



DUCTILE IRON FLANGED PIPE

About Electrosteel

Electrosteel is the largest manufacturer of Ductile Iron Pipes and Fittings in India. With operations spread in Europe, Africa, Middle East, South East and South Asia, Electrosteel caters to a wide variety of requirements and customer segments. It has a modern Plant at Khardah, near Kolkata, in West Bengal for manufacturing Ductile Iron Pipes and Fittings. The plant having its own Blast Furnace and captive power plant employs state-of-the-art technology and management concepts. Electrosteel is backed by a workforce of more than 2000 skilled professionals and a large marketing network.

Flanged Pipes from Electrosteel

We manufacture Flanged Pipes using all three methods, that is, Welded Flanged Pipes, Screwed Flanged Pipes and Cast Flanged Pipes.



Type of Pipe	Dia Range and Lengths	PN Ratings
Welded Flanged Pipes		
Flanges are welded on either side of a Class K9 Barrel or equivalent C Class	From 80 to 1200 mm diameter and length up to 5.0 mtr.	PN 10, PN 16 PN 25, PN 40
Screwed Flanged Pipes		
Flanges are screwed-fit on either side of a Class K9 Barrel or equivalent C Class	From 80 to 450 mm diameter and length up to 5.0 mtr.	PN 10, PN 16
"As Cast" Flanged Pipes		
Flanged Pipes are cast as a single unit using advanced Lost Foam method.	From 80 to 1200 mm diameter.	PN 10, PN 16 PN 25, PN 40

Note : For product improvement, the dimensions and specifications may be changed without prior notice.



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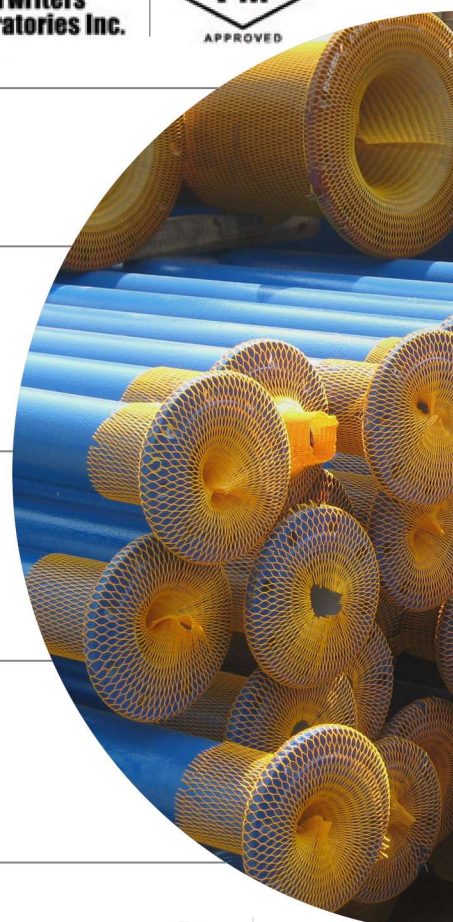
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Application

Over-ground and exposed installations

Ideal for over-ground pipelines and crossovers (such as on pillars, over a canal or other water bodies, roads, bridges etc.)

Vertical pipelines

Any vertical pipelines used in treatment plants, pump houses, elevated/overhead service reservoirs.

Interconnection and connection for accessories

In pump houses and water and sewage treatment plants where, various units and accessories are inter-connected.

As a Restrained Joint

Flanged joints are rigid but can act as a restrained joint, reducing the requirement of thrust blocks and external restraining devices.

As temporary installations

Applications where pipelines need to be disengaged or transferred from one location to the other.

Note: Flanged Pipes are not meant for underground installation. Due to the risk of excessive bending moments being imposed, it is recommended that the flanged pipeline is NOT buried.

Advantages

Ductile Flanged Pipes made by Electrosteel have several advantages. Some of these are :

Stronger: Ductile Iron Flanged Pipes are much stronger due to its higher tensile strength and better impact resistance.

Safer: It offers higher factor of safety against pressure fluctuations, water hammer and outside impacts.

Lighter: DI Flange Pipes are lighter, reducing handling and transportation cost.

Negligible breakages in transit and during handling: Does not break on sudden impacts. Loss due to transportation and handling are minimized.

Reduced pumping costs: Centrifugally Cement Mortar Lined pipes result in a smooth inside surface that also reduces friction loss.

Better casting process: Centrifugal casting of the Pipe barrel ensures compact casting and eliminates casting defects like blowholes, pinholes, slag inclusion and core displacement.

Longer life and excellent corrosion resistance: Internal cement mortar lining prevents corrosion of the inside surface. The external Zinc/Bitumen coating offers extra protection against external corrosion.

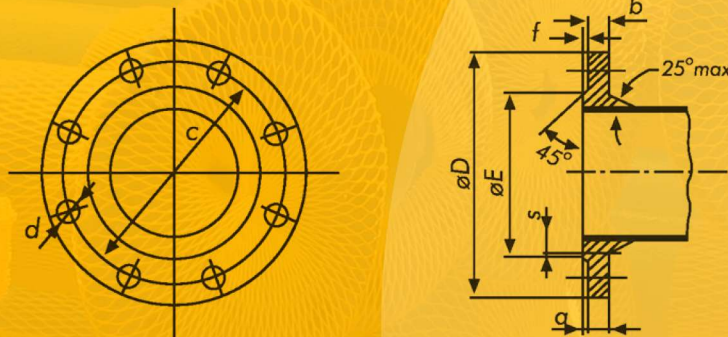
Dimensional accuracy and better finish: Centrifugal casting ensures uniform wall thickness and excellent surface finish. In green sand casting, uniform thickness cannot be achieved due to floating, shifting or deformation of the core.

Coatings and Linings:

Electrosteel offers a variety of linings and coatings for use with various types of fluids and for different applications. The most commonly used combinations of corrosion protection with recommended usage are :

Typical Use	Internal Lining	External Coating
Standard product for water transmission	Cement Mortar Lining	Bitumen coating over Zinc coating
Highly corrosive environment	Cement Mortar Lining	Blue epoxy coating over Zinc coating
Sewerage applications	High Alumina Cement Mortar Lining	Red epoxy coating over Zinc coating

Ductile Iron Flanged Pipes are available with Fusion Bonded Epoxy (FBE) coating up to 2.0 mtr. length. Customized coatings and linings can also be developed for special applications.



DIMENSIONS (Flanged Joint)

DN Nom	PN 10						PN 16					
	D	E	C	b	N	Metric	D	E	C	b	N	Metric
	Out side Dia	Dia of raised Face	Pitch Circle Dia	Flange width	No. of Bolts	Bolt size/ Total length/ Thread length	Outside Dia	Dia of raised Face	Pitch Circle Dia	Flange width	No. of Bolts	Bolt size/ Total length/ Thread length
80	200	132	160	16	4	M 16 x 65/38	200	132	160	16	8	M 16 x 65/38
100	220	156	180	16	8	M 16 x 65/38	220	156	180	16	8	M 16 x 65/38
125	250	184	210	16	8	M 16 x 65/38	250	184	210	16	8	M 16 x 65/38
150	285	211	240	16	8	M 20 x 70/46	285	211	240	16	8	M 20 x 70/46
200	340	266	295	17	8	M 20 x 70/46	340	266	295	17	12	M 20 x 70/46
250	395	319	350	19	12	M 20 x 70/46	400	319	355	19	12	M 24 x 90/54
300	445	370	400	20.5	12	M 20 x 85/46	455	370	410	20.5	12	M 24 x 90/54
350	505	429	460	20.5	16	M 20 x 85/46	520	429	470	22.5	16	M 24 x 90/54
400	565	480	515	20.5	16	M 24 x 90/54	580	480	525	24	16	M 27 x 100/60
450	615	530	565	21	20	M 24 x 90/54	640	548	585	26	20	M 27 x 100/60
500	670	582	620	22.5	20	M 24 x 105/54	715	609	650	27.5	20	M 30 x 110/66
600	780	682	725	25	20	M 27 x 100/60	840	720	770	31	20	M 33 x 120/78
700	895	794	840	27.5	24	M 27 x 110/60	910	794	840	34.5	24	M 33 x 130/78
750	960	857	900	29	24	M 27 x 110/60	970	857	900	36	24	M 33 x 130/78
800	1015	901	950	30	24	M 30 x 120/66	1025	901	950	38	24	M 36 x 140/84
900	1115	1001	1050	32.5	28	M 30 x 120/66	1125	1001	1050	41	28	M 36 x 150/84
1000	1230	1112	1160	35	28	M 33 x 130/78	1255	1112	1170	45	28	M 39 x 160/103
1100	1340	1231	1270	38	28	M 33 x 130/82	1355	1218	1270	48.5	32	M 39 x 160/110
1200	1455	1328	1380	40	32	M 36 x 140/84	1485	1328	1390	52	32	M 45 x 170/115

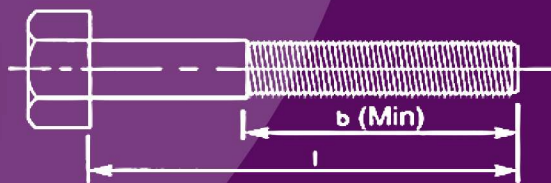
DN Nom	PN 25						PN 40					
	D	E	C	b	N	Metric	D	E	C	b	N	Metric
	Out side Dia	Dia of raised Face	Pitch Circle Dia	Flange width	No. of Bolts length	Bolt size/ Total length/ Thread	Outside Dia	Dia of raised Face	Pitch Circle Dia	Flange width	No. of Bolts length	Bolt size/ Total length/ Thread
80	200	132	160	16	8	M 16 x 65/38	200	132	160	16	8	M 16 x 65/38
100	235	156	190	16	8	M 20 x 70/46	235	166	190	16	8	M 20 x 70/46
125	270	184	220	16	8	M 24 x 85/54	270	184	220	20.5	8	M 24 x 90/54
150	300	211	250	17	8	M 24 x 90/54	300	211	250	23	8	M 24 x 100/54
200	360	274	310	19	12	M 24 x 90/54	375	284	320	27	12	M 27 x 100/60
250	425	330	370	21.5	12	M 27 x 100/60	450	345	385	31.5	12	M 30 x 120/66
300	485	389	430	23.5	16	M 27 x 100/60	515	409	450	35.5	16	M 30 x 130/72
350	555	448	490	26	16	M 30 x 110/66	580	465	510	40	16	M 33 x 140/78
400	620	503	550	28	16	M 33 x 120/78	660	535	585	44	16	M 36 x 150/84
450	670	548	600	30.5	20	M 33 x 120/78	685	560	610	46	20	M 36 x 150/84
500	730	609	660	32.5	20	M 33 x 120/78	755	615	670	48	20	M 39 x 170/90
600	845	720	770	37	20	M 36 x 140/84	890	735	795	53	20	M 45 x 180/102
700	960	820	875	41.5	24	M 39 x 160/90						
750	1020	883	940	45	24	M 39 x 170/90						
800	1085	928	990	46	24	M 45 x 180/102						
900	1185	1028	1090	50.5	28	M 45 x 180/102						
1000	1320	1140	1210	55	28	M 52 x 200/116						
1100	1420	1240	1310	60.5	32	M 52 x 210/124						
1200	1530	1350	1420	64	32	M 52 x 210/124						

Note: 1) Total length/thread length are indicative. Actual length will depend on exact flange thickness and gasket thickness
2) All dimensions are in mm.

Accessories for Flanged Pipes

Gaskets

For Flanged pipe jointing, flat rubber gaskets as per IS 638 are used. These gaskets are made of synthetic rubber like Styrene Butadiene Rubber (SBR) or Ethylene Propylene Diemethyle Monomer (EPDM). Use of poor quality gaskets made of natural rubber is not recommended.



Nuts & Bolts for the Joint

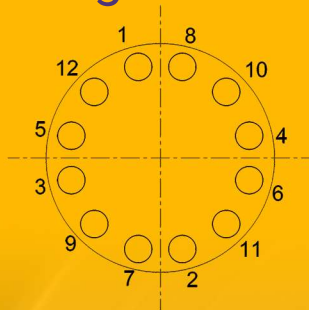
Nuts and bolts: Properly galvanized nuts and bolts made of Mild Steel as per IS 1367 and whose Material Grade is 4.6 are to be used. The bolt dimension should be as per IS:1364. High tension bolts may be used where high axial load is anticipated.



BOLT DIMENSION

Nom. Dia. (mm)	PN 10		PN 16		PN 25		PN 40	
	No. of bolts.	Bolt size /Total length /Thread length (mm)	No. of bolts.	Bolt size /Total length /Thread length (mm)	No. of bolts.	Bolt size /Total length /Thread length (mm)	No. of bolts.	Bolt size /Total length /Thread length (mm)
80	8	M 16 x 65/38	8	M 16 x 65/38	8	M 16 x 65/38	8	M 16 x 65/38
100	8	M 16 x 65/38	8	M 16 x 65/38	8	M 20 x 70/46	8	M 20 x 70/46
125	8	M 16 x 65/38	8	M 16 x 65/38	8	M 24 x 85/54	8	M 24 x 90/54
150	8	M 20 x 70/46	8	M 20 x 70/46	8	M 24 x 90/54	8	M 24 x 100/54
200	8	M 20 x 70/46	12	M 20 x 70/46	12	M 24 x 90/54	12	M 27 x 100/60
250	12	M 20 x 70/46	12	M 24 x 90/54	12	M 27 x 100/60	12	M 30 x 120/66
300	12	M 20 x 85/46	12	M 24 x 90/54	16	M 27 x 100/60	16	M 30 x 130/72
350	16	M 20 x 85/46	16	M 24 x 90/54	16	M 30 x 110/66	16	M 33 x 140/78
400	16	M 24 x 90/54	16	M 27x100/60	16	M 33 x 120/78	16	M 36 x 150/84
450	20	M 24 x 90/54	20	M 27x 100/60	20	M 33 x 120/78	20	M 36 x 150/84
500	20	M 24 x 105/54	20	M 30 x 110/66	20	M 33 x 120/78	20	M 39 x 170/90
600	20	M 27 x 100/60	20	M 33 x 120/78	20	M 36 x 140/84	20	M 45 x 180/102
700	24	M 27 x 110/60	24	M 33 x 130/78	24	M 39 x 160/90	-	-
750	24	M 27 x 110/60	24	M 33 x 130/78	24	M 39 x 170/90	-	-
800	24	M 30 x 120/66	24	M 36 x 140/84	24	M 45 x 180/102	-	-
900	28	M 30 x 120/66	28	M 36 x 150/84	28	M 45 x 180/102	-	-
1000	28	M 33 x 130/78	28	M 39x 160/103	28	M 52 x 200/116	-	-
1100	28	M 33 x 130/82	32	M 39x 160/110	32	M 52 x 210/124	-	-
1200	32	M 36 x 140/84	32	M 45x 170/115	32	M 52 x 210/124	-	-

Jointing Procedure



Bolt Tightening sequence

Jointing Procedure for DI Flange Pipes:

- Clean the faces of the flanges.
- Inspect the gasket for any damage or manufacturing defect.
- Align the pipes properly and position the gasket between the flanges.
- Put the bolts into the flange holes one by one maintaining the alignment.
- Keep the gap between the flanges approximately uniform while tightening.
- Tighten four location bolts in order to roughly secure the adjoining flange.
- Bolts to be tightened in the correct sequence and to the appropriate torque.
- Tighten nuts to finger tight.
- Check alignment of flange faces and gasket.
- Insert remaining bolts and tighten nuts to finger tight.
- Finish with one final pass by providing torque in a clockwise direction.
- Tighten to 100% of estimated torque using the same sequence.



Prescribed Torque for Tightening

Nom. DIA.	PN 10			PN 16			PN 25			PN 40		
	Bolt Size	Nos of Hole	Tightening Torque (Nm)	Bolt Size	Nos of Hole	Tightening Torque (Nm)	Bolt Size	Nos of Hole	Tightening Torque (Nm)	Bolt Size	Nos of Hole	Tightening Torque (Nm)
80	M16	8	20	M16	8	20	M16	8	30	M16	8	40
100	M16	8	20	M16	8	30	M20	8	50	M20	8	70
125	M16	8	20	M16	8	40	M24	8	70	M24	8	110
150	M20	8	40	M20	8	60	M24	8	90	M24	8	130
200	M20	8	60	M20	12	60	M24	12	100	M27	12	160
250	M20	12	60	M24	12	90	M27	12	160	M30	12	240
300	M20	12	70	M24	12	120	M27	16	160	M30	16	240
350	M20	16	70	M24	16	120	M30	16	230	M33	16	350
400	M24	16	110	M27	16	170	M33	16	320	M36	16	470
450	M24	20	110	M27	20	170	M33	20	320	M36	20	490
500	M24	20	120	M30	20	240	M33	20	370	M39	20	650
600	M27	20	190	M33	20	350	M36	20	550	M45	20	1040
700	M27	24	210	M33	24	350	M39	24	600	-	-	-
750	M27	24	240	M33	24	410	M39	24	700	-	-	-
800	M30	24	300	M36	24	490	M45	24	880	-	-	-
900	M30	28	320	M36	28	520	M45	28	930	-	-	-
1000	M33	28	410	M39	28	690	M52	28	1320	-	-	-
1100	M33	28	500	M39	32	720	-	-	-	-	-	-
1200	M36	32	560	M45	32	990	-	-	-	-	-	-

Precautions during installation of Flanged Pipes

- Flanged pipes are mainly for over-ground installation. Buried installation of flanged pipe is not recommended.
- Flanged joint being a rigid joint, perfect alignment of the flange face during jointing and bolt tightening is absolutely vital.
- Use of duckfoot bend at bottom of vertical flange pipe line is necessary.
- For high pressure application, even flanged pipeline (both horizontal and vertical) needs thrust block / support at bends/tees.





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Head Office:

G.K. Tower,
19, Camac Street Kolkata -700 017 (India)
Ph. No. +91- 33 - 22839990/ 7103 4400

Works:

30 B.T. Road, Khardah, P.O. Sukchar, Dist: 24 Parganas (N)
Pin -700 115, West Bengal, (India)
Ph. No.+91 (33) - 7101 4300/4450
Fax No. +91 - 33 - 7101 4504, 2553 1893

 **ELECTROSTEEL CASTINGS LIMITED**

www.electrosteel.com

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