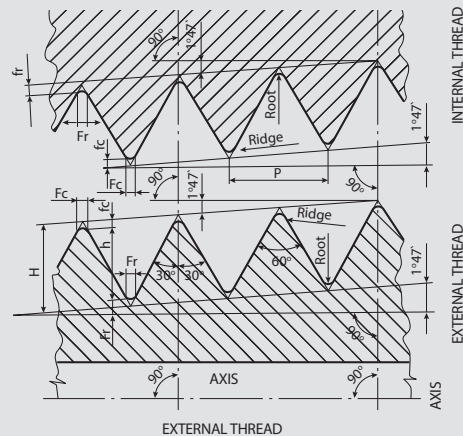
$p = 1^\circ 47' =$ crest taper angle up to 1/16 taper

fc = truncation depth at ridge

fr = root truncation depth

Fc = upper truncation width

Fr = root truncate width

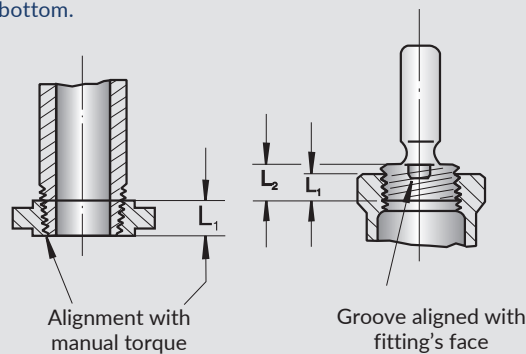


GENERAL NOTE: In parallel thread crests, $H = \text{quot.} a / 2n$. In tapered thread crests, $H = (\text{quot.} a - \tan 2 \beta \tan a) / 2n$. Therefore the exact value under the National American Standard for Taper Pipe Threads $H = 0.865743P$ against the value for $H = 0.866025P$ provided above. The corresponding values for H under this standard's largest tapered thread pitch (8 crests for every 25.40 mm) are 0.108218 and 0.108253 respectively, presenting a difference of 0.000035 inches. Since this difference is too small to be of significance, the value $H = 0.866025p$ remains in use for threads of 0.750 in., or less, taper/foot over diameter.

PRODUCT TOLERANCE

One additional turn in either direction relative to the plug gage's groove or ring gage's face.

Beveled parts, groove aligned with bevel bottom.



BASIC FORMAT UNDER AMERICAN NATIONAL STANDARD FOR TAPE PIPE THREADS

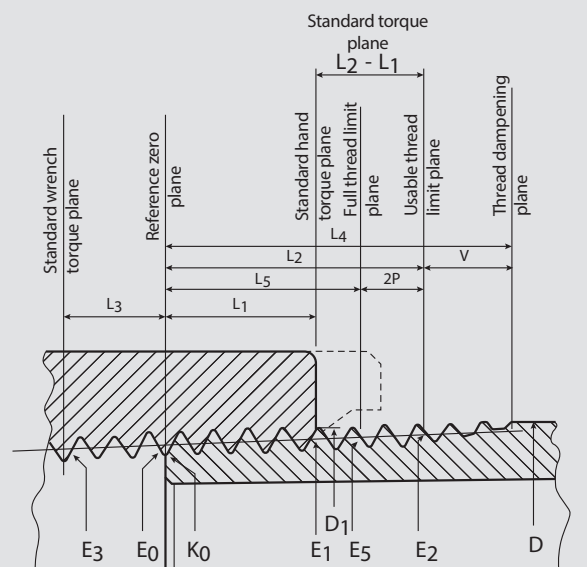


Table 4 - Basic Dimensions of Taper Tube Threads according to American National Standard, NPT (Cont.)

Nominal Pipe Size	Thread Pitch, P		Flank Diameter at Start of External Thread, E0		Manual Tightening Torque			Actual External Thread			Manual Tightening Length = (L2-L1)			Torque Thread Length			Incomplete Thread (or Vanish Thread) V		Total External Thread Length L ⁽⁴⁾ = (L2+V)	Complete Nominal External Thread			Change in Diameter per Turn, 0.0625/n	Smallest Basic Outer Diameter at Small End of KO Pipe ⁽⁶⁾		
	Pipe O.D., D	No. of strands/ inch (25.4mm)	mm	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19		20	21	22			23	24
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
¾	13.7160	18	1.41111122	12.125706	5.7861	4.10	12.487402	10.2057	7.23	12.76350	4.4196	3.13	4.2342	3	11.861038	4.8971	3.47	15.1028	7.3838	12.58722	1.12878	0.08814	10.99566			
¾	17.1450	18	1.41111122	15.545054	6.0960	4.32	15.926054	10.3581	7.34	16.19250	4.2621	3.02	4.2342	3	15.28064	4.8971	3.47	15.2552	7.5362	16.01622	1.12878	0.08814	14.4145			
¾	21.3360	14	1.81428568	19.264122	8.1280	4.48	19.772122	13.5560	7.47	20.11121	5.4280	2.99	5.4432	3	18.924016	6.2967	3.47	19.8501	9.9289	19.88464	1.45136	0.11328	17.81556			
¾	26.6700	14	1.81428568	24.579072	8.6106	4.75	25.117298	13.8608	7.64	25.44521	5.2502	2.89	5.4432	3	24.238966	6.2967	3.47	20.1549	10.2337	25.21864	1.45136	0.11328	23.12924			
1	33.4010	11.5	2.20869561	30.826202	10.1600	4.60	31.461202	17.3431	7.85	31.91027	7.1831	3.25	6.6269	3	30.412182	7.6632	3.47	25.0063	12.9261	31.63418	1.76708	0.13792	29.06014			
1¼	42.1640	11.5	2.20869561	39.551102	10.6680	4.83	40.217852	17.9527	8.13	40.67327	7.2847	3.3	6.6269	3	39.137082	7.6632	3.47	25.6159	13.5357	40.39718	1.76708	0.13792	37.78504			
1½	48.2600	11.5	2.20869561	45.620686	10.6680	4.83	46.287436	18.3769	8.32	46.76927	7.7089	3.49	6.6269	3	45.206412	7.6632	3.47	26.0401	13.9598	46.49318	1.76708	0.13792	43.85564			
2	60.3250	11.5	2.20869561	57.633108	11.0744	5.01	58.325258	19.2151	8.70	58.83402	8.1407	3.69	6.6269	3	57.219088	7.6632	3.47	26.8783	14.7980	58.55792	1.76708	0.13792	55.8673			
2½	73.0250	8	3.17500000	69.076062	17.3228	5.46	70.158864	28.8925	9.10	70.88200	11.5697	3.64	6.3500	2	68.679314	11.0185	3.47	39.9085	22.5425	70.48500	2.54000	0.19837	66.5353			
3	88.9000	8	3.17500000	84.852002	19.4564	6.13	86.06790	30.4800	9.60	86.75700	11.0236	3.47	6.3500	2	84.45500	11.0185	3.47	41.4960	24.1300	86.36000	2.54000	0.19837	82.31124			
4	114.3000	8	3.17500000	110.09325	21.4376	6.75	111.433102	33.0200	10.40	112.15700	11.5824	3.65	6.3500	2	109.69625	11.0185	3.47	44.0360	26.6700	111.76000	2.54000	0.19837	107.55122			
5	141.3002	8	3.17500000	136.92454	23.7998	7.5000	138.411966	35.7200	11.25	139.15720	11.9202	3.75	6.3500	2	136.527794	11.0185	3.47	46.7360	29.3700	138.76020	2.54000	0.19837	134.38378			
6	168.2750	8	3.17500000	163.73069	24.3332	7.66	165.25164	38.4175	12.10	166.13200	14.0843	4.44	6.3500	2	163.333938	11.0185	3.47	49.4335	32.0675	165.73500	2.54000	0.19837	161.1884			

GENERAL OBSERVATIONS

Basic dimensions of taper thread under the American National Standard are provided in inches to a total of four or five decimal places. Although this implies a greater degree of accuracy than that normally obtained, these dimensions are the basis for measurements and are intended to eliminate calculation errors.

NOTES

- (1) L1 also refers to the length of the ring gage measurement and the length of the plug gage measurement groove.
- (2) E1 also refers to the flank diameter of the plug gauge's measuring groove.
- (3) L2 also refers to the plug gauge's total thread length, considering thread crests installed above the groove.
- (4) Reference dimension.
- (5) Length L5, which is measured from the end of the pipe, determines the start of threads with incomplete ridges. The next two thread crests (at a length of 2P) present complete roots and incomplete ridges. L5 therefore = L2 - 2P.
- (6) Information used to select drills (drill bit) for the basic hole used to prepare internal thread.

FITTINGS

NPT

MEDIUM PRESSURE / CLASS 150

NPT FITTINGS - MEDIUM PRESSURE FOR APPLICATION AT UP TO 300 PSI (LB/INCH²) AT ROOM TEMPERATURE.

PRESSURE TABLE

	MAXIMUM WORKING PRESSURE (ACCORDING TO ASME B 16.3)	MAXIMUM UNION WORKING PRESSURE (ACCORDING TO ASME B 16.39)	MAXIMUM WORKING PRESSURE (ACCORDING TO ABNT NBR 6925)
Temperature °C	Nominal Pipe Size ¼ to 6 lb/in ² (psi)	Nominal Pipe Size ¼ to 4 lb/in ² (psi)	Nominal Pipe Size ¼ to 6 MPa (kgf/m ²)
-29 to 66	300	300	2.1 (21)
93	265	265	1.8 (18)
121	225	225	1.5 (15)
149	185	185	1.3 (13)
177	150	150	1.0 (10)
204	-	110	0.7 (7)
232	-	75	0.5 (5)

Note: 1 bar = 14.5 psi • 1 bar = 1 kgf/cm² • 1 bar = 0.1 MPa • 1 psi = 1 lbf/in²

BRANDS

TUPYNPT Medium Pressure fittings, whenever dimensions allow, are engraved with following markings:

- TUPY® brand (except in Nominal Pipe Sizes of ¾ x ¾ x to ¾ x ½ in Reducing Bushings and ¾ and ¾ in Plugs);
- Nominal pipe size;
- The MI (Malleable Iron) monogram, except in Reducing Bushings and Plugs;
- The number 150 (Indicates class), except in Reducing Bushings and Plugs;
- The name BRAZIL (Indicates country of origin);
- The NPT (National Pipe Taper) monogram, exclusively in Reducing Bushings and Plugs;
- The monogram® (Underwriters Laboratories Inc.).

FITTING DESIGNATION

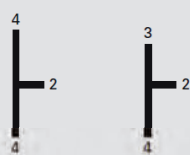
Fittings are given the following denominations:

- Fitting type;
- Reference standard number (ABNT NBR 6925; ASME B16.3, ASME B16.14 and ASME B16.39);
- Model (see Table 4 on page 55);
- Nominal pipe size - NPS (see pages 53 to 55);
- Surface finish - unfinished (black surface) (FE symbol) or hot dip galvanized (ZN symbol) or designation of other finishes to be defined by the manufacturer.

Sample designation:

- Female elbow fitted with two identical holes, black finish
NBR 6925 - 1015 Elbow - 1 ½" - Fe
- Female reducing elbow fitted with two different holes, hot dip galvanized finish
NBR 6925 - 1020R - Reducing elbow 1 ½ x 1" - Zn
- Reducing tee with passage of 1 ½ and 1 branch, hot dip galvanized finish **NBR 6925 - 1065R Reducing Tee - 1 ½ x 1 ½ x 1" - Zn**
- Tee fitted with three identical holes, black finish
NBR 6925 - 1060 Tee - 1 ½ - Fe

Reading sequence for reducing gauges:

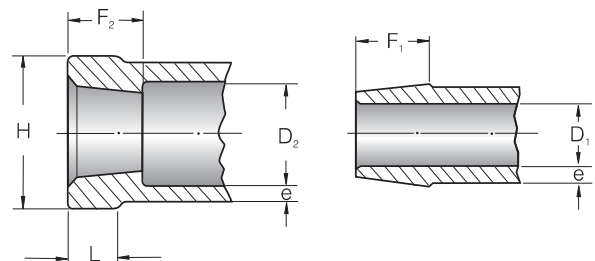


TYPE OF NPT LINE FITTINGS HIGH PRESSURE CLASS 150

1002R	1010	1015	1020R
			
1025	1030	1035	1045
			
1050R	1055	1060	1065R
			
1065R	1068	1070	1090
			

FITTING DIMENSIONS

NPT MEDIUM PRESSURE

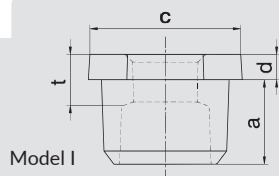


NOMINAL PIPE SIZE	F ₁ (min.)	F ₂ (min.)	D ₁ (max.)	D ₂ (min.)	e	L (min.)	H (min.)
¼	10.2	8.1	6.6	13.7	2.4	5.5	21.4
⅜	10.4	9.1	9.4	17.1	2.5	5.8	25.8
½	13.5	10.9	13.0	21.3	2.7	6.3	30.4
¾	14.0	12.7	17.5	26.7	3.1	6.9	37.0
1	17.3	14.7	23.1	33.4	3.4	7.7	45.0
1¼	18.0	17.0	30.2	42.2	3.7	8.7	54.7
1½	18.3	17.8	35.3	48.3	3.9	9.3	61.6
2	19.3	19.1	45.5	60.3	4.4	10.7	75.3
2½	29.0	23.4	55.9	73.0	5.3	12.1	91.2
3	30.5	24.9	70.6	88.9	5.9	13.9	108.8
4	33.0	27.4	94.0	114.4	6.7	16.8	137.2
6	38.4	32.5	144.0	168.3	8.5	29.9	197.3

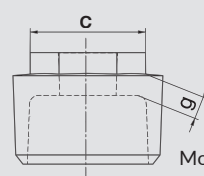
Dimensions in mm



REDUCING BUSH



Model I



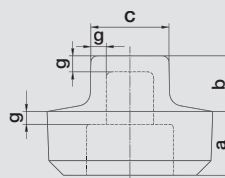
Model II

1002R

Nominal Pipe Size (NPS)		Code	Model	Dimensions (mm)					Unit Weight (kg)	
Inch	mm			a min.	t min.	d	c min.	g	Galv.	Black
3/8 x 1/4	10 x 8	6901023	I	12.2	10.2	4.1	17.3	-	0.018	0.017
1/2 x 1/4	15 x 8	6901025	I	14.2	8.1	4.8	22.1	-	0.044	0.042
1/2 x 3/8	15 x 10	6901026	I	14.2	10.4	4.8	22.1	-	0.032	0.031
3/4 x 3/8	20 x 10	6901028	I	16	9.1	5.6	29.2	-	0.070	0.068
3/4 x 1/2	20 x 15	6901029	I	16	13.5	5.6	29.2	-	0.056	0.054
1 x 1/2	25 x 15	6901032	I	19.1	10.9	6.4	36.1	-	0.118	0.114
1 x 3/4	25 x 20	6901033	I	19.1	12.7	6.4	36.1	-	0.096	0.093
1 1/4 x 1/2	32 x 15	6901035	II	20.3	10.9	8.6	34	4.8	0.160	0.155
1 1/4 x 3/4	32 x 20	6901036	I	20.3	12.7	7.1	44.7	-	0.196	0.193
1 1/4 x 1	32 x 25	6901037	I	20.3	14.7	7.1	44.7	-	0.156	0.153
1 1/2 x 3/4	40 x 20	6901040	II	21.1	12.7	9.4	41.4	5.1	0.211	0.208
1 1/2 x 1	40 x 25	6901041	I	21.1	14.7	7.9	50.8	-	0.257	0.250
1 1/2 x 1 1/4	40 x 32	6901042	I	21.1	18	7.9	50.8	-	0.174	0.169
2 x 1	50 x 25	6901045	II	22.4	14.7	10.4	49.5	-	0.338	0.331
2 x 1 1/4	50 x 32	6901046	I	22.4	17	8.6	63	-	0.408	0.401
2 x 1 1/2	50 x 40	6901047	I	22.4	17.8	8.6	63	-	0.342	0.336
2 1/2 x 1 1/2	65 x 40	6901050	I	27.2	17.8	11.2	68.1	-	0.784	0.771
2 1/2 x 2	65 x 50	6901051	I	27.2	19.1	9.4	75.7	-	0.578	0.574
3 x 2	80 x 50	6901055	II	28.7	19.1	12.2	68.1	6.6	1.160	1.153
3 x 2 1/2	80 x 65	6901056	I	28.7	23.4	10.2	98	-	0.953	0.945
4 x 2 1/2	100 x 65	6901059	II	32	25	16	99	6.7	1.392	1.385
4 x 3	100 x 80	6901060	I	44	29	13	119	-	1.780	1.761
6 x 4	150 x 100	6901071	II	48	35	19	148	7.5	3.595	3.536



PLUG



1010

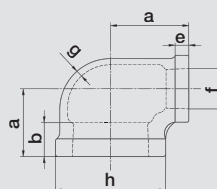
Nominal Pipe Size (NPS)		Code	Dimensions (mm)				Unit Weight (kg)	
Inch	mm		a	b	c	g	Galv.	Black
1/4	8	6902002	11.2	7.1	9.6	-	0.016	0.016
3/8	10	6902003	12.2	7.9	11.1	-	0.026	0.025
1/2	15	6902004	14.2	9.7	14.3	2.7	0.046	0.045
3/4	20	6902006	16	11.2	15.9	3	0.076	0.069
1	25	6902007	19.1	12.7	20.6	3.4	0.134	0.132
1 1/4	32	6902008	20.3	14.2	23.8	3.7	0.197	0.195
1 1/2	40	6902009	21.1	15.8	28.6	3.9	0.270	0.263
2	50	6902010	22.4	17.3	33.3	4.4	0.437	0.432
2 1/2	65	6902011	27.2	18.8	38.1	5.3	0.768	0.752
3	80	6902012	28.7	20.3	42.9	5.9	1.127	1.172
4	100	6902014	32	27	50	6.7	1.544	1.530
6	150	6902016	40	36	70	8.5	5.355	5.338

*See available finishes.

TUPYNPT fittings are available in a Blackheart (include 41 at the end of the product code) or Galvanized (include 43 at the end of the product code) finish.



ELBOWS

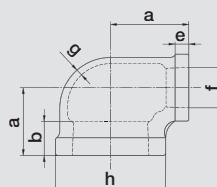


1015

Nominal Pipe Size (NPS)		Code	Dimensions (mm)							Unit Weight (kg)	
In.	mm		a	b min.	e min.	f		g	h min.	Galv.	Black
						min.	max.				
½	15	6907004	28.5	10.9	6.8	21.3	22.8	2.7	30.4	0.129	0.124
¾	20	6907006	33.3	12.7	6.9	26.7	28.1	3	37	0.204	0.195
1	25	6907007	38.1	14.7	7.7	33.4	35.2	3.4	45	0.308	0.303
1¼	32	6907008	44.5	17	8.7	42.3	43.9	3.7	54.7	0.486	0.475
1½	40	6907009	49.3	17.8	9.3	48.3	50	3.9	61.6	0.618	0.605
2	50	6907010	57.2	19.1	10.7	60.3	62.1	4.4	75.3	0.942	0.920
2½	65	6907011	68.6	23.4	12.1	73	75.6	5.3	91.2	1.650	1.610
3	80	6907012	78.2	24.9	13.9	88.9	91.4	5.9	108.8	2.413	2.353
4	100	6907014	96.3	27.4	16.8	114.4	116.8	6.7	137.2	4.452	4.343



REDUCING ELBOW

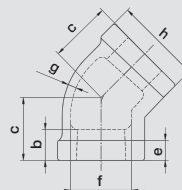


1020R

Nominal Pipe Size (NPS)		Code	Dimensions (mm)									Unit Weight (kg)	
In.	mm		In.	x	z	b min.	e min.	f		g	h min.	Galv.	Black
								min.	max.				
¾ x ½	20 x 15	6908029	¾	30.5	31	12.7	6.9	26.7	28.1	3	37	0.162	0.158
1 x ½	25 x 15	6908032	1	32	35.5	14.7	7.7	33.4	35.2	3.4	45	0.221	0.215
1 x ¾	25 x 20	6908033	1	34.8	36.8	14.7	7.7	33.4	35.2	3.4	45	0.240	0.233
1¼ x ½	32 x 15	6908035	1 ¼	34	38.9	17	8.7	42.3	43.9	3.7	54.7	0.295	0.283
1¼ x ¾	32 x 20	6908036	1 ¼	36.8	41.2	17	8.7	42.3	43.9	3.7	54.7	0.335	0.328
1¼ x 1	32 x 25	6908037	1 ¼	40.1	42.4	17	8.7	42.3	43.9	3.7	54.7	0.417	0.387
1½ x ¾	40 x 20	6908040	1 ½	38.6	44.5	17.8	9.3	48.3	50	3.9	61.6	0.408	0.396
1½ x 1	40 x 25	6908041	1 ½	41.2	45.7	17.8	9.3	48.3	50	3.9	61.6	0.470	0.454
1½ x 1¼*	40 x 32	6908042	1 ½	46.2	47.8	17.8	9.3	48.3	50	3.9	61.6	0.545	0.526
2 x ¾*	50 x 20	6908044	2	40.6	50	19.1	10.7	60.3	62.1	4.4	75.3	0.555	0.539
2 x 1	50 x 25	6908045	2	43.9	51.3	19.1	10.7	60.3	62.1	4.4	75.3	0.658	0.628
2 x 1¼	50 x 32	6908046	2	48.3	53.3	19.1	10.7	60.3	62.1	4.4	75.3	0.712	0.694
2 x 1½*	50 x 40	6908047	2	51.3	54.9	19.1	10.7	60.3	62.1	4.4	75.3	0.800	0.778



45° ELBOW



1025

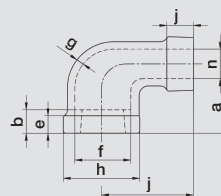
Nominal Pipe Size (NPS)		Code	Dimensions (mm)							Unit Weight (kg)	
In.	mm		c	b min.	e min.	f		g	h min.	Galv.	Black
						min.	max.				
½	15	6909004	22.4	10.9	6.8	21.3	22.8	2.7	30.4	0.113	0.108
¾	20	6909006	24.9	12.7	6.9	26.7	28.1	3	37	0.175	0.167
1	25	6909007	28.5	14.7	7.7	33.4	35.2	3.4	45	0.287	0.275
1¼	32	6909008	32.8	17	8.7	42.3	43.9	3.7	54.7	0.458	0.445
1½	40	6909009	36.3	17.8	9.3	48.3	50	3.9	61.6	0.521	0.507
2	50	6909010	42.7	19.1	10.7	60.3	62.1	4.4	75.3	0.890	0.875

* See available finishes.

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ELBOW

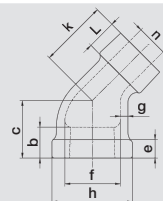


1030

Nominal Pipe Size (NPS)		Code	Dimensions (mm)										Unit Weight (kg)	
In.	mm		a	b min.	e min.	f		g	h min.	j	n	l min.	Galv.	Black
¼	8	6911002	20.6	8.1	5.5	18.7	14.8	2.4	21.4	30.2	6.6	10.2	0.048	0.045
⅜	10	6911003	24.1	9.1	5.8	17.1	18.3	2.5	25.8	36.6	9.4	10.4	0.075	0.074
½	15	6911004	28.5	10.9	6.8	21.3	22.8	2.7	30.4	29.2	13	13.5	0.109	0.107
¾	20	6911006	33.3	12.7	6.9	26.7	28.1	3	37	32.8	17.5	14	0.176	0.172
1	25	6911007	38.1	14.7	7.7	33.4	35.2	3.4	45	37.3	23.1	17.3	0.286	0.278
1¼	32	6911008	44.5	17	8.7	42.3	43.9	3.7	54.7	43.4	30.2	18	0.460	0.444
1½	40	6911009	49.3	17.8	9.3	48.3	50	3.9	61.6	47.8	35.3	18.3	0.580	0.553
2	50	6911010	57.2	19.1	10.7	60.3	62.1	4.4	75.3	56.4	45.5	19.3	0.989	0.962



45° STREET ELBOW

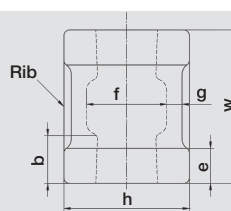


1035

Nominal Pipe Size (NPS)		Code	Dimensões (mm)										Unit Weight (kg)	
In.	mm		c	l min.	b min.	e min.	f		g	h min.	k	n	Galv.	Black
½	15	6910004	22.4	13.5	10.9	6.8	21.3	22.8	2.7	30.4	29.2	13	0.093	0.089
¾	20	6910006	24.9	14	12.7	6.9	26.7	28.1	3	37	32.8	17.5	0.151	0.146
1*	25	6910007	28.5	17.3	14.7	7.7	33.4	35.2	3.4	45	37.3	23.1	0.225	0.218
1¼*	32	6910008	32.8	18	17	8.7	42.3	43.9	3.7	54.7	43.4	30.2	0.376	0.363
1½*	40	6910009	36.3	18.3	17.8	9.3	48.3	50	3.9	61.6	47.8	35.3	0.512	0.499
2	50	6910010	42.7	19	19.1	10.7	60.3	62.1	4.4	75.3	56.4	45.5	0.795	0.770



SOCKET



1045

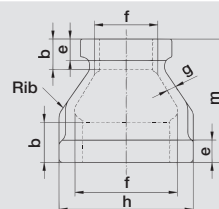
Nominal Pipe Size (NPS)		Code	Dimensions (mm)							Rib	Unit Weight (kg)	
In.	mm		w	b min.	e min.	f		g	h min.		Galv.	Black
¼	10	6931002	20.6	8.1	5.5	18.7	14.8	2.4	21.4	2.4	0.043	0.041
½	15	6931004	28.5	10.9	6.8	21.3	22.8	2.7	30.4	2.7	0.096	0.086
¾	20	6931006	33.3	12.7	6.9	26.7	28.1	3	37	3	0.156	0.145
1	25	6931007	38.1	14.7	7.7	33.4	35.2	3.4	45	3.4	0.224	0.216
1¼	32	6931008	44.5	17	8.7	42.3	43.9	3.7	54.7	3.7	0.352	0.344
1½	40	6931009	49.3	17.8	9.3	48.3	50	3.9	61.6	3.9	0.457	0.444
2	50	6931010	57.2	19.1	10.7	60.3	62.1	4.4	75.3	4.4	0.705	0.697

*See available finishes.

TUPYNPT fittings are available in a Blackheart (include 41 at the end of the product code) or Galvanized (include 43 at the end of the product code) finish.



REDUCING SOCKET

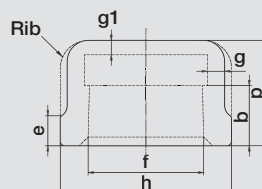


1050R

Nominal Pipe Size (NPS)		Code	Dimensions (mm)									Unit Weight (kg)	
In.	mm		In.	mm	b min.	e min.	f		g	h min.	Rib	Galv.	Black
1/4 x 1/2	20 x 15	6932029	1/4	36.6	12.7	6.9	26.7	28.1	3	37	3	0.118	0.114
1 x 1/2	25 x 15	6932032	1	42.9	14.7	7.7	33.4	35.2	3.4	45	3.4	0.182	0.179
1 x 3/4	25 x 20	6932033	1	42.9	14.7	7.7	33.4	35.2	3.4	45	3.4	0.193	0.185
1 1/4 x 1/2	32 x 15	6932035	1 1/4	52.3	17	8.7	42.3	43.9	3.7	54.7	3.7	0.287	0.279
1 1/4 x 3/4	32 x 20	6932036	1 1/4	52.3	17	8.7	42.3	43.9	3.7	54.7	3.7	0.280	0.269
1 1/4 x 1	32 x 25	6932037	1 1/4	52.3	17	8.7	42.3	43.9	3.7	54.7	3.7	0.329	0.316
1 1/2 x 1/2	40 x 15	6932039	1 1/2	58.7	17.8	9.3	48.3	50	3.9	61.6	3.9	0.339	0.333
1 1/2 x 3/4	40 x 20	6932040	1 1/2	58.7	17.8	9.3	48.3	50	3.9	61.6	3.9	0.382	0.351
1 1/2 x 1	40 x 25	6932041	1 1/2	58.7	17.8	9.3	48.3	50	3.9	61.6	3.9	0.385	0.370
1 1/2 x 1 1/4	40 x 32	6932042	1 1/2	58.7	17.8	9.3	48.3	50	3.9	61.6	3.9	0.417	0.404
2 x 1/2	50 x 15	6932043	2	71.4	19.1	10.7	60.3	62.1	4.4	75.3	4.4	0.540	0.532
2 x 3/4	50 x 20	6932044	2	71.4	19.1	10.7	60.3	62.1	4.4	75.3	4.4	0.557	0.537
2 x 1	50 x 25	6932045	2	71.4	19.1	10.7	60.3	62.1	4.4	75.3	4.4	0.587	0.557
2 x 1 1/4	50 x 32	6932046	2	71.4	19.1	10.7	60.3	62.1	4.4	75.3	4.4	0.618	0.606
2 x 1 1/2	50 x 40	6932047	2	71.4	19.1	10.7	60.3	62.1	4.4	75.3	4.4	0.660	0.646



CAP

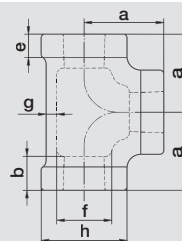


1055

Nominal Pipe Size (NPS)		Code	Dimensions (mm)									Unit Weight (kg)	
In.	mm		p	b min.	e min.	f		g	h min.	Rib	g1	Galv.	Black
1/2	15	6942004	22.1	10.9	6.8	21.3	22.8	2.7	30.4	2.7	-	0.067	0.056
3/4	20	6942006	24.6	12.7	6.9	26.7	28.1	3	37	3	3.3	0.120	0.120
1	25	6942007	29.5	14.7	7.7	33.4	35.2	3.4	45	3.4	3.8	0.184	0.178
1 1/4	32	6942008	32.5	17	8.7	42.3	43.9	3.7	54.7	3.7	4.3	0.275	0.268
1 1/2	40	6942009	33.8	17.8	9.3	48.3	50	3.9	61.6	3.9	4.9	0.376	0.377
2	50	6942010	36.8	19.1	10.7	60.3	62.1	4.4	75.3	4.4	5.6	0.452	0.437



TEE



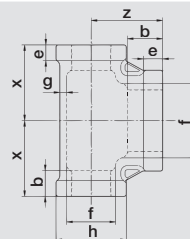
1060

Nominal Pipe Size (NPS)		Code	Dimensions (mm)							Unit Weight (kg)	
In.	mm		a	b min.	e min.	f		g	h min.	Galv.	Black
1/4	10	6944002	20.6	8.1	5.5	13.7	14.8	2.4	21.4	0.077	0.074
1/2	15	6944004	28.5	10.9	6.8	21.3	22.8	2.7	30.4	0.166	0.159
3/4	20	6944006	33.3	12.7	6.9	26.7	28.1	3	37	0.282	0.278
1	25	6944007	38.1	14.7	7.7	33.4	35.2	3.4	45	0.447	0.434
1 1/4	32	6944008	44.5	17	8.7	42.3	43.9	3.7	54.7	0.624	0.606
1 1/2	40	6944009	49.3	17.8	9.3	48.3	50	3.9	61.6	0.844	0.865
2	50	6944010	57.2	19.1	10.7	60.3	62.1	4.4	75.3	1.281	1.242
2 1/2	65	6944011	68.6	23.4	12.1	73	75.6	5.3	91.2	2.210	2.155
3	80	6944012	78.2	24.9	13.9	88.9	91.4	5.9	108.8	3.270	3.232
4	100	6944014	96.3	27.4	16.8	114.4	116.8	6.7	137.2	5.585	5.333

*See available finishes.

TUPYNPT fittings are available in a Blackheart (include 41 at the end of the product code) or Galvanized (include 43 at the end of the product code) finish.

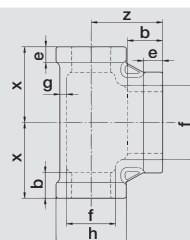
REDUCING TEE



1065R

Nominal Pipe Size (NPS)		Code	Dimensions (mm)									Unit Weight (kg)	
In.	mm		In.	x	z	b min.	e min.	f		g	h min.	Galv.	Black
3/4 x 3/4 x 1/2	20 x 15	6945029	3/4	30.5	31	12.7	6.9	26.7	28.1	3	37	0.237	0.232
1 x 1 x 1/2	25 x 15	6945032	1	32	35.8	14.7	7.7	33.4	35.2	3.4	45	0.355	0.345
1 x 1 x 3/4	25 x 20	6945033	1	34.8	36.8	14.7	7.7	33.4	35.2	3.4	45	0.390	0.377
1 1/4 x 1 1/4 x 1/2	32 x 15	6945035	1 1/4	34	38.9	17	8.7	42.3	43.9	3.7	54.7	0.449	0.442
1 1/4 x 1 1/4 x 3/4	32 x 20	6945036	1 1/4	36.8	41.2	17	8.7	42.3	43.9	3.7	54.7	0.485	0.475
1 1/4 x 1 1/4 x 1	32 x 25	6945037	1 1/4	40.1	42.4	17	8.7	42.3	43.9	3.7	54.7	0.556	0.540
1 1/2 x 1 1/2 x 1/2	40 x 15	6945039	1 1/2	35.8	42.2	17.8	9.3	48.3	50	3.9	61.6	0.540	0.535
1 1/2 x 1 1/2 x 3/4	40 x 20	6945040	1 1/2	38.6	44.5	17.8	9.3	48.3	50	3.9	61.6	0.570	0.595
1 1/2 x 1 1/2 x 1	40 x 25	6945041	1 1/2	41.9	45.7	17.8	9.3	48.3	50	3.9	61.6	0.714	0.697
1 1/2 x 1 1/2 x 1 1/4	40 x 32	6945042	1 1/2	46.2	47.8	17.8	9.3	48.3	50	3.9	61.6	0.754	0.730
2 x 2 x 1/2	50 x 15	6945043	2	37.9	47.8	19.1	10.7	60.3	62.1	4.4	75.3	0.830	0.824
2 x 2 x 3/4	50 x 20	6945044	2	40.6	50	19.1	10.7	60.3	62.1	4.4	75.3	0.860	0.840
2 x 2 x 1	50 x 25	6945045	2	43.9	51.3	19.1	10.7	60.3	62.1	4.4	75.3	0.978	0.951
2 x 2 x 1 1/4	50 x 32	6945046	2	48.3	53.3	19.1	10.7	60.3	62.1	4.4	75.3	1.042	1.001
2 x 2 x 1 1/2	50 x 40	6945047	2	51.3	54.9	19.1	10.7	60.3	62.1	4.4	75.3	1.140	1.124

REDUCING TEE



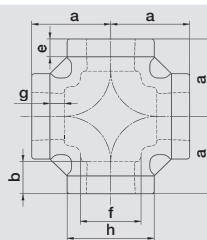
1065R

Nominal Pipe Size (NPS)		Code	Dimensions (mm)									Unit Weight (kg)	
In.	mm		In.	x	z	b min.	e min.	f		g	h min.	Galv.	Black
1/2 x 1/2 x 3/4	15 x 20	6946229	1/2	31	30.5	10.9	6.8	21.3	22.8	2.7	30.4	0.207	0.201
1/2 x 1/2 x 1	15 x 25	6946232	1/2	34.6	32	10.9	6.8	21.3	22.8	2.7	30.4	0.258	0.250
3/4 x 3/4 x 1	20 x 25	6946233	3/4	36.8	34.8	12.7	6.9	26.7	28.1	3	37	0.323	0.312
3/4 x 3/4 x 1 1/4	20 x 32	6946236	3/4	41.2	36.8	12.7	6.9	26.7	28.1	3	37	0.399	0.410
1 x 1 x 1 1/4	25 x 32	6946237	1	42.4	40.1	14.7	7.7	33.4	35.2	3.4	45	0.510	0.494
1 x 1 x 1 1/2	25 x 40	6946241	1	45.7	41.9	14.7	7.7	33.4	35.2	3.4	45	0.564	0.564
1 x 1 x 2	25 x 50	6946242	1	51.3	48.9	14.7	7.7	33.4	35.2	3.4	45	0.730	0.730
1 1/4 x 1 1/4 x 1 1/2	32 x 40	6946245	1 1/4	47.8	46.2	17	8.7	42.3	43.9	3.7	54.7	0.765	0.726
1 1/4 x 1 1/4 x 2	32 x 50	6946246	1 1/4	58.3	48.3	17	8.7	42.3	43.9	3.7	54.7	0.866	0.860
1 1/2 x 1 1/2 x 2	40 x 50	6946247	1 1/2	54.9	51.3	17.8	9.3	48.3	50	3.9	61.6	0.993	0.993

*See available finishes.

TUPYNPT fittings are available in a Blackheart (include 41 at the end of the product code) or Galvanized (include 43 at the end of the product code) finish.

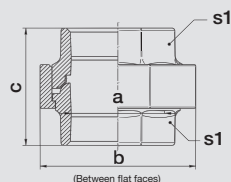
CROSS



1068

Nominal Pipe Size (NPS)		Code	Dimensions (mm)							Unit Weight (kg)	
In.	mm		a	b min.	e min.	f		g	h min.	Galv.	Black
						min.	max.				
¼	10	6918002	20.6	8.1	5.5	13.7	14.8	2.4	21.4	0.091	0.085
½	15	6918004	28.5	10.9	6.8	21.3	22.8	2.7	30.4	0.225	0.215
¾	20	6918006	33.3	12.7	6.9	26.7	28.1	3	37	0.341	0.335
1	25	6918007	38.1	14.7	7.7	33.4	35.2	3.4	45	0.531	0.510
1¼	32	6918008	44.5	17	8.7	42.3	43.9	3.7	54.7	0.780	0.765
1½	40	6918009	49.3	17.8	9.3	48.3	50	3.9	61.6	1.000	0.980
2	50	6918010	57.2	19.1	10.7	60.3	62.1	4.4	75.3	1.495	1.462

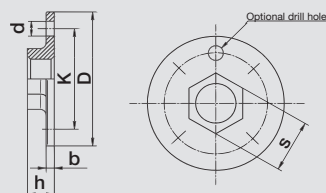
UNION SINGLE BRASS SEAT



1070

Nominal Pipe Size (NPS)		Code	Dimensions (mm)		Reference wrench size (mm)		Thread g	Unit Weight (kg)	
In.	mm		c	a	b	s1		Galv.	Black
½	15	6961004	43.7	15.5	36.8	25	1	0.192	0.187
¾	20	6961006	49.3	20.3	43.4	31	1¼	0.283	0.268
1	25	6961007	52.3	25.4	52.6	38	1½	0.376	0.354
1¼	32	6961008	57.4	33.3	63.5	48	2	0.623	0.609
1½	40	6961009	61.2	39.4	71.6	54	2¼	0.740	0.727
2	50	6961010	69.9	51.6	86.6	68	2½	1.147	1.190
2½	65	6961011	81.8	60.5	104.6	84	31½	2.063	1.930
3	80	6961012	88.9	76.2	120.7	97	4	2.776	2.736

FLOOR FLANGE



1090

Nominal Pipe Size (NPS)		Code	Dimensions (mm)						No. of holes	Ø hole nominal	Unit Weight (kg)	
In.	mm		d	b	h	s	k	e			Galv.	Black
½	15	6999004	89	6	15	28	63.5	6.4	4	¼	0.189	0.180
¾	20	6999006	89	6	16	34	63.5	6.4	4	¼	0.273	0.260
1	25	6999007	102	6.5	18	41	76.2	6.4	4	¼	0.340	0.370
1¼	32	6999008	102	6.5	20	51	76.2	6.4	4	¼	0.421	0.420
1½*	40	6999009	114	7	22	57	88.9	8	4	⅝	0.575	0.530
2*	50	6999010	140	9	26	70	108	8	4	¾	0.895	0.883

*See available finishes.

TUPYNPT fittings are available in a Blackheart (include 41 at the end of the product code) or Galvanized (include 43 at the end of the product code) finish.

FITTINGS NPT

HIGH PRESSURE / CLASS 300

NPT FITTINGS - HIGH PRESSURE FOR APPLICATION AT UP TO 2,000 PSI (LB/INCH²) AT ROOM TEMPERATURE.

PRESSURE TABLE

Temperature °C	MAXIMUM WORKING PRESSURE (ACCORDING TO ABNT NBR 6925 AND ASME B 16.3)			MAXIMUM UNION WORKING PRESSURE (ACCORDING TO ABNT NBR 6925 AND ASME B 16.39)
	Nominal Pipe Size			Nominal Pipe Size
	¼ to 1 lb/in ² (psi)	¼ to 2 lb/in ² (psi)	2½ to 6 lb/in ² (psi)	¼ to 4 lb/in ² (psi)
-29 a 66	2.000	1.500	1.000	600
93	1.785	1.350	910	550
121	1.575	1.200	825	505
149	1.360	1.050	735	460
177	1.150	900	650	415
204	935	750	560	370
232	725	600	475	325
260	510	450	450	280
288	300	300	300	230

Note: 1 bar ≈ 14,5 psi • 1 bar ≈ 1 kgf/cm² • 1 bar = 0,1 MPa • 1 psi = 1 lbf/pol²

BRANDS

TUPYNPT Medium Pressure fittings, whenever dimensions allow, are engraved with following markings:

- The TUPY® Brand;
- Nominal pipe size;
- The MI (Malleable Iron) monogram;
- The WOG (water, oil and gas) monogram;
- The number 300 (Indicates class);
- The number 2000, 1500, 1000 or 500 (indicates working pressure in psi in range between -29 and 66°C);
- The name BRAZIL (Indicates country of origin);
- The monogram (UL) (Underwriters Laboratories Inc.);
- FM monogram (FM APPROVALS LLC).

SURFACE PROTECTION

TUPYNPT fittings are produced with a black finish (non-toxic oil) and hot dip galvanized according to ABNT NBR 6323 and ASTM A153. Other special coatings (Epoxy paints, cataphoretic, hybrid, double galvanizing, etc.) may be provided on request.

APPLICATIONS

TUPYNPT High Pressure fittings are used to conduct liquids, gases and vapors.

FITTING DELIVERY CONDITIONS

TUPY reserves the right to introduce any changes to its product lines it deems appropriate in accordance with ABNT NBR 6925, ASME B16.3, ASME B16.14 and ASME B16.39 standards.

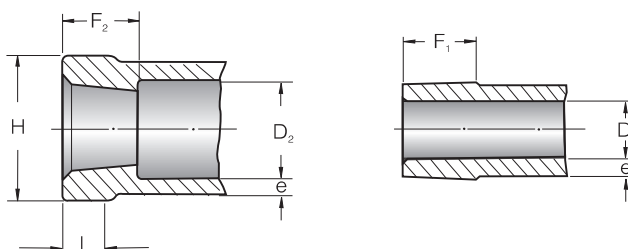
Weights (g) in this catalog are subject to change without notice.

For safety reasons, purchased fittings must comply with the above-mentioned standards and watertightness tests be carried out before final use in installed networks.

TYPE OF NPT LINE FITTINGS HIGH PRESSURE CLASS 300

2001	2015	2025	2030
			
2033	2045	2050R	2055
			
2060	2065R	2070	2075
			

BASIC DIMENSIONS OF HIGH PRESSURE NPT FITTINGS

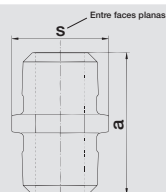


NOMINAL PIPE SIZE	F ₁ (min.)	F ₂ (min.)	D ₁ (max.)	D ₂ (min.)	e	L (min.)	H (min.)
¼	10.2	10.9	6.6	13.7	3.6	9.7	23.6
⅜	10.4	11.9	9.1	17.1	3.8	11.2	28.5
½	13.5	14.5	12.5	21.3	4.1	12.7	34.0
¾	14.0	16.3	17.0	26.7	4.6	14.2	41.4
1	17.3	19.1	22.4	33.4	5.1	15.8	49.5
1¼	18.0	21.3	29.5	42.2	5.6	17.5	60.7
1½	18.3	22.1	34.3	48.3	6.1	19.1	68.1
2	19.3	25.4	44.5	60.3	6.6	21.3	83.3
2½	29.0	29.7	54.9	73.0	7.9	23.9	98.0
3	30.5	31.2	67.8	88.9	8.9	25.4	117.3
4	33.0	33.7	88.0	114.0	10.8	28.0	145.4
6	38.4	39.0	141.0	172.0	12.5	32.0	211.2

Dimensions in mm



HEXAGON NIPPLE

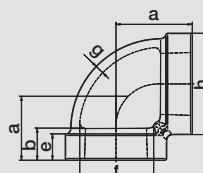


2001

Nominal Pipe Size (NPS)		Code	Dimensions (mm)			Unit Weight (kg)	
In.	mm		a	s	Ø Max. internal	Galv.	Black
¼	8	6838002	41	19	6.6	0.040	0.033
⅜	10	6838003	42	22	9.4	0.054	0.053
½	15	6838004	53	27	13	0.097	0.095
¾	20	6838006	53	32	17.5	0.111	0.109
1	25	6838007	64	41	23.1	0.230	0.222
1 ¼	32	6838008	65	50	30.2	0.330	0.110
1 ½	40	6838009	67	55	35.3	0.475	0.425
2	50	6838010	70	70	45.5	0.675	0.659
2 ½	65	6838011	100	85	55.9	1.264	1.246
3	80	6838012	102	100	70.6	1.916	1.899
4	100	6838014	110	130	94	3.511	3.506
6	150	6838016	125	180	144	7.345	7.242



ELBOW

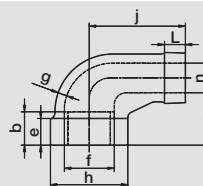


2015

Nominal Pipe Size (NPS)		Code	Dimensions (mm)							Unit Weight (kg)	
In.	mm		a	b (min.)	e (min.)	f		g	h (min.)	Galv.	Black
¼	8	6807002	23.9	10.9	9.7	13.7	13.7	3.6	23.6	0.086	88
⅜	10	6807003	26.9	11.9	11.2	17.1	17.1	3.8	28.5	0.132	0.131
½	15	6807004	31.8	14.5	12.7	21.3	21.3	4.1	34	0.218	0.211
¾	20	6807006	36.6	16.3	14.2	26.7	26.7	4.6	41.4	0.340	0.325
1	25	6807007	41.4	19.1	15.8	33.4	33.4	5.1	49.5	0.522	0.514
1 ¼	32	6807008	49.3	21.3	17.5	42.2	42.2	5.6	60.7	0.829	0.812
1 ½	40	6807009	54.1	22.1	19.1	48.3	48.3	6.1	68.1	1.096	1.090
2	50	6807010	63.5	25.4	21.3	60.3	60.3	6.6	83.3	1.738	1.701
2 ½	65	6807011	74.7	29.7	23.9	73	73	7.9	98	2.723	2.672
3	80	6807012	85.9	31.2	25.4	88.9	88.9	8.9	117.3	4.214	4.230
4	100	6807014	114.0	33.8	29.1	114.3	114.3	9.8	148	7.941	7.876
6	150	6807016	159.0	38.9	36.8	168.1	168.1	12.9	204.1	17.360	17.160



ELBOW



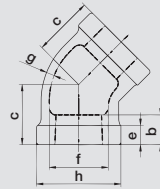
2030

Nominal Pipe Size (NPS)		Code	Dimensions (mm)										Unit Weight (kg)	
In.	mm		a	b (min.)	e (min.)	f		g	(min.)	j	n	l (min.)	Galv.	Black
⅜	10	6811003	26.9	11.9	11.2	17.1	18.3	3.8	28.5	41.4	9.1	10.4	0.111	0.110
½	15	6811004	31.8	14.5	12.7	21.3	22.8	4.1	34	50.8	12.5	13.5	0.195	0.185
¾	20	6811006	36.6	16.3	14.2	26.7	28.1	4.6	41.4	55.6	17	14	0.300	0.287
1	25	6811007	41.4	19.1	15.8	33.4	35.2	5.1	49.5	65	22.4	17.3	0.463	0.455
1 ¼	32	6811008	49.3	21.3	17.5	42.2	43.9	5.6	60.7	73.2	29.5	18	0.692	0.712
1 ½	40	6811009	54.1	22.1	19.1	48.3	50	6.1	68.1	79.5	34.3	18.3	0.928	0.928
2	50	6811010	63.5	25.4	21.3	60.3	62.1	6.6	83.3	93.7	44.5	19.3	1.603	1.571
2 ½	65	6811011	74.7	29.7	23.9	73	75.6	7.9	98	114.3	54.9	29	2.550	2.510
3	80	6811012	85.9	31.2	25.4	88.9	91.4	8.9	117.3	130.3	67.8	30.5	4.150	4.081

*See available finishes.

TUPYNPT fittings are available in a Blackheart (include 41 at the end of the product code) or Galvanized (include 43 at the end of the product code) finish.

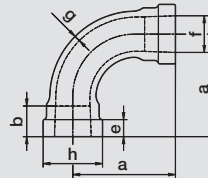
45° ELBOW



2025

Nominal Pipe Size (NPS)		Code	Dimensions (mm)							Unit Weight (kg)	
In.	mm		c	b (min.)	e (min.)	f		g	h (min.)	Galv.	Black
						min.	max.				
¼	8	6809002	20.6	10.9	9.7	13.7	14.8	3.6	23.6	0.089	0.85
⅜	10	6809003	22.4	11.9	11.2	17.1	18.3	3.8	28.5	0.120	0.117
½	15	6809004	25.4	14.5	12.7	21.3	22.8	4.1	34	0.194	0.188
¾	20	6809006	28.7	16.3	14.2	26.7	28.1	4.6	41.4	0.310	0.300
1	25	6809007	33.3	19.1	15.8	33.4	35.2	5.1	49.5	0.485	0.476
1 ¼	32	6809008	38.1	21.3	17.5	42.2	43.9	5.6	60.7	0.742	0.698
1 ½	40	6809009	42.9	22.1	19.1	48.3	50	6.1	68.1	0.963	0.958
2	50	6809010	50.8	25.4	21.3	60.3	62.1	6.6	83.3	1.614	1.589
2 ½	65	6809011	57.2	29.7	23.9	73	75.6	7.9	98	2.528	2.440
3	80	6809012	63.5	31.2	25.4	88.9	91.4	8.9	117.3	3.622	3.600
4	100	6809014	72	33.8	29.1	114.3	116.9	9.8	148	5.956	6.054
6	150	6809016	90	38.9	36.8	168.1	170.7	12.9	204.1	13.070	12.950

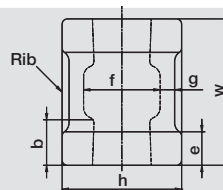
LONG SWEEP BENDS



2033

Nominal Pipe Size (NPS)		Code	Dimensions (mm)							Unit Weight (kg)	
In.	mm		a	b (min.)	e (min.)	f		g	h (min.)	Galv.	Black
						min.	max.				
½	15	6823004	55	14.5	12.7	14	20	4.1	34	0.341	0.340
¾	20	6823006	69	16.3	14.2	19	25	4.6	41.4	0.535	0.523
1	25	6823007	85	19.1	15.8	25	31	5.1	49.5	0.885	0.861
1 ¼	32	6823008	105	21.3	17.5	35	40	5.6	60.7	1.372	1.348
1 ½	40	6823009	116	22.1	19.1	39	45	6.1	68.1	1.877	1.825
2	50	6823010	140	25.4	21.3	51	57	6.6	83.3	2.794	2.780
2 ½	65	6823011	176	29.7	23.9	61	67	7.9	98	4.976	4.971
3	80	6823012	205	31.2	25.4	76	82	8.9	117.3	7.842	7.940
4	100	6823014	260	33.8	29.1	98	104	9.8	148	14.505	14.500

SOCKET



2045

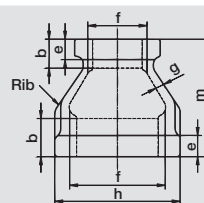
Nominal Pipe Size (NPS)		Code	Dimensions (mm)							Rib	Unit Weight (kg)	
In.	mm		w	b (min.)	e (min.)	f		g	h (min.)		Galv.	Black
						min.	max.					
¼	8	6831002	35.1	10.9	9.7	13.7	14.8	3.6	23.6	2.2	0.077	0.076
⅜	10	6831003	41.4	11.9	11.2	17.1	18.3	3.8	28.5	3.2	0.122	0.120
½	15	6831004	47.8	14.5	12.7	21.3	22.8	4.1	34	3.8	0.194	0.189
¾	20	6831006	54.1	16.3	14.2	26.7	28.1	4.6	41.4	4.8	0.303	0.293
1	25	6831007	60.5	19.1	15.8	33.4	35.2	5.1	49.5	5.0	0.454	0.447
1 ¼	32	6831008	73.2	21.3	17.5	42.2	43.9	5.6	60.7	6.5	0.701	0.689
1 ½	40	6831009	73.2	22.1	19.1	48.3	50	6.1	68.1	6.7	0.859	0.849
2	50	6831010	92.2	25.4	21.3	60.3	62.1	6.6	83.3	8.9	1.556	1.526
2 ½	65	6831011	104.9	29.7	23.9	73	75.6	7.9	98	7.9	2.351	2.324
3	80	6831012	104.9	31.2	25.4	88.9	91.4	8.9	117.3	9.3	3.307	3.270
4	100	6831014	120	33.8	29.1	114.3	116.9	9.8	148	12.8	5.396	5.331
6	150	6831016	150	38.9	36.8	168.1	170.7	12.9	204.1	8.9	12.075	12.005

*See available finishes.

TUPYNT fittings are available in a Blackheart (include 41 at the end of the product code) or Galvanized (include 43 at the end of the product code) finish.



REDUCING SOCKET

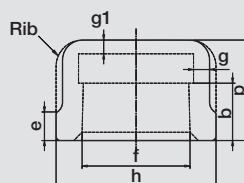


2050R

Nominal Pipe Size (NPS)		Code	Dimensions (mm)								Rib	Unit Weight (kg)	
In.	mm		In.	m	b (min.)	e (min.)	f		g	h (min.)		Galv.	Black
-	-	-	¼	-	10.9	9.7	13.7	14.8	3.6	23.6	2.2	-	-
-	-	-	½	-	11.9	11.2	17.1	18.3	3.8	28.5	3.2	-	-
½ x ¼	15 x 8	6832025	½	42.9	14.5	12.7	21.3	22.8	4.1	34	3.8	0.142	0.138
½ x 3/8	15 x 10	6832026	¾	44.5	16.3	14.2	26.7	28.1	4.6	41.4	4.8	0.151	0.146
¾ x 3/8	20 x 10	6832028	¾	44.5	16.3	14.2	26.7	28.1	4.6	41.4	4.8	0.211	0.184
¾ x ½	20 x 15	6832029	1	50.8	19.1	15.8	33.4	35.2	5.1	49.5	5	0.227	0.223
1 x ½	25 x 15	6832032	1	50.8	19.1	15.8	33.4	35.2	5.1	49.5	5	0.306	0.298
1 x ¾	25 x 20	6832033	1 ¼	60.5	21.3	17.5	42.2	43.9	5.6	60.7	6.5	0.358	0.350
1 ¼ x ¾	32 x 20	6832036	1 ¼	60.5	21.3	17.5	42.2	43.9	5.6	60.7	6.5	0.521	0.507
1 ¼ x 1	32 x 25	6832037	1 ½	68.3	22.1	19.1	48.3	50	6.1	68.1	6.7	0.573	0.560
1 ½ x 1	40 x 25	6832041	1 ½	68.3	22.1	19.1	48.3	50	6.1	68.1	6.7	0.670	0.655
1 ½ x 1 ¼	40 x 32	6832042	2	81	25.4	21.3	60.3	62.1	6.6	83.3	8.9	0.748	0.732
2 x 1 ¼	50 x 32	6832046	2	81	25.4	21.3	60.3	62.1	6.6	83.3	8.9	1.172	1.140
2 x 1 ½	50 x 40	6832047	2 ½	93.7	29.7	23.9	73	75.6	7.9	98	7.9	1.240	1.223
2 ½ x 1 ½	65 x 40	6832050	2 ½	93.7	29.7	23.9	73	75.6	7.9	98	7.9	1.780	1.670
2 ½ x 2	65 x 50	6832051	3	103.1	31.2	25.4	88.9	91.4	8.9	117.3	9.3	1.830	1.800
3 x 2	80 x 50	6832055	3	103.1	31.2	25.4	88.9	91.4	8.9	117.3	9.3	2.632	2.596
3 x 2 ½	80 x 65	6832056	4	117	33.8	29.1	114.3	116.9	9.8	148	12.8	2.872	2.833
4 x 2 ½	100 x 65	6832059	4	117	33.8	29.1	114.3	116.9	9.8	148	12.8	4.000	3.967
4 x 3	100 x 80	6832060	6	137	38.9	36.8	168.1	170.7	12.9	204.1	8.9	4.810	4.746
6 x 4	150 x 100	6832071	6	137	38.9	36.8	168.1	170.7	12.9	204.1	8.9	9.470	8.951



CAP



2055

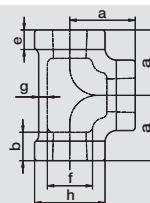
Nominal Pipe Size (NPS)		Code	Dimensions (mm)								Rib	Unit Weight (kg)	
In.	mm		p	b (min.)	e (min.)	f		g	g1	h (min.)		Galv.	Black
¼	8	6842002	19.8	10.9	9.7	13.7	14.8	3.6	4.6	23.6	2.2	0.051	0.049
¾	10	6842003	21.1	11.9	11.2	17.1	18.3	3.8	4.8	28.5	3.2	0.072	0.070
½	15	6842004	24.9	14.5	12.7	21.3	22.8	4.1	5.1	34	3.8	0.125	0.122
¾	20	6842006	27.4	16.3	14.2	26.7	28.1	4.6	5.8	41.4	4.8	0.193	0.189
1	25	6842007	32.0	19.1	15.8	33.4	35.2	5.1	6.4	49.5	5	0.333	0.331
1 ¼	32	6842008	35.1	21.3	17.5	42.2	43.9	5.6	7.1	60.7	6.5	0.421	0.476
1 ½	40	6842009	36.3	22.1	19.1	48.3	50	6.1	7.6	68.1	6.7	0.638	0.632
2	50	6842010	42.7	25.4	21.3	60.3	62.1	6.6	8.4	83.3	8.9	1.009	0.985
2 ½	65	6842011	52.3	29.7	23.9	73	75.6	7.9	9.9	98.0	7.9	1.680	1.660
3	80	6842012	55.1	31.2	25.4	88.9	91.4	8.9	11.2	117.3	9.3	2.189	2.138
4	100	6842014	61.2	33.8	29.1	114.3	116.9	9.8	12.1	148	12.8	3.884	3.849
6	150	6842016	69	38.9	36.8	168.1	170.7	12.9	13.2	204.1	8.9	7.815	7.389

*See available finishes.

TUPYNPT fittings are available in a Blackheart (include 41 at the end of the product code) or Galvanized (include 43 at the end of the product code) finish.



TEE

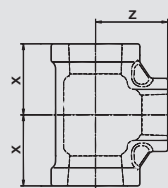


2060

Nominal Pipe Size (NPS)		Code	Dimensions (mm)							Unit Weight (kg)	
In.	mm		a	b (min.)	e (min.)	f		g	h (min.)	Galv.	Black
						min.	max.				
1/8	8	6844002	23.9	10.9	9.7	13.7	14.8	3.6	23.6	0.120	0.095
1/4	10	6844003	26.9	11.9	11.2	17.1	18.3	3.8	28.5	0.186	0.184
1/2	15	6844004	31.8	14.5	12.7	21.3	22.8	4.1	34	0.296	0.286
3/4	20	6844006	36.6	16.3	14.2	26.7	28.1	4.6	41.4	0.463	0.452
1	25	6844007	41.4	19.1	15.8	33.4	35.2	5.1	49.5	0.745	0.730
1 1/4	32	6844008	49.3	21.3	17.5	42.2	43.9	5.6	60.7	1.151	1.118
1 1/2	40	6844009	54.1	22.1	19.1	48.3	50	6.1	68.1	1.490	1.460
2	50	6844010	63.5	25.4	21.3	60.3	62.1	6.6	83.3	2.396	2.367
2 1/2	65	6844011	74.7	29.7	23.9	73	75.6	7.9	98	3.690	3.609
3	80	6844012	85.9	31.2	25.4	88.9	91.4	8.9	117.3	5.629	5.587
4	100	6844014	114	33.8	29.1	114.3	116.9	9.8	148	10.707	10.654
6	150	6844016	159	38.9	36.8	168.1	170.7	12.9	204.1	25.195	24.505



REDUCING TEE



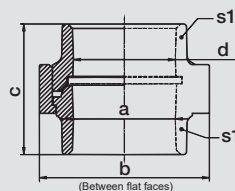
2065R

Nominal Pipe Size		Code	Dimensions (mm)		Unit Weight (kg)	
Inch	mm		x	z	Galv.	Black
1 2 3	1 2 3					
1/2 x 1/2 x 1/4	15 x 15 x 8	6845025	28	29	0.238	0.229
1/2 x 1/2 x 3/8	15 x 15 x 10	6845026	30.2	30.2	0.268	0.258
3/4 x 3/4 x 1/2	20 x 20 x 10	6845028	30	34	0.363	0.354
3/4 x 3/4 x 3/8	20 x 20 x 15	6845029	33.3	35.1	0.414	0.393
1 x 1 x 1/2	25 x 25 x 15	6845032	36.6	38.1	0.592	0.615
1 x 1 x 3/4	25 x 25 x 20	6545033	38.1	39.6	0.615	0.615
1 1/4 x 1 1/4 x 3/4	32 x 32 x 20	6845036	41.4	44.5	0.887	0.875
1 1/4 x 1 1/4 x 1	32 x 32 x 25	6845037	44.5	46	0.985	0.972
1 1/2 x 1 1/2 x 1	40 x 40 x 25	6845041	46	50.8	1.225	1.195
1 1/2 x 1 1/2 x 1 1/4	40 x 40 x 32	6845042	50.8	52.3	1.359	1.316
2 x 2 x 1 1/4	50 x 50 x 32	6845046	54.1	58.7	1.881	1.863
2 x 2 x 1 1/2	50 x 50 x 40	6845047	57.2	60.5	2.067	2.025
2 1/2 x 2 1/2 x 1 1/2	65 x 65 x 40	6845050	62	66.8	2.872	2.837
2 1/2 x 2 1/2 x 2	65 x 65 x 50	6845051	68.3	70	3.260	3.103
3 x 3 x 2	80 x 80 x 50	6845055	71.4	79.5	4.365	4.320
3 x 3 x 2 1/2	80 x 80 x 65	6845056	77.7	84.1	4.994	4.809
4 x 4 x 2 1/2	100 x 100 x 65	6845059	86	97	7.462	7.165
4 x 4 x 3	100 x 100 x 80	6845060	92	100	7.904	7.890
6 x 6 x 4	150 x 150 x 100	6845071	112	125.4	16.920	16.888

*See available finishes.

TUPYNT fittings are available in a Blackheart (include 41 at the end of the product code) or Galvanized (include 43 at the end of the product code) finish.

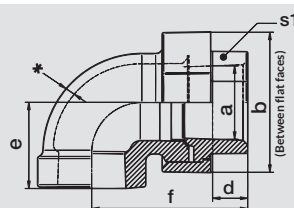
UNION SINGLE BRASS SEAT



2070

Nominal Pipe Size (NPS)		Code	Dimensions (mm)					Thread g	Unit Weight (kg)	
In.	mm		a	b	c	d	s1		Galv.	Black
3/8	8	6861002	7.6	33.8	39.4	10.9	19	3/4	0.144	0.118
	10	6861003	10.7	38.1	43.4	11.9	23	7/8	0.204	0.201
1/2	15	6861004	13.7	44.7	46	14.5	27	1 1/8	0.281	0.268
3/4	20	6861006	18.8	54.6	53.9	16.3	34	1 1/2	0.523	0.498
1	25	6861007	24.1	63	58.7	19.1	41	1 3/4	0.650	0.640
1 1/4	32	6861008	32.3	76.7	67.6	21.3	50	2 1/4	0.941	0.917
1 1/2	40	6861009	38.1	83.3	72.4	22.1	57	2 1/2	1.375	1.734
2	50	6861010	49	100.6	82.1	25.4	70	3	1.897	1.886
2 1/2	65	6861011	58.9	119.9	84.6	29.7	85	3 3/4	3.142	3.089
3	80	6861012	73.7	136.4	103.9	31.2	104	*	4.471	4.420
4	100	6861014	97	177.8	113.5	33.9	132	#	8.481	8.305
6	150	6842016	69	38.9	36.8	12.9	13.2	8.9	7.815	7.389

UNION ELBOW SINGLE BRASS SEAT



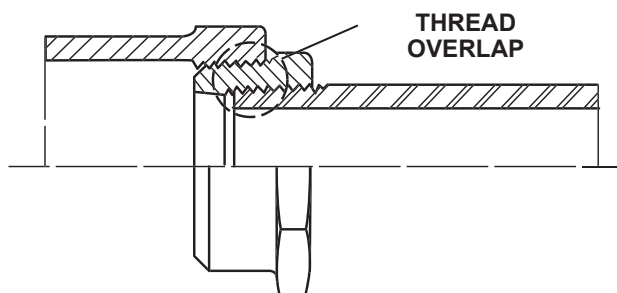
2075

Nominal Pipe Size (NPS)		Code	Dimensions (mm)						Thread g	Unit Weight (kg)	
In.	mm		a	b	f	d	e	s1		Galv.	Black
½	15	6870004	13.7	44.7	59.0	14.5	32	27	1 1/8	0.427	0.411
¾	20	6870006	18.8	54.6	70.0	16.3	37	34	1 ½	0.731	0.712
1	25	6870007	24.1	63.0	78.0	19.1	42	41	1 ¾	0.968	0.927
1 ¼	32	6870008	32.3	76.7	90.0	21.3	49	50	2 ¼	1.489	1.498
1 ½	40	6870009	38.1	83.3	96.0	22.1	54	57	2 ½	2.045	2.019
2	50	6870010	49.0	100.6	110.0	25.4	64	70	3	2.955	2.918

IMPORTANT NOTE

Class 300 Reducing Bush and TUPYNPT Plugs are not manufactured and are listed exclusively as available Class 150 parts, as shown above. However, by meeting the test specifications for Class 300 working pressures, and in accordance with the NBR-6925 standard, Reducing Bush and TUPY NPT#150 Plugs may be used in pipes for which other connections are specified under Class 300.

The above considerations are supported by the fact that these parts generate an overlay in wall thickness when applied to piping, which increases safety. See the drawing below:



*See available finishes.

TUPYNPT fittings are available in a Blackheart (include 41 at the end of the product code) or Galvanized (include 43 at the end of the product code) finish.

MEASUREMENT OF NPT THREAD CALIBRATION PLANE (ASME B1.20.1)

VERIFYING CALIBRATION PLANE IN INTERNAL THREAD USING A PLUG GAUGE FOR GAUGES BETWEEN $\frac{1}{4}$ " AND 6"

A tolerance of -1 to +1 turns is provided.

Verify start of thread observing the start of the tool's initial point of contact, which marks the start of measurement of the calibration plane's position.

1. Establishing nominal calibration plane: insert gage into the part, turning it until the start of the part's thread is flush with the gage's central groove to determine the nominal calibration plane as detailed in figure 01.

START OF THREAD - NOMINAL CALIBRATION

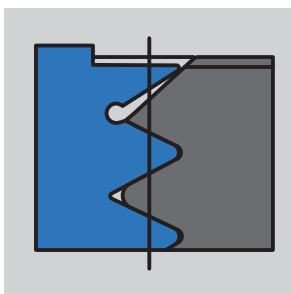


Figure 1 - Nominal CP

1. Establishing minimum calibration plane: rotate gage a -1 turn from the nominal plane, as shown in Figure 2

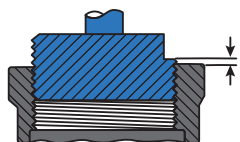


Figure 2 - Minimum CP

2. Establishing maximum calibration plane: rotate gage a +1 turn from the nominal plane, as shown in Figure 3.

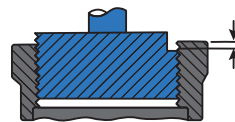


Figure 3 - Maximum CP

VERIFYING EXTERNAL THREAD'S CALIBRATION PLANE USING A PLUG GAUGE FOR GAUGES BETWEEN $\frac{1}{4}$ " AND 6"

A tolerance of -1 to +1 turns is provided.

Verify start of thread observing the start of the tool's initial point of contact, which marks the start of measurement of the calibration plane's position.

1. Establishing nominal calibration plane: insert ring gage into the part, turning it until the start of the part's thread is flush with the gage's central groove to determine the nominal calibration plane as detailed in Figure 4.

START OF THREAD - NOMINAL CALIBRATION

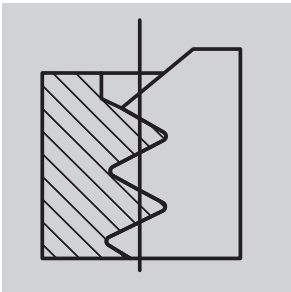


Figure 4 - Nominal CP

2. Establishing minimum calibration plane: rotate gage a -1 turn from the nominal plane, as shown in Figure 5.

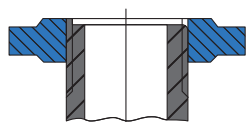


Figure 5 - Minimum CP

3. Establishing maximum calibration plane: rotate gage a +1 turn from the nominal plane, as shown in Figure 6

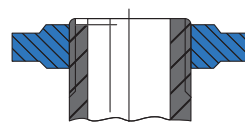


Figure 6 - Maximum CP

CONDUCTION PIPES

FITTED WITH NPT THREAD

CARBON STEEL PIPES MEETING QUALITY REQUIREMENTS FOR FLUID CONDUCTION UNDER ABNT NBR 5590

Welded or Seamless - Zinc Plated or Blackheart

THREAD : NPT according to ANSI B 120.1 and ABNT NBR 12912.

CLASS : The following classes are included under these specifications:

- NORMAL (N)
- REINFORCED (R)
- DOUBLE REINFORCED (DR)

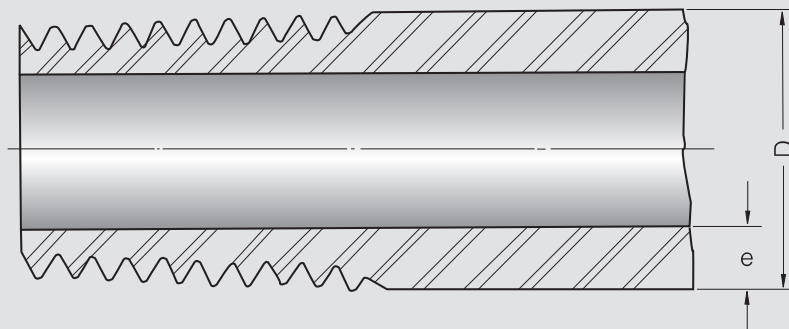
MATERIAL : Carbon steel.

TEMPERATURE : Recommended maximum temperature of 200°C.

TOLERANCE : wall thickness: minimum of (-) 12.5%.
outside diameter: up to 1½. $\left\{ \begin{array}{l} + 0,4\text{mm} \\ - 0,8\text{mm} \end{array} \right.$
Larger pipes $2'' \pm 0,01D$.

ZINC LAYER : Minimum average weight of both pipe ends $\geq 550 \text{ g/m}^2$ (77 microns)
Minimum weight at either pipe end $\geq 490 \text{ g/m}^2$ (68 microns)

DIMENSIONS : See tables on following page.



NOTES

TUPY does not manufacture carbon steel pipes. Pipe data have been included in this catalog for information purposes only.

PIPE DIMENSIONS TABLE

STANDARD ABNT NBR 5590 CLASS PIPES (SIMILAR TO ANSI B 36-10)

Nominal Pipe Size		Outer Diameter (D) mm	Class	Series (Schedule)	Wall Thickness (e)		Mass per Meter	
mm	pol				Welded mm	Seamless mm	Welded kg/m	Seamless kg/m
6	1/8	10.29	N	40	1.70	1.72	0.36	0.36
8	1/4	13.72	N	40	2.25	2.24	0.63	0.63
10	3/8	17.25	N	40	2.36	2.31	0.86	0.85
15	1/2	21.34	N	40	2.80	2.77	1.28	1.27
20	3/4	26.67	N	40	2.80	2.87	1.65	1.68
25	1	33.40	N	40	3.35	3.38	2.48	2.50
32	1 1/4	42.16	N	40	3.55	3.56	3.38	3.39
40	1 1/2	48.26	N	40	3.75	3.68	4.12	4.05
50	2	60.32	N	40	4.00	3.91	5.56	5.44
65	2 1/2	73.03	N	40	5.30	5.16	8.85	8.64
80	3	88.90	N	40	5.60	5.49	11.50	11.29
90	3 1/2	101.60	N	40	5.60	5.74	13.26	13.57
100	4	114.30	N	40	6.00	6.02	16.02	16.07
125	5	141.30	N	40	6.70	6.55	22.24	21.77
150	6	168.28	N	40		7.11	28.22	28.26

REINFORCED ABNT NBR 5590 CLASS PIPES (SIMILAR TO ANSI B 36-10)

Nominal Pipe Size		Outer Diameter (D) mm	Class	Series (Schedule)	Wall Thickness (e)		Mass per Meter	
mm	pol				Welded mm	Seamless mm	Welded kg/m	Seamless kg/m
6	1/8	10.29	R	80	2.36	2.41	0.46	0.47
8	1/4	13.72	R	80	3.00	3.02	0.79	0.80
10	3/8	17.25	R	80	3.15	3.20	1.09	1.10
15	1/2	21.34	R	80	3.75	3.73	1.63	1.62
20	3/4	26.67	R	80	4.00	3.91	2.24	2.19
25	1	33.40	R	80	4.50	4.55	3.21	3.24
32	1 1/4	42.16	R	80	5.00	4.85	4.58	4.46
40	1 1/2	48.26	R	80	5.00	5.08	5.33	5.41
50	2	60.32	R	80	5.60	5.54	7.56	7.48
65	2 1/2	73.03	R	80	7.10	7.01	11.54	11.41
80	3	88.90	R	80	7.50	7.62	15.24	15.46
90	3 1/2	101.60	R	80	8.00	8.08	18.47	18.63
100	4	114.30	R	80	8.50	8.56	22.18	22.32
125	5	141.30	R	80	9.50	9.53	30.88	30.97
150	6	168.28	R	80	11.20	10.97	43.38	42.56

DUAL REINFORCED ABNT NBR 5590 CLASS PIPES (SIMILAR TO ANSI B 36-10)

Nominal Pipe Size		Outer Diameter (D) mm	Class	Series (Schedule)	Wall Thickness (e)		Mass per Meter	
mm	pol				Welded mm	Seamless mm	Welded kg/m	Seamless kg/m
15	1/2	21.34	DR	-	7.50	7.47	2.56	2.55
20	3/4	26.67	DR	-	8.00	7.82	3.68	3.64
25	1	33.40	DR	-	9.00	9.09	5.42	5.45
32	1 1/4	42.16	DR	-	9.50	9.70	7.65	7.76
40	1 1/2	48.26	DR	-	10.00	10.16	9.43	9.55
50	2	60.32	DR	-	11.20	11.07	13.57	13.44
65	2 1/2	73.03	DR	-	14.00	14.02	20.38	20.41
80	3	88.90	DR	-	15.00	15.24	27.34	27.68
100	4	114.30	DR	-	17.00	17.12	40.79	41.03
125	5	141.30	DR	-	19.00	19.05	57.30	57.43
150	6	168.28	DR	-	22.40	21.95	80.58	79.21

Note: these tables exclusively refer to the most commonly used pipes. However, the ABNT NBR 5587 standard is greater in scope.

NOTES

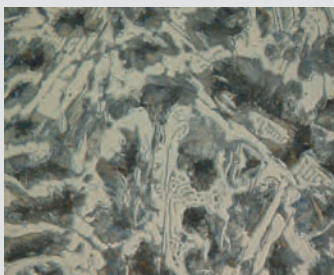
TUPY does not manufacture carbon steel pipes. Pipe data have been included in this catalog for information purposes only.

ADDITIONAL INFORMATION ON TUPY FITTINGS

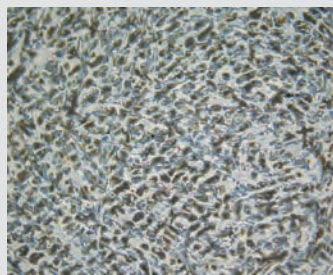
BLACKHEART MALLEABLE CAST IRON (FMP)

Black Head Malleable Cast Iron is an alloy essentially consisting of iron, carbon and silicon. Its microstructure, in a raw casting state, contains carbon in a completely combined form, that after the heat treatment applied during graphitization forms graphite during annealing processes (compact), ferrite, perlite or develops a quenching and tempering microstructure without the significant presence of eutectic carbides (standards: ISO 5922, EN 1562 and ABNT NBR 6590).

Structure of Blackheart Malleable Cast Iron in its raw state prior to heat treatment, i.e. WHITEHEART CAST IRON.



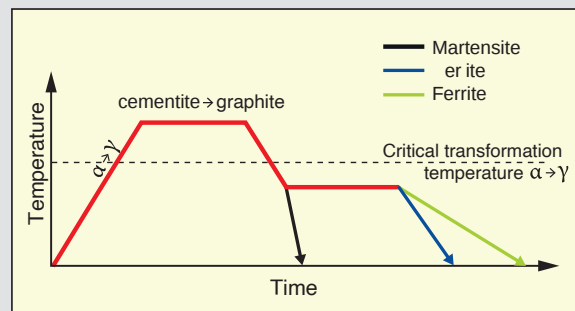
100X increase



500X increase

Blackheart iron is transformed into **MALLEABLE IRON** through a Malleabilization process. Malleabilization is a process through which whiteheart cast iron, in its primary form comprising Ledeburite and Perlite is subject to a prolonged heat cycle under controlled temperature, time and means in order transform part of the combined carbon into graphite, as shown in the following figure:

HEAT TREATMENT CYCLE



This heat treatment cycle produces the microstructure shown in Figures 1 and 2, below:

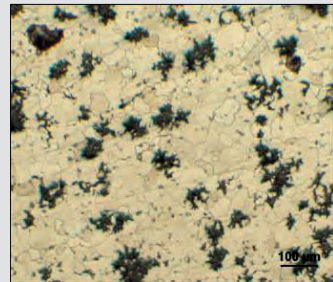
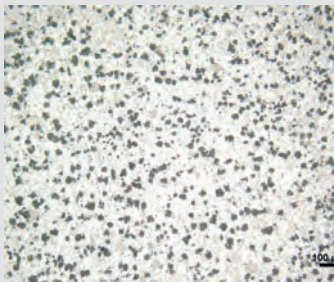


Figure 1 - FERRITIC MBI
(100X and 500X increase)

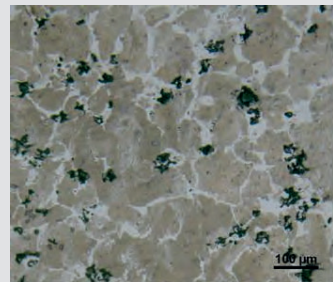
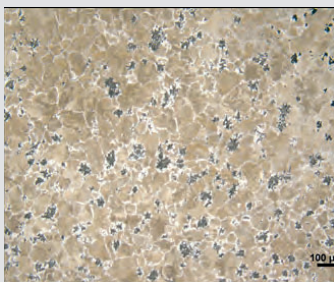
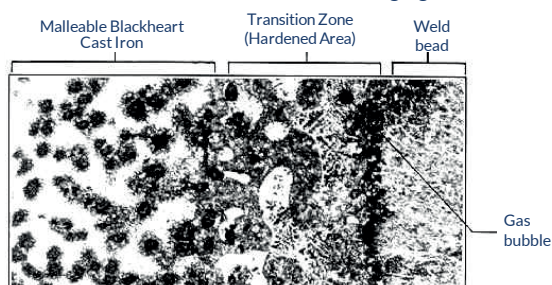


Figure 2 - PERLITIC MBI
(100X and 500X increase)

WELDABILITY

Carbon content in the region to be welded is the main parameter dictating a material's weldability. A high carbon content favors the formation of martensite, cementite and gas bubbles in the area subject to heat treatment, thereby causing it to weaken.

Malleable BLACKHEART cast iron, which is annealed in a neutral atmosphere, undergoes the decomposition of cementite (Fe_3C). Annealing graphite is in turn formed during the process. Graphite considerably hinders welding since it oxidizes during heating and causes the gas bubbles to form that may become occluded during cooling, resulting in weakened and porous welds, as can be observed in the microstructure shown in the following figure:



Important Note: TUPY does not recommend nor approve welding processes applied to its fittings for the reasons described above. Such a practice, which is not rare on the market, may cause structural damage to parts and leaks in pipes, leading to considerable economic losses.

APPLICATIONS

Black malleable cast iron is considered an intermediary between steel and gray cast iron. It presents the fundamental characteristics of cast iron combined with the mechanical properties of low and medium carbon steels, with a significant level of ductility. Black malleable cast iron has a consistent corrosion resistance due to the surface characteristics originating during the malleability processes. It is widely applied in the following industries: mechanical, electrical, automotive, construction materials and heavy-duty equipment. Black malleable cast iron is widely used in the manufacture of parts such as hydraulic pipes fittings, electric transmission line connections, spring supports, vehicle steering columns and differentials, wheel hub, brake shoes, gearboxes, etc.

PROPERTIES OF BLACKHEART MALLEABLE CAST IRON - FMP 350-10

Mechanical Properties

MATERIAL DESIGNATION ACCORDING TO ISO 5922 - JMB 350-10				
Body diameter (mm)	Minimum shear strength limit - LR (MPa)	Minimum yield strength (0.2%) - LE 0.2 (Mpa)	Minimum 3D Elongation - A (%)	Brinell HB Hardness *
12 or 15	350	200	10	150

Reference hardness: ABNT NBR 6943 and NBR 6925.

Other Properties

CHARACTERISTICS	UNITS	RESULT
Modulus of Elasticity	N/mm ²	175,000 to 195,000
¹ Compression Strength	N/mm ²	4X (Tensile Strength)
² Yield Strength 0.2%	N/mm ²	0.5x (Shear Strength)
Flexural Strength	N/mm ²	2X (Tensile Strength)
Shear Strength	N/mm ²	0.9X (Shear Strength)
³ Impact flexural strength (at room temperature)	mN/cm ²	100

1: Cylindrical specimen with a 10mm and 15mm diameter and length, respectively.

2: Cylindrical specimen with a 20mm and 60mm diameter and length, respectively.

3: Specimen not fitted with groove and raw surface without finish with dimensions of 10x10x55cm.

Physical Properties

CHARACTERISTICS	UNITS	RESULT
Specific Weight	g/cm ³	7.2
Specific Heat (10 to 100°C)	J/g.K	0.46
Thermal Conductivity (10 to 100°C)	W/cm.K	0.42
Thermal Expansion Coefficient (20 to 400°C)	°C	12
Electrical Resistivity (20°C)	Qmm ² /m	0.3

Magnetic properties

CHARACTERISTICS	UNITS	RESULT
Magnetic Induction at field strength of:		
30 Oe	Gauss	13000
60 Oe		14000
125 Oe		15000
Remanence	Gauss	6000
Magnetic Coercive Force	Oersted	1.5
Maximum Permeability	Gauss/Oersted	2500

MALLEABILITY OF IRON

In order for us to determine whether iron has been properly cast and treated, the following malleability test is performed:

BSP LINE

Parts must be compressed, after heat treatment, to 10% of their external diameter for fittings with a NPS of up to 2 and 5% of their external diameter for fittings with a NPS greater than 2, without cracking and/or formation of fissures in their internal parts. Parts with a wall thickness greater than 10 mm must not shatter. The above procedure is shown in Figure 1.



Figure 1

NPT LINE

Specimen consists of a ring cut from the fitting in its raw state using a saw without any further operations performed after heat treatment. The ring is the pipe's relief itself (in diameter and width), as shown in Figure 2.

Specimens must be compressed to a minimum of 4% of their outer diameter, also according to Figure 1.

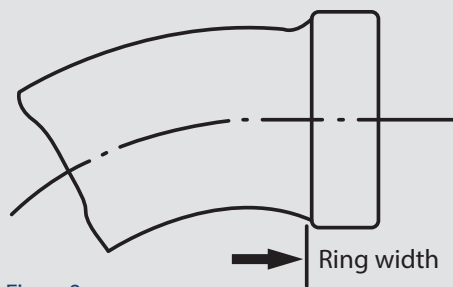


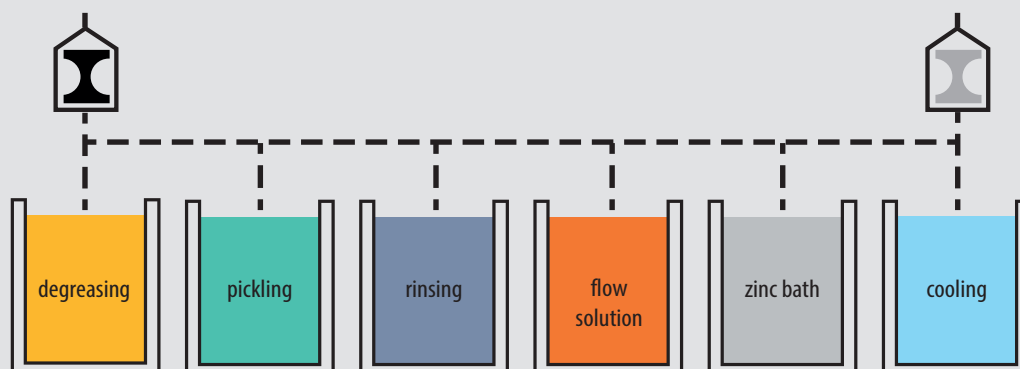
Figure 2

SURFACE PROTECTION

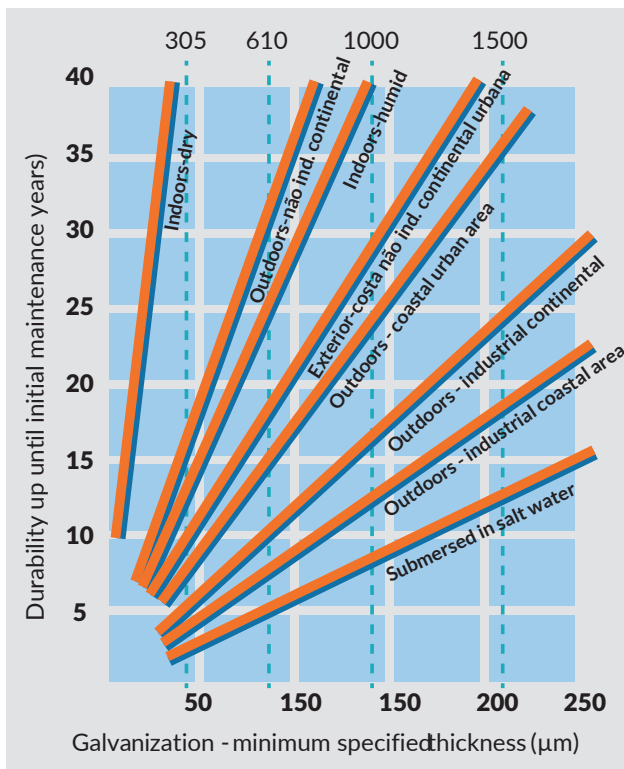
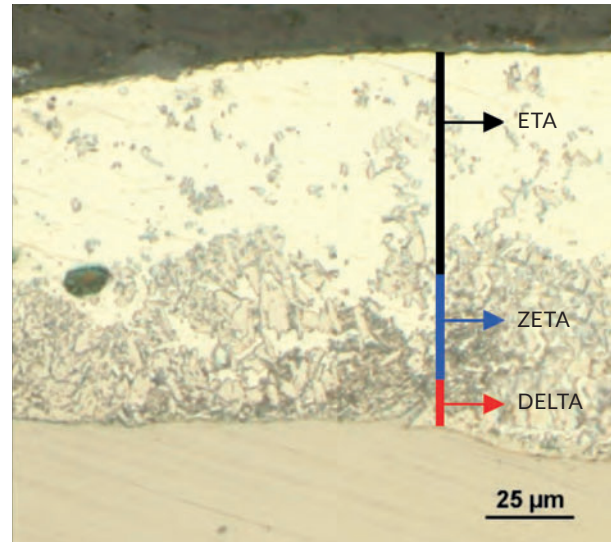
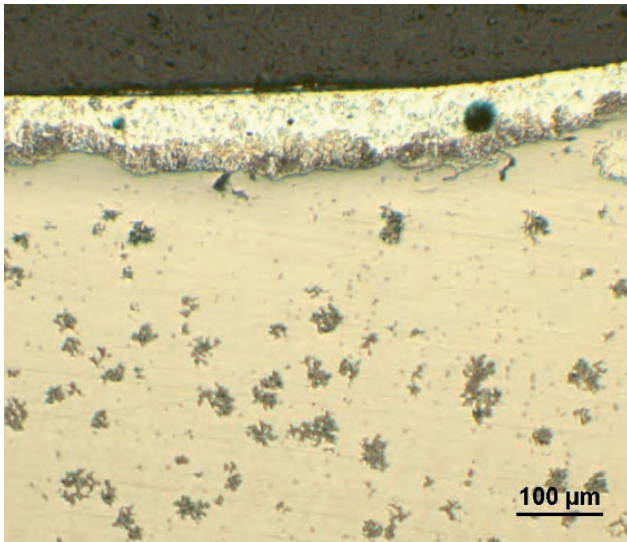
1. "GALVANIZED" FINISH

The main purpose of hot-dip galvanizing is to prevent iron from corroding. Zinc, since it has a higher oxidation potential than iron, generally corrodes first and serves the purpose of protecting the base metal. Hot dip galvanizing, i.e. coating iron with zinc, is likely the most environmentally friendly corrosion prevention process.

The operational flow used for hot dip galvanizing is presented below:



The results of introducing molten zinc into metal and tested service life are presented below:



Additionally, hot-dip galvanizing, since it occurs at high temperatures, promotes fusion between metals (zinc and base metal), creating an extremely adherent protection that is not easily removed through mechanical damage.

2. "OILED" FINISH

After the machining (threading) process is performed on the product, the final surface protection is applied. This protection serves to protect fittings against corrosion while in its packaging.

The oil used in the process is a water-soluble anticorrosive and is based on **pharmaceutical grade white oil**. It is intended for use in the temporary protection of metal surfaces. When diluted in water, this oil provides a white, stable and long-lasting emulsion. It is highly resistant to microorganisms and offers prolonged corrosion protection.

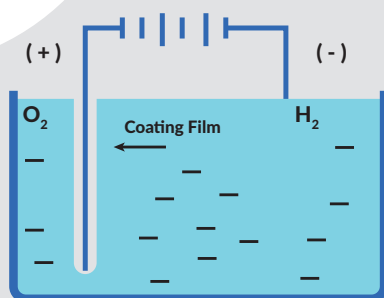
The film retained after water has evaporated is thin and oily and presents semi-drying properties.

3. KTL PAINT COATING

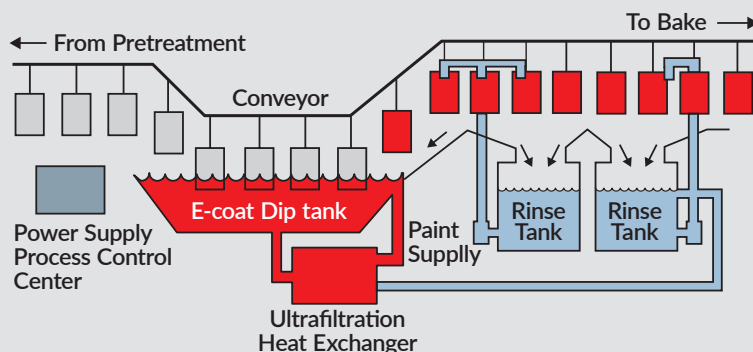
Electrodeposition is the most efficient means of replacing metal parts of a complex geometry.

Electrodeposition painting is referred to by several different names, including e-coat, electrocoat, electrophoretic painting or KTL painting (Kathodische Tauchlackierung - which means cathodic electrodeposition), etc.

During electrodeposition painting, organic molecules are deposited onto an electrically magnetized substrate. The electrodeposition process occurs whenever a metallic object is immersed in a paint bath diluted with water, through which a continuous electric current is passed. The part to be painted is connected to the positive pole. The opposing negative pole - the tank itself, or the electrodes are positioned on the bath's lateral walls. An electrodeposition system is presented below:



ANODIC SYSTEM



WHY USE KTL PAINT

Electroplating finishing offers increased efficiency during the use of materials when compared to conventional liquid spraying and powder coating systems.

Electrodeposition on non-visible surfaces or interior coverings may be carried out through the phenomenon known as penetration power - which refers the possibility of obtaining a film of uniform thickness, even in recessed areas. As result, complex surfaces are covered without any difficulty. This provides fittings with greater corrosion resistance.

CORROSION AND ABRASION RESISTANCE

Due to the uniform application of paint and the increase in concentrated grain closure, the tests performed demonstrated increased resistance to corrosion and abrasion, according to salt spray (ASTM B117) and Taber abrasion test (ASTM D4060).

This type of paint can provide superior marks offering 1,000 hours in resistance to salt spray (atmosphere chamber saturated by NaCl solution vapor) and loss in mass, after 100 revolutions of less than 14mg.

Tests photos are presented below:



500 hours of Salt Spray



2,000 hours of Salt Spray



Abrasion test
(loss of mass totaling 13.1 mg after 100 revolutions)

ADVANTAGES OF USING PAINT

- Non-toxic product, free of ethyl glycol and heavy metals;
- Low rates of volatile organic solvents - VOC;
- Excellent corrosion protection and highly adhesive to unpainted metal;
- Highly resistant to chemical agents;
- Consistent UV - Ultraviolet resistance;
- Wear-resistant;
- Not harmful to the environment;
- Uniform layer of the film that does not interfere with threaded assemblies;
- Increased flexibility in difficult to access areas, hollow parts and optimal edge protection, thereby providing an improved overall finish.

BSP LINE - FM CERTIFICATION	
TupyCode	TupyDescription
1201025	REDUCING BUSHING 1/2 X 1/4
1201026	REDUCING BUSHING 1/2 X 3/8
1201027	REDUCING BUSHING 3/4 X 1/4
1201028	REDUCING BUSHING 3/4 X 3/8
1201031	REDUCING BUSHING 1 X 3/8
1201032	REDUCING BUSHING 1 X 1/2
1201033	REDUCING BUSHING 1 X 3/4
1201035	REDUCING BUSHING 1 1/4 X 1/2
1201036	REDUCING BUSHING 1 1/4 X 3/4
1201037	REDUCING BUSHING 1 1/4 X 1
1201039	REDUCING BUSHING 1 1/2 X 1/2
1201040	REDUCING BUSHING 1 1/2 X 3/4
1201041	REDUCING BUSHING 1 1/2 X 1
1201042	REDUCING BUSHING 1 1/2 X 1 1/4
1201043	REDUCING BUSHING 2 X 1/2
1201044	REDUCING BUSHING 2 X 3/4
1201045	REDUCING BUSHING 2 X 1
1201046	REDUCING BUSHING 2 X 1 1/4
1201047	REDUCING BUSHING 2 X 1 1/2
1201048	REDUCING BUSHING 2 1/2 X 1
1201049	REDUCING BUSHING 2 1/2 X 1 1/4
1201050	REDUCING BUSHING 2 1/2 X 1 1/2
1201051	REDUCING BUSHING 2 1/2 X 2
1201054	REDUCING BUSHING 3 X 1 1/2
1201055	REDUCING BUSHING 3 X 2
1201056	REDUCING BUSHING 3 X 2 1/2
1201058	REDUCING BUSHING 4 X 2
1201059	REDUCING BUSHING 4 X 2 1/2
1201060	REDUCING BUSHING 4 X 3
1203004	FLANGED PLUG 1/2*
1203006	FLANGED PLUG 3/4*
1203007	FLANGED PLUG 1*
1203008	FLANGED PLUG 1 1/4*
1203009	FLANGED PLUG 1 1/2*
1203010	FLANGED PLUG 2*
1203011	FLANGED PLUG 2 1/2*
1203012	FLANGED PLUG 3*
1202006	PLUG 3/4*
1202007	PLUG 1*
1202008	PLUG 1 1/4*
1202009	PLUG 1 1/2
1202010	PLUG 2*
1202011	PLUG 2 1/2
1202012	PLUG 3
1202014	PLUG 4
1207004	ELBOW 90 1/2*
1207006	ELBOW 90 3/4*
1207007	ELBOW 90 1*
1207008	ELBOW 90 1 1/4*
1207009	ELBOW 90 1 1/2*
1207010	ELBOW 90 2*
1207011	ELBOW 90 2 1/2*
1207012	ELBOW 90 3*
1207014	ELBOW 90 4*
1209004	ELBOW 45° 1/2
1209006	ELBOW 45° 3/4
1209007	ELBOW 45° 1*
1209008	ELBOW 45° 1 1/4
1209009	ELBOW 45° 1 1/2*
1209010	ELBOW 45° 2
1209011	ELBOW 45° 2 1/2

BSP LINE - FM CERTIFICATION	
TupyCode	TupyDescription
1209012	ELBOW 45° 3*
1209014	ELBOW 45° 4*
1215004	ELBOW WITH LATERAL OUTLET1/2*
1215006	ELBOW WITH LATERAL OUTLET3/4*
1215007	ELBOW WITH LATERAL OUTLET1
1215008	ELBOW WITH LATERAL OUTLET1 1/4
1215009	ELBOW WITH LATERAL OUTLET1 1/2
1215010	ELBOW WITH LATERAL OUTLET2
1208025	REDUCING ELBOW 1/2 X 1/4
1208026	REDUCING ELBOW 1/2 X 3/8
1208028	REDUCING ELBOW 3/4 X 3/8
1208029	REDUCING ELBOW 3/4 X 1/2*
1208032	REDUCING ELBOW 1 X 1/2*
1208033	REDUCING ELBOW 1 X 3/4*
1208036	REDUCING ELBOW 1 1/4 X 3/4*
1208037	REDUCING ELBOW 1 1/4 X 1*
1208040	REDUCING ELBOW 1 1/2 X 3/4
1208041	REDUCING ELBOW 1 1/2 X 1
1208042	REDUCING ELBOW 1 1/2 X 1 1/4*
1208047	REDUCING ELBOW 2 X 1 1/2*
1208051	REDUCING ELBOW 2 1/2 X 2
1211004	ELBOW MF 1/2*
1211006	ELBOW MF 3/4*
1211007	ELBOW MF 1*
1211008	ELBOW MF 1 1/4*
1211009	ELBOW MF 1 1/2*
1211010	ELBOW MF 2*
1211011	ELBOW MF 2 1/2*
1211012	ELBOW MF 3*
1211014	ELBOW MF 4*
1210004	ELBOW MF 45° 1/2
1210006	ELBOW MF 45° 3/4
1210007	ELBOW MF 45° 1
1218004	CROSS TEE FITTING 1/2*
1218006	CROSS TEE FITTING 3/4*
1218007	CROSS TEE FITTING 1*
1218008	CROSS TEE FITTING 1 1/4
1218009	CROSS TEE FITTING 1 1/2
1218010	CROSS TEE FITTING 2*
1218011	CROSS TEE FITTING 2 1/2
1218012	CROSS TEE FITTING 3*
1229004	RETURN BEND 1/2
1229006	RETURN BEND 3/4
1229007	RETURN BEND 1
1229008	RETURN BEND 1 1/4*
1229009	RETURN BEND 1 1/2
1229010	RETURN BEND 2
1228076	TRANSPOSITION BEND 1/2 - 1/2
1228078	TRANSPOSITION BEND 1/2 - 1*
1228079	TRANSPOSITION BEND 3/4 - 3/4*
1228080	TRANSPOSITION BEND 3/4 - 1
1223004	FEMALE BEND 1/2*
1223006	FEMALE BEND 3/4*
1223007	FEMALE BEND 1*
1223008	FEMALE BEND 1 1/4*
1223009	FEMALE BEND 1 1/2*
1223010	FEMALE BEND 2*

BSP LINE - FM CERTIFICATION	
TupyCode	TupyDescription
1223011	FEMALE BEND 2 1/2*
1223012	FEMALE BEND 3*
1223014	FEMALE BEND 4*
1221004	SHORT FEMALE BEND1/2*
1221006	SHORT FEMALE BEND3/4
1221007	SHORT FEMALE BEND1 *
1221008	SHORT FEMALE BEND1 1/4
1221009	SHORT FEMALE BEND1 1/2*
1221010	SHORT FEMALE BEND2*
1226004	FEMALE BEND 45° 1/2*
1226006	FEMALE BEND 45° 3/4
1226007	FEMALE BEND 45° 1*
1226008	FEMALE BEND 45° 1 1/4*
1226009	FEMALE BEND 45° 1 1/2*
1226010	FEMALE BEND 45° 2*
1225004	MALE BEND 1/2*
1225006	MALE BEND 3/4*
1225007	MALE BEND 1
1225008	MALE BEND 1 1/4*
1225009	MALE BEND 1 1/2*
1225010	MALE BEND 2*
1225011	MALE BEND 2 1/2
1225012	MALE BEND 3
1225014	MALE BEND 4
1227004	BEND MF 45° 1/2*
1227006	BEND MF 45° 3/4*
1227007	BEND MF 45° 1*
1227008	BEND MF 45° 1 1/4*
1227009	BEND MF 45° 1 1/2*
1227010	BEND MF 45° 2*
1227011	BEND MF 45° 2 1/2*
1227012	BEND MF 45° 3*
1224004	BEND MF 1/2*
1224006	BEND MF 3/4*
1224007	BEND MF 1*
1224008	BEND MF 1 1/4*
1224009	BEND MF 1 1/2
1224010	BEND MF 2*
1224011	BEND MF 2 1/2*
1224012	BEND MF 3*
1224014	BEND MF 4
126400430	WATER TANK FLANGE1/2*
126400630	WATER TANK FLANGE3/4*
126400730	WATER TANK FLANGE1
126400830	WATER TANK FLANGE1 1/4
126400930	WATER TANK FLANGE1 1/2
126401030	WATER TANK FLANGE2
126401130	WATER TANK FLANGE2 1/2
1231004	FULL COUPLING 1/2*
1231006	FULL COUPLING 3/4*
1231007	FULL COUPLING 1*
1231008	FULL COUPLING 1 1/4*
1231009	FULL COUPLING 1 1/2*
1231010	FULL COUPLING 2*
1231011	FULL COUPLING 2 1/2*
1231012	FULL COUPLING 3*
1231014	FULL COUPLING 4*

BSP LINE - FM CERTIFICATION	
TupyCode	TupyDescription
1236003	FULL LEFT/RIGHT THREADED COUPLING3/8
1236004	FULL LEFT/RIGHT THREADED COUPLING1/2
1236006	FULL LEFT/RIGHT THREADED COUPLING3/4
1236007	FULL LEFT/RIGHT THREADED COUPLING1
1236008	FULL LEFT/RIGHT THREADED COUPLING1 1/4
1236009	FULL LEFT/RIGHT THREADED COUPLING1 1/2
1236010	FULL LEFT/RIGHT THREADED COUPLING2
1232023	REDUCING COUPLING 3/8 x 1/4
1232025	REDUCING COUPLING 1/2 x 1/4
1232026	REDUCING COUPLING 1/2 x 3/8
1232028	REDUCING COUPLING 3/4 x 3/8*
1232029	REDUCING COUPLING 3/4 x 1/2*
1232031	REDUCING COUPLING 1 x 3/8
1232032	REDUCING COUPLING 1 x 1/2*
1232033	REDUCING COUPLING 1 x 3/4*
1232035	REDUCING COUPLING 1 1/4 x 1/2*
1232036	REDUCING COUPLING 1 1/4 x 3/4*
1232037	REDUCING COUPLING 1 1/4 x 1*
1232040	REDUCING COUPLING 1 1/2 x 3/4*
1232041	REDUCING COUPLING 1 1/2 x 1*
1232042	REDUCING COUPLING 1 1/2 x 1 1/4*
1232045	REDUCING COUPLING 2 x 1
1232046	REDUCING COUPLING 2 x 1 1/4*
1232047	REDUCING COUPLING 2 x 1 1/2*
1232049	REDUCING COUPLING 2 1/2 x 1 1/4*
1232050	REDUCING COUPLING 2 1/2 x 1 1/2*
1232051	REDUCING COUPLING 2 1/2 x 2*
1232054	REDUCING COUPLING 3 x 1 1/2*
1232055	REDUCING COUPLING 3 x 2*
1232056	REDUCING COUPLING 3 x 2 1/2*
1232058	REDUCING COUPLING 4 x 2*
1232059	REDUCING COUPLING 4 x 2 1/2*
1232060	REDUCING COUPLING 4 x 3*
1233004	FULL COUPLING MF 1/2
1233006	FULL COUPLING MF 3/4
1233007	FULL COUPLING MF 1
1233008	FULL COUPLING MF 1 1/4
1234104	EXTENDED MF COUPLING1/2 - 60
1234206	EXTENDED MF COUPLING3/4 - 70*
1234106	EXTENDED MF COUPLING3/4 - 90*
1235025	MF REDUCING COUPLING 1/2 x 1/4
1235026	MF REDUCING COUPLING 1/2 x 3/8
1235028	MF REDUCING COUPLING 3/4 x 3/8
1235029	MF REDUCING COUPLING 3/4 x 1/2*
1235032	MF REDUCING COUPLING 1 x 1/2
1235033	MF REDUCING COUPLING 1 x 3/4
1235036	MF REDUCING COUPLING 1 1/4 x 3/4*
1235037	MF REDUCING COUPLING 1 1/4 x 1
1235041	MF REDUCING COUPLING 1 1/2 x 1
1235042	MF REDUCING COUPLING 1 1/2 x 1 1/4
1235045	MF REDUCING COUPLING 2 x 1
1235046	MF REDUCING COUPLING 2 x 1 1/4
1235047	MF REDUCING COUPLING 2 x 1 1/2
1238004	DOUBLE NIPPLE 1/2*
1238006	DOUBLE NIPPLE 3/4*
1238007	DOUBLE NIPPLE 1*
1238008	DOUBLE NIPPLE 1 1/4*
1238009	DOUBLE NIPPLE 1 1/2*
1238010	DOUBLE NIPPLE 2*
1238011	DOUBLE NIPPLE 2 1/2*

BSP LINE - FM CERTIFICATION	
TupyCode	TupyDescription
1238012	DOUBLE NIPPLE 3*
1238014	DOUBLE NIPPLE 4*
1239025	DOUBLE REDUCING NIPPLE 1/2 x 1/4
1239026	DOUBLE REDUCING NIPPLE 1/2 x 3/8
1239028	DOUBLE REDUCING NIPPLE 3/4 x 3/8
1239029	DOUBLE REDUCING NIPPLE 3/4 x 1/2*
1239032	DOUBLE REDUCING NIPPLE 1 x 1/2
1239033	DOUBLE REDUCING NIPPLE 1 x 3/4*
1239036	DOUBLE REDUCING NIPPLE 1 1/4 x 3/4*
1239037	DOUBLE REDUCING NIPPLE 1 1/4 x 1
1239040	DOUBLE REDUCING NIPPLE 1 1/2 x 3/4
1239041	DOUBLE REDUCING NIPPLE 1 1/2 x 1
1239042	DOUBLE REDUCING NIPPLE 1 1/2 x 1 1/4
1239045	DOUBLE REDUCING NIPPLE 2 x 1
1239046	REDUCING NIPPLE 2 x 1 1/4
1239047	REDUCING NIPPLE 2 x 1 1/2
1239051	REDUCING NIPPLE 2 1/2 x 2
1239055	REDUCING NIPPLE 3 x 2
1239056	REDUCING NIPPLE 3 x 2 1/2
1242004	PLUG 1/2*
1242006	PLUG 3/4
1242007	PLUG 1*
1242008	PLUG 1 1/4
1242009	PLUG 1 1/2
1242010	PLUG 2
1242011	PLUG 2 1/2
1242012	PLUG 3
1242014	PLUG 4
1241004	HEX PLUG 1/2*
1241006	HEX PLUG 3/4*
1241007	HEX PLUG 1*
1241008	HEX PLUG 1 1/4*
1241009	HEX PLUG 1 1/2*
1241010	HEX PLUG 2*
1241011	HEX PLUG 2 1/2*
1241012	HEX PLUG 3*
1241014	HEX PLUG 4*
1244004	TEE JOINT 1/2*
1244006	TEE JOINT 3/4*
1244007	TEE JOINT 1*
1244008	TEE JOINT 1 1/4*
1244009	TEE JOINT 1 1/2*
1244010	TEE JOINT 2*
1244011	TEE JOINT 2 1/2*
1244012	TEE JOINT 3*
1244014	TEE JOINT 4*
1244016	TEE JOINT 6
1254004	TEE JOINT 45° 1/2*
1254006	TEE JOINT 45° 3/4*
1254007	TEE JOINT 45° 1*
1254008	TEE JOINT 45° 1 1/4
1254009	TEE JOINT 45° 1 1/2*
1254010	TEE JOINT 45° 2*
1254011	TEE JOINT 45° 2 1/2
1254012	TEE JOINT 45° 3*
1254014	TEE JOINT 45° 4
1255004	DOUBLE BEND TEE 1/2*
1255006	DOUBLE BEND TEE 3/4*

BSP LINE - FM CERTIFICATION	
TupyCode	TupyDescription
1245023	REDUCING TEE 3/8 x 1/4 x 3/8
1245025	REDUCING TEE 1/2 x 1/4 x 1/2
1245026	REDUCING TEE 1/2 x 3/8 x 1/2
1245028	REDUCING TEE 3/4 x 3/8 x 3/4
1245029	REDUCING TEE 3/4 x 1/2 x 3/4*
1245031	REDUCING TEE 1 x 3/8 x 1
1245032	REDUCING TEE 1 x 1/2 x 1*
1245033	REDUCING TEE 1 x 3/4 x 1*
1245035	REDUCING TEE 1 1/4 x 1/2 x 1 1/4*
1245036	REDUCING TEE 1 1/4 x 3/4 x 1 1/4*
1245037	REDUCING TEE 1 1/4 x 1 x 1 1/4*
1245039	REDUCING TEE 1 1/2 x 1/2 x 1 1/2*
1245040	REDUCING TEE 1 1/2 x 3/4 x 1 1/2*
1245041	REDUCING TEE 1 1/2 x 1 x 1 1/2*
1245042	REDUCING TEE 1 1/2 x 1 1/4 x 1 1/2*
1245043	REDUCING TEE 2 x 1/2 x 2*
1245044	REDUCING TEE 2 x 3/4 x 2*
1245045	REDUCING TEE 2 x 1 x 2*
1245046	REDUCING TEE 2 x 1 1/4 x 2*
1245047	REDUCING TEE 2 x 1 1/2 x 2*
1245048	REDUCING TEE 2 1/2 x 1 x 2 1/2*
1245049	REDUCING TEE 2 1/2 x 1 1/4 x 2 1/2*
1245050	REDUCING TEE 2 1/2 x 1 1/2 x 2 1/2*
1245051	REDUCING TEE 2 1/2 x 2 x 2 1/2*
1245052	REDUCING TEE 3 x 1 x 3*
1245053	REDUCING TEE 3 x 1 1/4 x 3*
1245054	REDUCING TEE 3 x 1 1/2 x 3*
1245055	REDUCING TEE 3 x 2 x 3*
1245056	REDUCING TEE 3 x 2 1/2 x 3*
1245058	REDUCING TEE 4 x 2 x 4*
1245059	REDUCING TEE 4 x 2 1/2 x 4
1245060	REDUCING TEE 4 x 3 x 4*
1246233	REDUCING TEE 3/4 x 1 x 3/4*
1247129	REDUCING TEE 3/4 x 1/2 x 1/2*
1247135	REDUCING TEE 1 1/4 x 1/2 x 1
1247137	REDUCING TEE 1 1/4 x 1 x 1
1247139	REDUCING TEE 1 1/2 x 1/2 x 1 1/4
1247141	REDUCING TEE 1 1/2 x 1 x 1 1/4
1247146	REDUCING TEE 2 x 1 x 1 1/2
1248137	REDUCING TEE 1 1/4 x 1 1/4 x 1
1249059	HYDRANT TEE 4 X 2 1/2
1261004	UNION WITH TAPERED BRONZE/IRON SEAT1/2
1261006	UNION WITH TAPERED BRONZE/IRON SEAT3/4
1261007	UNION WITH TAPERED BRONZE/IRON SEAT1
1261008	UNION WITH TAPERED BRONZE/IRON SEAT 1 1/4
1261009	UNION WITH TAPERED BRONZE/IRON SEAT 1 1/2
1261010	UNION WITH TAPERED BRONZE/IRON SEAT2
1261011	UNION WITH TAPERED BRONZE/IRON SEAT 2 1/2
1261012	UNION WITH TAPERED BRONZE/IRON SEAT3
1261014	UNION WITH TAPERED BRONZE/IRON SEAT4
1262004	UNION WITH TAPERED IRON SEAT1/2
1262006	UNION WITH TAPERED IRON SEAT3/4
1262007	UNION WITH TAPERED IRON SEAT1
1262008	UNION WITH TAPERED IRON SEAT1 1/4
1262009	UNION WITH TAPERED IRON SEAT1 1/2
1262010	UNION WITH TAPERED IRON SEAT2
1262011	UNION WITH TAPERED IRON SEAT2 1/2
1262012	UNION WITH TAPERED IRON SEAT3
1262014	UNION WITH TAPERED IRON SEAT4

BSP LINE - FM CERTIFICATION	
TupyCode	TupyDescription
1265004	UNION WITH TAPERED IRON SEATMF 1/2
1265006	UNION WITH TAPERED IRON SEATMF 3/4
1265007	UNION WITH TAPERED IRON SEATMF 1
1265008	UNION WITH TAPERED IRON SEATMF 1 1/4
1265009	UNION WITH TAPERED IRON SEATMF 1 1/2
1265010	UNION WITH TAPERED IRON SEATMF 2
1265011	UNION WITH TAPERED IRON SEATMF 2 1/2
1265012	UNION WITH TAPERED IRON SEATMF 3
1265014	UNION WITH TAPERED IRON SEATMF 4
1263004	FLAT SEAT UNION1/2
1263006	FLAT SEAT UNION3/4
1263007	FLAT SEAT UNION1
1263008	FLAT SEAT UNION1 1/4
1263009	FLAT SEAT UNION1 1/2
1263010	FLAT SEAT UNION2
1263011	FLAT SEAT UNION2 1/2
1263012	FLAT SEAT UNION3
1263014	FLAT SEAT UNION4
1267004	FLAT SEAT UNIONMF 1/2
1267006	FLAT SEAT UNIONMF 3/4
1267007	FLAT SEAT UNIONMF 1
1267008	FLAT SEAT UNIONMF 1 1/4
1267009	FLAT SEAT UNIONMF 1 1/2
1267010	FLAT SEAT UNIONMF 2
1268004	ELBOW UNION WITH TAPERED IRON SEAT 1/2
1268006	ELBOW UNION WITH TAPERED IRON SEAT 3/4
1268007	ELBOW UNION WITH TAPERED IRON SEAT 1
1268008	ELBOW UNION WITH TAPERED IRON SEAT 1 1/4
1268009	ELBOW UNION WITH TAPERED IRON SEAT 1 1/2
1268010	ELBOW UNION WITH TAPERED IRON SEAT 2
1268011	ELBOW UNION WITH TAPERED IRON SEAT 2 1/2
1268012	ELBOW UNION WITH TAPERED IRON SEAT 3
1269004	ELBOW UNION WITH TAPERED IRON SEAT MF 1/2
1269006	ELBOW UNION WITH TAPERED IRON SEAT MF 3/4
1269007	ELBOW UNION WITH TAPERED IRON SEAT MF 1
1269008	ELBOW UNION WITH TAPERED IRON SEAT MF 1 1/4
1269009	ELBOW UNION WITH TAPERED IRON SEAT MF 1 1/2
1269010	ELBOW UNION WITH TAPERED IRON SEAT MF 2
1269011	ELBOW UNION WITH TAPERED IRON SEAT MF 2 1/2
1269012	ELBOW UNION WITH TAPERED IRON SEAT MF 3
1285004	UNION NUT 1/2
1285006	UNION NUT 3/4
1285007	UNION NUT 1
1285008	UNION NUT 1 1/4
1285009	UNION NUT 1 1/2
1285010	UNION NUT 2
1285011	UNION NUT 2 1/2
1285012	UNION NUT 3
1285014	UNION NUT 4

BSP LINE - UL CERTIFICATION	
TupyCode	TupyDescription
1201023	REDUCING BUSHING 3/8 X 1/4
1201025	REDUCING BUSHING 1/2 X 1/4
1201026	REDUCING BUSHING 1/2 X 3/8
1201027	REDUCING BUSHING 3/4 X 1/4
1201028	REDUCING BUSHING 3/4 X 3/8
1201029	REDUCING BUSHING 3/4 X 1/2
1201031	REDUCING BUSHING 1 X 3/8
1201032	REDUCING BUSHING 1 X 1/2
1201033	REDUCING BUSHING 1 X 3/4
1201035	REDUCING BUSHING 1 1/4 X 1/2
1201036	REDUCING BUSHING 1 1/4 X 3/4
1201037	REDUCING BUSHING 1 1/4 X 1
1201039	REDUCING BUSHING 1 1/2 X 1/2
1201040	REDUCING BUSHING 1 1/2 X 3/4
1201041	REDUCING BUSHING 1 1/2 X 1
1201042	REDUCING BUSHING 1 1/2 X 1 1/4
1201043	REDUCING BUSHING 2 X 1/2
1201044	REDUCING BUSHING 2 X 3/4
1201045	REDUCING BUSHING 2 X 1
1201046	REDUCING BUSHING 2 X 1 1/4
1201047	REDUCING BUSHING 2 X 1 1/2
1201048	REDUCING BUSHING 2 1/2 X 1
1201049	REDUCING BUSHING 2 1/2 X 1 1/4
1201050	REDUCING BUSHING 2 1/2 X 1 1/2
1201051	REDUCING BUSHING 2 1/2 X 2
1201054	REDUCING BUSHING 3 X 1 1/2
1201055	REDUCING BUSHING 3 X 2
1201056	REDUCING BUSHING 3 X 2 1/2
1201058	REDUCING BUSHING 4 X 2
1201059	REDUCING BUSHING 4 X 2 1/2
1201060	REDUCING BUSHING 4 X 3
1203002	FLANGED PLUG 1/4
1203003	FLANGED PLUG 3/8
1203004	FLANGED PLUG 1/2*
1203006	FLANGED PLUG 3/4*
1203007	FLANGED PLUG 1*
1203008	FLANGED PLUG 1 1/4*
1203009	FLANGED PLUG 1 1/2*
1203010	FLANGED PLUG 2*
1203011	FLANGED PLUG 2 1/2*
1203012	FLANGED PLUG 3*
1202002	PLUG 1/4 *
1202003	PLUG 3/8*
1202004	PLUG 1/2*
1202006	PLUG 3/4*
1202007	PLUG 1*
1202008	PLUG 1 1/4*
1202009	PLUG 1 1/2
1202010	PLUG 2*
1202011	PLUG 2 1/2
1202012	PLUG 3
1202014	PLUG 4
1206003	JAM NUT 3/8*
1206004	JAM NUT 1/2*
1206006	JAM NUT 3/4*
1206007	JAM NUT 1*
1206008	JAM NUT 1 1/4*
1206009	JAM NUT 1 1/2*
1206010	JAM NUT 2*
1206011	JAM NUT 2 1/2*
1206012	JAM NUT 3*

BSP LINE - UL CERTIFICATION	
TupyCode	TupyDescription
1207002	ELBOW 90 1/4*
1207003	ELBOW 90 3/8*
1207004	ELBOW 90 1/2*
1207006	ELBOW 90 3/4*
1207007	ELBOW 90 1*
1207008	ELBOW 90 1 1/4*
1207009	ELBOW 90 1 1/2*
1207010	ELBOW 90 2*
1207011	ELBOW 90 2 1/2*
1207012	ELBOW 90 3*
1207014	ELBOW 90 4*
1209003	ELBOW 45° 3/8
1209004	ELBOW 45° 1/2
1209006	ELBOW 45° 3/4
1209007	ELBOW 45° 1*
1209008	ELBOW 45° 1 1/4
1209009	ELBOW 45° 1 1/2*
1209010	ELBOW 45° 2
1215004	ELBOW WITH LATERAL OUTLET1/2*
1215006	ELBOW WITH LATERAL OUTLET3/4*
1215007	ELBOW WITH LATERAL OUTLET1
1215008	ELBOW WITH LATERAL OUTLET1 1/4
1215009	ELBOW WITH LATERAL OUTLET1 1/2
1215010	ELBOW WITH LATERAL OUTLET2
1208023	REDUCING ELBOW 3/8 X 1/4
1208026	REDUCING ELBOW 1/2 X 3/8
1208028	REDUCING ELBOW 3/4 X 3/8
1208029	REDUCING ELBOW 3/4 X 1/2*
1208032	REDUCING ELBOW 1 X 1/2*
1208033	REDUCING ELBOW 1 X 3/4*
1208036	REDUCING ELBOW 1 1/4 X 3/4*
1208037	REDUCING ELBOW 1 1/4 X 1*
1208041	REDUCING ELBOW 1 1/2 X 1
1208042	REDUCING ELBOW 1 1/2 X 1 1/4*
1208047	REDUCING ELBOW 2 X 1 1/2*
1208051	REDUCING ELBOW 2 1/2 X 2
1211002	ELBOW MF 1/4*
1211003	ELBOW MF 3/8*
1211004	ELBOW MF 1/2*
1211006	ELBOW MF 3/4*
1211007	ELBOW MF 1*
1211008	ELBOW MF 1 1/4*
1211009	ELBOW MF 1 1/2*
1211010	ELBOW MF 2*
1211011	ELBOW MF 2 1/2*
1211012	ELBOW MF 3*
1211014	ELBOW MF 4*
1210003	ELBOW MF 45° 3/8
1210004	ELBOW MF 45° 1/2
1210006	ELBOW MF 45° 3/4
1210007	ELBOW MF 45° 1
1218002	CROSS TEE FITTING 1/4
1218003	CROSS TEE FITTING 3/8
1218004	CROSS TEE FITTING 1/2*
1218006	CROSS TEE FITTING 3/4*
1218007	CROSS TEE FITTING 1*
1218008	CROSS TEE FITTING 1 1/4
1218009	CROSS TEE FITTING 1 1/2

BSP LINE - UL CERTIFICATION	
TupyCode	TupyDescription
1218010	CROSS TEE FITTING 2*
1218011	CROSS TEE FITTING 2 1/2
1218012	CROSS TEE FITTING 3*
1223003	FEMALE BEND 3/8
1223004	FEMALE BEND 1/2*
1223006	FEMALE BEND 3/4*
1223007	FEMALE BEND 1*
1223008	FEMALE BEND 1 1/4*
1223009	FEMALE BEND 1 1/2*
1223010	FEMALE BEND 2*
1223011	FEMALE BEND 2 1/2*
1223012	FEMALE BEND 3*
1223014	FEMALE BEND 4*
1221004	SHORT FEMALE BEND1/2*
1221006	SHORT FEMALE BEND3/4
1221007	SHORT FEMALE BEND1 *
1221008	SHORT FEMALE BEND1 1/4
1221009	SHORT FEMALE BEND1 1/2*
1221010	SHORT FEMALE BEND2*
1226004	FEMALE BEND 45° 1/2*
1226006	FEMALE BEND 45° 3/4
1226007	FEMALE BEND 45° 1*
1226008	FEMALE BEND 45° 1 1/4*
1226009	FEMALE BEND 45° 1 1/2*
1226010	FEMALE BEND 45° 2*
1225003	MALE BEND 3/8
1225004	MALE BEND 1/2*
1225006	MALE BEND 3/4*
1225007	MALE BEND 1
1225008	MALE BEND 1 1/4*
1225009	MALE BEND 1 1/2*
1225010	MALE BEND 2*
1227003	BEND MF 45° 3/8
1227004	BEND MF 45° 1/2*
1227006	BEND MF 45° 3/4*
1227007	BEND MF 45° 1*
1227008	BEND MF 45° 1 1/4*
1227009	BEND MF 45° 1 1/2*
1227010	BEND MF 45° 2*
1227011	BEND MF 45° 2 1/2*
1227012	BEND MF 45° 3*
1224002	BEND MF 1/4
1224003	BEND MF 3/8
1224004	BEND MF 1/2*
1224006	BEND MF 3/4*
1224007	BEND MF 1*
1224008	BEND MF 1 1/4*
1224009	BEND MF 1 1/2
1224010	BEND MF 2*
1224011	BEND MF 2 1/2*
1224012	BEND MF 3*
1224014	BEND MF 4
126400430	WATER TANK FLANGE1/2*
126400630	WATER TANK FLANGE3/4*
126400730	WATER TANK FLANGE1
126400830	WATER TANK FLANGE1 1/4
126400930	WATER TANK FLANGE1 1/2
126401030	WATER TANK FLANGE2
126401130	WATER TANK FLANGE2 1/2

BSP LINE - UL CERTIFICATION	
TupyCode	TupyDescription
1231002	FULL COUPLING 1/4
1231003	FULL COUPLING 3/8
1231004	FULL COUPLING 1/2*
1231006	FULL COUPLING 3/4*
1231007	FULL COUPLING 1*
1231008	FULL COUPLING 1 1/4*
1231009	FULL COUPLING 1 1/2*
1231010	FULL COUPLING 2*
1231011	FULL COUPLING 2 1/2*
1231012	FULL COUPLING 3
1231014	FULL COUPLING 4*
1231015	FULL COUPLING 5*
1231016	FULL COUPLING 6
1236003	FULL LEFT/RIGHT THREADED COUPLING3/8
1236004	FULL LEFT/RIGHT THREADED COUPLING1/2
1236006	FULL LEFT/RIGHT THREADED COUPLING3/4
1236007	FULL LEFT/RIGHT THREADED COUPLING1
1236008	FULL LEFT/RIGHT THREADED COUPLING1 1/4
1236009	FULL LEFT/RIGHT THREADED COUPLING1 1/2
1236010	FULL LEFT/RIGHT THREADED COUPLING2
1232023	REDUCING COUPLING 3/8 x 1/4
1232025	REDUCING COUPLING 1/2 x 1/4
1232026	REDUCING COUPLING 1/2 x 3/8
1232028	REDUCING COUPLING 3/4 x 3/8*
1232029	REDUCING COUPLING 3/4 x 1/2*
1232031	REDUCING COUPLING 1 x 3/8
1232032	REDUCING COUPLING 1 x 1/2*
1232033	REDUCING COUPLING 1 x 3/4*
1232035	REDUCING COUPLING 1 1/4 x 1/2*
1232036	REDUCING COUPLING 1 1/4 x 3/4*
1232037	REDUCING COUPLING 1 1/4 x 1*
1232040	REDUCING COUPLING 1 1/2 x 3/4*
1232041	REDUCING COUPLING 1 1/2 x 1*
1232042	REDUCING COUPLING 1 1/2 x 1 1/4*
1232045	REDUCING COUPLING 2 x 1
1232046	REDUCING COUPLING 2 x 1 1/4*
1232047	REDUCING COUPLING 2 x 1 1/2*
1232049	REDUCING COUPLING 2 1/2 x 1 1/4*
1232050	REDUCING COUPLING 2 1/2 x 1 1/2*
1232051	REDUCING COUPLING 2 1/2 x 2*
1232054	REDUCING COUPLING 3 x 1 1/2*
1232055	REDUCING COUPLING 3 x 2*
1232056	REDUCING COUPLING 3 x 2 1/2*
1232058	REDUCING COUPLING 4 x 2*
1232059	REDUCING COUPLING 4 x 2 1/2*
1232060	REDUCING COUPLING 4 x 3*
1233004	FULL COUPLING MF 1/2
1233006	FULL COUPLING MF 3/4
1233007	FULL COUPLING MF 1
1233008	FULL COUPLING MF 1 1/4
1235023	MF REDUCING COUPLING 3/8 x 1/4
1235025	MF REDUCING COUPLING 1/2 x 1/4
1235026	MF REDUCING COUPLING 1/2 x 3/8
1235028	MF REDUCING COUPLING 3/4 x 3/8
1235029	MF REDUCING COUPLING 3/4 x 1/2*
1235032	MF REDUCING COUPLING 1 x 1/2
1235033	MF REDUCING COUPLING 1 x 3/4
1235036	MF REDUCING COUPLING 1 1/4 x 3/4*
1235037	MF REDUCING COUPLING 1 1/4 x 1
1235041	MF REDUCING COUPLING 1 1/2 x 1
1235042	MF REDUCING COUPLING 1 1/2 x 1 1/4

BSP LINE - UL CERTIFICATION	
TupyCode	TupyDescription
1235046	MF REDUCING COUPLING 2 x 1 1/4
1235047	MF REDUCING COUPLING 2 x 1 1/2
1238002	DOUBLE NIPPLE 1/4
1238003	DOUBLE NIPPLE 3/8
1238004	DOUBLE NIPPLE 1/2*
1238006	DOUBLE NIPPLE 3/4*
1238007	DOUBLE NIPPLE 1*
1238008	DOUBLE NIPPLE 1 1/4*
1238009	DOUBLE NIPPLE 1 1/2*
1238010	DOUBLE NIPPLE 2*
1238011	DOUBLE NIPPLE 2 1/2*
1238012	DOUBLE NIPPLE 3*
1238014	DOUBLE NIPPLE 4*
1239023	DOUBLE REDUCING NIPPLE 3/8 x 1/4
1239025	DOUBLE REDUCING NIPPLE 1/2 x 1/4
1239026	DOUBLE REDUCING NIPPLE 1/2 x 3/8
1239028	DOUBLE REDUCING NIPPLE 3/4 x 3/8
1239029	DOUBLE REDUCING NIPPLE 3/4 x 1/2*
1239032	DOUBLE REDUCING NIPPLE 1 x 1/2
1239033	DOUBLE REDUCING NIPPLE 1 x 3/4*
1239036	DOUBLE REDUCING NIPPLE 1 1/4 x 3/4*
1239037	DOUBLE REDUCING NIPPLE 1 1/4 x 1
1239040	DOUBLE REDUCING NIPPLE 1 1/2 x 3/4
1239041	DOUBLE REDUCING NIPPLE 1 1/2 x 1
1239042	DOUBLE REDUCING NIPPLE 1 1/2 x 1 1/4
1239045	DOUBLE REDUCING NIPPLE 2 x 1
1239046	REDUCING NIPPLE 2 x 1 1/4
1239047	REDUCING NIPPLE 2 x 1 1/2
1239051	REDUCING NIPPLE 2 1/2 x 2
1239055	REDUCING NIPPLE 3 x 2
1239056	REDUCING NIPPLE 3 x 2 1/2
1241004	HEX PLUG 1/2*
1241006	HEX PLUG 3/4*
1241007	HEX PLUG 1*
1241008	HEX PLUG 1 1/4*
1241009	HEX PLUG 1 1/2*
1241010	HEX PLUG 2*
1241011	HEX PLUG 2 1/2*
1241012	HEX PLUG 3*
1241014	HEX PLUG 4*
1241016	HEX PLUG 6*
1244002	TEE JOINT 1/4*
1244003	TEE JOINT 3/8*
1244004	TEE JOINT 1/2*
1244006	TEE JOINT 3/4*
1244007	TEE JOINT 1*
1244008	TEE JOINT 1 1/4*
1244009	TEE JOINT 1 1/2*
1244010	TEE JOINT 2*
1244011	TEE JOINT 2 1/2*
1244012	TEE JOINT 3 *
1244014	TEE JOINT 4*
1244015	TEE JOINT 5
1245023	REDUCING TEE 3/8 x 1/4 x 3/8
1245025	REDUCING TEE 1/2 x 1/4 x 1/2
1245026	REDUCING TEE 1/2 x 3/8 x 1/2
1245028	REDUCING TEE 3/4 x 3/8 x 3/4
1245029	REDUCING TEE 3/4 x 1/2 x 3/4*
1245031	REDUCING TEE 1 x 3/8 x 1

BSP LINE - UL CERTIFICATION	
TupyCode	TupyDescription
1245032	REDUCING TEE 1 x 1/2 x 1*
1245033	REDUCING TEE 1 x 3/4 x 1*
1245035	REDUCING TEE 1 1/4 x 1/2 x 1 1/4*
1245036	REDUCING TEE 1 1/4 x 3/4 x 1 1/4*
1245037	REDUCING TEE 1 1/4 x 1 x 1 1/4*
1245039	REDUCING TEE 1 1/2 x 1/2 x 1 1/2*
1245040	REDUCING TEE 1 1/2 x 3/4 x 1 1/2*
1245041	REDUCING TEE 1 1/2 x 1 x 1 1/2*
1245042	REDUCING TEE 1 1/2 x 1 1/4 x 1 1/2*
1245043	REDUCING TEE 2 x 1/2 x 2*
1245044	REDUCING TEE 2 x 3/4 x 2*
1245045	REDUCING TEE 2 x 1 x 2*
1245046	REDUCING TEE 2 x 1 1/4 x 2*
1245047	REDUCING TEE 2 x 1 1/2 x 2*
1245048	REDUCING TEE 2 1/2 x 1 x 2 1/2*
1245049	REDUCING TEE 2 1/2 x 1 1/4 x 2 1/2*
1245050	REDUCING TEE 2 1/2 x 1 1/2 x 2 1/2*
1245051	REDUCING TEE 2 1/2 x 2 x 2 1/2*
1245052	REDUCING TEE 3 x 1 x 3*
1245053	REDUCING TEE 3 x 1 1/4 x 3*
1245054	REDUCING TEE 3 x 1 1/2 x 3*
1245055	REDUCING TEE 3 x 2 x 3*
1245056	REDUCING TEE 3 x 2 1/2 x 3*
1245058	REDUCING TEE 4 x 2 x 4*
1245060	REDUCING TEE 4 x 3 x 4*
1246233	REDUCING TEE 3/4 x 1 x 3/4*
1247129	REDUCING TEE 3/4 x 1/2 x 1/2*
1247135	REDUCING TEE 1 1/4 x 1/2 x 1
1247137	REDUCING TEE 1 1/4 x 1 x 1
1247139	REDUCING TEE 1 1/2 x 1/2 x 1 1/4
1247141	REDUCING TEE 1 1/2 x 1 x 1 1/4
1247146	REDUCING TEE 2 x 1 x 1 1/2
1248137	REDUCING TEE 1 1/4 x 1 1/4 x 1
1262004	UNION WITH TAPERED IRON SEAT1/2
1262006	UNION WITH TAPERED IRON SEAT3/4
1262007	UNION WITH TAPERED IRON SEAT1
1262008	UNION WITH TAPERED IRON SEAT1 1/4
1262009	UNION WITH TAPERED IRON SEAT1 1/2
1262010	UNION WITH TAPERED IRON SEAT2
1262011	UNION WITH TAPERED IRON SEAT2 1/2
1262012	UNION WITH TAPERED IRON SEAT3

BSP LINE - FM CERTIFICATION	
TupyCode	TupyDescription
1291010	ADAPTER FOR CONCRETE WATER TANK 150mm 2
1291011	ADAPTER FOR CONCRETE WATER TANK 150mm 2 1/2
1291012	ADAPTER FOR CONCRETE WATER TANK 150mm 3
1291014	ADAPTER FOR CONCRETE WATER TANK 150mm 4
1292010	ADAPTER FOR CONCRETE WATER TANK 200mm 2
1292011	ADAPTER FOR CONCRETE WATER TANK 200mm 2 1/2
1292012	ADAPTER FOR CONCRETE WATER TANK 200mm 3
1292014	ADAPTER FOR CONCRETE WATER TANK 200mm 4
1201023	REDUCING BUSHING 3/8 X 1/4
1201025	REDUCING BUSHING 1/2 X 1/4
1201026	REDUCING BUSHING 1/2 X 3/8
1201027	REDUCING BUSHING 3/4 X 1/4
1201028	REDUCING BUSHING 3/4 X 3/8
1201031	REDUCING BUSHING 1 X 3/8
1201032	REDUCING BUSHING 1 X 1/2
1201033	REDUCING BUSHING 1 X 3/4
1201035	REDUCING BUSHING 1 1/4 X 1/2
1201036	REDUCING BUSHING 1 1/4 X 3/4
1201037	REDUCING BUSHING 1 1/4 X 1
1201039	REDUCING BUSHING 1 1/2 X 1/2
1201040	REDUCING BUSHING 1 1/2 X 3/4
1201041	REDUCING BUSHING 1 1/2 X 1
1201042	REDUCING BUSHING 1 1/2 X 1 1/4
1201043	REDUCING BUSHING 2 X 1/2
1201044	REDUCING BUSHING 2 X 3/4
1201045	REDUCING BUSHING 2 X 1
1201046	REDUCING BUSHING 2 X 1 1/4
1201047	REDUCING BUSHING 2 X 1 1/2
1201048	REDUCING BUSHING 2 1/2 X 1
1201049	REDUCING BUSHING 2 1/2 X 1 1/4
1201050	REDUCING BUSHING 2 1/2 X 1 1/2
1201051	REDUCING BUSHING 2 1/2 X 2
1201054	REDUCING BUSHING 3 X 1 1/2
1201055	REDUCING BUSHING 3 X 2
1201056	REDUCING BUSHING 3 X 2 1/2
1201058	REDUCING BUSHING 4 X 2
1201059	REDUCING BUSHING 4 X 2 1/2
1201060	REDUCING BUSHING 4 X 3
1201066	REDUCING BUSHING 5 X 4
1201071	REDUCING BUSHING 6 X 4
1201072	REDUCING BUSHING 6 X 5
1203002	FLANGED PLUG 1/4
1203003	FLANGED PLUG 3/8
1203004	FLANGED PLUG 1/2*
1203006	FLANGED PLUG 3/4*
1203007	FLANGED PLUG 1*
1203008	FLANGED PLUG 1 1/4*
1203009	FLANGED PLUG 1 1/2*
1203010	FLANGED PLUG 2*
1203011	FLANGED PLUG 2 1/2*
1203012	FLANGED PLUG 3*
1202002	PLUG 1/4 *
1202003	PLUG 3/8*
1202004	PLUG 1/2*
1202006	PLUG 3/4*
1202007	PLUG 1*
1202008	PLUG 1 1/4*
1202009	PLUG 1 1/2
1202010	PLUG 2*
1202011	PLUG 2 1/2
1202012	PLUG 3
1202014	PLUG 4

BSP LINE - FM CERTIFICATION	
TupyCode	TupyDescription
1206003	JAM NUT 3/8*
1206004	JAM NUT 1/2*
1206006	JAM NUT 3/4*
1206007	JAM NUT 1*
1206008	JAM NUT 1 1/4*
1206009	JAM NUT 1 1/2*
1206010	JAM NUT 2*
1206011	JAM NUT 2 1/2*
1206012	JAM NUT 3*
1207002	ELBOW 90 1/4*
1207003	ELBOW 90 3/8*
1207004	ELBOW 90 1/2*
1207006	ELBOW 90 3/4*
1207007	ELBOW 90 1*
1207008	ELBOW 90 1 1/4*
1207009	ELBOW 90 1 1/2*
1207010	ELBOW 90 2*
1207011	ELBOW 90 2 1/2*
1207012	ELBOW 90 3*
1207014	ELBOW 90 4*
1207015	ELBOW 90 5
1207016	ELBOW 90 6
1209003	ELBOW 45° 3/8
1209004	ELBOW 45° 1/2
1209006	ELBOW 45° 3/4
1209007	ELBOW 45° 1*
1209008	ELBOW 45° 1 1/4
1209009	ELBOW 45° 1 1/2*
1209010	ELBOW 45° 2
1209011	ELBOW 45° 2 1/2
1209012	ELBOW 45° 3*
1209014	ELBOW 45° 4*
1209015	ELBOW 45° 5
1209016	ELBOW 45° 6
1215004	ELBOW WITH LATERAL OUTLET1/2*
1215006	ELBOW WITH LATERAL OUTLET3/4*
1215007	ELBOW WITH LATERAL OUTLET1
1215008	ELBOW WITH LATERAL OUTLET1 1/4
1215009	ELBOW WITH LATERAL OUTLET1 1/2
1215010	ELBOW WITH LATERAL OUTLET2
1208023	REDUCING ELBOW 3/8 X 1/4
1208025	REDUCING ELBOW 1/2 X 1/4
1208026	REDUCING ELBOW 1/2 X 3/8
1208028	REDUCING ELBOW 3/4 X 3/8
1208029	REDUCING ELBOW 3/4 X 1/2*
1208032	REDUCING ELBOW 1 X 1/2*
1208033	REDUCING ELBOW 1 X 3/4*
1208036	REDUCING ELBOW 1 1/4 X 3/4*
1208037	REDUCING ELBOW 1 1/4 X 1*
1208040	REDUCING ELBOW 1 1/2 X 3/4
1208041	REDUCING ELBOW 1 1/2 X 1
1208042	REDUCING ELBOW 1 1/2 X 1 1/4*
1208047	REDUCING ELBOW 2 X 1 1/2*
1208051	REDUCING ELBOW 2 1/2 X 2
1211002	ELBOW MF 1/4*
1211003	ELBOW MF 3/8*
1211004	ELBOW MF 1/2*
1211006	ELBOW MF 3/4*
1211007	ELBOW MF 1*
1211008	ELBOW MF 1 1/4*

BSP LINE - FM CERTIFICATION	
TupyCode	TupyDescription
1211009	ELBOW MF 1 1/2*
1211010	ELBOW MF 2*
1211011	ELBOW MF 2 1/2*
1211012	ELBOW MF 3*
1211014	ELBOW MF 4*
1210003	ELBOW MF 45° 3/8
1210004	ELBOW MF 45° 1/2
1210006	ELBOW MF 45° 3/4
1210007	ELBOW MF 45° 1
1218002	CROSS TEE FITTING 1/4
1218003	CROSS TEE FITTING 3/8
1218004	CROSS TEE FITTING 1/2*
1218006	CROSS TEE FITTING 3/4*
1218007	CROSS TEE FITTING 1*
1218008	CROSS TEE FITTING 1 1/4
1218009	CROSS TEE FITTING 1 1/2
1218010	CROSS TEE FITTING 2*
1218011	CROSS TEE FITTING 2 1/2
1218012	CROSS TEE FITTING 3*
1218014	CROSS TEE FITTING 4
1229004	RETURN BEND 1/2
1229006	RETURN BEND 3/4
1229007	RETURN BEND 1
1229008	RETURN BEND 1 1/4*
1229009	RETURN BEND 1 1/2
1229010	RETURN BEND 2
1228076	TRANSPOSITION BEND 1/2 - 1/2
1228078	TRANSPOSITION BEND 1/2 - 1*
1228079	TRANSPOSITION BEND 3/4 - 3/4*
1228080	TRANSPOSITION BEND 3/4 - 1
1223003	FEMALE BEND 3/8
1223004	FEMALE BEND 1/2*
1223006	FEMALE BEND 3/4*
1223007	FEMALE BEND 1*
1223008	FEMALE BEND 1 1/4*
1223009	FEMALE BEND 1 1/2*
1223010	FEMALE BEND 2*
1223011	FEMALE BEND 2 1/2*
1223012	FEMALE BEND 3*
1223014	FEMALE BEND 4*
1226004	FEMALE BEND 45° 1/2*
1226006	FEMALE BEND 45° 3/4
1226007	FEMALE BEND 45° 1*
1226008	FEMALE BEND 45° 1 1/4*
1226009	FEMALE BEND 45° 1 1/2*
1226010	FEMALE BEND 45° 2*
1225003	MALE BEND 3/8
1225004	MALE BEND 1/2*
1225006	MALE BEND 3/4*
1225007	MALE BEND 1
1225008	MALE BEND 1 1/4*
1225009	MALE BEND 1 1/2*
1225010	MALE BEND 2*
1225011	MALE BEND 2 1/2
1225012	MALE BEND 3
1225014	MALE BEND 4
1225016	MALE BEND 6*

BSP LINE - FM CERTIFICATION	
TupyCode	TupyDescription
1227003	BEND MF 45° 3/8
1227004	BEND MF 45° 1/2*
1227006	BEND MF 45° 3/4*
1227007	BEND MF 45° 1*
1227008	BEND MF 45° 1 1/4*
1227009	BEND MF 45° 1 1/2*
1227010	BEND MF 45° 2*
1227011	BEND MF 45° 2 1/2*
1227012	BEND MF 45° 3*
1224002	BEND MF 1/4
1224003	BEND MF 3/8
1224004	BEND MF 1/2*
1224006	BEND MF 3/4*
1224007	BEND MF 1*
1224008	BEND MF 1 1/4*
1224009	BEND MF 1 1/2
1224010	BEND MF 2*
1224011	BEND MF 2 1/2*
1224012	BEND MF 3*
1224014	BEND MF 4
1222004	SHORT MF BEND1/2
1222006	SHORT MF BEND3/4*
1222007	SHORT MF BEND1*
1222008	SHORT MF BEND1 1/4
1222009	SHORT MF BEND1 1/2
1222010	SHORT MF BEND2
1299002	HEX FLANGE 1/4*
1299003	HEX FLANGE 3/8
1299004	HEX FLANGE 1/2
1299006	HEX FLANGE 3/4*
1299007	HEX FLANGE 1*
1299008	HEX FLANGE 1 1/4
1299009	HEX FLANGE 1 1/2*
1299010	HEX FLANGE 2*
1299011	HEX FLANGE 2 1/2*
1299012	HEX FLANGE 3
1299014	HEX FLANGE 4
1299015	HEX FLANGE 5*
1299016	HEX FLANGE 6*
126400430	WATER TANK FLANGE1/2*
126400630	WATER TANK FLANGE3/4*
126400730	WATER TANK FLANGE1
126400830	WATER TANK FLANGE1 1/4
126400930	WATER TANK FLANGE1 1/2
126401030	WATER TANK FLANGE2
126401130	WATER TANK FLANGE2 1/2
1231002	FULL COUPLING 1/4
1231003	FULL COUPLING 3/8
1231004	FULL COUPLING 1/2*
1231006	FULL COUPLING 3/4*
1231007	FULL COUPLING 1*
1231008	FULL COUPLING 1 1/4*
1231009	FULL COUPLING 1 1/2*
1231010	FULL COUPLING 2*
1231011	FULL COUPLING 2 1/2*
1231012	FULL COUPLING 3*
1231014	FULL COUPLING 4*
1231015	FULL COUPLING 5*
1231016	FULL COUPLING 6

BSP LINE - FM CERTIFICATION	
TupyCode	TupyDescription
1236003	FULL LEFT/RIGHT THREADED COUPLING3/8
1236004	FULL LEFT/RIGHT THREADED COUPLING1/2
1236006	FULL LEFT/RIGHT THREADED COUPLING3/4
1236007	FULL LEFT/RIGHT THREADED COUPLING1
1236008	FULL LEFT/RIGHT THREADED COUPLING1 1/4
1236009	FULL LEFT/RIGHT THREADED COUPLING1 1/2
1236010	FULL LEFT/RIGHT THREADED COUPLING2
1232023	REDUCING COUPLING 3/8 x 1/4
1232025	REDUCING COUPLING 1/2 x 1/4
1232026	REDUCING COUPLING 1/2 x 3/8
1232028	REDUCING COUPLING 3/4 x 3/8*
1232029	REDUCING COUPLING 3/4 x 1/2*
1232031	REDUCING COUPLING 1 x 3/8
1232032	REDUCING COUPLING 1 x 1/2*
1232033	REDUCING COUPLING 1 x 3/4*
1232035	REDUCING COUPLING 1 1/4 x 1/2*
1232036	REDUCING COUPLING 1 1/4 x 3/4*
1232037	REDUCING COUPLING 1 1/4 x 1*
1232040	REDUCING COUPLING 1 1/2 x 3/4*
1232041	REDUCING COUPLING 1 1/2 x 1*
1232042	REDUCING COUPLING 1 1/2 x 1 1/4*
1232045	REDUCING COUPLING 2 x 1
1232046	REDUCING COUPLING 2 x 1 1/4*
1232047	REDUCING COUPLING 2 x 1 1/2*
1232049	REDUCING COUPLING 2 1/2 x 1 1/4*
1232050	REDUCING COUPLING 2 1/2 x 1 1/2*
1232051	REDUCING COUPLING 2 1/2 x 2*
1232054	REDUCING COUPLING 3 x 1 1/2*
1232055	REDUCING COUPLING 3 x 2*
1232056	REDUCING COUPLING 3 x 2 1/2*
1232058	REDUCING COUPLING 4 x 2*
1232059	REDUCING COUPLING 4 x 2 1/2*
1232060	REDUCING COUPLING 4 x 3*
1233004	FULL COUPLING MF 1/2
1233006	FULL COUPLING MF 3/4
1233007	FULL COUPLING MF 1
1233008	FULL COUPLING MF 1 1/4
1234104	EXTENDED MF COUPLING 1/2 - 60
1234206	EXTENDED MF COUPLING 3/4 - 70*
1234106	EXTENDED MF COUPLING 3/4 - 90*
1235023	MF REDUCING COUPLING 3/8 x 1/4
1235025	MF REDUCING COUPLING 1/2 x 1/4
1235026	MF REDUCING COUPLING 1/2 x 3/8
1235028	MF REDUCING COUPLING 3/4 x 3/8
1235029	MF REDUCING COUPLING 3/4 x 1/2*
1235032	MF REDUCING COUPLING 1 x 1/2
1235033	MF REDUCING COUPLING 1 x 3/4
1235036	MF REDUCING COUPLING 1 1/4 x 3/4*
1235037	MF REDUCING COUPLING 1 1/4 x 1
1235041	MF REDUCING COUPLING 1 1/2 x 1
1235042	MF REDUCING COUPLING 1 1/2 x 1 1/4
1235045	MF REDUCING COUPLING 2 x 1
1235046	MF REDUCING COUPLING 2 x 1 1/4
1235047	MF REDUCING COUPLING 2 x 1 1/2
1238002	DOUBLE NIPPLE 1/4
1238003	DOUBLE NIPPLE 3/8
1238004	DOUBLE NIPPLE 1/2*
1238006	DOUBLE NIPPLE 3/4*
1238007	DOUBLE NIPPLE 1*
1238008	DOUBLE NIPPLE 1 1/4*

BSP LINE - FM CERTIFICATION	
TupyCode	TupyDescription
1238009	DOUBLE NIPPLE 1 1/2*
1238010	DOUBLE NIPPLE 2*
1238011	DOUBLE NIPPLE 2 1/2*
1238012	DOUBLE NIPPLE 3*
1238014	DOUBLE NIPPLE 4*
1238015	DOUBLE NIPPLE 5
1238016	DOUBLE NIPPLE 6
1239023	DOUBLE REDUCING NIPPLE 3/8 x 1/4
1239025	DOUBLE REDUCING NIPPLE 1/2 x 1/4
1239026	DOUBLE REDUCING NIPPLE 1/2 x 3/8
1239028	DOUBLE REDUCING NIPPLE 3/4 x 3/8
1239029	DOUBLE REDUCING NIPPLE 3/4 x 1/2*
1239032	DOUBLE REDUCING NIPPLE 1 x 1/2
1239033	DOUBLE REDUCING NIPPLE 1 x 3/4*
1239036	DOUBLE REDUCING NIPPLE 1 1/4 x 3/4*
1239037	DOUBLE REDUCING NIPPLE 1 1/4 x 1
1239040	DOUBLE REDUCING NIPPLE 1 1/2 x 3/4
1239041	DOUBLE REDUCING NIPPLE 1 1/2 x 1
1239042	DOUBLE REDUCING NIPPLE 1 1/2 x 1 1/4
1239045	DOUBLE REDUCING NIPPLE 2 X 1
1239046	REDUCING NIPPLE 2 x 1 1/4
1239047	REDUCING NIPPLE 2 x 1 1/2
1239051	REDUCING NIPPLE 2 1/2 x 2
1239055	REDUCING NIPPLE 3 x 2
1239056	REDUCING NIPPLE 3 x 2 1/2
1242002	PLUG 1/4
1242003	PLUG 3/8
1242004	PLUG 1/2*
1242006	PLUG 3/4
1242007	PLUG 1*
1242008	PLUG 1 1/4
1242009	PLUG 1 1/2
1242010	PLUG 2
1242011	PLUG 2 1/2
1242012	PLUG 3
1242014	PLUG 4
1241004	HEX PLUG 1/2*
1241006	HEX PLUG 3/4*
1241007	HEX PLUG 1*
1241008	HEX PLUG 1 1/4*
1241009	HEX PLUG 1 1/2*
1241010	HEX PLUG 2*
1241011	HEX PLUG 2 1/2*
1241012	HEX PLUG 3*
1241014	HEX PLUG 4*
1241016	HEX PLUG 6*
1244002	TEE JOINT 1/4*
1244003	TEE JOINT 3/8*
1244004	TEE JOINT 1/2*
1244006	TEE JOINT 3/4*
1244007	TEE JOINT 1*
1244008	TEE JOINT 1 1/4*
1244009	TEE JOINT 1 1/2*
1244010	TEE JOINT 2*
1244011	TEE JOINT 2 1/2*
1244012	TEE JOINT 3 *
1244014	TEE JOINT 4*
1244015	TEE JOINT 5
1244016	TEE JOINT 6

BSP LINE - FM CERTIFICATION	
TupyCode	TupyDescription
1254004	TEE JOINT 45° 1/2*
1254006	TEE JOINT 45° 3/4*
1254007	TEE JOINT 45° 1*
1254008	TEE JOINT 45° 1 1/4
1254009	TEE JOINT 45° 1 1/2*
1254010	TEE JOINT 45° 2*
1254011	TEE JOINT 45° 2 1/2
1254012	TEE JOINT 45° 3*
1254014	TEE JOINT 45° 4
1255004	DOUBLE BEND TEE 1/2*
1255006	DOUBLE BEND TEE 3/4*
1245023	REDUCING TEE 3/8 x 1/4 x 3/8
1245025	REDUCING TEE 1/2 x 1/4 x 1/2
1245026	REDUCING TEE 1/2 x 3/8 x 1/2
1245028	REDUCING TEE 3/4 x 3/8 x 3/4
1245029	REDUCING TEE 3/4 x 1/2 x 3/4*
1245031	REDUCING TEE 1 x 3/8 x 1
1245032	REDUCING TEE 1 x 1/2 x 1*
1245033	REDUCING TEE 1 x 3/4 x 1*
1245035	REDUCING TEE 1 1/4 x 1/2 x 1 1/4*
1245036	REDUCING TEE 1 1/4 x 3/4 x 1 1/4*
1245037	REDUCING TEE 1 1/4 x 1 x 1 1/4*
1245039	REDUCING TEE 1 1/2 x 1/2 x 1 1/2*
1245040	REDUCING TEE 1 1/2 x 3/4 x 1 1/2*
1245041	REDUCING TEE 1 1/2 x 1 x 1 1/2*
1245042	REDUCING TEE 1 1/2 x 1 1/4 x 1 1/2*
1245043	REDUCING TEE 2 x 1/2 x 2*
1245044	REDUCING TEE 2 x 3/4 x 2*
1245045	REDUCING TEE 2 x 1 x 2*
1245046	REDUCING TEE 2 x 1 1/4 x 2*
1245047	REDUCING TEE 2 x 1 1/2 x 2*
1245048	REDUCING TEE 2 1/2 x 1 x 2 1/2*
1245049	REDUCING TEE 2 1/2 x 1 1/4 x 2 1/2*
1245050	REDUCING TEE 2 1/2 x 1 1/2 x 2 1/2*
1245051	REDUCING TEE 2 1/2 x 2 x 2 1/2*
1245052	REDUCING TEE 3 x 1 x 3*
1245053	REDUCING TEE 3 x 1 1/4 x 3*
1245054	REDUCING TEE 3 x 1 1/2 x 3*
1245055	REDUCING TEE 3 x 2 x 3*
1245056	REDUCING TEE 3 x 2 1/2 x 3*
1245058	REDUCING TEE 4 x 2 x 4*
1245059	REDUCING TEE 4 x 2 1/2 x 4
1245060	REDUCING TEE 4 x 3 x 4*
1246233	REDUCING TEE 3/4 x 1 x 3/4*
1247129	REDUCING TEE 3/4 x 1/2 x 1/2*
1247135	REDUCING TEE 1 1/4 x 1/2 x 1
1247137	REDUCING TEE 1 1/4 x 1 x 1
1247139	REDUCING TEE 1 1/2 x 1/2 x 1 1/4
1247141	REDUCING TEE 1 1/2 x 1 x 1 1/4
1247146	REDUCING TEE 2 x 1 x 1 1/2
1248137	REDUCING TEE 1 1/4 x 1 1/4 x 1
1249059	HYDRANT TEE 4 X 2 1/2
1261002	UNION WITH TAPERED BRONZE/IRON SEAT 1/4
1261003	UNION WITH TAPERED BRONZE/IRON SEAT 3/8
1261004	UNION WITH TAPERED BRONZE/IRON SEAT 1/2
1261006	UNION WITH TAPERED BRONZE/IRON SEAT 3/4
1261007	UNION WITH TAPERED BRONZE/IRON SEAT 1
1261008	UNION WITH TAPERED BRONZE/IRON SEAT 1 1/4
1261009	UNION WITH TAPERED BRONZE/IRON SEAT 1 1/2
1261010	UNION WITH TAPERED BRONZE/IRON SEAT 2
1261011	UNION WITH TAPERED BRONZE/IRON SEAT 2 1/2

BSP LINE - FM CERTIFICATION	
TupyCode	TupyDescription
1261012	UNION WITH TAPERED BRONZE/IRON SEAT3
1261014	UNION WITH TAPERED BRONZE/IRON SEAT4
1261015	UNION WITH TAPERED BRONZE/IRON SEAT5
1261016	UNION WITH TAPERED BRONZE/IRON SEAT6
1262006	UNION WITH TAPERED IRON SEAT3/4
1262007	UNION WITH TAPERED IRON SEAT1
1262008	UNION WITH TAPERED IRON SEAT1 1/4
1262009	UNION WITH TAPERED IRON SEAT1 1/2
1262010	UNION WITH TAPERED IRON SEAT2
1262011	UNION WITH TAPERED IRON SEAT2 1/2
1262012	UNION WITH TAPERED IRON SEAT3
1262014	UNION WITH TAPERED IRON SEAT4
1265003	UNION WITH TAPERED IRON SEATMF 3/8
1265004	UNION WITH TAPERED IRON SEATMF 1/2
1265006	UNION WITH TAPERED IRON SEATMF 3/4
1265010	UNION WITH TAPERED IRON SEATMF 2
1265011	UNION WITH TAPERED IRON SEATMF 2 1/2
1265012	UNION WITH TAPERED IRON SEATMF 3
1265014	UNION WITH TAPERED IRON SEATMF 4
1263002	FLAT SEAT UNION1/4
1263003	FLAT SEAT UNION3/8
1263004	FLAT SEAT UNION1/2
1263006	FLAT SEAT UNION3/4
1263007	FLAT SEAT UNION1
1263008	FLAT SEAT UNION1 1/4
1263012	FLAT SEAT UNION3
1263014	FLAT SEAT UNION4
1267003	FLAT SEAT UNIONMF 3/8
1267004	FLAT SEAT UNIONMF 1/2
1267006	FLAT SEAT UNIONMF 3/4
1267007	FLAT SEAT UNIONMF 1
1267008	FLAT SEAT UNIONMF 1 1/4
1267009	FLAT SEAT UNIONMF 1 1/2
1267010	FLAT SEAT UNIONMF 2
1268004	ELBOW UNION WTH TAPERED IRON SEAT 1/2
1268006	ELBOW UNION WTH TAPERED IRON SEAT 3/4
1268007	ELBOW UNION WITH TAPERED IRON SEAT 1
1268008	ELBOW UNION WITH TAPERED IRON SEAT 1 1/4
1268009	ELBOW UNION WTH TAPERED IRON SEAT 1 1/2
1268010	ELBOW UNION WTH TAPERED IRON SEAT 2
1268011	ELBOW UNION WTH TAPERED IRON SEAT 2 1/2
1268012	ELBOW UNION WITH TAPERED IRON SEAT 3
1269004	ELBOW UNION WITH TAPERED IRON SEAT MF 1/2
1269006	ELBOW UNION WITH TAPERED IRON SEAT MF 3/4
1269007	ELBOW UNION WITH TAPERED IRON SEAT MF 1
1269008	ELBOW UNION WITH TAPERED IRON SEAT MF 1 1/4
1269009	ELBOW UNION WITH TAPERED IRON SEAT MF 1 1/2
1269010	ELBOW UNION WITH TAPERED IRON SEAT MF 2
1269011	ELBOW UNION WITH TAPERED IRON SEAT MF 2 1/2
1269012	ELBOW UNION WITH TAPERED IRON SEAT MF 3
1285002	UNION NUT 1/4
1285003	UNION NUT 3/8
1285004	UNION NUT 1/2
1285006	UNION NUT 3/4
1285007	UNION NUT 1
1285008	UNION NUT 1 1/4
1285009	UNION NUT 1 1/2
1285010	UNION NUT 2

BSP LINE - FM CERTIFICATION	
TupyCode	TupyDescription
1285011	UNION NUT 2 1/2
1285012	UNION NUT 3
1285014	UNION NUT 4

NPT MEDIUM PRESSURE LINE - FM CERTIFICATION	
TupyCode	TupyDescription
6901025	REDUCING BUSHING 1/2 x 1/4
6901026	REDUCING BUSHING 1/2 x 3/8
6901028	REDUCING BUSHING 3/4 x 3/8
6901029	REDUCING BUSHING 3/4 x 1/2
6901032	REDUCING BUSHING 1 x 1/2
6901033	REDUCING BUSHING 1 x 3/4
6901035	REDUCING BUSHING 1 1/4 x 1/2
6901036	REDUCING BUSHING 1 1/4 x 3/4
6901037	REDUCING BUSHING 1 1/4 x 1
6901040	REDUCING BUSHING 1 1/2 x 3/4
6901041	REDUCING BUSHING 1 1/2 x 1
6901042	REDUCING BUSHING 1 1/2 x 1 1/4
6901045	REDUCING BUSHING 2 x 1
6901046	REDUCING BUSHING 2 x 1 1/4
6901047	REDUCING BUSHING 2 x 1 1/2
6901050	REDUCING BUSHING 2 1/2 x 1 1/2
6901051	REDUCING BUSHING 2 1/2 x 2
6901055	REDUCING BUSHING 3 x 2
6901056	REDUCING BUSHING 3 x 2 1/2
6901059	REDUCING BUSHING 4 x 2 1/2
6901060	REDUCING BUSHING 4 x 3
6902004	PLUG 1/2
6902006	PLUG 3/4
6902007	PLUG 1
6902008	PLUG 1 1/4
6902009	PLUG 1 1/2
6902010	PLUG 2
6902011	PLUG 2 1/2
6902012	BUJÃO 3
6902014	PLUG 4
6907004	ELBOW 1/2
6907006	ELBOW 3/4
6907007	ELBOW 1
6907008	ELBOW 1 1/4
6907009	ELBOW 1 1/2
6907010	ELBOW 2
6907011	ELBOW 2 1/2
6907012	ELBOW 3
6907014	ELBOW 4
6909004	ELBOW 45° 1/2
6909006	ELBOW 45° 3/4
6909007	ELBOW 45° 1
6909008	ELBOW 45° 1 1/4
6909009	ELBOW 45° 1 1/2
6909010	ELBOW 45° 2
6908029	REDUCING ELBOW 3/4 x 1/2
6908032	REDUCING ELBOW 1 x 1/2
6908033	REDUCING ELBOW 1 x 3/4
6908035	REDUCING ELBOW 1 1/4 x 1/2
6908036	REDUCING ELBOW 1 1/4 x 3/4
6908037	REDUCING ELBOW 1 1/4 x 1
6908040	REDUCING ELBOW 1 1/2 x 3/4
6908041	REDUCING ELBOW 1 1/2 x 1
6908042	REDUCING ELBOW 1 1/2 x 1 1/4
6908044	REDUCING ELBOW 2 x 3/4
6908045	REDUCING ELBOW 2 x 1
6908046	REDUCING ELBOW 2 x 1 1/4
6908047	REDUCING ELBOW 2 x 1 1/2
6911004	ELBOW MF 1/2
6911006	ELBOW MF 3/4
6911007	ELBOW MF 1

NPT MEDIUM PRESSURE LINE - FM CERTIFICATION	
TupyCode	TupyDescription
6911008	ELBOW MF 1 1/4
6911009	ELBOW MF 1 1/2
6911010	ELBOW MF 2
6910004	ELBOW MF 45° 1/2
6910006	ELBOW MF 45° 3/4
6910007	ELBOW MF 45° 1
6910008	ELBOW MF 45° 1 1/4
6910009	ELBOW MF 45° 1 1/2
6910010	ELBOW MF 45° 2
6918004	CROSS TEE FITTING 1/2
6918006	CROSS TEE FITTING 3/4
6918007	CROSS TEE FITTING 1
6918008	CROSS TEE FITTING 1 1/4
6918009	CROSS TEE FITTING 1 1/2
6918010	CROSS TEE FITTING 2
6999004	FLANGE 1/2
6999006	FLANGE 3/4
6999007	FLANGE 1
6999008	FLANGE 1 1/4
6999009	FLANGE 1 1/2
6999010	FLANGE 2
6931004	FULL COUPLING 1/2
6931006	FULL COUPLING 3/4
6931007	FULL COUPLING 1
6931008	FULL COUPLING 1 1/4
6931009	FULL COUPLING 1 1/2
6931010	FULL COUPLING 2
6932029	REDUCING COUPLING 3/4 x 1/2
6932032	REDUCING COUPLING 1 x 1/2
6932033	REDUCING COUPLING 1 x 3/4
6932035	REDUCING COUPLING 1 1/4 x 1/2
6932036	REDUCING COUPLING 1 1/4 x 3/4
6932037	REDUCING COUPLING 1 1/4 x 1
6932039	REDUCING COUPLING 1 1/2 x 1/2
6932040	REDUCING COUPLING 1 1/2 x 3/4
6932041	REDUCING COUPLING 1 1/2 x 1
6932042	REDUCING COUPLING 1 1/2 x 1 1/4
6932043	REDUCING COUPLING 2 x 1/2
6932044	REDUCING COUPLING 2 x 3/4
6932045	REDUCING COUPLING 2 x 1
6932046	REDUCING COUPLING 2 x 1 1/4
6932047	REDUCING COUPLING 2 x 1 1/2
6942004	PLUG 1/2
6942006	PLUG 3/4
6942007	PLUG 1
6942008	PLUG 1 1/4
6942009	PLUG 1 1/2
6942010	PLUG 2
6944004	TEE JOINT 1/2
6944006	TEE JOINT 3/4
6944007	TEE JOINT 1
6944008	TEE JOINT 1 1/4
6944009	TEE JOINT 1 1/2
6944010	TEE JOINT 2
6944011	TEE JOINT 2 1/2
6944012	TEE JOINT 3
6944014	TEE JOINT 4

NPT MEDIUM PRESSURE LINE - FM CERTIFICATION

TupyCode	TupyDescription
6945029	REDUCING TEE 3/4 x 3/4 x 1/2
6945032	REDUCING TEE 1 x 1 x 1/2
6945033	REDUCING TEE 1 x 1 x 3/4
6945035	REDUCING TEE 1 1/4 x 1 1/4 x 1/2
6945036	REDUCING TEE 1 1/4 x 1 1/4 x 3/4
6945037	REDUCING TEE 1 1/4 x 1 1/4 x 1
6945039	REDUCING TEE 1 1/2 x 1 1/2 x 1/2
6945040	REDUCING TEE 1 1/2 x 1 1/2 x 3/4
6945041	REDUCING TEE 1 1/2 x 1 1/2 x 1
6945042	REDUCING TEE 1 1/2 x 1 1/2 x 1 1/4
6945043	REDUCING TEE 2 x 2 x 1/2
6945044	REDUCING TEE 2 x 2 x 3/4
6945045	REDUCING TEE 2 x 2 x 1
6945046	REDUCING TEE 2 x 2 x 1 1/4
6945047	REDUCING TEE 2 x 2 x 1 1/2
6961004	UNION WITH TAPERED BRONZE SEAT1/2
6961006	UNION WITH TAPERED BRONZE SEAT3/4
6961007	UNION WITH TAPERED BRONZE SEAT1
6961008	UNION WITH TAPERED BRONZE SEAT1 1/4
6961009	UNION WITH TAPERED BRONZE SEAT1 1/2
6961010	UNION WITH TAPERED BRONZE SEAT2
6961011	UNION WITH TAPERED BRONZE SEAT2 1/2
6961012	UNION WITH TAPERED BRONZE SEAT3

NPT MEDIUM PRESSURE LINE - INMETRO CERTIFICATION

TupyCode	TupyDescription
6901035	REDUCING BUSHING 1 1/4 x 1/2
6901036	REDUCING BUSHING 1 1/4 x 3/4
6901040	REDUCING BUSHING 1 1/2 x 3/4
6901041	REDUCING BUSHING 1 1/2 x 1
6901045	REDUCING BUSHING 2 x 1
6901046	REDUCING BUSHING 2 x 1 1/4
6901047	REDUCING BUSHING 2 x 1 1/2
6901050	REDUCING BUSHING 2 1/2 x 1 1/2
6901051	REDUCING BUSHING 2 1/2 x 2
6901055	REDUCING BUSHING 3 x 2
6901056	REDUCING BUSHING 3 x 2 1/2
6901059	REDUCING BUSHING 4 x 2 1/2
6901060	REDUCING BUSHING 4 x 3
6901071	REDUCING BUSHING 6 x 4
6902008	PLUG 1 1/4
6902009	PLUG 1 1/2
6902010	PLUG 2
6902011	PLUG 2 1/2
6902012	PLUG 3
6907004	ELBOW 1/2
6907006	ELBOW 3/4
6907007	ELBOW 1
6907008	ELBOW 1 1/4
6907009	ELBOW 1 1/2
6907010	ELBOW 2
6907011	ELBOW 2 1/2
6907012	ELBOW 3
6907014	ELBOW 4
6909004	ELBOW 45° 1/2
6909006	ELBOW 45° 3/4
6909007	ELBOW 45° 1
6909008	ELBOW 45° 1 1/4
6909009	ELBOW 45° 1 1/2
6909010	ELBOW 45° 2
6908029	REDUCING ELBOW 3/4 x 1/2
6908032	REDUCING ELBOW 1 x 1/2
6908033	REDUCING ELBOW 1 x 3/4
6908035	REDUCING ELBOW 1 1/4 x 1/2
6908036	REDUCING ELBOW 1 1/4 x 3/4
6908037	REDUCING ELBOW 1 1/4 x 1
6908040	REDUCING ELBOW 1 1/2 x 3/4
6908041	REDUCING ELBOW 1 1/2 x 1
6908042	REDUCING ELBOW 1 1/2 x 1 1/4
6908044	REDUCING ELBOW 2 x 3/4
6908045	REDUCING ELBOW 2 x 1
6908046	REDUCING ELBOW 2 x 1 1/4
6908047	REDUCING ELBOW 2 x 1 1/2
6911004	ELBOW MF 1/2
6911006	ELBOW MF 3/4
6911007	ELBOW MF 1
6911008	ELBOW MF 1 1/4
6911009	ELBOW MF 1 1/2
6911010	ELBOW MF 2
6910004	ELBOW MF 45° 1/2
6910006	ELBOW MF 45° 3/4
6910007	ELBOW MF 45° 1
6910008	ELBOW MF 45° 1 1/4
6910009	ELBOW MF 45° 1 1/2
6910010	ELBOW MF 45° 2

NPT MEDIUM PRESSURE LINE - INMETRO CERTIFICATION	
TupyCode	TupyDescription
6918004	CROSS TEE FITTING 1/2
6918006	CROSS TEE FITTING 3/4
6918007	CROSS TEE FITTING 1
6918008	CROSS TEE FITTING 1 1/4
6918009	CROSS TEE FITTING 1 1/2
6918010	CROSS TEE FITTING 2
6999004	FLANGE 1/2
6999006	FLANGE 3/4
6999007	FLANGE 1
6999008	FLANGE 1 1/4
6999009	FLANGE 1 1/2
6999010	FLANGE 2
6931002	FULL COUPLING 1/4
6931004	FULL COUPLING 1/2
6931006	FULL COUPLING 3/4
6931007	FULL COUPLING 1
6931008	FULL COUPLING 1 1/4
6931009	FULL COUPLING 1 1/2
6931010	FULL COUPLING 2
6932029	REDUCING COUPLING 3/4 x 1/2
6932032	REDUCING COUPLING 1 x 1/2
6932033	REDUCING COUPLING 1 x 3/4
6932035	REDUCING COUPLING 1 1/4 x 1/2
6932036	REDUCING COUPLING 1 1/4 x 3/4
6932037	REDUCING COUPLING 1 1/4 x 1
6932039	REDUCING COUPLING 1 1/2 x 1/2
6932040	REDUCING COUPLING 1 1/2 x 3/4
6932041	REDUCING COUPLING 1 1/2 x 1
6932042	REDUCING COUPLING 1 1/2 x 1 1/4
6932043	REDUCING COUPLING 2 x 1/2
6932044	REDUCING COUPLING 2 x 3/4
6932045	REDUCING COUPLING 2 x 1
6932046	REDUCING COUPLING 2 x 1 1/4
6932047	REDUCING COUPLING 2 x 1 1/2
6944002	TEE JOINT 1/4
6944004	TEE JOINT 1/2
6944006	TEE JOINT 3/4
6944007	TEE JOINT 1
6944008	TEE JOINT 1 1/4
6944012	TEE JOINT 3
6944014	TEE JOINT 4
6945029	REDUCING TEE 3/4 x 3/4 x 1/2
6945032	REDUCING TEE 1 x 1 x 1/2
6945033	REDUCING TEE 1 x 1 x 3/4
6945035	REDUCING TEE 1 1/4 x 1 1/4 x 1/2
6945036	REDUCING TEE 1 1/4 x 1 1/4 x 3/4
6945037	REDUCING TEE 1 1/4 x 1 1/4 x 1
6945039	REDUCING TEE 1 1/2 x 1 1/2 x 1/2
6945040	REDUCING TEE 1 1/2 x 1 1/2 x 3/4
6945041	REDUCING TEE 1 1/2 x 1 1/2 x 1
6945042	REDUCING TEE 1 1/2 x 1 1/2 x 1 1/4
6945043	REDUCING TEE 2 x 2 x 1/2
6945044	REDUCING TEE 2 x 2 x 3/4
6945045	REDUCING TEE 2 x 2 x 1
6945046	REDUCING TEE 2 x 2 x 1 1/4
6945047	REDUCING TEE 2 x 2 x 1 1/2

NPT MEDIUM PRESSURE LINE - INMETRO CERTIFICATION	
TupyCode	TupyDescription
6961004	UNION WITH TAPERED BRONZE SEAT1/2
6961006	UNION WITH TAPERED BRONZE SEAT3/4
6961007	UNION WITH TAPERED BRONZE SEAT1
6961008	UNION WITH TAPERED BRONZE SEAT1 1/4
6961009	UNION WITH TAPERED BRONZE SEAT1 1/2
6961010	UNION WITH TAPERED BRONZE SEAT2
6961011	UNION WITH TAPERED BRONZE SEAT2 1/2
6961012	UNION WITH TAPERED BRONZE SEAT3

NPT MEDIUM PRESSURE LINE - INMETRO	
TupyCode	TupyDescription
6901023	REDUCING BUSHING 3/8 x 1/4
6901025	REDUCING BUSHING 1/2 x 1/4
6901026	REDUCING BUSHING 1/2 x 3/8
6901028	REDUCING BUSHING 3/4 x 3/8
6901029	REDUCING BUSHING 3/4 x 1/2
6901032	REDUCING BUSHING 1 x 1/2
6901033	REDUCING BUSHING 1 x 3/4
6901035	REDUCING BUSHING 1 1/4 x 1/2
6901036	REDUCING BUSHING 1 1/4 x 3/4
6901037	REDUCING BUSHING 1 1/4 x 1
6901040	REDUCING BUSHING 1 1/2 x 3/4
6901041	REDUCING BUSHING 1 1/2 x 1
6901042	REDUCING BUSHING 1 1/2 x 1 1/4
6901045	REDUCING BUSHING 2 x 1
6901046	REDUCING BUSHING 2 x 1 1/4
6901047	REDUCING BUSHING 2 x 1 1/2
6901050	REDUCING BUSHING 2 1/2 x 1 1/2
6901051	REDUCING BUSHING 2 1/2 x 2
6901055	REDUCING BUSHING 3 x 2
6901056	REDUCING BUSHING 3 x 2 1/2
6901059	REDUCING BUSHING 4 x 2 1/2
6901060	REDUCING BUSHING 4 x 3
6901071	REDUCING BUSHING 6 x 4
6902002	PLUG 1/4
6902003	PLUG 3/8
6902004	PLUG 1/2
6902006	PLUG 3/4
6902007	PLUG 1
6902008	PLUG 1 1/4
6902009	PLUG 1 1/2
6902010	PLUG 2
6902011	PLUG 2 1/2
6902012	PLUG 3
6902014	PLUG 4
6902016	PLUG 6
6907004	ELBOW 1/2
6907006	ELBOW 3/4
6907007	ELBOW 1
6907008	ELBOW 1 1/4
6907009	ELBOW 1 1/2
6907010	ELBOW 2
6907011	ELBOW 2 1/2
6907012	ELBOW 3
6907014	ELBOW 4
6909004	ELBOW 45° 1/2
6909006	ELBOW 45° 3/4
6909007	ELBOW 45° 1
6909008	ELBOW 45° 1 1/4
6909009	ELBOW 45° 1 1/2
6909010	ELBOW 45° 2
6908029	REDUCING ELBOW 3/4 x 1/2
6908032	REDUCING ELBOW 1 x 1/2
6908033	REDUCING ELBOW 1 x 3/4
6908035	REDUCING ELBOW 1 1/4 x 1/2
6908036	REDUCING ELBOW 1 1/4 x 3/4
6908037	REDUCING ELBOW 1 1/4 x 1
6908040	REDUCING ELBOW 1 1/2 x 3/4
6908041	REDUCING ELBOW 1 1/2 x 1
6908042	REDUCING ELBOW 1 1/2 x 1 1/4
6908044	REDUCING ELBOW 2 x 3/4
6908045	REDUCING ELBOW 2 x 1

NPT MEDIUM PRESSURE LINE - INMETRO	
TupyCode	TupyDescription
6908046	REDUCING ELBOW 2 x 1 1/4
6908047	REDUCING ELBOW 2 x 1 1/2
6911002	ELBOW MF 1/4
6911003	ELBOW MF 3/8
6911004	ELBOW MF 1/2
6911006	ELBOW MF 3/4
6911007	ELBOW MF 1
6911008	ELBOW MF 1 1/4
6911009	ELBOW MF 1 1/2
6911010	ELBOW MF 2
6910004	ELBOW MF 45° 1/2
6910006	ELBOW MF 45° 3/4
6910007	ELBOW MF 45° 1
6910008	ELBOW MF 45° 1 1/4
6910009	ELBOW MF 45° 1 1/2
6910010	ELBOW MF 45° 2
6918002	CROSS TEE FITTING 1/4
6918004	CROSS TEE FITTING 1/2
6918006	CROSS TEE FITTING 3/4
6918007	CROSS TEE FITTING 1
6918008	CROSS TEE FITTING 1 1/4
6918009	CROSS TEE FITTING 1 1/2
6918010	CROSS TEE FITTING 2
6999008	FLANGE 1 1/4
6999009	FLANGE 1 1/2
6999010	FLANGE 2
6931002	FULL COUPLING 1/4
6931004	FULL COUPLING 1/2
6931006	FULL COUPLING 3/4
6931010	FULL COUPLING 2
6932029	REDUCING COUPLING 3/4 x 1/2
6932032	REDUCING COUPLING 1 x 1/2
6932033	REDUCING COUPLING 1 x 3/4
6932035	REDUCING COUPLING 1 1/4 x 1/2
6932036	REDUCING COUPLING 1 1/4 x 3/4
6932037	REDUCING COUPLING 1 1/4 x 1
6932042	REDUCING COUPLING 1 1/2 x 1 1/4
6932043	REDUCING COUPLING 2 x 1/2
6932044	REDUCING COUPLING 2 x 3/4
6932045	REDUCING COUPLING 2 x 1
6932046	REDUCING COUPLING 2 x 1 1/4
6932047	REDUCING COUPLING 2 x 1 1/2
6942004	PLUG 1/2
6942006	PLUG 3/4
6942007	PLUG 1
6942008	PLUG 1 1/4
6942009	PLUG 1 1/2
6942010	PLUG 2
6944002	TEE JOINT 1/4
6944004	TEE JOINT 1/2
6944006	TEE JOINT 3/4
6944007	TEE JOINT 1
6944008	TEE JOINT 1 1/4
6944009	TEE JOINT 1 1/2
6944010	TEE JOINT 2
6944011	TEE JOINT 2 1/2
6944012	TEE JOINT 3
6944014	TEE JOINT 4

NPT MEDIUM PRESSURE LINE - INMETRO	
TupyCode	TupyDescription
6945029	REDUCING TEE 3/4 x 3/4 x 1/2
6945032	REDUCING TEE 1 x 1 x 1/2
6945033	REDUCING TEE 1 x 1 x 3/4
6945035	REDUCING TEE 1 1/4 x 1 1/4 x 1/2
6945036	REDUCING TEE 1 1/4 x 1 1/4 x 3/4
6945037	REDUCING TEE 1 1/4 x 1 1/4 x 1
6945039	REDUCING TEE 1 1/2 x 1 1/2 x 1/2
6945040	REDUCING TEE 1 1/2 x 1 1/2 x 3/4
6945041	REDUCING TEE 1 1/2 x 1 1/2 x 1
6945042	REDUCING TEE 1 1/2 x 1 1/2 x 1 1/4
6945043	REDUCING TEE 2 x 2 x 1/2
6945044	REDUCING TEE 2 x 2 x 3/4
6945045	REDUCING TEE 2 x 2 x 1
6945046	REDUCING TEE 2 x 2 x 1 1/4
6945047	REDUCING TEE 2 x 2 x 1 1/2
6961004	UNION WITH TAPERED BRONZE SEAT1/2
6961006	UNION WITH TAPERED BRONZE SEAT3/4
6961007	UNION WITH TAPERED BRONZE SEAT1
6961008	UNION WITH TAPERED BRONZE SEAT1 1/4
6961009	UNION WITH TAPERED BRONZE SEAT1 1/2
6961010	UNION WITH TAPERED BRONZE SEAT2
6961011	UNION WITH TAPERED BRONZE SEAT2 1/2
6961012	UNION WITH TAPERED BRONZE SEAT3

NPT HIGH PRESSURE LINE - FM CERTIFICATION	
TupyCode	TupyDescription
6807004	ELBOW 1/2
6807006	ELBOW 3/4
6807007	ELBOW 1
6807008	ELBOW 1 1/4
6807009	ELBOW 1 1/2
6807010	ELBOW 2
6807011	ELBOW 2 1/2
6807012	ELBOW 3
6807014	ELBOW 4
6809004	ELBOW 45° 1/2
6809006	ELBOW 45° 3/4
6809007	ELBOW 45° 1
6809008	ELBOW 45° 1 1/4
6809009	ELBOW 45° 1 1/2
6809010	ELBOW 45° 2
6809011	ELBOW 45° 2 1/2
6809012	ELBOW 45° 3
6809014	ELBOW 45° 4
6811004	ELBOW MF 1/2
6811006	ELBOW MF 3/4
6811007	ELBOW MF 1
6811008	ELBOW MF 1 1/4
6811009	ELBOW MF 1 1/2
6811010	ELBOW MF 2
6811011	ELBOW MF 2 1/2
6811012	ELBOW MF 3
6823004	FEMALE BEND 1/2
6823006	FEMALE BEND 3/4
6823007	FEMALE BEND 1
6823008	FEMALE BEND 1 1/4
6823009	FEMALE BEND 1 1/2
6823010	FEMALE BEND 2
6823011	FEMALE BEND 2 1/2
6823012	FEMALE BEND 3
6823014	FEMALE BEND 4
6831004	FULL COUPLING 1/2
6831006	FULL COUPLING 3/4
6831007	FULL COUPLING 1
6831008	FULL COUPLING 1 1/4
6831009	FULL COUPLING 1 1/2
6831010	FULL COUPLING 2
6831011	FULL COUPLING 2 1/2
6831012	FULL COUPLING 3
6831014	FULL COUPLING 4
6832025	REDUCING COUPLING 1/2 x 1/4
6832026	REDUCING COUPLING 1/2 x 3/4
6832028	REDUCING COUPLING 1/2 x 3/4
6832029	REDUCING COUPLING 3/4 x 1/2
6832032	REDUCING COUPLING 1 x 1/2
6832033	REDUCING COUPLING 1 x 3/4
6832036	REDUCING COUPLING 1 1/4 x 3/4
6832037	REDUCING COUPLING 1 1/4 x 1
6832041	REDUCING COUPLING 1 1/2 x 1
6832042	REDUCING COUPLING 1 1/2 x 1 1/4
6832046	REDUCING COUPLING 2 x 1 1/4
6832047	REDUCING COUPLING 2 x 1 1/2
6832050	REDUCING COUPLING 2 1/2 x 1 1/2
6832051	REDUCING COUPLING 2 1/2 x 2
6832055	REDUCING COUPLING 3 x 2
6832056	REDUCING COUPLING 3 x 2 1/2

NPT HIGH PRESSURE LINE - FM CERTIFICATION	
TupyCode	TupyDescription
6832059	REDUCING COUPLING 4 x 2 1/2
6832060	REDUCING COUPLING 4 x 3
6838004	DOUBLE NIPPLE 1/2
6838006	DOUBLE NIPPLE 3/4
6838007	DOUBLE NIPPLE 1
6838008	DOUBLE NIPPLE 1 1/4
6838009	DOUBLE NIPPLE 1 1/2
6838010	DOUBLE NIPPLE 2
6838011	DOUBLE NIPPLE 2 1/2
6838012	DOUBLE NIPPLE 3
6838014	DOUBLE NIPPLE 4
6842004	PLUG 1/2
6842006	PLUG 3/4
6842007	PLUG 1
6842008	PLUG 1 1/4
6842009	PLUG 1 1/2
6842010	PLUG 2
6842011	PLUG 2 1/2
6842012	PLUG 3
6842014	PLUG 4
6844004	TEE JOINT 1/2
6844006	TEE JOINT 3/4
6844007	TEE JOINT 1
6844008	TEE JOINT 1 1/4
6844009	TEE JOINT 1 1/2
6844010	TEE JOINT 2
6844011	TEE JOINT 2 1/2
6844012	TEE JOINT 3
6844014	TEE JOINT 4
6845025	REDUCING TEE 1/2 x 1/2 x 1/4
6845026	REDUCING TEE 1/2 x 1/2 x 3/8
6845028	REDUCING TEE 3/4 x 3/4 x 3/8
6845029	REDUCING TEE 3/4 x 3/4 x 1/2
6845032	REDUCING TEE 1 x 1 x 1/2
6545033	REDUCING TEE 1 x 1 x 3/4
6845036	REDUCING TEE 1 1/4 x 1 1/4 x 3/4
6845037	REDUCING TEE 1 1/4 x 1 1/4 x 1
6845041	REDUCING TEE 1 1/2 x 1 1/2 x 1
6845042	REDUCING TEE 1 1/2 x 1 1/2 x 1 1/4
6845046	REDUCING TEE 2 x 2 x 1 1/4
6845047	REDUCING TEE 2 x 2 x 1 1/2
6845050	REDUCING TEE 2 1/2 x 2 1/2 x 1 1/2
6845051	REDUCING TEE 2 1/2 x 2 1/2 x 2
6845055	REDUCING TEE 3 x 3 x 2
6845056	REDUCING TEE 3 x 3 x 2 1/2
6845059	REDUCING TEE 4 x 4 x 2 1/2
6845060	REDUCING TEE 4 x 4 x 3
6861004	UNION WITH TAPERED BRONZE SEAT 1/2
6861006	UNION WITH TAPERED BRONZE SEAT 3/4
6861007	UNION WITH TAPERED BRONZE SEAT 1
6861008	UNION WITH TAPERED BRONZE SEAT 1 1/4
6861009	UNION WITH TAPERED BRONZE SEAT 1 1/2
6861010	UNION WITH TAPERED BRONZE SEAT 2
6861011	UNION WITH TAPERED BRONZE SEAT 2 1/2
6861012	UNION WITH TAPERED BRONZE SEAT 3
6861014	UNION WITH TAPERED BRONZE SEAT 4

NPT HIGH PRESSURE LINE - FM CERTIFICATION	
TupyCode	TupyDescription
6870004	ELBOW UNION WITH TAPERED BRONZE SEAT 1/2
6870006	ELBOW UNION WITH TAPERED BRONZE SEAT 3/4
6870007	ELBOW UNION WITH TAPERED BRONZE SEAT 1
6870008	ELBOW UNION WITH TAPERED BRONZE SEAT 1 1/4
6870009	ELBOW UNION WITH TAPERED BRONZE SEAT 1 1/2
6870010	ELBOW UNION WITH TAPERED BRONZE SEAT 2

NPT HIGH PRESSURE LINE - UL CERTIFICATION	
TupyCode	TupyDescription
6807002	ELBOW 1/4
6807003	ELBOW 3/8
6807004	ELBOW 1/2
6807006	ELBOW 3/4
6807007	ELBOW 1
6807008	ELBOW 1 1/4
6807009	ELBOW 1 1/2
6807010	ELBOW 2
6807011	ELBOW 2 1/2
6807012	ELBOW 3
6809002	ELBOW 45° 1/4
6809003	ELBOW 45° 3/8
6809004	ELBOW 45° 1/2
6809006	ELBOW 45° 3/4
6809007	ELBOW 45° 1
6809008	ELBOW 45° 1 1/4
6809009	ELBOW 45° 1 1/2
6809010	ELBOW 45° 2
6809011	ELBOW 45° 2 1/2
6809012	ELBOW 45° 3
6811003	ELBOW MF 3/8
6811004	ELBOW MF 1/2
6811006	ELBOW MF 3/4
6811007	ELBOW MF 1
6811008	ELBOW MF 1 1/4
6811009	ELBOW MF 1 1/2
6811010	ELBOW MF 2
6811011	ELBOW MF 2 1/2
6811012	ELBOW MF 3
6831002	FULL COUPLING 1/4
6831003	FULL COUPLING 3/8
6831004	FULL COUPLING 1/2
6831006	FULL COUPLING 3/4
6831007	FULL COUPLING 1
6831008	FULL COUPLING 1 1/4
6831009	FULL COUPLING 1 1/2
6831010	FULL COUPLING 2
6831011	FULL COUPLING 2 1/2
6831012	FULL COUPLING 3
6832025	REDUCING COUPLING 1/2 x 1/4
6832026	REDUCING COUPLING 1/2 x 3/4
6832028	REDUCING COUPLING 1/2 x 3/4
6832029	REDUCING COUPLING 3/4 x 1/2
6832032	REDUCING COUPLING 1 x 1/2
6832033	REDUCING COUPLING 1 x 3/4
6832036	REDUCING COUPLING 1 1/4 x 3/4
6832037	REDUCING COUPLING 1 1/4 x 1
6832041	REDUCING COUPLING 1 1/2 x 1
6832042	REDUCING COUPLING 1 1/2 x 1 1/4
6832046	REDUCING COUPLING 2 x 1 1/4
6832047	REDUCING COUPLING 2 x 1 1/2
6832050	REDUCING COUPLING 2 1/2 x 1 1/2
6832051	REDUCING COUPLING 2 1/2 x 2
6832055	REDUCING COUPLING 3 x 2
6832056	REDUCING COUPLING 3 x 2 1/2

NPT HIGH PRESSURE LINE - UL CERTIFICATION	
TupyCode	TupyDescription
6842002	PLUG 1/4
6842003	PLUG 3/8
6842004	PLUG 1/2
6842006	PLUG 3/4
6842007	PLUG 1
6842008	PLUG 1 1/4
6842009	PLUG 1 1/2
6842010	PLUG 2
6842011	PLUG 2 1/2
6842012	PLUG 3
6844002	TEE JOINT 1/4
6844003	TEE JOINT 3/8
6844004	TEE JOINT 1/2
6844006	TEE JOINT 3/4
6844007	TEE JOINT 1
6844008	TEE JOINT 1 1/4
6844009	TEE JOINT 1 1/2
6844010	TEE JOINT 2
6844011	TEE JOINT 2 1/2
6844012	TEE JOINT 3
6845025	REDUCING TEE 1/2 x 1/2 x 1/4
6845026	REDUCING TEE 1/2 x 1/2 x 3/8
6845028	REDUCING TEE 3/4 x 3/4 x 3/8
6845029	REDUCING TEE 3/4 x 3/4 x 1/2
6845032	REDUCING TEE 1 x 1 x 1/2
6545033	REDUCING TEE 1 x 1 x 3/4
6845036	REDUCING TEE 1 1/4 x 1 1/4 x 3/4
6845037	REDUCING TEE 1 1/4 x 1 1/4 x 1
6845041	REDUCING TEE 1 1/2 x 1 1/2 x 1
6845042	REDUCING TEE 1 1/2 x 1 1/2 x 1 1/4
6845046	REDUCING TEE 2 x 2 x 1 1/4
6845047	REDUCING TEE 2 x 2 x 1 1/2
6845050	REDUCING TEE 2 1/2 x 2 1/2 x 1 1/2
6845051	REDUCING TEE 2 1/2 x 2 1/2 x 2
6845055	REDUCING TEE 3 x 3 x 2
6845056	REDUCING TEE 3 x 3 x 2 1/2
6861002	UNION WITH TAPERED BRONZE SEAT 1/4
6861003	UNION WITH TAPERED BRONZE SEAT 3/8
6861004	UNION WITH TAPERED BRONZE SEAT 1/2
6861006	UNION WITH TAPERED BRONZE SEAT 3/4
6861007	UNION WITH TAPERED BRONZE SEAT 1
6861008	UNION WITH TAPERED BRONZE SEAT 1 1/4
6861009	UNION WITH TAPERED BRONZE SEAT 1 1/2
6861010	UNION WITH TAPERED BRONZE SEAT 2
6861011	UNION WITH TAPERED BRONZE SEAT 2 1/2
6861012	UNION WITH TAPERED BRONZE SEAT 3

NPT HIGH PRESSURE LINE - INMETRO CERTIFICATION	
TupyCode	TupyDescription
6807002	ELBOW 1/4
6807003	ELBOW 3/8
6807004	ELBOW 1/2
6807006	ELBOW 3/4
6807007	ELBOW 1
6807008	ELBOW 1 1/4
6807009	ELBOW 1 1/2
6807010	ELBOW 2
6807011	ELBOW 2 1/2
6807012	ELBOW 3
6807014	ELBOW 4
6807016	ELBOW 6
6809002	ELBOW 45° 1/4
6809003	ELBOW 45° 3/8
6809004	ELBOW 45° 1/2
6809006	ELBOW 45° 3/4
6809007	ELBOW 45° 1
6809008	ELBOW 45° 1 1/4
6809009	ELBOW 45° 1 1/2
6809010	ELBOW 45° 2
6809011	ELBOW 45° 2 1/2
6809012	ELBOW 45° 3
6809014	ELBOW 45° 4
6809016	ELBOW 45° 6
6811003	ELBOW MF 3/8
6811004	ELBOW MF 1/2
6811006	ELBOW MF 3/4
6811007	ELBOW MF 1
6811008	ELBOW MF 1 1/4
6811009	ELBOW MF 1 1/2
6811010	ELBOW MF 2
6811011	ELBOW MF 2 1/2
6811012	ELBOW MF 3
6823004	FEMALE BEND 1/2
6823006	FEMALE BEND 3/4
6823007	FEMALE BEND 1
6823008	FEMALE BEND 1 1/4
6823009	FEMALE BEND 1 1/2
6823010	FEMALE BEND 2
6823011	FEMALE BEND 2 1/2
6823012	FEMALE BEND 3
6823014	FEMALE BEND 4
6831002	FULL COUPLING 1/4
6831003	FULL COUPLING 3/8
6831004	FULL COUPLING 1/2
6831006	FULL COUPLING 3/4
6831007	FULL COUPLING 1
6831008	FULL COUPLING 1 1/4
6831009	FULL COUPLING 1 1/2
6831010	FULL COUPLING 2
6831011	FULL COUPLING 2 1/2
6831012	FULL COUPLING 3
6831014	FULL COUPLING 4
6831016	FULL COUPLING 6
6832025	REDUCING COUPLING 1/2 x 1/4
6832026	REDUCING COUPLING 1/2 x 3/4
6832028	REDUCING COUPLING 1/2 x 3/4
6832029	REDUCING COUPLING 3/4 x 1/2
6832032	REDUCING COUPLING 1 x 1/2
6832033	REDUCING COUPLING 1 x 3/4

NPT HIGH PRESSURE LINE - INMETRO CERTIFICATION	
TupyCode	TupyDescription
6832036	REDUCING COUPLING 1 1/4 x 3/4
6832037	REDUCING COUPLING 1 1/4 x 1
6832041	REDUCING COUPLING 1 1/2 x 1
6832042	REDUCING COUPLING 1 1/2 x 1 1/4
6832046	REDUCING COUPLING 2 x 1 1/4
6832047	REDUCING COUPLING 2 x 1 1/2
6832050	REDUCING COUPLING 2 1/2 x 1 1/2
6832051	REDUCING COUPLING 2 1/2 x 2
6832055	REDUCING COUPLING 3 x 2
6832056	REDUCING COUPLING 3 x 2 1/2
6832059	REDUCING COUPLING 4 x 2 1/2
6832060	REDUCING COUPLING 4 x 3
6832071	REDUCING COUPLING 6 x 4
6838002	DOUBLE NIPPLE 1/4
6838003	DOUBLE NIPPLE 3/8
6838004	DOUBLE NIPPLE 1/2
6838006	DOUBLE NIPPLE 3/4
6838007	DOUBLE NIPPLE 1
6838008	DOUBLE NIPPLE 1 1/4
6838009	DOUBLE NIPPLE 1 1/2
6838010	DOUBLE NIPPLE 2
6838011	DOUBLE NIPPLE 2 1/2
6838012	DOUBLE NIPPLE 3
6838014	DOUBLE NIPPLE 4
6838016	DOUBLE NIPPLE 6
6842002	PLUG 1/4
6842003	PLUG 3/8
6842004	PLUG 1/2
6842006	PLUG 3/4
6842007	PLUG 1
6842008	PLUG 1 1/4
6842009	PLUG 1 1/2
6842010	PLUG 2
6842011	PLUG 2 1/2
6842012	PLUG 3
6842014	PLUG 4
6842016	PLUG 6
6844002	TEE JOINT 1/4
6844003	TEE JOINT 3/8
6844004	TEE JOINT 1/2
6844006	TEE JOINT 3/4
6844007	TEE JOINT 1
6844008	TEE JOINT 1 1/4
6844009	TEE JOINT 1 1/2
6844010	TEE JOINT 2
6844011	TEE JOINT 2 1/2
6844012	TEE JOINT 3
6844014	TEE JOINT 4
6844016	TEE JOINT 6
6845025	REDUCING TEE 1/2 x 1/2 x 1/4
6845026	REDUCING TEE 1/2 x 1/2 x 3/8
6845028	REDUCING TEE 3/4 x 3/4 x 3/8
6845029	REDUCING TEE 3/4 x 3/4 x 1/2
6845032	REDUCING TEE 1 x 1 x 1/2
6545033	REDUCING TEE 1 x 1 x 3/4
6845036	REDUCING TEE 1 1/4 x 1 1/4 x 3/4
6845037	REDUCING TEE 1 1/4 x 1 1/4 x 1
6845041	REDUCING TEE 1 1/2 x 1 1/2 x 1
6845042	REDUCING TEE 1 1/2 x 1 1/2 x 1 1/4
6845046	REDUCING TEE 2 x 2 x 1 1/4
6845047	REDUCING TEE 2 x 2 x 1 1/2

NPT HIGH PRESSURE LINE - INMETRO CERTIFICATION

TupyCode	TupyDescription
6845050	REDUCING TEE 2 1/2 x 2 1/2 x 1 1/2
6845051	REDUCING TEE 2 1/2 x 2 1/2 x 2
6845055	REDUCING TEE 3 x 3 x 2
6845056	REDUCING TEE 3 x 3 x 2 1/2
6845059	REDUCING TEE 4 x 4 x 2 1/2
6845060	REDUCING TEE 4 x 4 x 3
6845071	REDUCING TEE 6 x 6 x 4
6861002	UNION WITH TAPERED BRONZE SEAT 1/4
6861003	UNION WITH TAPERED BRONZE SEAT 3/8
6861004	UNION WITH TAPERED BRONZE SEAT 1/2
6861006	UNION WITH TAPERED BRONZE SEAT 3/4
6861007	UNION WITH TAPERED BRONZE SEAT 1
6861008	UNION WITH TAPERED BRONZE SEAT 1 1/4
6861009	UNION WITH TAPERED BRONZE SEAT 1 1/2
6861010	UNION WITH TAPERED BRONZE SEAT 2
6861011	UNION WITH TAPERED BRONZE SEAT 2 1/2
6861012	UNION WITH TAPERED BRONZE SEAT 3
6861014	UNION WITH TAPERED BRONZE SEAT 4
6870004	ELBOW UNION WITH TAPERED BRONZE SEAT 1/2
6870006	ELBOW UNION WITH TAPERED BRONZE SEAT 3/4
6870007	ELBOW UNION WITH TAPERED BRONZE SEAT 1
6870008	ELBOW UNION WITH TAPERED BRONZE SEAT 1 1/4
6870009	ELBOW UNION WITH TAPERED BRONZE SEAT 1 1/2
6870010	ELBOW UNION WITH TAPERED BRONZE SEAT 2



Important note: Consult Tupy for information on parts certified by each certifier. TUPY fittings are traceable while in their original packaging through the packaging date inserted into each label.

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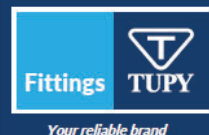
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