

“Because *real* happiness flows from within”

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### About the Company

Tata Steel Metaliks Division has its state-of-the-art manufacturing plant at Kharagpur, West Bengal, which produces the finest quality Pig Iron and Ductile Iron Pipes in India. With focus on Safety and Sustainability, TSMD has been consistently fulfilling its vision of **Reaching Tomorrow First** through innovative and superior quality products and service offerings.

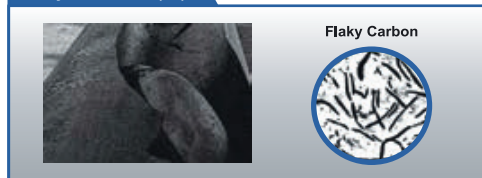
Combining customer centricity with technical efficiency, Tata Steel Metaliks Division is the supplier of choice through its end-to-end product and service offerings for customers. It is also taking significant steps in its journey of digital transformation by rapidly adopting Industry 4.0 principles and becoming a 'Digital Factory' in line with its vision.

Aligned with its legacy of sustainable value creation, Tata Steel Metaliks Division is steadily working on its long-term Sustainability Strategy of becoming Net Zero by 2045. Its high-impact Corporate Social Responsibility interventions aim to uplift the lives of communities with a focus on Education, Essential Amenities and Skill Development.

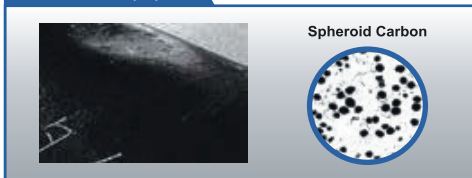
### Ductile iron's superiority

Ductile iron's superiority lies in its spheroid graphite microstructure. Since the graphite structure of grey cast iron is linear, under severe loading, stress builds up unevenly around the ends of particles and weakens the metal. However, in ductile iron, since the graphite structure is spherical, similar stress distributes evenly, thereby maintaining strength. Yet, the basic chemical composition of ductile iron is similar to that of grey cast iron, giving it the same excellent anticorrosive properties. Together, these features give ductile iron, excellent resistance to impact, pressure and corrosion.

#### Grey Cast Iron (CI)



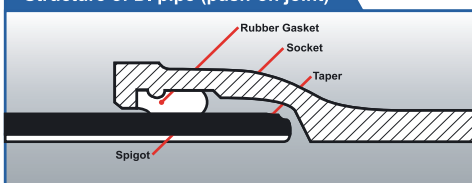
#### Ductile Iron (DI)



### Ductile Iron pipe (DI pipe)

Tata Ductura, Ductile iron pipes come with socket and spigot ends. Rubber gasket is required as an accessory for all sockets before joining socket and spigot. Ductile iron is known for its longevity, corrosion resistance and high durability which makes it the preferred choice for pipeline networks all over the world across various applications viz. Drinking Water, Waste-water conveyance and others.

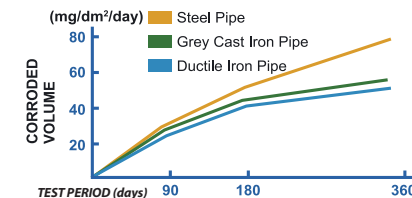
#### Structure of DI pipe (push-on joint)



### Excellent corrosion resistance

Ductile iron is nearly identical to grey cast iron in chemical composition. It also contains far more silicon, carbon and other elements than steel. The resistance of ductile iron to corrosion is also similar to that of grey iron.

Pipe Materials	Corroded Volume (gr/cm <sup>2</sup> )	
	After 45 days	After 90 days
Ductile Iron Pipe (DI)	0.0060	0.0090
Grey Cast Iron Pipe (CI)	0.0060	0.0103
Seamless Steel Pipe (MS)	0.0170	0.0273
Welded Steel Pipe (MS)	0.0294	0.0396



### Superior mechanical properties

	DI Ductile Iron	MS Mild Steel	uPVC Polyvinyl Chloride	HDPE High Density Polyethylene	GI Galvanized Steel Iron
Tensile Strength (MPa)	420	400	49	20	400
Elongation (%)	10	18	50 to 150	350	18
Elasticity (N/mm <sup>2</sup> )	1.5 to 1.7 x 10 <sup>5</sup>	2.1 x 10 <sup>5</sup>	2.7 to 3.0 x 10 <sup>3</sup>	1.3 x 10 <sup>3</sup>	2.1 x 10 <sup>5</sup>
Hardness	Brinell 230	Brinell 140	Brinell 115	Brinell 163	Brinell 140
Poison Ratio	0.28 to 0.29	0.3	0.37	0.47	0.3
Specific Weight	7.05	7.85	1.43	0.96	7.85
Linear coefficient of expansion (1/°C)	1.0 x 10 <sup>-5</sup>	1.0 x 10 <sup>-5</sup>	6 to 8 x 10 <sup>-5</sup>	1.3 x 10 <sup>-4</sup>	1.1 x 10 <sup>-5</sup>

### Product portfolio

Tata Steel Metaliks Division is committed to exceed customer's expectations in product quality, supply and service. The Company manufactures ductile iron pipes conforming to:

Nominal Diameter (mm)	Product Range		Market Type
	Class	Standard Length (m)	
80 to 1200	K7, K9 & K12 Classes	4, 5 & 5.5	Domestic
80 to 1200	K7, K9 Classes and C Class	4, 5 & 5.5	International Market as per Standards guideline

- EN 545:2006 • EN 545:2010 • EN 598:2007 + A1:2009 • IS 8329:2000
- ISO 2531:1998 ISO 2531:2009 ISO 7186:2011

The range comprises ductile iron pipes suitable for push on joints.

DN (mm)	Pressure Class		Metal Thickness		Allowable Operating Pressure excluding surge		
	Preferred Class	**Nominal metal Thickness for preferred class (mm)	# Class K7	# Class K9	*K7 (MPa)	*K9 (MPa)	**C-Class (bar)
80	C40	4.4	5.0	6.0	0.8	6.4	40
100	C40	4.4	5.0	6.0	0.8	6.4	40
125	C40	4.5	5.0	6.0	0.8	6.4	40
150	C40	4.5	5.0	6.0	0.8	6.4	40
200	C40	4.7	5.0	6.3	0.8	6.2	40
250	C40	5.5	5.3	6.8	0.8	5.4	40
300	C40	6.2	5.6	7.2	0.8	4.9	40
350	C30	6.3	6.0	7.7	0.8	4.5	30
400	C30	6.5	6.3	8.1	0.8	4.2	30
450	C30	6.9	6.6	8.6	0.8	4.0	30
500	C30	7.5	7.0	9.0	0.8	3.8	30
600	C30	8.7	7.7	9.9	0.8	3.6	30
700	C25	8.8	9.0	10.8	0.8	3.4	25
750			9.7	11.3	0.8	3.3	
800	C25	9.6	10.4	11.7	1.0	3.2	25
900	C25	10.6	11.2	12.6	1.0	3.1	25
1000	C25	11.6	12.0	13.5	1.0	3.0	25
1100	C25	12.6	14.4	14.4	2.9	2.9	25
1200	C25	13.6	15.3	15.3	2.8	2.8	25

\*\* Nominal metal thickness and allowable operating pressure excluding surge for Preferred 'C' Classes as per ISO 2531 : 2009

\* Allowable operating pressure excluding surge for K7 & K9 classes as per Annexure - E, Table:1 of IS 8329 : 2000

# Metal thickness for K7 & K9 classes as per Table 2 of IS 8329 : 2000