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APPROVAL REPORT

**WELDED PIPE OUTLETS AND STEEL PIPE FITTINGS
IN VARIOUS SIZES**

**MALLEABLE IRON PIPE FITTINGS WITH BRITISH
STANDARD THREADS IN VARIOUS SIZES**

**DUCTILE IRON GROOVED PIPE FITTINGS, RIGID
COUPLINGS, MECHANICAL TEES, AND SPLIT
FLANGES IN VARIOUS SIZES**

Prepared For:
Jinan Meide Casting Co. Ltd.
No. 3 Nanmen Rd.
Pingyin Jinan 250400
Shandong, China

Project Identifier: 3038663

Class: 1920

Approval Date: March 4, 2011

Authorized by:


Richard B. Dunne, Group Manager, Hydraulics

FM Approvals
1151 Boston-Providence Turnpike
P. O. Box 9102
Norwood, MA 02062

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From

**Jinan Meide Casting Co. Ltd.
No. 3 Nanmen Rd.
Pingyin Jinan 250400
Shandong, China**

I INTRODUCTION

- 1.1 Jinan Meide Casting Co. Ltd. requested an approval examination of welded pipe outlets, steel pipe fittings, malleable iron threaded pipe fittings with British Standard threads, and ductile iron grooved pipe fittings, rigid couplings, mechanical tees, and split flanges for use in aboveground fire protection systems.
- 1.2 Jinan Meide Casting Co. Ltd. has various cast, malleable, and ductile iron pipe fittings, similar to those discussed in this Report, that are Approved under the following FM Approvals Project I.D. numbers:

FM Approvals Project I.D.	Date of Approval
3010938	June 12, 2002
3015770	July 14, 2003
3019371	April 1, 2004
3018023	October 8, 2004
3023410	November 4, 2005
3024517	January 20, 2006
3026224	September 11, 2006
3030707	September 19, 2007
3032520	July 24, 2008
3032877	May 5, 2009

- 1.3 This Report may be freely reproduced only in its entirety and without modification.
- 1.4 Approval Standard

Title	Class Number	Date
Approval Standard for Pipe Couplings and Fittings for Aboveground Fire Protection Systems	1920	November, 2007

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- 1.5 **Listing:** The Approvals will appear in the *Approval Guide*, an online resource of FM Approvals, under the heading “Fire Protection\ Automatic Sprinkler Systems \ Pipes and Fittings for Aboveground” under the sub-headings as listed in the following sections.

1.5.1 **Pipe Fittings \ Welded Pipe Outlets:**

Model BNO, BNOG

<i>Product Designation</i>	<i>Fitting Description</i>	<i>Nominal Run Pipe Size, in.</i>	<i>Nominal Outlet Pipe Size, in.</i>	<i>Max Working Pressure, psi (kPa)</i>	<i>Remarks</i>
BNO	Welded Pipe Outlet Threaded	1, 1-1/4, 1-1/2, 2, 3, 4, 6	1/2	300 (2070)	a
		1, 1-1/2, 2, 2-1/2, 3, 4, 6	3/4		
		1-1/4, 1-1/2, 2, 2-1/2, 3, 4, 6	1		
		1-1/2, 2, 2-1/2, 3, 4, 6	1-1/4		
		2, 2-1/2, 3, 4, 6	1-1/2		
		2-1/2, 3, 4, 6, 8	2		
		3, 4, 6, 8	2-1/2		
		4, 6, 8	3		
		6, 8	4		
		1-1/2, 2, 2-1/2, 3, 4, 6	1-1/4		
BNOG	Welded Pipe Outlet Grooved	2, 2-1/2, 3, 4, 6	1-1/2	300 (2070)	a
		2-1/2, 3, 4, 6, 8	2		
		3, 4, 6, 8	2-1/2		
		4, 6, 8	3		
		6, 8	4		
		8	6		

Remarks:

a. Outlet connection achieved by welding fitting to pipe. Requires precutting of hole in pipe.

1.5.2 **Pipe Fittings \ Pipe Fittings:**

Pipe Fittings

<i>Product Designation</i>	<i>Fitting Description</i>	<i>End Connection</i>	<i>Nominal Pipe Size, in.</i>	<i>Max Working Pressure, psi (kPa)</i>	<i>Remarks</i>
1#	90° Bend	Male BSP	1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3, 4	500 (3445)	a
		X			
		Female BSP	6	300 (2070)	a
1A	90° Bend Short	Male BSP	1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 4	500 (3445)	a
		X			
		Female BSP			
2#	90° Bend	Female BSP	1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3, 4	500 (3445)	a
2A	90° Bend Short	Female BSP	1/2, 3/4, 1, 1-1/4, 1-1/2, 2	500 (3445)	a

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<i>Product Designation</i>	<i>Fitting Description</i>	<i>End Connection</i>	<i>Nominal Pipe Size, in.</i>	<i>Max Working Pressure, psi (kPa)</i>	<i>Remark</i>
3#	90° Bend	Male BSP	1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3, 4	500 (3445)	a
		Male BSP X	1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3, 4	500 (3445)	a
40	45° Bend	Female BSP			
		BSP X	6	300 (2070)	a
		Female BSP			
41	45° Bend	Female BSP	1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3, 4	500 (3445)	a
85	Crossover	BSP	1/2, 3/4, 1, 1-1/4, 1-1/2, 2	500 (3445)	a
		Grooved	76 mm	500 (3445)	b
90	90° Elbow		1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3, 4	500 (3445)	a
		BSP		300 (2070)	a
			5, 6		
			1/2×1/4, 3/8, 3/4×1/4, 3/8, 1/2 1×1/4, 3/8, 1/2, 3/4 1-1/4×3/8, 1/2, 3/4, 1 1-1/2×1/2, 3/4, 1, 1-1/4 2×1/2, 3/4, 1, 1-1/4, 1-1/2 2-1/2×1/2, 3/4, 1, 1-1/4, 1-1/2, 2 3×1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2 4×1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3	500 (3445)	a
90R	90° Reducing Elbow	BSP			
			6×4	300 (2070)	a
90S	90° Short Radius Elbow	Grooved	114, 165 mm	365 (2510)	b
			1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3, 4	500 (3445)	a
92	90° Street Elbow	BSP		300 (2070)	a
			6		
92R	90° Reducing Street Elbow	BSP	3/4×1/2 1×3/4	500 (3445)	a
	Union Elbow, Flat Seat without gasket				
95		Female BSP	1/2, 3/4, 1, 1-1/4, 1-1/2, 2	500 (3445)	a

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<i>Product Designation</i>	<i>Fitting Description</i>	<i>End Connection</i>	<i>Nominal Pipe Size, in.</i>	<i>Max Working Pressure, psi (kPa)</i>	<i>Remarks</i>
96	Union Elbow, Conical Joint Iron to Iron	Female BSP	1/2, 3/4, 1, 1-1/4, 1-1/2, 2	500 (3445)	a
97	Union Elbow, Flat Seat without gasket	Male BSP X Female BSP	1-1/2	500 (3445)	a
98	Union Elbow, Conical Joint Iron to Iron	Male BSP X Female BSP	1/2, 3/4, 1, 1-1/4, 1-1/2, 2	500 (3445)	a
110	22.5° Elbow	Grooved	73 mm	500 (3445)	b
			1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3, 4	500 (3445)	a
120	45° Elbow	BSP	5, 6	300 (2070)	a
121	45° Street Elbow	BSP	1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3, 4	500 (3445)	a
		Grooved	76 mm	500 (3445)	b
130	Equal Tee	BSP	1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3, 4	500 (3445)	a
			5, 6	300 (2070)	a
130R	Reducing Tee	Grooved	60 x 48 mm 88.9 x 48, 60, 73 mm 114.3 x 34, 60, 73, 88.9 mm 141 x 114.3 mm 168 x 60, 73, 89, 114, 141 mm 219.1 x 60, 89, 114.3, 141.3, 168 mm	500 (3445)	b
				300 (2070)	b

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<i>Product Designation</i>	<i>Fitting Description</i>	<i>End Connection</i>	<i>Nominal Pipe Size, in.</i>	<i>Max Working Pressure, psi (kPa)</i>	<i>Remarks</i>
			1/2×1/4, 3/8 3/4×1/4, 3/8, 1/2 1×1/4, 3/8, 1/2, 3/4 1-1/4×3/8, 1/2, 3/4, 1 1-1/2×3/8, 1/2, 3/4, 1, 1-1/4 2×3/8, 1/2, 3/4, 1, 1-1/4, 1-1/2 2-1/2×3/4, 1/2, 1, 1-1/4, 1-1/2, 2 3×1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2 4×1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3		
			1/2×1/2×3/4, 1 3/4×3/4×1, 1-1/4 1×1×1-1/4, 1-1/2, 2, 2-1/2 1-1/4×1-1/4×1-1/2, 2 1-1/2×1-1/2×2, 2-1/2 2×2×2-1/2 2-1/2×2-1/2×3, 4 3/4, 1 ×1/2×1/2 1, 1-1/4, 1-1/2 ×3/4×3/4 1-1/4×1/2×1/2 1-1/4, 1-1/2, 2 ×1×1 1-1/2, 2 ×1-1/4×1-1/4 2×1-1/2×1-1/2 2-1/2, 3 ×2×2 3/4×1/2×3/4 1×1/2×1, 1×3/4×1, 1×1/4×1 1-1/4×1/2×1-1/4, 1-1/4×3/4×1-1/4, 1- 1/4×1×1-1/4 1-1/2×1/2×1-1/2, 1-1/2×3/4×1-1/2, 1- 1/2×1×1-1/2, 1-1/2×1-1/4×1-1/2 2×1/2×2, 2×3/4×2, 2×1×2, 2×1-1/4×2, 2×1-1/2×2 2-1/2×1-1/2×2-1/2, 2-1/2×2×2-1/2 3/4×1/2×1, 1×1/2×3/4, 1×3/4×1/2 1-1/4×1/2×3/4, 1 1-1/4×3/4×1/2, 1 1-1/4×1×1/2, 3/4 1-1/2×3/4×1, 1-1/4 1-1/2×1×1/2, 1-1/4 1-1/2×1-1/4×1/2, 3/4, 2 2×1×1-1/2 2×1-1/4×1, 1-1/2 2×1-1/2×3/4, 1, 1-1/4 2-1/2×2×1/2, 1, 1-1/4	500 (3445)	a
130S	Short Radius Tee	Grooved	114, 165 mm	300 (2070) 365 (2510)	a b

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<i>Product Designation</i>	<i>Fitting Description</i>	<i>End Connection</i>	<i>Nominal Pipe Size, in.</i>	<i>Max Working Pressure, psi (kPa)</i>	<i>Remarks</i>
131	Equal Tee	BSP	1/2, 3/4, 1, 1-1/4, 1-1/2, 2	500 (3445)	a
134	Service Tee	BSP	1/2, 3/4, 1, 1-1/4, 1-1/2, 2	500 (3445)	a
134R	Service Tee Reducing	BSP	2×1-1/2 2-1/2×2 3×2-1/2	500 (3445)	a
165	Lateral Y Branch	BSP	1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3, 4	500 (3445)	a
		Grooved	60, 73, 76, 89, 114, 141, 165, 168 mm	500 (3450)	b
180	Equal Cross		219 mm	300 (2070)	b
		BSP	1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3, 4	500 (3445)	a
180R	Reducing Cross	BSP	3/4×1/2 1×1/2, 3/4 1-1/4×1/2, 3/4, 1 1-1/2×1/2, 3/4, 1, 1-1/4 2×3/4, 1, 1-1/4, 1-1/2 2-1/2×3/4, 1, 1-1/4, 1-1/2, 2 3×3/4, 1, 1-1/4, 1-1/2, 2 4×1, 1-1/4, 1-1/2, 2, 2-1/2, 3	500 (3445)	a
220	Coupling	BSP	1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3, 4	500 (3445)	a
			5, 6	300 (2070)	a
230	Eccentric Reducer	Grooved	219 x 168 mm 273 x 219 mm	365 (2510)	b
240	Reducing Socket	BSP	1/2×1/4, 3/8 3/4×1/4, 3/8, 1/2 1×1/4, 3/8, 1/2, 3/4 1-1/4×1/4, 3/8, 1/2, 3/4, 1 1-1/2×1/4, 3/8, 1/2, 3/4, 1, 1-1/4 2×1/2, 3/4, 1, 1-1/4, 1-1/2 2-1/2×1/2, 3/4, 1, 1-1/4, 1-1/2, 2 3×1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2	500 (3445)	a
240	Concentric Reducer	Grooved	89 x 42 mm 141 x 89, 114 mm	500 (3450)	b
240N	Concentric Reducer	Grooved × Female NPT	89 x 21 mm 141.3 x 89, 114 mm	500 (3450)	b

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<i>Product Designation</i>	<i>Fitting Description</i>	<i>End Connection</i>	<i>Nominal Pipe Size, in.</i>	<i>Max Working Pressure, psi (kPa)</i>	<i>Remarks</i>
241	Bushing	BSP	1/2×1/4, 3/8 3/4×1/4, 3/8, 1/2 1×1/4, 3/8, 1/2, 3/4 1-1/4×1/4, 3/8, 1/2, 3/4, 1 1-1/2×1/4, 3/8, 1/2, 3/4, 1, 1-1/4 2×1/4, 3/8, 1, 1-1/4, 1-1/2 2-1/2×1/2, 3/4, 1-1/2, 2 3×2, 2-1/2 3-1/2×3 4×3/4, 1, 1-1/4, 1-1/2, 3	500 (3445)	a
			5×3, 4 6×2, 2-1/2, 5	300 (2070)	a
			2×1/2, 3/4 2-1/2×1, 1-1/4 3×1/2, 3/4, 1, 1-1/4, 1-1/2 4×2, 2-1/2	500 (3445)	a
241D	Bushing	BSP	6×3, 4	300 (2070)	a
			1/2×1/4, 3/8 3/4×1/4, 3/8, 1/2 1×1/2, 3/4 1-1/4×1/2, 3/4, 1 1-1/2×1/2, 3/4, 1, 1-1/4 2×1/2, 3/4, 1, 1-1/4, 1-1/2 2-1/2×1, 1-1/4, 1-1/2 3×1-1/2, 2, 2-1/2 4×2, 4×2-1/2, 4×3	500 (3445)	a
245	Hex Nipple Reducing	BSP	1/2×1/4, 3/8 3/4×3/8, 1/2 1×1/2, 3/4 1-1/4×1/2, 3/4, 1 1-1/2×3/4, 1, 1-1/4 2×1, 1-1/4, 1-1/2	500 (3445)	a
			1/2×1/4, 3/8 3/4×3/8, 1/2 1×1/2, 3/4 1-1/4×1/2, 3/4, 1 1-1/2×3/4, 1, 1-1/4 2×1, 1-1/4, 1-1/2	500 (3445)	a
246	Extension Reducing	Male BSP X Female BSP	1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3, 4 6	500 (3445)	a
			1/2, 3/4, 1, 1-1/4, 1-1/2, 2	500 (3445)	a
270	Socket	BSP Parallel Threads	1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3, 4	500 (3445)	a
			1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3, 4	500 (3445)	a
271	Socket	BSP Right and Left Threads	1/2, 3/4, 1, 1-1/4, 1-1/2, 2	500 (3445)	a
			1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3, 4	500 (3445)	a
280	Hex Nipple	BSP	5, 6	300 (2070)	a
			1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3, 4	500 (3445)	a
291	Plug, Sq. Hd.	BSP	1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3, 4	500 (3445)	a

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<i>Product Designation</i>	<i>Fitting Description</i>	<i>End Connection</i>	<i>Nominal Pipe Size, in.</i>	<i>Max Working Pressure, psi (kPa)</i>	<i>Remarks</i>
			6	300 (2070)	a
291N	Plug, Sq. Socket	BSP	1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3	500 (3445)	a
291S	Plug, Solid Sq.	BSP	1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3, 4	500 (3445)	a
		Grooved	89, 114, 140, 165 mm	500 (3450)	b
300	End Cap	BSP	1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3, 4	500 (3445)	a
			5, 6	300 (2070)	a
300PX	End Cap with BSP threaded outlet	Grooved × BSP	89 x 48, 60 mm 114 x 48, 60 mm 140 x 48, 60 mm 165 x 48 mm 168 x 48, 60 mm	500 (3445)	b
			219 x 48, 60 mm	300 (2070)	b
310	Locknut	BSP	1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3, 4	500 (3445)	a
312	Backnut	BSP	1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 4	500 (3445)	a
321-4	Flange Adapter	Flanged × BSP	1-1/4, 1-1/2, 2, 2-1/2, 3, 4	500 (3445)	a
			6	300 (2070)	a
321-6	Flange Adapter	Flanged × BSP	1-1/4, 1-1/2, 2, 2-1/2, 3, 4	500 (3445)	a
			6	300 (2070)	a
321G	Flange Adapter	Flanged × Grooved	60, 73, 76.1, 89, 114 mm	365 (2510)	b
			139.7, 141.3, 165, 168, 219, 273, 324 mm	225 (1550)	b
321H	Flange Adapter	Flanged × BSP	1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3, 4	500 (3450)	a
321N	Flange Adapter	Flanged × BSP	2	500 (3450)	a
321P	Flange Adapter	Flanged × BSP	1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3, 4	500 (3450)	a
			5, 6	300 (2070)	a

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<i>Product Designation</i>	<i>Fitting Description</i>	<i>End Connection</i>	<i>Nominal Pipe Size, in.</i>	<i>Max Working Pressure, psi (kPa)</i>	<i>Remark</i>
321PW	Flange Adapter	Flanged × BSP	1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3, 4	500 (3450)	a
			5, 6	300 (2070)	a
321TD	Flange Adapter	Flanged × BSP	1, 1-1/4, 1-1/2, 2, 2-1/2, 3, 4	500 (3450)	a
			6	300 (2070)	a
321W	Flange Adapter	Flanged × BSP	1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3, 4	500 (3450)	a
330	Union Flat Seat without gasket	BSP	1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3, 4	500 (3445)	a
331	Union Flat Seat without gasket	Male BSP X Female BSP	1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3, 4	500 (3445)	a
340	Union Conical Joint Iron to Iron	BSP	1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3, 4	500 (3445)	a
340F	Union Nut	BSP	1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3, 4	500 (3445)	a
341	Union Conical Joint Iron to Iron	Male BSP X Female BSP	1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3, 4	500 (3445)	a
342	Union Conical Joint Brass to Iron	BSP	1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3, 4	500 (3445)	a
526	Extension	BSP	1/2	500 (3445)	a
529A	Extension Long	BSP	1/2, 3/4, 1, 1-1/4, 1-1/2, 2	500 (3445)	a
529X	Extension Short	BSP	1/2	500 (3445)	a
1090	90° Elbow Plain	BSP	1/2, 3/4, 1, 1-1/4, 2	500 (3445)	a
1130	Equal Tee Plain	BSP	1/2, 3/4, 1, 1-1/4, 1-1/2, 2	500 (3445)	a

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<i>Product Designation</i>	<i>Fitting Description</i>	<i>End Connection</i>	<i>Nominal Pipe Size, in.</i>	<i>Max Working Pressure, psi (kPa)</i>	<i>Remarks</i>
1220	Socket Plain	BSP	1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3	500 (3445)	a
1221	Side Outlet Elbow	BSP	1/2, 3/4, 1, 1-1/4, 2	500 (3445)	a
1223	Side Outlet Tee	BSP	1/2, 3/4, 1	500 (3445)	a
Steel Merchant Socket	Socket	BSP	1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3	500 (3445)	d
			4, 5, 6	300 (2070)	d
		NPT	1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3	500 (3445)	d
			4, 5, 6	300 (2070)	d

Remarks:

- a. Malleable Iron Fittings
- b. Ductile Iron Fittings
- c. Cast Iron Fittings
- d. Steel Fittings

1.5.3 Grooved Couplings or Fittings \ Grooved Couplings, Standard-Rigid:

Model 1G, 1GS

<i>Product Designation</i>	<i>Nominal Pipe Size, in.</i>	<i>Pipe Ends</i>	<i>Remarks</i>	<i>Max Working Pressure, psi (kPa)</i>
1G	73 mm	Cut Groove Rolled Groove	c, d	300 (2070)
1GS	114 mm	Cut Groove Rolled Groove	c, d	300 (2070)

Remarks:

- c. Approved when supplied with EPDM gasket.
- d. Approved for use with GB/T3092 regular and extra heavy pipe, ISO 4200, and BS 1387 medium and heavy pipe.

1.5.4 Pipe Fittings \ Fittings, Side Outlet, Rigid:

Model 3GS, 3JS

<i>Product Designation</i>	<i>Fitting Description</i>	<i>Nominal Pipe Size, in.</i>	<i>Remarks</i>	<i>Max Rated Pressure, psi (kPa)</i>
3GS	Mechanical Tee,	89 x 34, 42, 48, 60 mm	a, c	365 (2510)

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<i>Product Designation</i>	<i>Fitting Description</i>	<i>Nominal Pipe Size, in.</i>	<i>Remarks</i>	<i>Max Rated Pressure, psi (kPa)</i>
3JS	Grooved Outlet	114 x 34, 42, 48, 60, 73, 76, 89 mm	a, c	300 (2070)
		133 x 89 mm		
		140 x 42, 48, 60, 76, 89 mm		
		159 x 108, 114 mm		
		165 x 42, 48, 60, 76, 89, 108, 114 mm		
	Mechanical Tee, Threaded Outlet	168 x 42, 48, 60, 73, 76, 89, 114 mm	a, b, c, d	365 (2510)
		219 x 60, 73, 76, 89, 108, 114 mm		
		89 x 21, 27, 34, 42, 48, 60 mm		
		114 x 21, 27, 34, 42, 48, 60, 73, 76, 89 mm		
		168 x 34, 42, 48, 60, 73, 76, 89, 114 mm		
	Mechanical Tee, Threaded Outlet	219 x 34, 42, 48, 60, 73, 76, 89, 114 mm	a, b, c, d	300 (2070)
		108 x 21, 27, 34, 42, 48, 60, 76 mm		
		133 x 21, 27, 34, 42, 48, 60, 76, 89 mm		
		140 x 21, 27, 34, 42, 48, 60, 76, 89, 114 mm		
		159 x 21, 27, 34, 42, 48, 60, 76, 89, 114 mm		
	Mechanical Tee, Threaded Outlet	165 x 21, 27, 34, 42, 48, 60, 76, 89, 114 mm	a, c, d	300 (2070)

Remarks:

- a. For use on Schedule 10 and heavier steel sprinkler pipe.
- b. Approved when supplied with NPT female threads.
- c. Approved when supplied with EPDM gasket.
- d. Approved when supplied with BSP or DIN female threads.

1.5.5 Grooved Couplings or Fittings \ Grooved Split Flanges-Flexible:

321S, 321HS

<i>Product Designation</i>	<i>Fitting Description</i>	<i>Nominal Pipe Size, in.</i>	<i>Remarks</i>	<i>Max Rated Pressure, psi (kPa)</i>
321S	Split Flange	48, 60, 76, 89, 108, 114 mm	a, b, c, d, e	365 (2510)
		133, 140, 159, 165, 168 mm	a, b, c, d, e	225 (1550)
321HS	Split Flange	108 mm	a, b, c, e, f	365 (2510)
		165 mm	a, b, c, e, f	225 (1550)

Remarks:

- a. Minimum schedule cut groove pipe to be joined: 6 in. NPS and smaller - Schedule 40; 8 in. NPS and larger - Schedule 30.
- b. Minimum schedule rolled groove pipe to be joined: 6 in. NPS and smaller - Schedule 10S; 8 in. NPS and larger 0.188 in. (5 mm) wall.
- c. Approved when supplied with EPDM gasket.
- d. Approved when supplied with an ISO PN10 bolt pattern.
- e. Approved when used with GB/T3092 regular and extra heavy pipe, ISO 4200, and BS 1387 Medium and Heavy pipe.
- f. Approved when supplied with an ISO PN25 bolt pattern

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II DESCRIPTION

The rated working pressure for the products discussed in this Report range from 225 psi (1550 kPa) to 500 psi (3445 kPa), as shown in Section 1.5.

III EXAMINATIONS AND TESTS

- 3.1 The samples shown below were considered to be representative of the product lines and were examined, tested, and compared to the manufacture's drawings. All data is on file at FM Approvals along with other documents and correspondence applicable to this program.

Table 3.1

<i>Sample Material</i>	<i>Product Designation / Description</i>	<i>Nominal Pipe Size, in.</i>	<i>Rated Pressure</i>	<i>Required Test(s)</i>
Steel Fittings	BNO Welded Pipe Outlet	4 x 1-1/4, 2	300 psi	Hydrostatic Strength
		6 x 1, 3		
		8 x 2-1/2, 4		
	BNOG Welded Pipe Outlet	4 x 1-1/2, 3	300 psi	
		6 x 2, 4		
Malleable Iron Fittings	1# / 90° Bend	8 x 2-1/2, 4	300 psi	Hydrostatic Strength
		1/2, 1, 2, 3	500 psi	
	95 / Union	4, 5, 6	300 psi	
		2, 4	500 psi	
		6	300 psi	
Ductile Iron Fittings	180 / Equal Cross	2, 4	500 psi	Hydrostatic Strength
		6	300 psi	
	230 / Eccentric Reducer	1, 2	500 psi	
		2, 4	500 psi	
	300PX / End Cap with BSP threaded outlet	6	300 psi	
		2, 4, 6	500 psi	
	321G / Flange Adaptor	8	300 psi	
		8 x 6, 10 x 8	365 psi	
	321S / Split Flange	4 x 2, 6 x 2	500 psi	
		8 x 2	300 psi	
	3JS / Mech. Tee, Threaded Outlet	4	365 psi	Hydrostatic Strength & Bending Moment
		6, 10, 12	225 psi	
	3GS / Mech. Tee, Grooved Outlet	2, 3, 4	365 psi	
		6	225 psi	
	3GS / Mech. Tee, Grooved Outlet	3 x 2	365 psi	Hydrostatic Strength & Bending Moment
		4 x 3, 6 x 3, 8 x 4	300 psi	

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3.2 Hydrostatic Test

Sample pipe fittings as outlined in Section 3.1, considered representative of all products discussed in this Report, were subjected to hydrostatic strength testing. These samples were subjected to a hydrostatic pressure of four times their rated working pressure, for five minutes. There were no signs of permanent distortion, cracking, or rupture to any sample as a result of this test. These results are considered satisfactory.

3.3 Rotational Bending Moment Resistance

Sample 3GS mechanical tees as outlined in Section 3.1, considered representative of all mechanical tees discussed in this Report, were subjected to a rotational bending moment test while internally pressured to their corresponding rated working pressure. The test assemblies consisted of the mechanical tees centered on a short length of the pipe with grooved couplings and end caps on the free ends. With the run pipe securely restrained, the bending moment was applied to a length of pipe installed in the outlet of the fitting, first parallel, then perpendicular to the run pipe axis. The bending moment was calculated based on water filled schedule 40 steel sprinkler pipe, a maximum hanger spacing of 12 or 15 ft (3.6 or 4.6 m) depending on the nominal pipe size, and the assumption of a missing hanger. In each test, there was no evidence of leakage, cracking, or rupture at the required bending loads. These results are considered satisfactory.

- 3.4 Due to the results of the above testing and similarities between the products discussed in this Report and those currently Approved, no additional tests were deemed necessary.

IV MARKINGS

The following information appears on the products discussed in this report and meets Standard requirements:

- Manufacturer's Name
- Model Designation
- Nominal Size
- Country of Origin
- Date Code
- FM Approval Mark

V REMARKS

Installations shall comply with the latest edition of the manufacturer's instruction manual and be in accordance with applicable FM Global Property Loss Prevention Data Sheets.

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VI FACILITIES AND PROCEDURES AUDIT

The manufacturing location below is currently part of FM Approvals auditing program and is subject to regularly scheduled follow-up audit inspections.

**Jinan Meide Casting Co. Ltd.
No. 3 Nanmen Rd.
Pingyin Jinan 250400
Shandong, China**

The facilities and quality control procedures in place at this facility has been found to be satisfactory to manufacture product identical to that examined and tested as described in this report.

VII MANUFACTURERS RESPONSIBILITIES

7.1 Documentation considered critical to this Approval is on file at FM Approvals and listed in the Documentation File, Section VIII of this report. No changes of any nature shall be implemented unless notice of the proposed change has been given and written authorization obtained from FM Approvals. The FM Approved Product Revision Report, Form 797, shall be forwarded to FM Approvals as notice of proposed changes.

7.2 Manufacturer's literature shall indicate the rated working pressures for the products discussed in this Report as they are shown in Section 1.5.

7.3 Test Requirement No. 1 - Visual Inspection

The manufacturer shall perform visual inspections on 100 percent of fitting production. The visual inspection shall look for obvious surface or casting defects that would affect the performance of the part. Samples that have defects as outlined by the manufacturer's criteria shall be scrapped.

7.4 Test Requirement No. 2 - Dimensional Inspection

The manufacturer shall perform dimensional inspection on a sampling of the production of each fitting discussed in this Approval Standard. The frequency of dimensional inspection shall be outlined in the manufacturer's quality manual including the dimensions to be checked, and the data records to be maintained. At minimum, dimensional checks shall be recorded once per shift.

7.5 Test Requirement No. 3 – Leakage

The manufacturer shall perform leakage testing on a sampling of the production of each fitting discussed in this Approval Standard. The frequency of the leakage testing shall be outlined in the manufacturer's quality manual in addition to the test pressure, test time, and the data records that shall be maintained.

7.6 Test Requirement No. 4 - Quality Inspection

Where all or part of the quality control has been subcontracted, the manufacturer shall, at a minimum, conduct sufficient oversight audits to verify continued application of the required controls.

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VIII DOCUMENTATION

- 8.1 The following drawings describe the products without gaskets discussed in this Report and are filed in the Hydraulics Information Center under P.I. 3010938.

Drawing No.	Description	Revision Level
1221#-27-0-S-1	1# / Bend 90 degree, male and female	0
1221#-27-0-S-2	1# / Bend 90 degree, male and female	0
1221#-31-0-S-1	1# / Bend 90 degree, male and female (Marking Drawing)	0
1221#-31-0-S-2	1# / Bend 90 degree, male and female (Marking Drawing)	0
1221090-27-0-S	1090 / Elbow 90 degree plain	0
1221090-31-0-S	1090 / Elbow 90 degree plain (Marking Drawing)	0
1221130-27-0-S	1130 / Tee Plain	0
1221130-31-0-S	1130 / Tee Plain (Marking Drawing)	0
122120-27-0-S-1	120 / Elbow 45	0
122120-27-0-S-2	120 / Elbow 45	0
122120-31-0-S-1	120 / Elbow 45 degree (Marking Drawing)	0
122120-31-0-S-2	120 / Elbow 45 degree (Marking Drawing)	0
122121-27-0-S-1	121 / Street Elbow 45	0
122121-27-0-S-2	121 / Street Elbow 45	0
122121-31-0-S-1	121 / Street Elbow 45 degree (Marking Drawing)	0
122121-31-0-S-2	121 / Street Elbow 45 degree (Marking Drawing)	0
1221220-27-0-S	1220 / Socket, plain with ribs	0
1221220-31-0-S	1220 / Socket, plain with ribs (Marking Drawing)	0
1221221-27-0-s	1221 / Side outlet elbow	0
1221221-31-0-s	1221 / Side outlet elbow (Marking Drawing)	0
1221223-27-0-S	1223 / Side outlet tee	0
1221223-31-0-S	1223 / Side outlet tee (Marking Drawing)	0
122130-27-0-S-1	130 / Tee	0
122130-27-0-S-2	130 / Tee	0
122130-31-0-S-1	130 / Tee (Marking Drawing)	0
122130-31-0-S-2	130 / Tee (Marking Drawing)	0
122130R-27-0-S-1	130R / Tee Reducing	0
122130R-27-0-S-10	130R / Tee Reducing	0
122130R-27-0-S-11	130R / Tee Reducing	0
122130R-27-0-S-2	130R / Tee Reducing	0
122130R-27-0-S-3	130R / Tee Reducing	0
122130R-27-0-S-4	130R / Tee Reducing	0
122130R-27-0-S-5	130R / Tee Reducing	0
122130R-27-0-S-6	130R / Tee Reducing	0
122130R-27-0-S-7	130R / Tee Reducing	0
122130R-27-0-S-8	130R / Tee Reducing	0
122130R-27-0-S-9	130R / Tee Reducing	0
122130R-31-0-S-1	130R / Tee Reducing (Marking Drawing)	0
122130R-31-0-S-10	130R / Tee Reducing (Marking Drawing)	0
122130R-31-0-S-11	130R / Tee Reducing (Marking Drawing)	0
122130R-31-0-S-12	130R / Tee Reducing(Marking Drawing)	0
122130R-31-0-S-2	130R / Tee Reducing (Marking Drawing)	0
122130R-31-0-S-3	130R / Tee Reducing (Marking Drawing)	0
122130R-31-0-S-4	130R / Tee Reducing (Marking Drawing)	0
122130R-31-0-S-5	130R / Tee Reducing (Marking Drawing)	0

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122130R-31-0-S-6	130R / Tee Reducing (Marking Drawing)	0
122130R-31-0-S-7	130R / Tee Reducing (Marking Drawing)	0
122130R-31-0-S-8	130R / Tee Reducing (Marking Drawing)	0
122130R-31-0-S-9	130R / Tee Reducing (Marking Drawing)	0
122131-27-0-S	131 / Pitcher Tee, Equal 90	0
122131-31-0-S	131 / Pitcher Tee, Equal 90 (Marking Drawing)	0
122134-27-0-S	134 / Service Tee Equal	0
122134-31-0-S	134 / Service Tee Equal (Marking Drawing)	0
122134R-27-0-S	134R / Service Tee Reducing	0
122134R-31-0-S	134R / Service Tee Reducing (Marking Drawing)	0
122165-27-0-S	165 / Lateral Y Branch, 45 degree	0
122165-31-0-S	165 / Lateral Y Branch, 45 degree (Marking Drawing)	0
122180-27-0-S	180 / Cross	0
122180-31-0-S-1	180 / Cross (Marking Drawing)	0
122180-31-0-S-2	180 / Cross (Marking Drawing)	0
122180R-27-0-S-1	180R / Cross Reducing	0
122180R-27-0-S-2	180R / Cross Reducing	0
122180R-27-0-S-3	180R / Cross Reducing	0
122180R-27-0-S-4	180R / Cross Reducing	0
122180R-31-0-S-1	180R / Cross Reducing (Marking Drawing)	0
122180R-31-0-S-2	180R / Cross Reducing (Marking Drawing)	0
122180R-31-0-S-3	180R / Cross Reducing (Marking Drawing)	0
1221A-27-0-S	1A / Short Bend 90 Degree, male and female	0
1221A-31-0-S	1A / Short Bend 90 Degree, male and female (Marking Drawing)	0
1222#-27-0-S	2# / Bend 90 degree, female	0
1222#-31-0-S-1	2# / Bend 90 degree, female (Marking Drawing)	0
1222#-31-0-S-2	2# / Bend 90 degree, female (Marking Drawing)	0
122220-27-0-S-1	220 / Coupling	0
122220-27-0-S-2	220 / Coupling	0
122220-31-0-S-1	220 / Coupling (Marking Drawing)	0
122220-31-0-S-2	220 / Coupling (Marking Drawing)	0
122240-27-0-S-1	240 / Reducing Coupling	0
122240-27-0-S-2	240 / Reducing Coupling	0
122240-27-0-S-3	240 / Reducing Coupling	0
122240-27-0-S-4	240 / Reducing Coupling	0
122240-31-0-S-1	240 / Reducing Coupling (Marking Drawing)	0
122240-31-0-S-2	240 / Reducing Coupling (Marking Drawing)	0
122240-31-0-S-3	240 / Reducing Coupling (Marking Drawing)	0
122241-27-0-1	241 / Bushing	0
122241-27-0-2	241 / Bushing	0
122241-27-0-3	241 / Bushing	0
122241-27-0-4	241 / Bushing	0
122241-27-0-5	241 / Bushing	0
122241-31-0-1	241 / Bushing	0
122241-31-0-2	241 / Bushing	0
122241-31-0-3	241 / Bushing	0
122241-31-0-4	241 / Bushing	0
122241-31-0-5	241 / Bushing	0
122241D-27-0	241D / Bushing	0
122241D-31-0	241D / Bushing	0
122245-27-0-S-1	245 / Hexagon Nipples, Reducing	0
122245-27-0-S-2	245 / Hexagon Nipples, Reducing	0

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122245-27-0-S-3	245 / Hexagon Nipples, Reducing	0
122245-31-0-S-1	245 / Hexagon Nipples, Reducing (Marking Drawing)	0
122245-31-0-S-2	245 / Hexagon Nipples, Reducing (Marking Drawing)	0
122246-27-0-S	246 / Extension Piece,socket M&F Reducing	0
122246-31-0-S-1	246 / Extension Piece,socket M&F Reducing (Marking Drawing)	0
122246-31-0-S-2	246 / Extension Piece,socket M&F Reducing (Marking Drawing)	0
122270-27-0-S	270 / Socket, Parallel Threads equal	0
122270-31-0-S-1	270 / Socket, Parallel Threads equal (Marking Drawing)	0
122270-31-0-S-2	270 / Socket, Parallel Threads equal (Marking Drawing)	0
122271-27-0-S	271 / Socket, Right and Left Threads	0
122271-31-0-S	271 / Socket, Right and Left Threads (Marking Drawing)	0
122280-27-0-S-1	280 / Hexagon Nipples, Equal	0
122280-27-0-S-2	280 / Hexagon Nipples, Equal	0
122280-31-0-S-1	280 / Hexagon Nipples, Equal (Marking Drawing)	0
122280-31-0-S-2	280 / Hexagon Nipples, Equal (Marking Drawing)	0
122291-27-0	291 / Plug	0
122291-31-0	291 / Plug	0
122291N-27-0	291N / Plug	0
122291N-31-0	291N / Plug	0
122291S-27-0	291S / Plug	0
122291S-31-0	291S / Plug	0
1222A-27-0-S	2A / short bend 90 degree, female	0
1222A-31-0-S	2A / short bend 90 degree, female (Marking Drawing)	0
1223#-27-0-S	3# / bend 90 degree male	0
1223#-31-0-S	3# / bend 90 degree male (Marking Drawing)	0
122300-27-0	300 / End Cap	0
122300-31-0	300 / End Cap	0
122310-27-0	310 / Locknut	0
122310-31-0	310 / Locknut	0
122312-27-0	312 / Backnut	0
122312-31-0	312 / Backnut	0
122321-4-27-0-S	321-4 / Flange	0
122321-4-31-0-S	321-4 / Flange (Marking Drawing)	0
122321-6-27-0-S	321-6 / Flange	0
122321-6-31-0-S	321-6 / Flange (Marking Drawing)	0
122321H-27-0-S	321H / Flange	0
122321H-31-0-S	321H / Flange (Marking Drawing)	0
122321N50-01-0-S	321N / Flange	0
122321N50-09-0-S	321N / Flange (Marking Drawing)	0
122321P-27-0-S	321P / Flange Drp D	0
122321P-31-0-S	321P / Flange Drp D (Marking Drawing)	0
122321PW-27-0-S	321PW / Flange U/D	0
122321PW-31-0-S	321PW / Flange U/D (Marking Drawing)	0
122321TD-27-0-S	321TD / Flange BS table D	0
122321TD-31-0-S	321TD / Flange BS table D (Marking Drawing)	0
122321W-27-0-S	321W / Flange without bolt hole	0
122321W-31-0-S	321W / Flange without bolt hole (Marking Drawing)	0
122330-27-0	330 / Union Flat Seat	0
122331-27-0	331 / Union Flat Seat	0
122340-27-0	340 / Union Conical Joint	0
122340F-31-0	340F / Union Nut	0

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122341-27-0	341 / Union Conical Joint	0
122342-27-0	342 / Union Conical Joint	0
122342-31-0	342 / Union Conical Joint	0
12240-27-0-S	40 / Bend 45 degree, male and female	0
12240-31-0-S	40 / Bend 45 degree, male and female (Marking Drawing)	0
12241-27-0-S	41 / Bend 45 degree, female	0
12241-31-0-S	41 / Bend 45 degree, female ((Marking Drawing)	0
122526-27-0-S	526 / Extension Tube	0
122526-31-0-S	526 / Extension Tube (Marking Drawing)	0
122529A-27-0-S	529A / Extension long piece	0
122529A-31-0-S	529A / Extension long piece (Marking Drawing)	0
122529X15-01-0-S	529X / Extension short piece	0
122529X15-09-0-S	529X / Extension short piece (Marking Drawing)	0
12285-27-0-S	85 / Crossover	0
12285-31-0-S	85 / Crossover (Marking Drawing)	0
12290-27-0-s-1	90 / Elbow 90 degree	0
12290-27-0-s-2	90 / Elbow 90 degree	0
12290-31-0-S-1	90 / Elbow 90 degree (Marking Drawing)	0
12290-31-0-S-2	90 / Elbow 90 degree (Marking Drawing)	0
12290R-27-0-s-1	90R / Elbow 90 degree reducing	0
12290R-27-0-s-2	90R / Elbow 90 degree reducing	0
12290R-27-0-s-3	90R / Elbow 90 degree reducing	0
12290R-27-0-s-4	90R / Elbow 90 degree reducing	0
12290R-27-0-s-5	90R / Elbow 90 degree reducing	0
12290R-27-0-s-6	90R / Elbow 90 degree reducing	0
12290R-31-0-s-1	90R / Elbow 90 degree reducing (Marking Drawing)	0
12290R-31-0-s-2	90R / Elbow 90 degree reducing (Marking Drawing)	0
12290R-31-0-s-3	90R / Elbow 90 degree reducing (Marking Drawing)	0
12290R-31-0-s-4	90R / Elbow 90 degree reducing (Marking Drawing)	0
12290R-31-0-s-5	90R / Elbow 90 degree reducing (Marking Drawing)	0
12292-27-0-S	92 / Street Elbow 90	0
12292-31-0-S-1	92 / Street Elbow 90 (Marking Drawing)	0
12292-31-0-S-2	92 / Street Elbow 90 (Marking Drawing)	0
12292R-27-0-S	92R / Street Elbow 90 Reducing	0
12292R-31-0-S	92R / Street Elbow 90 Reducing (Marking Drawing)	0
12295-27-0	95 / Union Elbow Flat Seat	0
12296-27-0	96 / Union Elbow Conical Joint	0
12297-27-0	97 / Union Elbow Flat Seat	0
12298-27-0	98 / Union Elbow Conical Joint	0
309SC001	STEEL MERCHANT COUPLINGS/SOCKETS	A
309SCX1-2001	STEEL MERCHANT COUPLINGS/SOCKETS	A
342SC001	STEEL MERCHANT COUPLINGS/SOCKETS	A
343BNO001	COOPLET THREADED	A
343BNOG001	COOPLET GROOVED	A
348SC001	STEEL MERCHANT COUPLINGS/SOCKETS	A
361SC001	STEEL MERCHANT COUPLINGS/SOCKETS HALF	A
40111073-01-2-R	FIG# 110-22.5°ELBOW 73.0MM	2
401130-01-2-R	FIG# 130 TEE	2
401130R-01-3-R	FIG# 130R TEE	3
401130S-01-2-R-1	FIG# 130S SHORT TEE -1	2
401130S-01-2-R-2	FIG# 130S SHORT TEE -2	2
401180-01-2-R-2	FIG# 180-CROSS -2	2
401180-01-3-R-1	FIG# 180-CROSS -1	3

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401230-01-3-R-1	FIG230-GROOVED CONCENTRIC REDUCER 8"X6" 10"X8"	3
401240-01-3-R-1	FIG240-GROOVED CONCENTRIC REDUCER 5"x3" 5"x4"	3
401240-01-3-R-3	FIG240-GROOVED CONCENTRIC REDUCER 89X42MM 140X60MM	3
401240N-01-3-R-1	FIG240N-GROOVED CONCENTRIC REDUCER 5"x3" 5"x4"	3
401240N-01-3-R-5	FIG#240N-CONCENTRIC REDUCER WITH FEMALE THREAD 3"X1/2"	3
401300-01-2-R-1	FIG# 300-CAP -1	2
401300-01-2-R-2	FIG# 300-CAP -2	2
401300PX-01-2-R-1	FIG# 300PX-CAP 89X60	2
401300PX-01-2-R-2	FIG# 300PX-CAP -2	2
401300PX-01-2-R-3	FIG# 300PX-CAP -3	2
401321G-01-2-R-1	FIG# 321G-ADAPTOR FLAGE 219-324	2
401321G-01-2-R-2	FIG# 321G-ADAPTOR FLAGE 89-168	2
401321G-01-2-R-3	FIG# 321G-ADAPTOR FLAGE 60-76	2

8.2 The following drawings describe the products with gaskets discussed in this Report and are filed in the Hydraulics Information Center under P.I. 3018023.

4011G-173-01-1-R	FIG#1G- RIGID COUPLING 2-1/2"[73.0MM]HOUSING	1
4011G73-27-1-R	FIG#1G-RIGID COUPLING 2-1/2"[73.0MM] ASSEMBLY WITH ANSI NUTS&BOLTS&GASKET	1
4011GS-1114-01-1-R	FIG#1GS-LIGHT RIGID COUPLING 4"[114.3MM] HOUSING	1
4011GS114-27-1-R	FIG#1GS-LIGHTWEIGHT RIGID COUPLING 4"[114.3] ASSEMBLY WITH METRIC NUTS&BOLTS	1
401321S-1-01-2-R-1	FIG.321S&321AS-1 LIGHT GROOVED FLANGE 1-1/2"[48.3MM] TO 3"[88.9MM] BODY	2
401321S-1-01-2-R-2	FIG.321S&321AS-1 LIGHT GROOVED FLANGE 3"[88.9MM] TO 133.0MM BODY	2
401321S-1-01-2-R-3	FIG.321S&321AS-1 LIGHT GROOVED FLANGE 139.7MM TO 6"[168.3MM] BODY	2
401321S-27-2-R-1	FIG.321S&321AS LIGHT GROOVED FLANGE 1-1/2"[48.3MM] TO 3"[88.9MM] WITH ANSI NUTS & BOLTS ASSEMBLY	2
401321S-27-2-R-2	FIG.321S&321AS LIGHT GROOVED FLANGE 3"[88.9MM] TO 133.0MM WITH ANSI NUTS & BOLTS ASSEMBLY	2
401321S-27-2-R-3	FIG.321S&321AS LIGHT GROOVED FLANGE 139.7MM TO 6"[168.3MM] WITH ANSI NUTS & BOLTS ASSEMBLY	2
4013GS-2-27-1-R-2	FIG# 3GS-2 LIGHT GROOVED MECHANICAL TEE 6X1-1/4" TO 8X4" BODY	1
4013GS-2-27-2-R-1	FIG# 3GS-2 LIGHT GROOVED MECHANICAL TEE 3X1" TO 4X3" BODY	2
4013GS-27-1-R-1	FIG# 3GS LIGHT GROOVED MECHANICAL TEE 3X1/2 TO 3X2 ASSEMBLY WITH ANSI NUTS & BOLTS	1
4013GS-27-1-R-3	FIG# 3GS LIGHT GROOVED MECHANICAL TEE 6X1-1/2 TO 6X4 ASSEMBLY WITH ANSI NUTS & BOLTS	1
4013GS-27-1-R-4	FIG# 3GS LIGHT GROOVED MECHANICAL TEE 8X2 TO 8X4 ASSEMBLY WITH ANSI NUTS & BOLTS	1

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4013GS-27-2-R-2	FIG# 3GS LIGHT GROOVED MECHANICAL TEE 4X1-1/4 TO 4X3 ASSEMBLY WITH ANSI NUTS & BOLTS	2
4013JS-1-27-0-R	FIG# 3JS-1-LIGHT MECHANICAL TEE 3" TO 8" LOWER HOUSING	0
4013JS-2-27-2-R-2	FIG# 3JS-2 LIGHT THREADED MECHANICAL TEE 6X1" TO 8X4" BODY	2
4013JS-2-27-3-R-1	FIG# 3JS-2 LIGHT THREADED MECHANICAL TEE 3X1/2" TO 4X3" BODY	3
4013JS-27-1-R-1	FIG# 3JS LIGHT THREADED MECHANICAL TEE 3X1/2 TO 3X2 ASSEMBLY WITH ANSI NUTS & BOLTS	1
4013JS-27-1-R-3	FIG# 3JS LIGHT THREADED MECHANICAL TEE 6X1/2 TO 6X4 ASSEMBLY WITH ANSI NUTS & BOLTS	1
4013JS-27-1-R-4	FIG# 3JS LIGHT THREADED MECHANICAL TEE 8X1 TO 8X4 ASSEMBLY WITH ANSI NUTS & BOLTS	1
4013JS-27-2-R-2	FIG# 3JS LIGHT THREADED MECHANICAL TEE 4X1/2 TO 4X3 ASSEMBLY WITH ANSI NUTS & BOLTS	2
4016FLM8.8-27-0-R	FIG#6FLM8.8- ZINC PLATED HEAVY HEX NUT	0
40190-01-2-R	FIG# 90-90° ELBOW	2
40190S-01-2-R-1	FIG# 90S-90° SHORT RADIUS ELBOW	2
40190S-01-2-R-2	FIG# 90S-90° SHORT RADIUS ELBOW	2
401EPDM-27-2-R-1	EPDM 3G,3GS,3J,3JS Mech Tee	2
401EPDM-27-3-R-2	EPDM 3G,3GS,3J,3JS Mech Tee	3
401EPDM73-01-0-R	FIG#EPDM- RIGID,FLEXIBLE&HEAVY DUTY FLEXIBLE COUPLING MOLDED GASKET AND MARKINGS 2-1/2"[73.0MM]	0
401EPDMS114-01-0-R	FIG#EPDMS-LIGHT RIGID COUPLING MOLDED GASKET AND MARKINGS 4"[114.3MM]	0
401MD-27-0-R	SEMI-TUBULAR OVAL HEAD & W/STRIGHT HOLE RIVET	0
401YLS9.8-27-0-R	FIG#YLS9.8- ZINC PLATED OVER NECK TRACK BOLT	0
4121GK-01-0-R	FIG#1GK RIGID COUPLING	0
4123GS-2-27-1-R	FIG# 3GS-2 LIGHT GROOVED MECHANICAL TEE 133.0MMX3" TO 165.1MMX4" BODY	1
4123GS-27-1-R-1	FIG# 3GS LIGHT GROOVED MECHANICAL TEE 133.0MMX3 TO 139.7MMX4 ASSEMBLY WITH ANSI NUTS & BOLTS	1
4123GS-27-1-R-2	FIG# 3GS LIGHT GROOVED MECHANICAL TEE 159.0X108.0MM TO 165.1MMX4 ASSEMBLY WITH ANSI NUTS & BOLTS	1
4123JS-2-27-2-R-1	FIG# 3JS-2 LIGHT THREADED MECHANICAL TEE 108.0MMX1/2" TO 133.0MMX3" BODY	2
4123JS-2-27-2-R-2	FIG# 3JS-2 LIGHT THREADED MECHANICAL TEE 139.7MMX1/2" TO 159.0MMX2" BODY	2
4123JS-2-27-2-R-3	FIG# 3JS-2 LIGHT THREADED MECHANICAL TEE 159.0MMX2-1/2" TO 165.1MMX4" BODY	2
4123JS-27-1-R-1	FIG# 3JS LIGHT THREADED MECHANICAL TEE 108.0MMX1/2 TO 108.0MMX2-1/2 ASSEMBLY WITH ANSI NUTS & BOLTS	1
4123JS-27-1-R-2	FIG# 3JS LIGHT THREADED MECHANICAL TEE 133.0MMX1/2 TO 133.0MMX3 ASSEMBLY WITH ANSI NUTS & BOLTS	1
4123JS-27-1-R-3	FIG# 3JS LIGHT THREADED MECHANICAL TEE 139.7MMX1/2 TO 139.7MMX4 ASSEMBLY WITH ANSI NUTS & BOLTS	1

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4123JS-27-1-R-4	FIG# 3JS LIGHT THREADED MECHANICAL TEE 159.0MMX1/2 TO 159.0MMX4 ASSEMBLY WITH ANSI NUTS & BOLTS	1
4123JS-27-1-R-5	FIG# 3JS LIGHT THREADED MECHANICAL TEE 165.1MMX1/2 TO 165.1MMX4 ASSEMBLY WITH ANSI NUTS & BOLTS	1
412EPDM114-01-0-R	FIG#EPDM- RIGID&FLEXIBLE COUPLING MOLDED GASKET AND MARKINGS 4"[114.3MM]	0
412EPDM140-01-0-R	FIG#EPDM- RIGID&FLEXIBLE COUPLING MOLDED GASKET AND MARKINGS 139.7MM	0
412EPDM165-01-0-R	FIG#EPDM- RIGID&FLEXIBLE COUPLING MOLDED GASKET AND MARKINGS 165.1MM	0
412EPDM216-01-0-R	FIG#EPDM- RIGID&FLEXIBLE COUPLING MOLDED GASKET AND MARKINGS 216.3MM	0
412EPDM42-01-0-R	FIG#EPDM- RIGID&FLEXIBLE COUPLING MOLDED GASKET AND MARKINGS 1 1/4"[42.4MM]	0
412EPDM48-01-0-R	FIG#EPDM- RIGID&FLEXIBLE COUPLING MOLDED GASKET AND MARKINGS 1 1/2"[48.3MM]	0
412EPDM60-01-0-R	FIG#EPDM- RIGID&FLEXIBLE COUPLING MOLDED GASKET AND MARKINGS 2"[60.3MM]	0
412EPDM76-01-0-R	FIG#EPDM- RIGID&FLEXIBLE COUPLING MOLDED GASKET AND MARKINGS 76.1MM	0
412EPDM89-01-0-R	FIG#EPDM- RIGID&FLEXIBLE COUPLING MOLDED GASKET AND MARKINGS 3"[88.9MM]	0
4511GK-1114-01-0-R	FIG#1G-RIGID COUPLING 4"[114.3MM] HOUSING	0
4511GK-1140-01-0-R	FIG#1G-RIGID COUPLING 139.7MM HOUSING	0
4511GK-1165-01-0-R	FIG#1G-RIGID COUPLING 165.1MM HOUSING	0
4511GK-1216-01-0-R	FIG#1G-RIGID COUPLING 216.3MM HOUSING	0
4511GK-142-01-0-R	FIG#1G-RIGID COUPLING 1 1/4"[42.4MM] HOUSING	0
4511GK-148-01-0-R	FIG#1G-RIGID COUPLING 1 1/2"[48.3MM] HOUSING	0
4511GK-160-01-0-R	FIG#1G-RIGID COUPLING 2"[60.3MM] HOUSING	0
4511GK-176-01-0-R	FIG#1G-RIGID COUPLING 76.1MM HOUSING	0
4511GK-189-01-0-R	FIG#1G-RIGID COUPLING 3"[88.9MM] HOUSING	0

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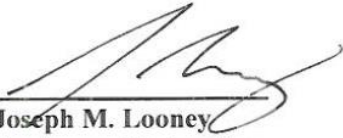
IX CONCLUSION

The pipe fittings described in Section 1.4, when manufactured at the facility listed in Section VI, meet FM Approval requirements. Since a duly signed Master Agreement is on file for this manufacturer, Approval is effective as of the date of this signed Approval Report.

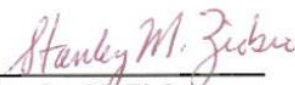
EXAMINATION BY:	Joseph M. Looney
TESTING PERFORMED BY:	Jinan Meide Casting Co., Ltd. Personnel
TESTING WITNESSED BY:	Douglas Zhou
PROJECT DATA RECORD:	Filed as P.I. 3038663

REPORT BY:

REVIEWED BY:



Joseph M. Looney
Engineer - Hydraulics



Stanley M. Ziobro
Technical Team Manager - Hydraulics



HHXX.EX6624 Fittings, Cast Iron, Ductile Iron, Malleable Iron and Bronze

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JINAN MEIDE CASTING CO LTD
3 NANMEN RD
PINGYIN
JINAN, SHANDONG 250400 CHINA

EX6624

Ductile Iron Fittings (ANSI/ASME B16.3)

Fittings fabricated with dimensional specifications in accordance with ANSI/ASME B16.3

Model	Configuration	Size, in.	Rated Pressure, psig
90	90° Elbow	1/2, 3/4, 1,	500
		1-1/4, 1-1/2, 2, 2-1/2,	
		3, 4	
90R	Reducing 90° Elbow	3/4 × 1/2	500
		1 × 1/2, 3/4	
		1-1/4 × 1/2, 3/4, 1	
		1-1/2 × 1/2, 3/4, 1, 1-1/4;	
		2 × 1/2, 3/4, 1, 1-1/4, 1-1/2	
		2-1/2 × 1-1/2, 2	
		3 × 3/4	
120	45° Elbow	1/2, 3/4, 1,	500
		1-1/4, 1-1/2, 2, 2-1/2	
130	Tee	1/2, 3/4, 1,	500
		1-1/4, 1-1/2, 2, 2-1/2,	
		3, 4	
130R	Reducing Tee	3/4 × 3/4 × 1/2, 1	500
		3/4 × 1/2 × 1/2, 3/4	
		1 × 1/2 × 1	
		1 × 3/4 × 3/4, 1	
		1 × 1 × 1/2, 3/4, 1-1/4, 1-1/2	
		1-1/4 × 1/2 × 1-1/4	
		1-1/4 × 3/4 × 1-1/4	
		1-1/4 × 1 × 1/2, 3/4, 1, 1-1/2, 1-1/4	
		1-1/4 × 1-1/4 × 1/2, 3/4, 1, 1-1/2, 2	
		1-1/2 × 1/2 × 1-1/4, 1-1/2	
		1-1/2 × 3/4 × 1-1/4, 1-1/2	
		1-1/2 × 1 × 1/2, 3/4, 1, 1-1/4, 1-1/2	
		1-1/2 × 1-1/4 × 1/2, 3/4, 1, 1-1/4, 1-1/2, 1, 2	
		1-1/2 × 1-1/2 × 1/2, 3/4, 1, 1-1/4, 2	
		2 × 1 × 2	

		2 x 1-1/4 x 2	
		2 x 1-1/2 x 1/2, 3/4, 1, 1-1/4, 1-1/2, 2	
		2 x 2 x 1/2, 3/4, 1, 1-1/4, 1-1/2, 2-1/2	
		2-1/2 x 2-1/2 x 3/4, 1, 1-1/4, 1-1/2, 2, 3	
241	Hex Bushing	1, 1-1/4, 1-1/2, 2,	500
		1-1/4x3/4	
220	Straight Coupling w/stop	1/2, 3/4,	500
		1, 1-1/4, 1-1/2, 2, 2-1/2	
240	Reducing	1 x 1/2, 3/4	500
	Coupling w/hex	1-1/4 x 3/4, 1	
		1-1/2 x 1, 1-1/4	
		2 x 1, 1-1/4, 1-1/2	
180	Cross	1, 1-1/4, 1-1/2, 2	500
		3/4	
180R	Reducing Cross	1-1/4 x 1	500
		1-1/2 x 1	
		2 x 1	
300	Cap	1/2, 3/4, 1,	500
		1-1/4, 1-1/2, 2, 2-1/2	
291	Square Head Plug	1/2, 3/4,	500
		1, 1-1/4, 1-1/2, 2	
342	Union	1, 1-1/4, 1-1/2, 2	500

CAST IRON FITTINGS

Cast Iron Fittings (ANSI/ASME B16.4)

Model	Configuration	Size, in.	Rated Pressure, psig
90	90° Elbow	1, 1-1/4, 1-1/2, 2, 2-1/2,	300
		3, 4	
90R	Reducing 90° Elbow	3/4 x 1/2	300
		1 x 1/2, 3/4	
		1-1/4 x 1/2, 3/4, 1	
		1-1/2 x 1/2, 3/4, 1, 1-1/4	
		2 x 1/2, 3/4, 1, 1-1/4, 1-1/2	
		2-1/2 x 3/4, 1, 1-1/4, 1-1/2, 2	
		3 x 2	
		3/4x1/2, 3x2	
120	45° Elbow	1, 1-1/4, 1-1/2, 2,	300
		2-1/2, 3, 4	
130	Tee	1, 1-1/4, 1-1/2, 2, 2-1/2	300
		3, 4	
130R	Reducing Tee	1x1x1-1/2, 2x1/2x2, 2x1x1-1/2, 2-1/2x1/2x2-1/2, 2-1/2x2x1/2, 2-1/2x2x3/4, 2-1/2x2x1, 2-1/2x2x1-1/4, 2-1/2x2x1-1/2, 2-1/2x2x2, 2-1/2x2x2-1/2, 3x3x1-1/4, 3x3x1-1/2, 3x3x2	300
180	Cross	1, 1-1/4, 1-1/2, 2	300
180R	Reducing Cross	1-1/4 x 1	300
		1-1/2 x 1	

		2 x 1	
240	Reducing Coupling w/hex	1 x 1/2, 3/4	300
		1-1/4 x 1	
		2 x 3/4, 1	
240N	Reducing Socket	1 x 3/4	300
291	Cored Plugs	3/4, 1, 1-1/4, 1-1/2, 2	300
291S	Solid Plugs	1/2	300

Malleable Iron Fittings (ANSI/ASME B16.3, ANSI/ASME B16.14)

Fittings fabricated with dimensional specifications in accordance with ANSI/ASME B16.3

Model	Configuration	Size, in.	Rated Pressure, psig
90	90° Elbow	1/2, 3/4, 1, 1-1/4, 1-1/2, 2	500
90	90° Elbow	2-1/2, 3, 3-1/2, 4, 5, 6	300
90R	90° Reducing Elbow	1/2x1/4, 3/8; 3/4x1/4, 3/8, 1/2; 1x3/8, 1/2, 3/4; 1-1/4x1/2, 3/4, 1; 1-1/2x3/4, 1, 1-1/4; 2x3/4, 1, 1-1/4, 1-1/2	500
90R	90° Reducing Elbow	2-1/2x1-1/2, 2; 3x2, 2-1/2; 4x3	300
92	90° Street Elbow	1/2, 3/4, 1, 1-1/4, 1-1/2, 2	500
92	90° Street Elbow	2-1/2, 3, 4, 6	300
120	45° Elbow	1/2, 3/4, 1, 1-1/4, 1-1/2, 2	500
120	45° Elbow	2-1/2, 3, 4, 5, 6	300
121	45° Street Elbow	1/2, 3/4, 1, 1-1/4, 1-1/2, 2	500
121	45° Street Elbow	2-1/2, 3, 4	300
130	Tee	1/2, 3/4, 1, 1-1/4, 1-1/2, 2	500
130	Tee	2-1/2, 3, 3-1/2, 4, 5, 6	300
130R	Reducing Tee	3/8x3/8x1/2, 1/2x1/4x1/2, 1/2x3/8x1/2, 1/2x1/2x1/4, 1/2x1/2x3/8, 1/2x1/2x3/4, 1/2x1/2x1, 3/4x1/2x1/2, 3/4x1/2x3/4, 3/4x3/4x1/4, 3/4x3/4x3/8, 3/4x3/4x1/2, 3/4x3/4x1, 1x1/2x1/2, 1x1/2x3/4, 1x1/2x1, 1x3/4x1/2, 1x3/4x3/4, 1x3/4x1, 1x1x1/4, 1x1x3/8, 1x1x1/2, 1x1x3/4, 1x1x1-1/4, 1x1x1-1/2, 1x1x2, 1-1/4x1/2x1, 1-1/4x1/2x1-1/4, 1-1/4x3/4x3/4, 1-1/4x3/4x1, 1-1/4x3/4x1-1/4, 1-1/4x1x1/2, 1-1/4x1x3/4, 1-1/4x1x1, 1-1/4x1x1-1/4, 1-1/4x1-1/4x3/8, 1-1/4x1-1/4x1/2, 1-1/4x1-1/4x3/4, 1-1/4x1-1/4x1, 1-1/4x1-1/4x1-1/2, 1-1/4x1-1/4x2, 1-1/2x1/2x1-1/2, 1-1/2x3/4x1-1/2, 1-1/2x1x1, 1-1/2x1x1-1/4, 1-1/2x1x1-1/2, 1-1/2x1-1/4x1/2, 1-1/2x1-1/4x3/4, 1-1/2x1-1/4x1, 1-1/2x1-1/4x1-1/4, 1-1/2x1-1/4x1-1/2, 1-1/2x1-1/2x1/2, 1-1/2x1-1/2x3/4, 1-1/2x1-1/2x1, 1-1/2x1-1/2x1-1/4, 1-1/2x1-1/2x2, 2x1/2x2, 2x3/4x2, 2x1x1-1/2, 2x1x2, 2x1-1/4x1-1/4, 2x1-1/4x1-1/2, 2x1-1/4x2, 2x1-1/2x1, 2x1-1/2x1-1/4, 2x1-1/2x1-1/2, 2x1-1/2x2, 2x2x1/2, 2x2x3/4, 2x2x1, 2x2x1-1/4, 2x2x1-1/2	500
130R	Reducing Tee	2x2x2-1/2, 2-1/2x1-1/2x2, 2-1/2x1-1/2x2-1/2, 2-1/2x2x2, 2-1/2x2x2-1/2, 2-1/2x2-1/2x3/4, 2-1/2x2-1/2x1, 2-1/2x2-1/2x1-1/4, 2-1/2x2-1/2x1-1/2, 2-1/2x2-1/2x2, 3x2x2, 3x2x3, 3x3x3/4, 3x3x1, 3x3x1-1/4, 3x3x1-1/2, 3x3x2, 3x3x2-1/2, 4x4x1-1/2, 4x4x2, 4x4x2-1/2, 4x4x3	300
134	Street Tee	1/2, 3/4, 1, 1-1/4, 1-1/2, 2	500
165	45° Y-Branches	1/2, 3/4, 1, 1-1/4, 1-1/2, 2	500
165	45° Y-Branches	2-1/2, 3, 4	300
180	Cross	1/2, 3/4, 1, 1-1/4, 1-1/2, 2	500
180	Cross	2-1/2, 3, 3-1/2, 4	300
180R	Reducing Cross	3/4x1/2, 1x1/2, 1x3/4, 1-1/4x3/4, 1-1/4x1, 1-1/2x3/4, 1-1/2x1, 1-1/2x1-1/4, 2x3/4, 2x1, 2x1-1/4, 2x1-1/2	500
180R	Reducing Cross	2-1/2x2, 3x2	300

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220	Coupling	1/2, 3/4, 1, 1-1/4, 1-1/2, 2	500
220	Coupling	2-1/2, 3, 4	300
240	Reducing Coupling	1/2x1/8, 1/2x1/4, 1/2x3/8, 3/4x1/4, 3/4x3/8, 3/4x1/2, 1x1/4, 1x3/8, 1x1/2, 1x3/4, 1-1/4x1/2, 1-1/4x3/4, 1-1/4x1, 1-1/2x1/2, 1-1/2x3/4, 1-1/2x1, 1-1/2x1-1/4, 2x1/2, 2x3/4, 2x1, 2x1-1/4, 2x1-1/2	500
240	Reducing Coupling	2-1/2x1-1/2, 2-1/2x2, 3x1-1/2, 3x2, 3x2-1/2, 4x2, 4x3	300
300	Cap	1/2, 3/4, 1, 1-1/4, 1-1/2, 2	500
300	Cap	2-1/2, 3, 3-1/2, 4, 5, 6	300

Fittings fabricated with dimensional specifications in accordance with ANSI/ASME B16.14

Model	Configuration	Size, in.	Rated Pressure, psig
241	Bushing	1/2x1/8, 1/2x1/4, 1/2x3/8, 3/4x1/8, 3/4x1/4, 3/4x3/8, 3/4x1/2, 1x1/8, 1x1/4, 1x3/8, 1x1/2, 1x3/4, 1-1/4x1/4, 1-1/4x3/8, 1-1/4x1/2, 1-1/4x3/4, 1-1/4x1, 1-1/2x1/4, 1-1/2x3/8, 1-1/2x1/2, 1-1/2x3/4, 1-1/2x1, 1-1/2x1-1/4, 2x1/4, 2x3/8, 2x1/2, 2x3/4, 2x1, 2x1-1/4, 2x1-1/2, 2-1/2x1/2, 2-1/2x3/4, 2-1/2x1, 2-1/2x1-1/4, 2-1/2x1-1/2, 2-1/2x2, 3x1/2, 3x3/4, 3x1, 3x1-1/4, 3x1-1/2, 3x2, 3x2-1/2, 3-1/2x2-1/2, 3-1/2x3, 4x1-1/4, 4x1-1/2, 4x3, 4x3-1/2, 5x4, 6x5	300
291	Cored Plugs	1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3, 3-1/2	300
291S	Solid Plugs	1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3, 3-1/2	300
291-4	Slotted Head Plugs	4, 5, 6	300
291N	Countersunk Plugs	1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3, 4	300

Malleable Iron Fittings, ISO 49/EN 10242 (threads manufactured in accordance with ISO 7-1):

Model	Configuration	Size, in.	Rated Pressure, psig
1#	Bend 90 degree, male and female	1/8", 1/4", 3/8", 1/2", 3/4", 1", 1-1/4", 1-1/2", 2", 2-1/2", 3", 4", 6"	500
1A	Short Bend 90 degree, male and female	1/4", 3/8", 1/2", 3/4", 1", 1-1/4", 1-1/2", 2", 2-1/2"	500
2#	Bend 90 degree, female	1/4", 3/8", 1/2", 3/4", 1", 1-1/4", 1-1/2", 2", 2-1/2", 3", 4"	500
2A	Short Bend 90 degree, female	1/2", 3/4", 1", 1-1/4", 1-1/2", 2"	500
3#	Bend 90 degree, male	3/8", 1/2", 3/4", 1", 1-1/4", 1-1/2", 2", 2-1/2", 3", 4"	500
40	Bend 45 degree, male and female	1/4", 3/8", 1/2", 3/4", 1", 1-1/4", 1-1/2", 2", 2-1/2", 3", 4", 6"	500
41	Bend 45 degree, female	1/4", 3/8", 1/2", 3/4", 1", 1-1/4", 1-1/2", 2", 2-1/2", 3", 4"	500
85	Crossover	1/2", 3/4", 1", 1-1/4", 1-1/2", 2"	500
90	Elbow, 90 degree	1/8", 1/4", 3/8", 1/2", 3/4", 1", 1-1/4", 1-1/2", 2", 2-1/2", 3", 4", 6", 5"	500
90R	Elbow, 90 degree, reducing	3/8"X1/4", 1/2x3/8", 3/4x3/8", 3/4x1/2", 1x1/2", 1x3/4", 1-1/4x3/4", 1-1/4x1", 1x1/4", 1x3/8", 1x1/2", 1x3/4", 1-1/4x3/8", 1-1/4x1/2", 1-1/4x3/4", 1-1/4x1", 1-1/2x1/2", 1-1/2x3/4", 1/4x1/8, 3/8x1/8, 1/2x1/4, 3/4x1/4, 1x1/4, 1x3/8, 1-1/4x3/8, 1-1/4x1/2, 1-1/2x1/2, 1-1/2x3/4, 2x1/2, 2x3/4, 2x1, 2x1-1/4, 2-1/2x1/2, 2-1/2x3/4, 2-1/2x1, 2-1/2x1-1/4, 2-1/2x1-1/2, 3x3/4, 3x1, 3x1-1/4, 3x1-1/2, 3x2, 3x2-1/2, 4x1, 4x1-1/4, 4x1-1/2, 4x2, 4x2-1/2, 4x3, 6x4	500
		11/2x1", 11/2x11/4", 2x11/2", 21/2x2"	
92	Stree Elbow, 90 degree	1/8", 1/4", 3/8", 1/2", 3/4", 1", 1-1/4", 1-1/2", 2", 2-1/2", 3", 4", 6"	500
92R	Stree Elbow, 90 degree, reducing	3/4"X1/2", 1"X3/4"	500
95	Union elbow, F&F, Flat seat without gasket	1/2", 3/4, 1, 1-1/4, 1-1/2, 2"	500

96	Union elbow, F&F, conical joint iron to iron	1/4, 3/8, 1/2", 3/4, 1, 1-1/4, 1-1/2, 2"	500
97	Union elbow, M&F, Flat seat without gasket	11/2"	500
98	Union elbow, M&F, conical joint iron to iron	1/2", 3/4, 1, 1-1/4, 1-1/2, 2"	500
120	Elbow, 45 degree	1/8", 1/4", 3/8", 1/2", 3/4", 1", 1-1/4", 1-1/2", 2, 2-1/2", 3", 4", 5, 6"	500
121	Stree Elbow, 45 degree	1/8", 1/4", 3/8", 1/2", 3/4", 1", 1-1/4",	500
		1-1/2", 2, 2-1/2, 3, 4"	
130	Tee	1/8", 1/4", 3/8", 1/2", 3/4", 1", 1-1/4", 1-1/2", 2", 2-1/2", 3", 4", 5, 6"	500
130R	Tee, reducing	3/8x1/4, 1/2x1/4, 1/2x3/8, 3/4x1/4,	500
		3/4x3/8, 3/4x1/2, 1x1/4, 1x3/8, 1x1/2, 1x3/4, 1-1/4x3/8, 1-1/4x1/2,	
		1-1/4x3/4, 1-1/4x1, 1-1/2x1/2, 1-1/2x3/4, 1-1/2x1, 1-1/2x1-1/4, 2x1/2, 2x3/4, 2x1,	
		2x1-1/4, 2x1-1/2, 2-1/2x1, 2-1/2x1-1/4, 2-1/2x1-1/2, 2-1/2x2, 3x1, 3x1-1/4, 3x1-1/2, 3x2, 3x2-1/2, 4x2, 4x3, 1/4x1/8, 1/2x1/8, 1-1/2x3/8, 2x3/8, 2-1/2x1/2, 2-1/2x3/4, 3x1/2, 3x3/4, 4x1/2, 4x3/4, 4x1, 4x1-1/4, 4x1-1/2, 4x2-1/2, 6x2, 6x3, 6x4, 1/2x1/2x3/4, 1/2x1/2x1, 3/4x3/4x1,	
		3/4x3/4x1-1/4, 1x1x1-1/4, 1x1x1-1/2, 1x1x2, 1x1x2-1/2, 1-1/4x1-1/4x1-1/2, 1-1/4x1-1/4x2, 1-1/2x1-1/2x2, 1-1/2x1-1/2x2-1/2, 2x2x2-1/2, 2-1/2x2-1/2x3, 2-1/2x2-1/2x4, 3/4x1/2x1/2, 1x1/2x1/2, 1x3/4x3/4,	
		1-1/4x1/2x1/2, 1-1/4x3/4x3/4, 1-1/4x1x1, 1-1/2x3/4x3/4, 1-1/2x1x1, 1-1/2x1-1/4x1-1/4, 2x1x1, 2x1-1/4x1-1/4, 2x1-1/2x1-1/2, 2-1/2x2x2, 3x2x2, 3/4x1/2x3/4, 1x1/2x1, 1x3/4x1, 1x1/4x1, 1-1/4x1/2x1-1/4, 1-1/4x3/4x1-1/4, 1-1/4x1x1-1/4, 1-1/2x1/2x1-1/2, 1-1/2x3/4x1-1/2, 1-1/2x1x1-1/2, 1-1/2x1-1/4x1-1/2, 2x1/2x2, 2x3/4x2, 2x1x2,	
		2x1-1/4x2, 2x1-1/2x2, 2-1/2x1-1/2x2-1/2, 2-1/2x2x2-	500
		1/2, 3/4x1/2x1, 1x1/2x3/4, 1x3/4x1/2,	
		1-1/4x1/2x3/4, 1-1/4x1/2x1, 1-1/4x3/4x1/2, 1-1/4x3/4x1, 1-1/4x1x1/2, 1-1/4x1x3/4, 1-1/2x3/4x1, 1-1/2x3/4x1-1/4, 1-1/2x1x1/2, 1-1/2x1x1-1/4, 1-1/2x1-1/4x1/2, 1-1/2x1-1/4x3/4, 1-1/2x1-1/4x1,	
		1-1/2x1-1/4x2, 2x1x1-1/2, 2x1-1/4x1, 2x1-1/4x1-1/2, 2x1-1/2x1/2, 2x1-1/2x3/4, 2x1-1/2x1, 2x1-1/2x1-1/4, 2-1/2x2x1/2, 2-1/2x2x1, 2-1/2x2x1-1/4	
131	Pitcher Tee, equal 90 degree	1/2, 3/4, 1, 1-1/4, 1-1/2, 2"	500
134	Service Tee, equal	1/4", 1/2, 3/4, 1, 1-1/4, 1-1/2, 2"	500
134R	Service Tee, Reducing	2"x11/2", 2-1/2x2, 3X21/2"	500
165	Lateral Y branch, 45 degree	1/2", 3/4", 1", 1-1/4", 1-1/2", 2",	500
		2-1/2", 3", 4	
180	Cross	1/8", 1/4, 1/2", 3/4", 1", 1-1/4", 1-1/2", 2",	500
		2-1/2", 3", 4", 3/8"	
180R	Cross, reducing	3/4"x1/2", 1x1/2, 1x3/4, 1-1/4x3/4,	500
		1-1/4x1, 11/2"x1", 11/4"x1/2", 1-1/2x1/2, 1-1/2x3/4, 1-1/2x1-1/4, 2x3/4, 2x1, 2x1-1/4,	
		2x1-1/2, 21/2"x1", 21/2"x11/4", 21/2"x11/2", 21/2"x2", 3x3/4, 3x1, 3x1-1/4, 3x1-1/2, 3"x2", 3"x21/2", 4x1, 4x1-1/4, 4x1-1/2,	
		4x2, 4x2-1/2, 4"x3"	
220	Socket/Coupling	1/8", 1/4", 3/8", 1/2", 3/4", 1", 1-1/4", 1-1/2", 2", 2-1/2", 3", 4", 5, 6"	500
240	Socket/Coupling, reducing	1/4"x1/8", 3/8x1/8, 3/8x1/4, 1/2x1/4,	500
		1/2x3/8, 3/4x1/4, 3/4x3/8, 3/4x1/2,	
		1x3/8, 1x1/2, 1"x3/4", 11/4"x1/2", 1-1/4x3/4, 1-1/4x1, 1-1/2x1/2,	
		1-1/2x3/4, 1-1/2x1, 1-1/2x1-1/4,	

		2x1/2, 2x3/4, 2x1, 2x1-1/4, 2"x11/2", 21/2"x11/4", 21/2"x11/2, 21/2"x2,	
		3x1-1/2, 3x2, 3"x21/2", 1/2"x11/8", 3/4"x11/8", 1x1/4, 1-1/4x1/4,	
		1-1/4x3/8, 1-1/2x1/4, 1-1/2x3/8, 2-1/2x1/2,	
		2-1/2x3/4, 2-1/2x1, 3x1/2, 3x3/4, 3x1,	
		3"x11/4"	
241	Bushing(241)	1/4"x11/8", 3/8x1/8, 3/8x1/4, 1/2x1/8,	500
		1/2x1/4, 1/2x3/8, 3/4x1/8, 3/4x1/4,	
		3/4x3/8, 3/4x1/2, 1x1/8, 1x1/4, 1"x3/8", 1x1/2, 1x3/4, 1-1/4x1/4, 1-1/4x3/8, 1-1/4x1/2, 1-1/4x3/4, 1-1/4x1, 1-1/2"x11/4", 1-1/2"x3/8",	
		1-1/2"x11/2", 21/2"x11/2", 2-1/2x2, 3x1/2,	
		3x3/4, 3x2, 3"x21/2", 11/2"x3/4", 1-1/2x1, 1-1/2x1-1/4,	
		2x1/4, 2x3/8, 2x1, 2x1-1/4, 2x1-1/2, 2-1/2x1/2, 21/2"x3/4", 31/2"x3", 4x3/4, 4x1, 4x1-1/4,	
		4x1-1/2, 4x3, 5x3, 5x4,	
		6x2, 6x2-1/2, 6x5	
241D	Bushing(241D)	2"x11/2", 2x3/4, 2-1/2x1, 2-1/2x1-1/4,	500
		3x1, 3x1-1/4, 3x1-1/2, 4x2,	
		4x2-1/2, 6x3, 6x4	
245	Hexagon Nipple, reducing	3/8"x11/4", 1/2x1/4, 1/2x3/8,	500
		3/4x3/8, 3/4x1/2, 1x1/2, 1x3/4,	
		1-1/4x1/2, 1-1/4x3/4, 11/4"x1", 11/2"x3/4", 1-1/2x1, 1-1/2x1-1/4,	
		2x1, 2x1-1/4, 2x1-1/2, 2-1/2x2,	
		3x2, 3"x21/2", 1/4"x11/8", 3/4x1/4, 1-1/2x1/2,	
		2x1/2, 2x3/4, 2-1/2x1, 2-1/2x1-1/4,	
		2-1/2x1-1/2, 3x1-1/2, 4x2, 4x2-1/2,	
		4"x3"	
246	Extension piece, sockets M&F, reducing	3/8"x11/4", 1/2x1/4, 1/2x3/8, 3/4x3/8,	500
		3/4x1/2, 1x1/2, 1x3/4, 1-1/4x1/2,	
		1-1/4x3/4, 1-1/4x1, 1-1/2x3/4, 1-1/2x1,	
		1-1/2x1-1/4, 2x1, 2x1-1/4, 2"x11/2"	
270	Socket, parallel threads, equal	1/8", 1/4", 3/8", 1/2", 3/4", 1", 1-1/4",	500
		1-1/2", 2", 2-1/2", 3", 4", 6"	
271	Socket, right & left threads	1/2", 3/4, 1, 1-1/4, 1-1/2, 2"	500
280	Hexagon Nipple, equal	1/8", 1/4", 3/8", 1/2", 3/4", 1", 1-1/4",	500
		1-1/2", 2", 2-1/2", 3", 4", 5", 6"	
291	Plug	1/8", 1/4", 3/8", 1/2", 3/4", 1", 1-1/4",	500
		1-1/2", 2", 2-1/2", 3", 4", 6"	
291N	Countersunk Plug	1/2, 3/4", 1", 1-1/4",	500
		1-1/2", 2", 2-1/2", 3"	
291S	Solid Plug	1/4", 3/8", 1/2", 3/4", 1", 1-1/4",	500
		1-1/2", 2", 2-1/2", 3", 4"	
300	Cap	1/8", 1/4", 3/8", 1/2", 3/4", 1", 1-1/4",	500
		1-1/2", 2", 2-1/2", 3", 4", 5, 6"	

310	Locknut	1/4", 3/8", 1/2", 3/4", 1", 1-1/4", 1-1/2", 2", 2-1/2", 3", 4"	500
312	Backnut	1/2", 3/4", 1", 1-1/4", 1-1/2", 2", 4"	500
321-4	Flange(321-4)	1-1/4", 1-1/2", 2", 2-1/2", 3", 4", 6"	500
321-6	Flange(321-6)	1-1/4", 1-1/2", 2", 2-1/2", 3", 4", 6"	500
321H	Flange(321H)	1/2", 3/4", 1", 1-1/4", 1-1/2", 2", 2-1/2", 3", 4"	500
321N	Flange(321N)	2"	500
321P	Flange, DRP D	1/2", 3/4", 1", 1-1/4", 1-1/2", 2", 2-1/2", 3", 4", 5, 6"	500
321PW	Flange, U/D	1/2", 3/4", 1", 1-1/4", 1-1/2", 2", 2-1/2", 3", 4", 5, 6"	500
321TD	Flange, BS Table D	1", 1-1/4", 1-1/2", 2", 2-1/2", 3", 4", 6"	500
321W	Flange, without bolt hole	1/2", 3/4", 1", 1-1/4", 1-1/2", 2", 2-1/2", 3", 4"	500
526	Extension Tube	1/2"X30, 1/2"X40, 1/2"X50, 1/2"X60, 1/2"X100	500
529A	Extention Long piece	1/2", 3/4", 1", 1-1/4", 1-1/2", 2"	500
529X	Extention Short piece	1/2"	500
1090	Elbow, 90 degree, plain	1/2", 1-1/4", 2"	500
1130	Tee, plain	1/2", 1", 1-1/4", 1-1/2"	500
1220	Socket, plain, with ribs	1/2", 3/4", 1", 1-1/4", 1-1/2", 2", 2-1/2", 3"	500
1221	Side outlet elbow	1/2", 3/4", 1", 1-1/4", 1-1/2", 2"	500
1223	Side outlet tee	1/2", 3/4", 1"	500



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EX6624

3 NANMEN RD

PINGYIN

JINAN, SHANDONG 250400 CHINA

Ductile Iron Fittings (ANSI/ASME B16.3)**Fittings fabricated with dimensional specifications in accordance with ANSI/ASME B16.3**

Model	Configuration	Size, in.	Rated Pressure, kPa
90	90° Elbow	1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3, 4	3447
90R	Reducing 90° Elbow	3/4 x 1/2 1 x 1/2, 3/4 1-1/4 x 1/2, 3/4, 1 1-1/2 x 1/2, 3/4, 1, 1-1/4; 2 x 1/2, 3/4, 1, 1-1/4, 1-1/2 2-1/2 x 1-1/2, 2 3 x 3/4	3447
120	45° Elbow	1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2	3447
130	Tee	1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2 3, 4	3447
130R	Reducing Tee	3/4 x 3/4 x 1/2, 1 3/4 x 1/2 x 1/2, 3/4 1 x 1/2 x 1 1 x 3/4 x 3/4, 1 1 x 1 x 1/2, 3/4, 1-1/4, 1-1/2 1-1/4 x 1/2 x 1-1/4 1-1/4 x 3/4 x 1-1/4 1-1/4 x 1 x 1/2, 3/4, 1, 1-1/2, 1-1/4 1-1/4 x 1-1/4 x 1/2, 3/4, 1, 1-1/2, 2 1-1/2 x 1/2 x 1-1/4, 1-1/2 1-1/2 x 3/4 x 1-1/4, 1-1/2 1-1/2 x 1 x 1/2, 3/4, 1, 1-1/4, 1-1/2 1-1/2 x 1-1/4 x 1/2, 3/4, 1, 1-1/4, 1-1/2, 1, 2 1-1/2 x 1-1/2 x 1/2, 3/4, 1, 1-1/4, 2 2 x 1 x 2	3447

		2 × 1-1/4 × 2	
		2 × 1-1/2 × 1/2, 3/4, 1, 1-1/4, 1-1/2, 2	
		2 × 2 × 1/2, 3/4, 1, 1-1/4, 1-1/2, 2-1/2	
		2-1/2 × 2-1/2 × 3/4, 1, 1-1/4, 1-1/2, 2, 3	
241	Hex Bushing	1, 1-1/4, 1-1/2, 2	3447
		1-1/4×3/4	
220	Straight Coupling w/stop	1/2, 3/4,	3447
		1, 1-1/4, 1-1/2, 2, 2-1/2	
240	Reducing	1 × 1/2, 3/4	3447
	Coupling w/hex	1-1/4 × 3/4, 1	
		1-1/2 × 1, 1-1/4	
		2 × 1, 1-1/4, 1-1/2	
180	Cross	1, 1-1/4, 1-1/2, 2	3447
		3/4	
180R	Reducing Cross	1-1/4 × 1	3447
		1-1/2 × 1	
		2 × 1	
300	Cap	1/2, 3/4, 1,	3447
		1-1/4, 1-1/2, 2, 2-1/2	
291	Square Head Plug	1/2, 3/4,	3447
		1, 1-1/4, 1-1/2, 2	
342	Union	1, 1-1/4, 1-1/2, 2	2068

CAST IRON FITTINGS

Cast Iron Fittings (ANSI/ASME B16.4)

Model	Configuration	Size, in.	Rated Pressure, kPa
90	90° Elbow	1, 1-1/4, 1-1/2, 2, 2-1/2,	2068
		3, 4	
90R	Reducing 90° Elbow	3/4 × 1/2	2068
		1 × 1/2, 3/4	
		1-1/4 × 1/2, 3/4, 1	
		1-1/2 × 1/2, 3/4, 1, 1-1/4	
		2 × 1/2, 3/4, 1, 1-1/4, 1-1/2	
		2-1/2 × 3/4, 1, 1-1/4, 1-1/2, 2	
		3 × 2	
		3/4×1/2, 3×2	
120	45° Elbow	1, 1-1/4, 1-1/2, 2,	2068
		2-1/2, 3, 4	
130	Tee	1, 1-1/4, 1-1/2, 2, 2-1/2	2068
		3, 4	
130R	Reducing Tee	1×1×1-1/2, 2×1/2×2, 2×1×1-1/2, 2-1/2×1/2×2-1/2, 2-1/2×2×1/2, 2-1/2×2×3/4, 2-1/2×2×1, 2-1/2×2×1-1/4, 2-1/2×2×1-1/2, 2-1/2×2×2, 2-1/2×2×2-1/2, 3×3×1-1/4, 3×3×1-1/2, 3×3×2	2068
180	Cross	1, 1-1/4, 1-1/2, 2	2068
180R	Reducing Cross	1-1/4 × 1	2068
		1-1/2 × 1	

		2 x 1	
240	Reducing Coupling w/hex	1 x 1/2, 3/4	2068
		1-1/4 x 1	
		2 x 3/4, 1	
240N	Reducing Socket	1x3/4	2068
291	Cored Plugs	3/4, 1, 1-1/4, 1-1/2, 2	2068
291S	Solid Plugs	1/2	2068

Malleable Iron Fittings (ANSI/ASME B16.3, ANSI/ASME B16.14)**Fittings fabricated with dimensional specifications in accordance with ANSI/ASME B16.3**

Model	Configuration	Size, in.	Rated Pressure, kPa
90	90° Elbow	1/2, 3/4, 1, 1-1/4, 1-1/2, 2	3447
90	90° Elbow	2-1/2, 3, 3-1/2, 4, 5, 6	2068
90R	90° Reducing Elbow	1/2x1/4, 3/8; 3/4x1/4, 3/8, 1/2; 1x3/8, 1/2, 3/4; 1-1/4x1/2, 3/4, 1; 1-1/2x3/4, 1, 1-1/4; 2x3/4, 1, 1-1/4, 1-1/2	3447
90R	90° Reducing Elbow	2-1/2x1-1/2, 2; 3x2, 2-1/2; 4x3	2068
92	90° Street Elbow	1/2, 3/4, 1, 1-1/4, 1-1/2, 2	3447
92	90° Street Elbow	2-1/2, 3, 4, 6	2068
120	45° Elbow	1/2, 3/4, 1, 1-1/4, 1-1/2, 2	3447
120	45° Elbow	2-1/2, 3, 4, 5, 6	2068
121	45° Street Elbow	1/2, 3/4, 1, 1-1/4, 1-1/2, 2	3447
121	45° Street Elbow	2-1/2, 3, 4	2068
130	Tee	1/2, 3/4, 1, 1-1/4, 1-1/2, 2	3447
130	Tee	2-1/2, 3, 3-1/2, 4, 5, 6	2068
130R	Reducing Tee	3/8x3/8x1/2, 1/2x1/4x1/2, 1/2x3/8x1/2, 1/2x1/2x1/4, 1/2x1/2x3/8, 1/2x1/2x3/4, 1/2x1/2x1, 3/4x1/2x1/2, 3/4x1/2x3/4, 3/4x3/4x1/4, 3/4x3/4x3/8, 3/4x3/4x1/2, 3/4x3/4x1, 1x1/2x1/2, 1x1/2x3/4, 1x1/2x1, 1x3/4x1/2, 1x3/4x3/4, 1x3/4x1, 1x1x1/4, 1x1x3/8, 1x1x1/2, 1x1x3/4, 1x1x1-1/4, 1x1x1-1/2, 1x1x2, 1-1/4x1/2x1, 1-1/4x1/2x1-1/4, 1-1/4x3/4x3/4, 1-1/4x3/4x1, 1-1/4x3/4x1-1/4, 1-1/4x1x1/2, 1-1/4x1x3/4, 1-1/4x1x1, 1-1/4x1x1-1/4, 1-1/4x1-1/4x3/8, 1-1/4x1-1/4x1/2, 1-1/4x1-1/4x3/4, 1-1/4x1-1/4x1, 1-1/4x1-1/4x1-1/2, 1-1/4x1-1/4x2, 1-1/2x1/2x1-1/2, 1-1/2x3/4x1-1/2, 1-1/2x1x1, 1-1/2x1x1-1/4, 1-1/2x1x1-1/2, 1-1/2x1-1/4x1/2, 1-1/2x1-1/4x3/4, 1-1/2x1-1/4x1, 1-1/2x1-1/4x1-1/4, 1-1/2x1-1/4x1-1/2, 1-1/2x1-1/2x1/2, 1-1/2x1-1/2x3/4, 1-1/2x1-1/2x1, 1-1/2x1-1/2x1-1/4, 1-1/2x1-1/2x2, 2x1/2x2, 2x3/4x2, 2x1x1-1/2, 2x1x2, 2x1-1/4x1-1/4, 2x1-1/4x1-1/2, 2x1-1/4x2, 2x1-1/2x1, 2x1-1/2x1-1/4, 2x1-1/2x1-1/2, 2x1-1/2x2, 2x2x1/2, 2x2x3/4, 2x2x1, 2x2x1-1/4, 2x2x1-1/2	3447
130R	Reducing Tee	2x2x2-1/2, 2-1/2x1-1/2x2, 2-1/2x1-1/2x2-1/2, 2-1/2x2x2, 2-1/2x2x2-1/2, 2-1/2x2-1/2x3/4, 2-1/2x2-1/2x1, 2-1/2x2-1/2x1-1/4, 2-1/2x2-1/2x1-1/2, 2-1/2x2-1/2x2, 3x2x2, 3x2x3, 3x3x3/4, 3x3x1, 3x3x1-1/4, 3x3x1-1/2, 3x3x2, 3x3x2-1/2, 4x4x1-1/2, 4x4x2, 4x4x2-1/2, 4x4x3	2068
134	Street Tee	1/2, 3/4, 1, 1-1/4, 1-1/2, 2	3447
165	45° Y-Branches	1/2, 3/4, 1, 1-1/4, 1-1/2, 2	3447
165	45° Y-Branches	2-1/2, 3, 4	2068
180	Cross	1/2, 3/4, 1, 1-1/4, 1-1/2, 2	3447
180	Cross	2-1/2, 3, 3-1/2, 4	2068
180R	Reducing Cross	3/4x1/2, 1x1/2, 1x3/4, 1-1/4x3/4, 1-1/4x1, 1-1/2x3/4, 1-1/2x1, 1-1/2x1-1/4, 2x3/4, 2x1, 2x1-1/4, 2x1-1/2	3447
180R	Reducing Cross	2-1/2x2, 3x2	2068

220	Coupling	1/2, 3/4, 1, 1-1/4, 1-1/2, 2	3447
220	Coupling	2-1/2, 3, 4	2068
240	Reducing Coupling	1/2x1/8, 1/2x1/4, 1/2x3/8, 3/4x1/4, 3/4x3/8, 3/4x1/2, 1x1/4, 1x3/8, 1x1/2, 1x3/4, 1-1/4x1/2, 1-1/4x3/4, 1-1/4x1, 1-1/2x1/2, 1-1/2x3/4, 1-1/2x1, 1-1/2x1-1/4, 2x1/2, 2x3/4, 2x1, 2x1-1/4, 2x1-1/2	3447
240	Reducing Coupling	2-1/2x1-1/2, 2-1/2x2, 3x1-1/2, 3x2, 3x2-1/2, 4x2, 4x3	2068
300	Cap	1/2, 3/4, 1, 1-1/4, 1-1/2, 2	3447
300	Cap	2-1/2, 3, 3-1/2, 4, 5, 6	2068

Fittings fabricated with dimensional specifications in accordance with ANSI/ASME B16.14

Model	Configuration	Size, in.	Rated Pressure, kPa
241	Bushing	1/2x1/8, 1/2x1/4, 1/2x3/8, 3/4x1/8, 3/4x1/4, 3/4x3/8, 3/4x1/2, 1x1/8, 1x1/4, 1x3/8, 1x1/2, 1x3/4, 1-1/4x1/4, 1-1/4x3/8, 1-1/4x1/2, 1-1/4x3/4, 1-1/4x1, 1-1/2x1/4, 1-1/2x3/8, 1-1/2x1/2, 1-1/2x3/4, 1-1/2x1, 1-1/2x1-1/4, 2x1/4, 2x3/8, 2x1/2, 2x3/4, 2x1, 2x1-1/4, 2x1-1/2, 2-1/2x1/2, 2-1/2x3/4, 2-1/2x1, 2-1/2x1-1/4, 2-1/2x1-1/2, 2-1/2x2, 3x1/2, 3x3/4, 3x1, 3x1-1/4, 3x1-1/2, 3x2, 3x2-1/2, 3-1/2x2-1/2, 3-1/2x3, 4x1-1/4, 4x1-1/2, 4x3, 4x3-1/2, 5x4, 6x5	2068
291	Cored Plugs	1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3, 3-1/2	2068
291S	Solid Plugs	1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3, 3-1/2	2068
291-4	Slotted Head Plugs	4, 5, 6	2068
291N	Countersunk Plugs	1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3, 4	2068

Malleable Iron Fittings, ISO 49/EN 10242 (threads manufactured in accordance with ISO 7-1):

Model	Configuration	Sizes, in.	Rated Pressure, (kPa)
1#	Bend 90 degree, male and female	1/8", 1/4", 3/8", 1/2", 3/4", 1", 1-1/4", 1-1/2", 2", 2-1/2", 3", 4", 6"	500
1A	Short Bend 90 degree, male and female	1/4", 3/8", 1/2", 3/4", 1", 1-1/4", 1-1/2", 2", 2-1/2"	500
2#	Bend 90 degree, female	1/4", 3/8", 1/2", 3/4", 1", 1-1/4", 1-1/2", 2", 2-1/2", 3", 4"	500
2A	Short Bend 90 degree, female	1/2", 3/4", 1", 1-1/4", 1-1/2", 2"	500
3#	Bend 90 degree, male	3/8", 1/2", 3/4", 1", 1-1/4", 1-1/2", 2", 2-1/2", 3", 4"	500
40	Bend 45 degree, male and female	1/4", 3/8", 1/2", 3/4", 1", 1-1/4", 1-1/2", 2", 2-1/2", 3", 4", 6"	500
41	Bend 45 degree, female	1/4", 3/8", 1/2", 3/4", 1", 1-1/4", 1-1/2", 2", 2-1/2", 3", 4"	500
85	Crossover	1/2", 3/4", 1", 1-1/4", 1-1/2", 2"	500
90	Elbow, 90 degree	1/8", 1/4", 3/8", 1/2", 3/4", 1", 1-1/4", 1-1/2", 2", 2-1/2", 3", 4", 6", 5"	500
90R	Elbow, 90 degree, reducing	3/8"X1/4", 1/2x3/8", 3/4x3/8", 3/4x1/2", 1x1/2", 1x3/4", 1-1/4x3/4", 1-1/4x1", 1x1/4", 1x3/8", 1x1/2", 1x3/4", 1-1/4x3/8", 1-1/4x1/2", 1-1/4x1", 1-1/2x1/2", 1-1/2x3/4", 1/4x1/8, 3/8x1/8, 1/2x1/4, 3/4x1/4, 1x1/4, 1x3/8, 1-1/4x3/8, 1-1/4x1/2, 1-1/2x1/2, 1-1/2x3/4, 2x1/2, 2x3/4, 2x1, 2x1-1/4, 2-1/2x1/2, 2-1/2x3/4, 2-1/2x1, 2-1/2x1-1/4, 2-1/2x1-1/2, 3x3/4, 3x1, 3x1-1/4, 3x1-1/2, 3x2, 3x2-1/2, 4x1, 4x1-1/4, 4x1-1/2, 4x2, 4x2-1/2, 4x3, 6x4	500
		11/2x1", 11/2x11/4", 2x11/2", 21/2x2"	
92	Stree Elbow, 90 degree	1/8", 1/4", 3/8", 1/2", 3/4", 1", 1-1/4", 1-1/2", 2", 2-1/2", 3", 4", 6"	500
92R	Stree Elbow, 90 degree, reducing	3/4"X1/2", 1"X3/4"	500
95	Union elbow, F&F, Flat seat without gasket	1/2", 3/4, 1, 1-1/4, 1-1/2, 2"	500

96	Union elbow, F&F, conical joint iron to iron	1/4, 3/8, 1/2", 3/4, 1, 1-1/4, 1-1/2, 2"	500
97	Union elbow, M&F, Flat seat without gasket	11/2"	500
98	Union elbow, M&F, conical joint iron to iron	1/2", 3/4, 1, 1-1/4, 1-1/2, 2"	500
120	Elbow, 45 degree	1/8", 1/4", 3/8", 1/2", 3/4", 1", 1-1/4", 1-1/2", 2, 2-1/2", 3", 4", 5, 6"	500
121	Stree Elbow, 45 degree	1/8", 1/4", 3/8", 1/2", 3/4", 1", 1-1/4",	500
		1-1/2", 2, 2-1/2, 3, 4"	
130	Tee	1/8", 1/4", 3/8", 1/2", 3/4", 1", 1-1/4", 1-1/2", 2", 2-1/2", 3", 4", 5, 6"	500
130R	Tee, reducing	3/8x1/4, 1/2x1/4, 1/2x3/8, 3/4x1/4,	500
		3/4x3/8, 3/4x1/2, 1x1/4, 1x3/8, 1x1/2, 1x3/4, 1-1/4x3/8, 1-1/4x1/2,	
		1-1/4x3/4, 1-1/4x1, 1-1/2x1/2, 1-1/2x3/4, 1-1/2x1, 1-1/2x1-1/4, 2x1/2, 2x3/4, 2x1,	
		2x1-1/4, 2x1-1/2, 2-1/2x1, 2-1/2x1-1/4, 2-1/2x1-1/2, 2-1/2x2, 3x1, 3x1-1/4, 3x1-1/2, 3x2, 3x2-1/2, 4x2, 4x3, 1/4x1/8, 1/2x1/8, 1-1/2x3/8, 2x3/8, 2-1/2x1/2, 2-1/2x3/4, 3x1/2, 3x3/4, 4x1/2, 4x3/4, 4x1, 4x1-1/4, 4x1-1/2, 4x2-1/2, 6x2, 6x3, 6x4, 1/2x1/2x3/4, 1/2x1/2x1, 3/4x3/4x1,	
		3/4x3/4x1-1/4, 1x1x1-1/4, 1x1x1-1/2, 1x1x2, 1x1x2-1/2, 1-1/4x1-1/4x1-1/2, 1-1/4x1-1/4x2, 1-1/2x1-1/2x2, 1-1/2x1-1/2x2-1/2, 2x2x2-1/2, 2-1/2x2-1/2x3, 2-1/2x2-1/2x4, 3/4x1/2x1/2, 1x1/2x1/2, 1x3/4x3/4,	
		1-1/4x1/2x1/2, 1-1/4x3/4x3/4, 1-1/4x1x1, 1-1/2x3/4x3/4, 1-1/2x1x1, 1-1/2x1-1/4x1-1/4, 2x1x1, 2x1-1/4x1-1/4, 2x1-1/2x1-1/2, 2-1/2x2x2, 3x2x2, 3/4x1/2x3/4, 1x1/2x1, 1x3/4x1, 1x1/4x1, 1-1/4x1/2x1-1/4, 1-1/4x3/4x1-1/4, 1-1/4x1x1-1/4, 1-1/2x1/2x1-1/2, 1-1/2x3/4x1-1/2, 1-1/2x1x1-1/2, 1-1/2x1-1/4x1-1/2, 2x1/2x2, 2x3/4x2, 2x1x2,	
		2x1-1/4x2, 2x1-1/2x2, 2-1/2x1-1/2x2-1/2, 2-1/2x2x2-1/2, 3/4x1/2x1, 1x1/2x3/4, 1x3/4x1/2,	500
		1-1/4x1/2x3/4, 1-1/4x1/2x1, 1-1/4x3/4x1/2, 1-1/4x3/4x1, 1-1/4x1x1/2, 1-1/4x1x3/4, 1-1/2x3/4x1, 1-1/2x3/4x1-1/4, 1-1/2x1x1/2, 1-1/2x1x1-1/4, 1-1/2x1-1/4x1/2, 1-1/2x1-1/4x3/4, 1-1/2x1-1/4x1,	
		1-1/2x1-1/4x2, 2x1x1-1/2, 2x1-1/4x1, 2x1-1/4x1-1/2, 2x1-1/2x1/2, 2x1-1/2x3/4, 2x1-1/2x1, 2x1-1/2x1-1/4, 2-1/2x2x1/2, 2-1/2x2x1, 2-1/2x2x1-1/4	
131	Pitcher Tee, equal 90 degree	1/2, 3/4, 1, 1-1/4, 1-1/2, 2"	500
134	Service Tee, equal	1/4", 1/2, 3/4, 1, 1-1/4, 1-1/2, 2"	500
134R	Service Tee, Reducing	2"X11/2", 2-1/2x2, 3X21/2"	500
165	Lateral Y branch, 45 degree	1/2", 3/4", 1", 1-1/4", 1-1/2", 2",	500
		2-1/2", 3", 4	
180	Cross	1/8", 1/4, 1/2", 3/4", 1", 1-1/4", 1-1/2", 2",	500
		2-1/2", 3", 4", 3/8"	
180R	Cross, reducing	3/4"X1/2", 1x1/2, 1x3/4, 1-1/4x3/4,	500
		1-1/4x1, 11/2"X1", 11/4"X1/2", 1-1/2x1/2, 1-1/2x3/4, 1-1/2x1-1/4, 2x3/4, 2x1, 2x1-1/4,	
		2x1-1/2, 21/2"X1", 21/2"X11/4", 21/2"X11/2", 21/2"X2", 3x3/4, 3x1, 3x1-1/4, 3x1-1/2, 3"X2", 3"X21/2", 4x1, 4x1-1/4, 4x1-1/2,	
		4x2, 4x2-1/2, 4"X3"	
220	Socket/Coupling	1/8", 1/4", 3/8", 1/2", 3/4", 1", 1-1/4", 1-1/2", 2", 2-1/2", 3", 4", 5, 6"	500
240	Socket/Coupling, reducing	1/4"X1/8", 3/8x1/8, 3/8x1/4, 1/2x1/4,	500
		1/2x3/8, 3/4x1/4, 3/4x3/8, 3/4x1/2,	
		1x3/8, 1x1/2, 1"X3/4", 11/4"X1/2", 1-1/4x3/4, 1-1/4x1, 1-1/2x1/2,	

		1-1/2x3/4,1-1/2x1,1-1/2x1-1/4,	
		2x1/2,2x3/4,2x1,2x1-1/4,2"x11/2",21/2"x11/4",21/2"x11/2,21/2"x2,	
		3x1-1/2,3x2,3"x21/2",1/2"x1/8",3/4"x1/8",1x1/4,1-1/4x1/4,	
		1-1/4x3/8,1-1/2x1/4,1-1/2x3/8,2-1/2x1/2,	
		2-1/2x3/4,2-1/2x1,3x1/2,3x3/4,3x1,	
		3"x11/4"	
241	Bushing(241)	1/4"x1/8",3/8x1/8,3/8x1/4,1/2x1/8,	500
		1/2x1/4,1/2x3/8,3/4x1/8,3/4x1/4,	
		3/4x3/8,3/4x1/2,1x1/8,1x1/4,1"x3/8",1x1/2,1x3/4,1-1/4x1/4,1-1/4x3/8,1-1/4x1/2,1-1/4x3/4,1-1/4x1,1-1/2"x1/4",1-1/2"x3/8",	
		1-1/2"x1/2",21/2"x11/2",2-1/2x2,3x1/2,	
		3x3/4,3x2,3"x21/2",11/2"x3/4",1-1/2x1,1-1/2x1-1/4,	
		2x1/4,2x3/8,2x1,2x1-1/4,2x1-1/2,2-1/2x1/2,21/2"x3/4",31/2"x3",4x3/4,4x1,4x1-1/4,	
		4x1-1/2,4x3,5x3,5x4,	
		6x2,6x2-1/2,6x5	
241D	Bushing(241D)	2"x1/2",2x3/4,2-1/2x1,2-1/2x1-1/4,	500
		3x1,3x1-1/4,3x1-1/2,4x2,	
		4x2-1/2,6x3,6x4	
245	Hexagon Nipple, reducing	3/8"x1/4",1/2x1/4,1/2x3/8,	500
		3/4x3/8,3/4x1/2,1x1/2,1x3/4,	
		1-1/4x1/2,1-1/4x3/4,11/4"x1",11/2"x3/4",1-1/2x1,1-1/2x1-1/4,	
		2x1,2x1-1/4,2x1-1/2,2-1/2x2,	
		3x2,3"x21/2",1/4"x1/8",3/4x1/4,1-1/2x1/2,	
		2x1/2,2x3/4,2-1/2x1,2-1/2x1-1/4,	
		2-1/2x1-1/2,3x1-1/2,4x2,4x2-1/2,	
		4"x3"	
246	Extension piece, sockets M&F, reducing	3/8"x1/4",1/2x1/4,1/2x3/8,3/4x3/8,	500
		3/4x1/2,1x1/2,1x3/4,1-1/4x1/2,	
		1-1/4x3/4,1-1/4x1,1-1/2x3/4,1-1/2x1,	
		1-1/2x1-1/4,2x1,2x1-1/4,2"x11/2"	
270	Socket, parallel threads, equal	1/8",1/4",3/8",1/2",3/4",1",1-1/4",	500
		1-1/2",2",2-1/2",3",4",6"	
271	Socket, right & left threads	1/2",3/4,1,1-1/4,1-1/2,2"	500
280	Hexagon Nipple, equal	1/8",1/4",3/8",1/2",3/4",1",1-1/4",	500
		1-1/2",2",2-1/2",3",4",5",6"	
291	Plug	1/8",1/4",3/8",1/2",3/4",1",1-1/4",	500
		1-1/2",2",2-1/2",3",4",6"	
291N	Countersunk Plug	1/2,3/4",1",1-1/4",	500
		1-1/2",2",2-1/2",3"	
291S	Solid Plug	1/4",3/8",1/2",3/4",1",1-1/4",	500
		1-1/2",2",2-1/2",3",4"	
300	Cap	1/8",1/4",3/8",1/2",3/4",1",1-1/4",	500

		1-1/2", 2", 2-1/2", 3", 4", 5, 6"	
310	Locknut	1/4", 3/8", 1/2", 3/4", 1", 1-1/4",	500
		1-1/2", 2", 2-1/2", 3", 4"	
312	Backnut	1/2", 3/4", 1", 1-1/4",	500
		1-1/2", 2", 4"	
321-4	Flange(321-4)	1-1/4",	500
		1-1/2", 2", 2-1/2", 3", 4", 6"	
321-6	Flange(321-6)	1-1/4",	500
		1-1/2", 2", 2-1/2", 3", 4", 6"	
321H	Flange(321H)	1/2", 3/4", 1", 1-1/4",	500
		1-1/2", 2", 2-1/2", 3", 4"	
321N	Flange(321N)	2"	500
321P	Flange, DRP D	1/2", 3/4", 1", 1-1/4",	500
		1-1/2", 2", 2-1/2", 3", 4", 5, 6"	
321PW	Flange, U/D	1/2", 3/4", 1", 1-1/4",	500
		1-1/2", 2", 2-1/2", 3", 4", 5, 6"	
321TD	Flange, BS Table D	1", 1-1/4",	500
		1-1/2", 2", 2-1/2", 3", 4", 6"	
321W	Flange, without bolt hole	1/2", 3/4", 1", 1-1/4",	500
		1-1/2", 2", 2-1/2", 3", 4"	
526	Extension Tube	1/2"X30, 1/2"X40, 1/2"X50, 1/2"X60,	500
		1/2"X100	
529A	Extention Long piece	1/2", 3/4", 1", 1-1/4",	500
		1-1/2", 2"	
529X	Extention Short piece	1/2"	500
1090	Elbow, 90 degree, plain	1/2", 1-1/4", 2"	500
1130	Tee, plain	1/2", 1", 1-1/4",	500
		1-1/2"	
1220	Socket, plain, with ribs	1/2", 3/4", 1", 1-1/4",	500
		1-1/2", 2", 2-1/2", 3"	
1221	Side outlet elbow	1/2", 3/4", 1", 1-1/4",	500
		1-1/2", 2"	
1223	Side outlet tee	1/2", 3/4", 1"	500

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