

# A HOUSE OF INFRASTRUCTURE SOLUTION



PRODUCT BOOKLET  
**DUCTILE IRON PIPE**

## DUCTILE IRON PIPES



### Overview of Rashmi Group of Industries

**Rashmi Group** of Industries is one of the leading companies in West Bengal and Eastern India making foray in the areas of Steel, Cement, Power, Coal Mining and Iron Ore Mining and Trading. The company has developed core competence in Minerals, Steel and Cement with more than three decades of experience across the entire value chain of these industries. Rashmi Group is one of the largest manufacturer of Sponge Iron in the State of West Bengal having Blast Furnace, Sinter, SMS and TMT with manufacturing units located at Kharagpur and Jhargram, West-Bengal, India.

**Rashmi Group** comprises of two major companies :-

- **Rashmi Cement Limited**
- **Rashmi Metaliks Limited**

Rashmi Metaliks Ltd, the flagship company of the group has an existing Ductile Iron Pipe plant at Kharagpur in the state of West Bengal. The group has ambitious plans of expanding its business in Steel, Cement, Power, Coal and Mineral trade. Therefore, **Rashmi Group** of Industries intends to become a diversified conglomerate having activities spread across Sponge Iron production, Blast Furnace operations, Sinter Plant, Seamless Pipe, Wire Rod, Ferro Alloys, Captive Power, Cement, Coal Washery, Coke Oven, Pellet Plant, Railway Siding (The group owns five WIS rakes), and Iron Ore Mining and Coal production.



Inauguration Ceremony Of DI Pipe Plant by Sri Ramdev Baba at Kharagpur



Following are the strength of our Group :-

- Three-decade old group with consistent growth.
- Major Player in manufacturing Sponge Iron, Pig Iron and Cement.
- Among the first company who got environmental and pollution clearances in West Bengal after implementation of new pollution guidelines.
- Awarded 'Ultra Mega Project' status by Govt. of West Bengal & Orissa, India.
- More than 3,000 employees all over India.
- Have long-term arrangement of Iron Ore with reputed Mines to cater to the requirements of our plants located at West Bengal, India.
- Excellent logistics support with Captive Railway Sidings at Barbil & Kharagpur with three tracks inside the plant.
- The Group owns 5 Rakes (under WIS scheme) for captive use.
- **Rashmi Group** has created a history by getting BIS Licence for all classes K7, K8, K9 from DN 80 to DN 1000 in one go.

### History of Ductile Iron

Grey Iron is being produced since hundreds of years. In 1948, a major event occurred when small amount of magnesium was added to molten cast iron.

It was found that the Flaky Graphite of Grey Iron was changed to spheroidal shape, accordingly all mechanical properties of the metal was changed and the new metal is called Ductile Iron.



Ductile Iron



Cast (Grey) Iron

### Advantage of Ductile Iron pipes: -

- Ductile Iron pipes have a high corrosion resistance after suitable protection
- Excellent hydraulic flow
- High tensile strength, good elastic modulus and excellent ductility, making it suitable for high stress applications and where pressure surge may be experienced
- High working pressure compared to other Metallic pipes
- Ease of installation
- Long service Life
- Can accommodate ground movement

### Main Application of Ductile Iron pipes: -

- Raw and clear water transmission
- Distribution network of potable water
- Water supply for industrial/process plant application
- Ash-Slurry Handling & Disposal system
- Fire-Fighting systems
- Sewerage and waste water main
- Gravity sewerage collection and disposal system
- Storm water drainage piping
- Effluent disposal system for domestic and industrial application
- Piping work inside water and sewerage treatment plants
- Vertical connection to utility and reservoirs
- Piling for ground stabilization
- Protective piping under major carriage-ways
- Irrigation water networks

### Pipe Manufacturing Process



### Mechanical Properties

Rashmi can offer Ductile Iron Spun Pipes with thickness in 'K' class as well as 'C' class meeting all standard specifications worldwide. Detailed technical specifications can be provided on request.

## Product Range



### Specifications

Ductile Iron (Socket & Spigot) pipes are manufactured by centrifugal process from DN 80 to DN 1000 as per the following specifications: -

- IS: 8329
- ISO: 2531
- BS EN: 545
- BS EN: 598



### Internal Lining

Pipes are lined internally with Portland Cement (Sulphate Resistant) / Blast Furnace Slag Cement / or as per desired specifications. Cement is applied by centrifugal process in compliance with ISO 4179 / IS 8329. Thickness of the cement is according to ISO & BSEN standards.

The cement lining is then cured under controlled temperature and humidity giving it the optimum mechanical strength and also producing a very smooth surface which reduces head losses and guarantee long-term hydraulic efficiency.

Cement lining is an active coating, when the pipe is filled, the mortar gradually absorbs water, which becomes enriched in Alkaline substance. Consequently, it is non-corrosive when it reaches the proximity of the metal wall. Also cement lining demonstrated the ability to withstand limited pipe deflection and good performance under high top loads.

Rashmi can offer any different specifications or lining as per customer requirements.

### External Coating



Pipes are coated externally by pure metallic Zinc. Zinc is then covered by bituminous paint as per ISO 8179 / IS 8329.

One of the particular features of Zinc coating is its capacity for restoring the continuity of the protective layer at points where it is locally damaged. The  $zn^{++}$  ions migrate to plug the damaged area and are then covered into stable insoluble zinc product.

Zinc coating is considered the built in Cathodic Protection due to the huge amount of zinc distributed uniformly all over the pipe.

Rashmi Can offer any different specifications or coating as per customer requirements.

### Marking

The following marking is casted on each pipe (inside the socket)

- The Nominal Diameter of Pipe (DN)

The following stenciling marking is done on the length of the pipe

- RASHMI
- Size
- Class
- Year of Manufacturer
- ISI Mark (in case of domestic pipes)



Further stenciling marking shall be done as per the request of the customers.

## Pipe Joint

The standard joints for the pipes are designed so that contact pressure between the gaskets and the metal increases as the water pressure increases, thus a perfect seal is guaranteed. The rubber gasket for the pipes is standard type which is known as Push-on Joints and are EPDM rubber quality.

## Pipe Deflection

Rashmi socket-spigot joints permits angular deflection which gives the following advantages:

- Accommodation of ground movements.
- Allowing adjustment while installation.
- Reducing the number of bends required.

## Permissible deflection of each joint in degree

Where it is necessary to deflect the pipeline from a straight line, either in the vertical or horizontal plane, to avoid obstructions etc, deflection at joint should not exceed the following: -



Push on Joint	Deviation Angle
80-200 mm	5°
250 - 350 mm	4°
400 - 600 mm	3°
700 - 900 mm	2°30'
1000 - 1100 mm	2°



## Pipe Dimensions

Basic dimension of pipe Class K7 and Class K9

Nominal Dia	External Dia	Tolerance	Thickness	Thickness
DN	DE	DE	K7	K9
MM	MM	MM	MM	MM
100mm	118	+1/-2.8	5.0	6.0
150mm	170	+1/-2.9	5.0	6.0
200mm	222	+1/-3.0	5.0	6.3
250mm	274	+1/-3.1	5.3	6.8
300mm	326	+1/-3.3	5.6	7.2
350mm	378	+1/-3.4	6.0	7.7
400mm	429	+1/-3.5	6.3	8.1
450mm	480	+1/-3.6	6.6	8.6
500mm	532	+1/-3.8	7.0	9.0
600mm	635	+1/-4.0	7.7	9.9
700mm	738	+1/-4.3	9.0	10.8
750mm	790	+1/-4.4	9.7	11.3
800mm	842	+1/-4.5	10.4	11.7
900mm	945	+1/-4.8	11.2	12.6
1000mm	1048	+1/-5.0	12.0	13.5



## Storage and Laying Instructions

### Pipe storage

#### General Recommendations:-

- The storage area must be flat. The ground must not be marshy or unstable and it must not contain any corrosive material.
- On arrival in storage area the goods must be inspected and if there is any damage (degradation of internal and external coating), it must be repaired before going into stock.
- The pipes must be stocked in the respective stakes according to diameter in accordance with a logical stock plan.
- It is always desirable to protect coating from the effects of weathering and prolonged exposure in the sun.
- Use shaped hooks covered with special protection of plastic material or rubber, to avoid any damage to the internal coating of pipes.  
Wooden spacers (timber, wedges etc...) must be strong enough and of good quality.
- Precaution must be taken when the pipes have special coating.



Please consult **Rashmi Group** for any assistance.



### Storage of Gaskets

As per the standard mainly the ring shall be stored in accordance with the following precautionary measures:

- Storage temperature should be below  $25^{\circ}\text{C}$  and preferably below  $15^{\circ}\text{C}$ .
- Elastomer rubber should be protected from light, direct sun light and strong artificial light with a high ultraviolet content.
- As ozone is particularly deleterious, storage room should not contain any equipment which is capable of generating ozone such as mercury vapour lamps, high voltage electrical equipment, electric motors or other equipments which may cause electric sparks or silent electrical discharge.
- Elastomer rubber should be stored in a normal position that is free from tension, compression and other deformation.

The maximum period for dispatching gaskets of the water type from the works or store of **Rashmi** is fixed at three years after manufacturing.

### Assembly of Push-on Joint

The method described below is given as an example. The method of making the joint and equipment used may vary, providing the course that the principals of assembling and recommendations specified will be strictly observed.

- Using a wire brush and a rag, carefully clean the inside of the socket particularly the gasket recesses. In particular, move any deposits of the earth, sand etc. also clean the spigot of the pipe to be joined and the gasket itself. Check the presence of the chamfer, as well as the absence of any damage on the spigot of the pipe.
- Check the condition of the gasket and insert it into its recess, with the lips pointing towards the bottom of the socket. Make sure that the gasket is correctly compressed all the way round.
- Coat with lubricating paste recommended by **RASHMI**, the spigot end of the pipe and the exposed surface of the gasket. The gasket recess must not be coated with lubricating paste, except for small diameter of pipes when problems arise on fitting the gasket.
- Center the spigot in the socket and hold the pipe in a position by resting it on two wedges of tamped earth or better, gravel.
- Push in the spigot until the first mark disappears inside the socket. The second mark must still be visible after assembly.
- Check that the gasket is correctly in position by inserting the end of a metal ruler through the annular spigot and socket gap until it touches the gasket. The ruler must penetrate to the same depth around the whole circumference.
- Jointing must be done with well aligned pipes. Make sure that the curvature after assembly does not exceed the permissible angular deflection of particular joint.

### Cutting Pipes

Pipes must be cut on site as infrequently as possible by using disc-type cutter. Such operations, which require particular care, must be carried out without fail in a plane perpendicular to the pipe axis.

Before cutting, make sure that the OD of the new spigot 'Cut Area' is within tolerance of the OD of the old spigot. It is advisable to use gauge pipe for cutting on site. Gauge pipe has a special mark on the socket face. After cutting the pipe, it is necessary:

- To restore the chamfer at the spigot end of the cut faces of pipe.
- To repair the pipe coating and cement lining if damaged.



### Chamfer Restoration

After cutting, complete deburring is recommended. It is essential to restore the chamfer on the cut faces of standard pipes so as to facilitate the assembly of the push-on joint and to prevent any damage to the elastomer (rubber) gasket, which can result in a leaking joint.

### Repair of Cement Lining

Any damage at the internal mortar lining caused accidentally during transportation, storage, laying or by rough handling can be repaired easily on site.

- The damaged area should be less than 0.1 m<sup>2</sup>
- The length of the damaged area should not exceed a quarter of pipe circumference.
- No localized pipe deformation otherwise cut off the damaged area.

## OUR PRINCIPLE

Quality	:	We Never Compromise
Relationship	:	We Never Break
Price	:	We Never Overcharge
Commitment	:	We Never Fail
Reason For Our Success	:	Quality Manpower
Strength	:	Our Customer



### Rashmi Metaliks Limited

#### CORPORATE OFFICE

39, Shakespeare Sarani, Premata Building, 6th Floor,  
Kolkata - 700 017, India,  
Phone no - +91 33 2289 4255/56,  
Fax no - +91 33 22894254

#### DELHI OFFICE

103, Akashdeep Building, 1st Floor,  
Sarakhamba Road, Connaught Place,  
New Delhi - 110001,  
Phone no - +91 11-23327749 / +91 9958880324

#### BHOPAL OFFICE

Biviera Town, House No- 127, Monaco,  
Katar Road Gate, Near M.S. City,  
Mata Mandi, Bhopal - 462003 (M.P.)  
Phone no - +91 (0) 755 3010846

#### FACTORY

Gokulput, P.O.: Shyamraipur, Kharagpur,  
Dist. West Midnapore, West Bengal, India,  
Phone no - +91 3222 234533 / 254076 / 254114

#### MUMBAI OFFICE

Office No. 8-205, Raghunath Krupa,  
Walawalkar Wadi, Aarey Road,  
Goregaon (E), Mumbai - 400 063  
Phone no - +91 7738349487

#### BHUBANESHWAR OFFICE

Plot No. 5-30, Malhi Bihari, Behind Fortune Tower,  
Nr. Mahindra Satyam Computer,  
Chandrasekharpur, Bhubaneswar - 751022,  
Phone no - +91 9861012377

For Domestic Enquires : [sales.marketingdomestic@rashmigroup.com](mailto:sales.marketingdomestic@rashmigroup.com), For Export Enquires : [mkt.exportdip@rashmigroup.com](mailto:mkt.exportdip@rashmigroup.com),  
Website : [www.rashmigroup.com](http://www.rashmigroup.com)