

TRANSPORTING WATER ACROSS THE CIVILIZATIONS



RASHMI METALIKS LIMITED

DUCTILE IRON PIPES



Mr. Sajjan Kumar Patwari (Group Chairman)

Growth with synergic expansion in Iron & Steel and Cement, Power & Ferro Alloy industry with diverse dimensions and position the organisation as dependable vendor with a comprehensive product mix.

EXCELLENCE: Strive relentlessly and constantly improve ourselves in our offerings.

INTEGRITY: Conduct our business fairly with "total" transparency and honesty.

RESPONSIBILITY: For our words and action.

RESPECT: For our stakeholders, environment and community.



Water is one of the most important and prime element for the survival of mankind. And the effective transmission of water to the distant lands has always been important for the progress of any civilization. In today's world the Ductile Iron Pipes have been acting as a linkage between land and water and act as a vein by carrying water as a lifeline to civilizations.



RASHMI METALIKS LIMITED

EMERGING LEADER IN WATER PIPELINE INDUSTRY

RASHMI METALIKS LIMITED is a part of Rashmi Group of Companies which is a fast growing group of Companies in the field of manufacturing of Ductile Iron Pipe, Steel, Cement and also export of Iron ore and other mineral products. The growth of the group during last few years has been phenomenal and fast catching the attention of bankers, professional and industry as a whole.

The Company gets an extra edge from other manufacturers and suppliers as the Company has their own railway siding and further having its own captive power plant and mines.

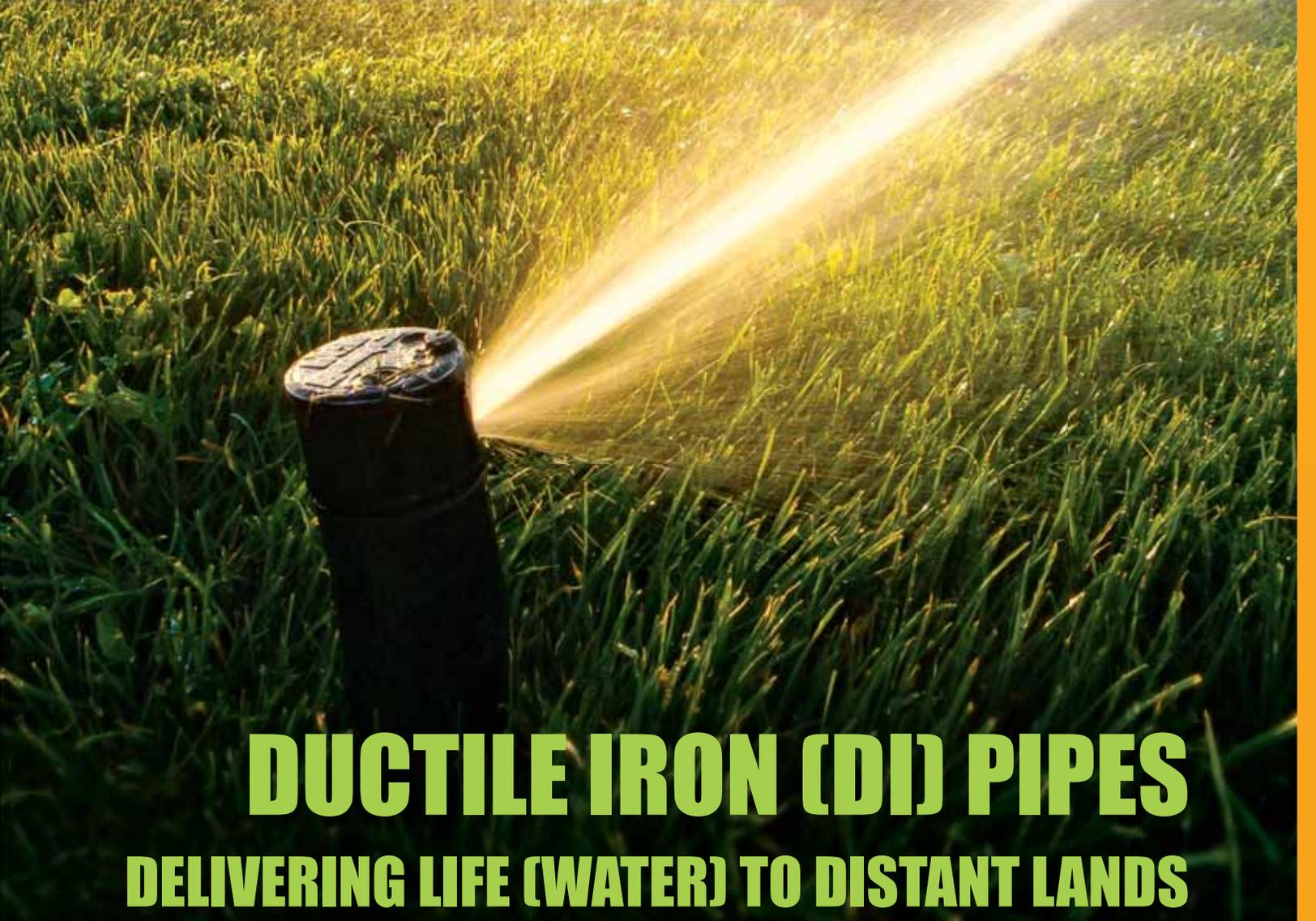
Rashmi Group of Companies is committed towards the goal of achieving the complete customer satisfaction by delivering them the products compiling to International standards, at a competitive pricing under best delivery schedule.

The Rashmi group thrive to work relentlessly to achieve their aim. The group has a vision which they pursue :

- To strive to be leader in their area of operation.
- To uphold the interest of stakeholders.
- To make their operation most environment friendly.





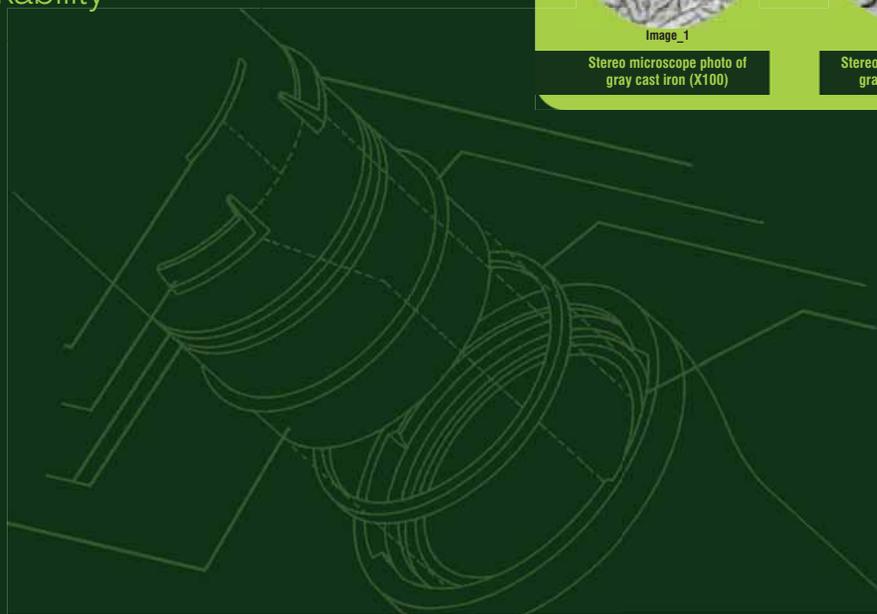
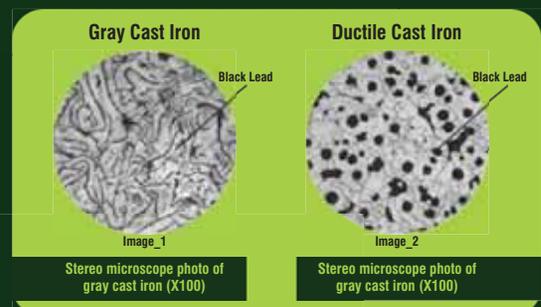


DUCTILE IRON (DI) PIPES

DELIVERING LIFE (WATER) TO DISTANT LANDS

Ductile Iron (DI) Pipes has become the most preferred pipe material for water supply and pressure sewerage applications around the world. Although ductile iron has a chemical composition which is very similar to cast iron, it is considered superior due to its spheroidal micro-structure which has vast advantages such as higher pressure bearing ability, impact resistance, corrosion resistance etc. listed below:

- High Tensile Strength
- Corrosion Resistant
- Flexible and Leak Resistant
- Durable Cement Mortar Lining
- Excellent Workability



MANUFACTURING PROCESS

Ductile Iron Pipes manufactured by RASHMI METALIKS LTD cover the size range from DN 80 to DN 1200, with a standard length of 5.5 meters. The product conforms to both Indian Standards IS:8329 and International Standards ISO: 2531 and BSEN545 and BSEN598 accredited with ISO 9001, OHSAS18001 and ISO 14001 certifications enabling the company to cater to the domestic and global markets.





INSPIRED BY QUALITY

Mechanical Properties of DI Pipes by Rashmi Metaliks Limited

Mechanical Properties	Values
Tensile Strength	Min. 4,200 Kg/cm ² or 420 MPA
Yield Strength	3,000 Kg/cm ² or 300 MPA
Minimum Elongation	10% (upto DN 1000 mm)
Modulus of Elasticity	1.62 x 10 ⁶ - 1.70 x 10 ⁶ Kg/cm ² or 162,000 - 170,000 MPA
Hardness	Max. 230 BHN
Density	7,050 Kg per cubic meter
Coefficient of Thermal Expansion	11.5 x 10 ⁻⁶ per degree celcius (°C) (for temperature range 20°C - 100°C)
Impact Strength	At Normal Temperature - 7 ft-lb (minimum) & At Low temperature - 3 ft-lb (minimum)

Angular Deflection of DI Pipes by Rashmi Metaliks Limited

Diameter Range (DN)	Angular Deflection
Dn 80 - DN 150	5°
Dn 200 - DN 300	5°
Dn 300 - DN 600	3°
Dn 700 - DN 800	2°
Dn 900 - DN 1000	1.5°
Dn 1100 - DN 1200	1°



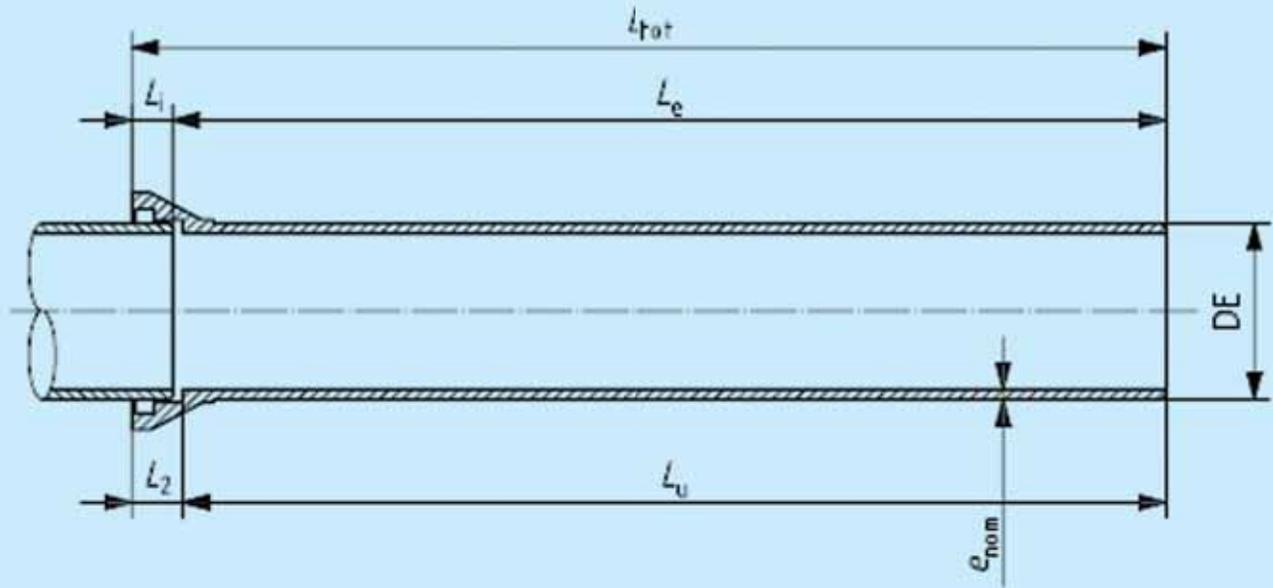


In-House Performance Test Facility



PUSH ON JOINTS

Dimension Details



Key
 OL = overall length in meters;
 DOS = depth of socket in meters;
 Lu = OL - DOS; standardized length in meters;

e = nominal wall thickness in mm;
 DE = nominal external diameter of spigot in mm;

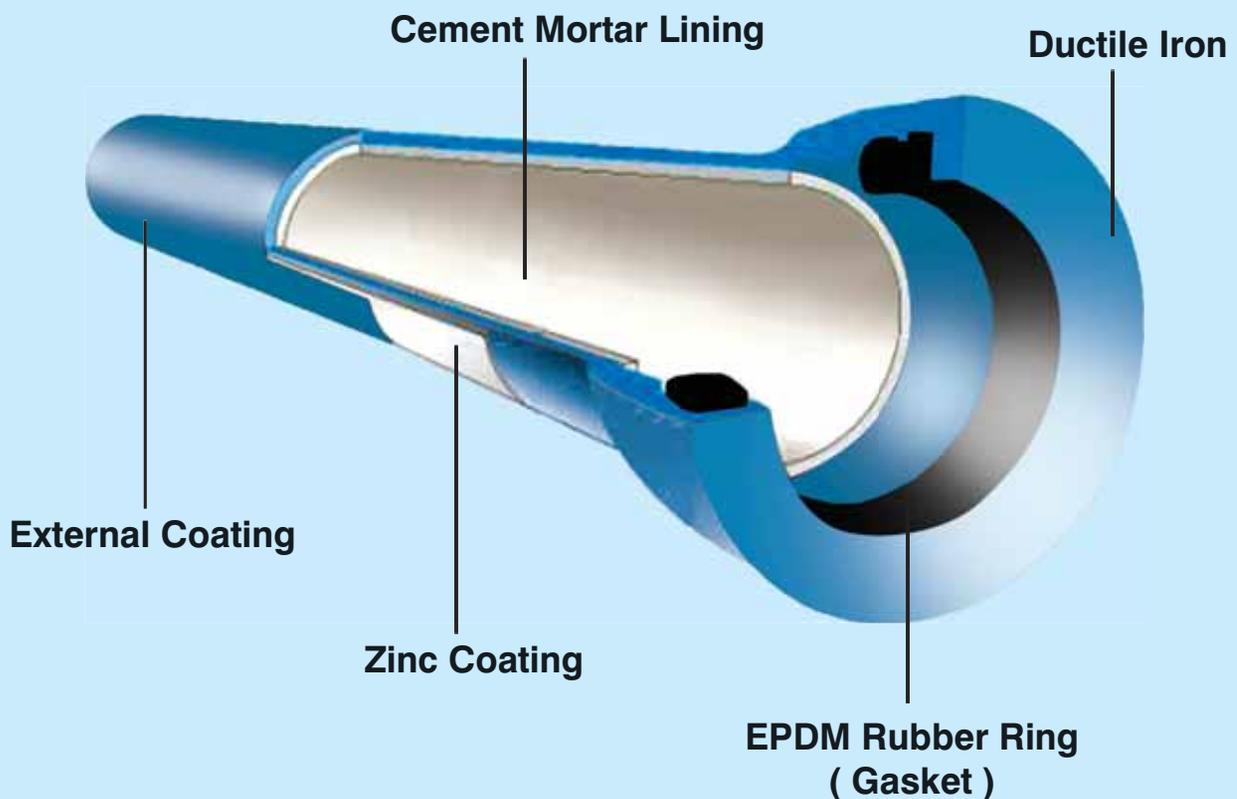
Nominal Wall Thickness Chart for Various Classes of DI Pipes Push on Joint

Nominal Diameter	External Diameter	Nominal Pipe Wall Thickness, e (mm)									
		Various Classes of Pipes									
DN (mm)	DE (mm)	Limit Deviation mm	C 25	C30	C40	C50	C64	C100	As Per BSEN - 598 (Pressure Pipe)	K7	K9
80	98	+1 / -2.7			4.4	4.4	4.4	4.8	4.8	5.0	6.0
100	118	+1 / -2.8			4.4	4.4	4.4	5.5	4.8	5.0	6.0
125	144	+1 / -2.8			4.5	4.5	4.8	6.5	4.8	5.0	6.0
150	170	+1 / -2.9			4.5	4.5	5.3	7.4	4.8	5.0	6.0
200	222	+1 / -3.0			4.7	5.4	6.5	9.2	4.9	5.0	6.3
250	274	+1 / -3.1			5.5	6.4	7.8	11.1	5.3	5.3	6.8
300	326	+1 / -3.3		5.1	6.2	7.4	8.9	12.9	5.6	5.6	7.2
350	378	+1 / -3.4	5.1	6.3	7.1	8.4	10.2	14.8	6.0	6.0	7.7
400	429	+1 / -3.5	5.5	6.5	7.8	9.3	11.3	16.5	6.3	6.3	8.1
450	480	+1 / -3.6	6.1	6.9	8.6	10.3	12.6	18.4	6.7	6.6	8.6
500	532	+1 / -3.8	6.5	7.5	9.3	11.2	13.7	20.2	7.0	7.0	9.0
600	635	+1 / -4.0	7.6	8.7	10.9	13.1	16.1	23.8	7.7	7.7	9.9
700	738	+1 / -4.3	8.8	9.9	12.4	15.0	18.5	27.5	9.6	8.4	10.8
750	790	+1								8.8	11.3
800	842	+1 / -4.5	9.6	11.1	14.0	16.9	21.0		10.4	9.1	11.7
900	945	+1 / -4.8	10.6	12.3	15.5	18.8	23.4		11.2	9.8	12.6
1000	1048	+1 / -5.0	11.6	13.4	17.1	20.7			12.0	10.5	13.5
1100	1152	+1 / -6.0	12.6	14.6	18.6	22.6			14.4	11.2	14.4
1200	1255	+1 / -6.2	13.6	15.8	20.2	24.5			15.3	11.9	15.3

Technical Specifications

Product	Ductile Iron (DI) Pipes suitable for Push-on-Joints*
Size Range	DN 80 to DN 1200
Class of DI Pipes	C20, C25, C30, C40, C50, C64, C100, PP, K-7 & K-9
Standard Length (in Meters)	5.5
Internal Linings	- Cement Mortar Lining of OPC / BFSC / SRC / HAC
	- Cement Mortar Lining with Epoxy Seal Coat
	- Cement Mortar Lining with Bituminous Seal Coat
External Coating - 1	- Zinc Coating (130 grm/m ² or 200 grm/m ² or 400 grm/m ²)
	- Alloy of Zinc & Aluminium (ZnAl) with minimum mass of 400 grm/m ²
External Coating - 2	- Bitumen Coating
	- Blue Epoxy
	- Red Epoxy
Outside OnSite Protection	Polyethylene Sleeving
Coating of Joint Area	Bitumen / Epoxy as per customer requirement
Conforming Specifications	- EN 545:2010 / EN 545:2006
	- ISO 2531:2009 / ISO 2531:1998
	- EN 598:2007 / ISO 7186:2011
	IS 8329 : 2000

* RML also provide customized pipe joint design suitable for Restrained/Anchor Joints as per the requirement of Customer





QUALITY OVER QUANTITY

MANUFACTURING FACILITIES

The state of the art integrated unit for the manufacturing of Ductile Iron Pipe and Pig Iron is a Greenfield Project is located at Kharagpur in eastern part of India in the state of West Bengal, near to Kolkata (Haldia) Sea Port. The manufacturing unit includes:

- Sintering Plant
- Blast Furnace
- DI Pipe manufacturing facility
- Committed Railway Sliding
- Pellet Plant
- Captive Power Unit

This facility is capable to manufacture DI pipes in size range of DN 80 to DN 1200, with an installed capacity of 4,00,000 MT per annum. In line to its vision to provide the quality pipes to its customers, the group has invested and is investing continuously in state of the art testing and monitoring equipments.

QUALITY MEASURES

Stringent quality parameters have been set at RASHMI METALIKS manufacturing unit, in order to ensure the quality product to its customers. Quality checks are done at every stage of the manufacturing process to create a product conforming to International Standards. The plant having its own Blast Furnace Manufacturing unit (MBF) provides for a steady and continuous feed of raw material to the casting unit. The facility is OHSAS18001 and ISO 14001:2004 certified unit with an advanced pollution control system that makes the unit completely environment-friendly,

QUALITY INSPECTION



CARBON EQUIVALENT



CHEMICAL ANALYSIS



MICROSTRUCTURE ANALYSIS



TEMPERATURE CONTROL



THICKNESS CONTROL



RING TEST



ZINC COATING MASS



HYDRAULIC TESTING MACHINE



CEMENT LINING THICKNESS



BITUMEN COATING THICKNESS



SPIGOT OUTER DIAMETER



SOCKET INNER DIAMETER



TENSILE AND ELONGATION



HARDNESS TESTING



IMPACT RESISTANCE

Typical Ground Conditions

Soil Corrosivity

Protection System

- ▣ Natural soils with resistivity above 2500 ohm.cm
- ▣ Natural soils with resistivity between 1500 and 2500 ohm.cm without water table.
- ▣ Natural soil with resistivity between 1500 and 2500 ohm.cm with seasonal water table or permanent waterlogging.
- ▣ Natural soils with resistivity between 750 and 1500 ohm.cm without water table.
- ▣ Natural peaty soils
- ▣ Natural soils containing coal, ironstone or shale without water table
- ▣ Natural soils with pH range 5 < pH < 6 without water table
- ▣ Made up ground containing clinker, brick, flints and other materials likely to cause mechanical damage without water table
- ▣ Natural soils with resistivity below 750 ohm.cm
- ▣ Natural soils with resistivity below 1500 ohm.cm with seasonal water table or permanent waterlogging
- ▣ Natural soils containing coal, ironstone or shale with seasonal water table or permanent waterlogging
- ▣ Natural soils with pH < 5
- ▣ Natural soils with pH range 5 < pH < 6 with seasonal water table or permanent waterlogging
- ▣ Made up ground with light chemical contaminations e.g. refuse sites, farmyard waste
- ▣ Stray electrical currents e.g. close proximity to cathodically protected pipelines and DC traction systems
- ▣ Made up ground containing clinker, brick, flints and other materials likely to cause mechanical damage with seasonal water table or permanent waterlogging
- ▣ Made up ground with heavy chemical contaminations, e.g. disused gas plants, industrial sites, mines, chemical plants
- ▣ Tidal waters e.g. estuaries, shorelines

Non Aggressive

Zinc & Bitumen

Aggressive

Zinc & Bitumen Plus PE Sleeving

Zinc & Bitumen Plus PE Sleeving Plus Imported Backfill

Zinc & Bitumen Plus Tape Wrap 25mm Overlap

Highly Aggressive

Zinc & Bitumen Plus Tape Wrap 55% Overlap

Why Ductile Iron Pipe...

S No.	Attributes	uPVC Pipe	HDPE Pipe	DI Pipe	GI Pipe
1	Type of Pipe	Rigid	Flexible	Rigid	Rigid
2	Available Length	6m or 12m	6m or 12m rolls upto 15m	5.5 m or 6m	6m
3	Tensile Strength	7,000 psi	3,500 psi	60,000 psi	40,000 psi
4	Pressure Rating	6, 8, 10, 12	2.55 to 16.3	upto 100 bars	Class-B: 30 at test and 20 at working; Class-C: 50 at test and 30 at working
5	Hydraulic Efficiency (Hazen's Roughness Coefficient)	145	145	140	100
6	Joining process	Fast	Slower	Fast	Fast
7	Flexibility of joints	Limited	High	Can take up to 5 degrees of deflection	Can take up to 2.5 degree of deflection
8	Corrosion resistance	Corrosion resistant	Corrosion resistant	Corrosion resistant	Susceptible to corrosion in long run
9	Life (Years)	50 yrs	50 yrs	Upto 100 yrs	30 yrs
10	Damage during laying	Moderate	Moderate	Least	High
11	Storage Requirement	To be stored under covered space. Pipe becomes brittle if exposed to Sun for long	Can be stored anywhere	Can be stored anywhere	Can be stored anywhere
12	Bedding Requirement	Sand bedding is required to avoid deflection of pipe	Excavated material can be refilled after removal of hard sharp edge material	Excavated material can be refilled after removal of hard sharp edge material	Excavated material can be refilled after removal of hard sharp edge material
13	Requirement of special equipment for laying and jointing	Not required	Requires sophisticated moulding equipment for butt fusion	Not required	Not required
14	Thermal Expansion	Yes	Yes	No	No

Rashmi Metaliks Product Certification / Accreditations





AMONGST OUR SATISFIED CUSTOMERS

Country / State	Name Of Authority
INTERNATIONAL PRESENCE	• SPAIN
	• ALGERIA
	• SEYCHELLE
	• REUNION ISLAND
	• LEBANON
	• BHUTAN
	• BANGLADESH
	• NEPAL
State of Jammu & Kashmir (India)	• PHED, Jammu • PHED, Srinagar
State of Himachal Pradesh (India)	• Irrigation & Flood Control Department (Through Contractors)
State of Punjab (India)	• Punjab Water Supply & Sewerage Board (Through Contractors)
State of Delhi (India)	• Delhi Jal Board (Through Contractor)
	• New Delhi Municipal Corporation (Through Contractor)
	• Delhi Development Authority (Through Contractor)
State of Haryana (India)	• Director of Supplies & Disposals, Haryana
	• Haryana State Industrial & Infrastructure Development Corporation Ltd., Haryana
	• PHED, Haryana
	• Haryana Urban Development Authority • Haryana State Roads And Bridges Development Corporation Ltd.
State of Uttar Pradesh (India)	• Uttar Pradesh Jal Nigam
State of Rajasthan (India)	• PHED, Rajasthan
	• RIICO (Through Contractors)
	• Jaipur Development Authority (Through Contractors)
	• Urban Improvement Trust (Through Contractors)
State of Madhya Pradesh (India)	• Madhya Pradesh Laghu Udyog Nigam Limited, Bhopal
	• Bhopal Municipal Corporation (Through Contractors)
	• Gwalior Municipal Corporation (Through Contractors)
	• PHED Dept., Madhya Pradesh (Through Contractors)
State of Gujarat (India)	• Ahmedabad Municipal Corporation
	• Surat Municipal Corporation (Bid under evaluation)
	• Gujarat Water Supply & Sewerage Board (Through Contractors)
State of Maharashtra (India)	• Mumbai Municipal Corporation (Through Contractor)
	• Maharashtra Jivan Pradhikaran
	• Pune Municipal Corporation (Through Contractor)
	• Nagar Palika Nigam, Mumbai (Through Contractor)
	• Pimpri Chinchwad Municipal Corporation (Through Contractor)
	• Indapur Municipal Council (Through Contractor)
	• Dahanu Municipal Council (Through Contractor)
	• Hingoli Municipal Corporation (Through Contractor)
State of Jharkhand (India)	• Drinking Water Supply & Sanitation Department, Jharkhand (Through Contractors)
State of Bihar (India)	• Bihar Urban Infrastructure Development Corporation (Through Contractors)
	• PHED, Bihar (Through Contractors)
State of Chhattisgarh (India)	• PHED, Chhattisgarh (Through Contractors)
	• Raipur Municipal Corporation (Through Contractors)
	• Rajnandgaon Municipal Corporation (Through Contractors)
	• Ambikapur Municipal Council (Through Contractors)
State of Odisha (India)	• PHE, Odisha
	• Rural Water Supply & Sewerage Division, Govt. of Odisha (Through Contractors)
State of West Bengal (India)	• Kolkata Metropolitan Development Authority
	• Kolkata Municipal Corporation
	• Purulia Municipality
	• Raghunathpur Municipality
	• Haldia Port Trust
	• IIT Kharagpur
	• Suri Municipality
	• North Barrackpore Municipality
	• Basishat Municipality
	• South Dum Dum Municipality
	• Egra Municipality
	• Dankuni Municipality
	• Barrackpore Municipality
	• Balurghat Municipality
• Hooghly-Chinsurah Municipality	
State of Andhra Pradesh (India)	• Hyderabad Metropolitan Water Supply & Sewerage Board, Hyderabad
	• Rural Water Supply & Sanitation Dept., Govt. of A.P. (Through Contractor)
	• Panchayet Raj Health Engineering Department, Govt. of A.P. (Through Contractor)
State of Karnataka (India)	• Karnataka Urban Water Supply & Drainage Board, Karnataka (Through Contractor)
	• Karnataka Rural Water Supply & Sanitation Department, Karnataka (Through Contractor)
State of Tamilnadu (India)	• Tamilnadu Water Supply & Drainage Board (Through Contractor)
State of Kerala (India)	• Chennai Metropolitan Water Supply & Sewerage Board
	• Kerala Water Authority (Through Contractor)





CONNECTING WATER AND LAND



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