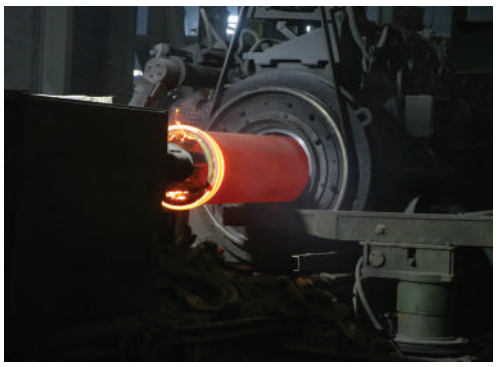
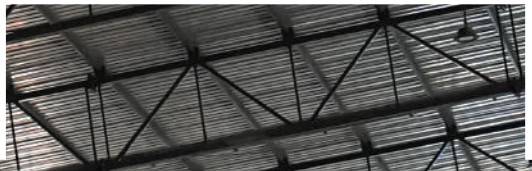
RASHMI GROUP





Carrying Water, Establishing Lifeline

About
Rashmi Group

"Rashmi Group envisions a future of innovation, sustainability, and global collaboration. Together, we lead with purpose, pioneering solutions that enrich lives and inspire progress for generations to come."

Rashmi Group stands as a prominent Business Conglomerate in India, recognized for its expansive operations. Pioneering the integration of Iron & Steel Products, Cement, Power, and Ferro Alloys, the group is under the astute guidance of **Mr. Sajjan Kumar Patwari** along with his three sons - **Mr. Sunil Kumar Patwari, Mr. Sanjib Kumar Patwari, and Mr. Sanjay Kumar Patwari.**

Strategically headquartered in Kolkata, the group maintains its operational footprint through strategically positioned manufacturing facilities in Kharagpur and Jhargram. The product portfolio boasts a diverse array, encompassing DI Pipes and Fittings, TMT Bars, Pig Iron, Wire Rods, MS Billets, Sponge Iron, Sinter, Ferro Alloys, Pellets, Cement, Nitrile Gloves, Seamless Pipes & Tubes, Digital Networking Devices, and Dredging solutions.

Rashmi Group holds a notable position as a prime exporter of Iron Ore Fines to China & various South East Asian nations, while simultaneously catering to global markets with mineral-based products. This achievement is underscored by the accolade of "**Ultra Mega Project**" status conferred upon the group by the West Bengal government, further complemented by its distinction as one of the earliest recipients of environmental and pollution clearances within the state.

Introduction to **Rashmi Metaliks**

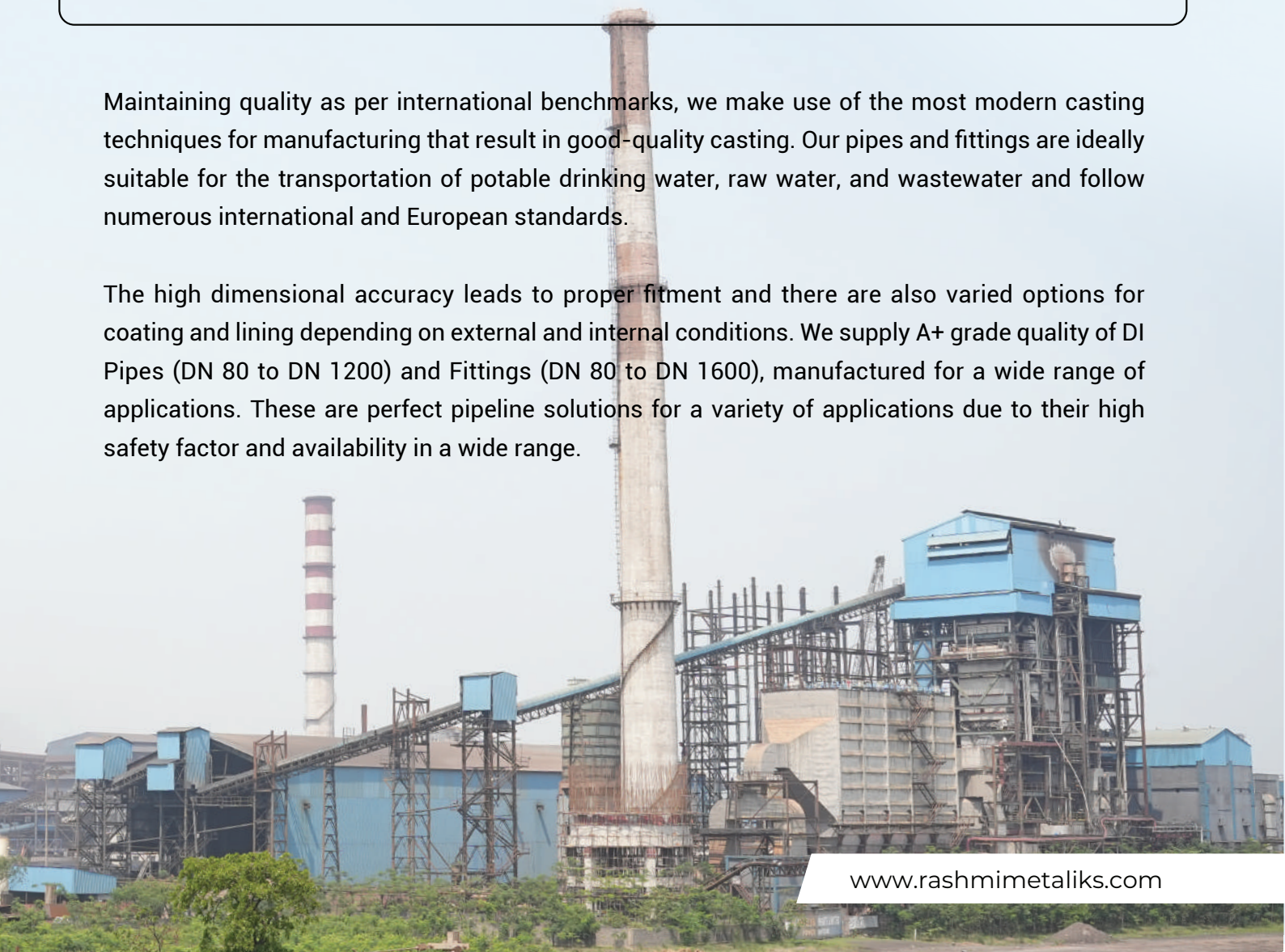
Rashmi Metaliks Limited is a name synonymous with reliability & quality in Eastern India's iron & steel manufacturing industry. It is one of the flagship companies of Rashmi Group, incorporated in the year 2004 in West Bengal. We have a State-Of-The-Art Integrated Steel manufacturing facility comprised of Pellet, Sinter, Pig iron, Sponge Iron, Ductile Iron Pipe and Fittings, Billet, TMT & Wire Rod.

Rashmi Metaliks is one of the leading manufacturers of DI Pipes & Fittings in India. We have a substantial number of jointing options with various internal and external coating types when it comes to fittings. Since its inception, Rashmi Metaliks has been expanding at an unbeatable CAGR of 62%. We have upgraded our production to **7,70,000 Metric Tonnes of DI Pipes & 26,000 Metric Tonnes of DI Fittings** annually.

Today, Rashmi Metaliks stands as the largest manufacturer of DI Pipes & Fittings in India and holds the second position in the globe.

Maintaining quality as per international benchmarks, we make use of the most modern casting techniques for manufacturing that result in good-quality casting. Our pipes and fittings are ideally suitable for the transportation of potable drinking water, raw water, and wastewater and follow numerous international and European standards.

The high dimensional accuracy leads to proper fitment and there are also varied options for coating and lining depending on external and internal conditions. We supply A+ grade quality of DI Pipes (DN 80 to DN 1200) and Fittings (DN 80 to DN 1600), manufactured for a wide range of applications. These are perfect pipeline solutions for a variety of applications due to their high safety factor and availability in a wide range.

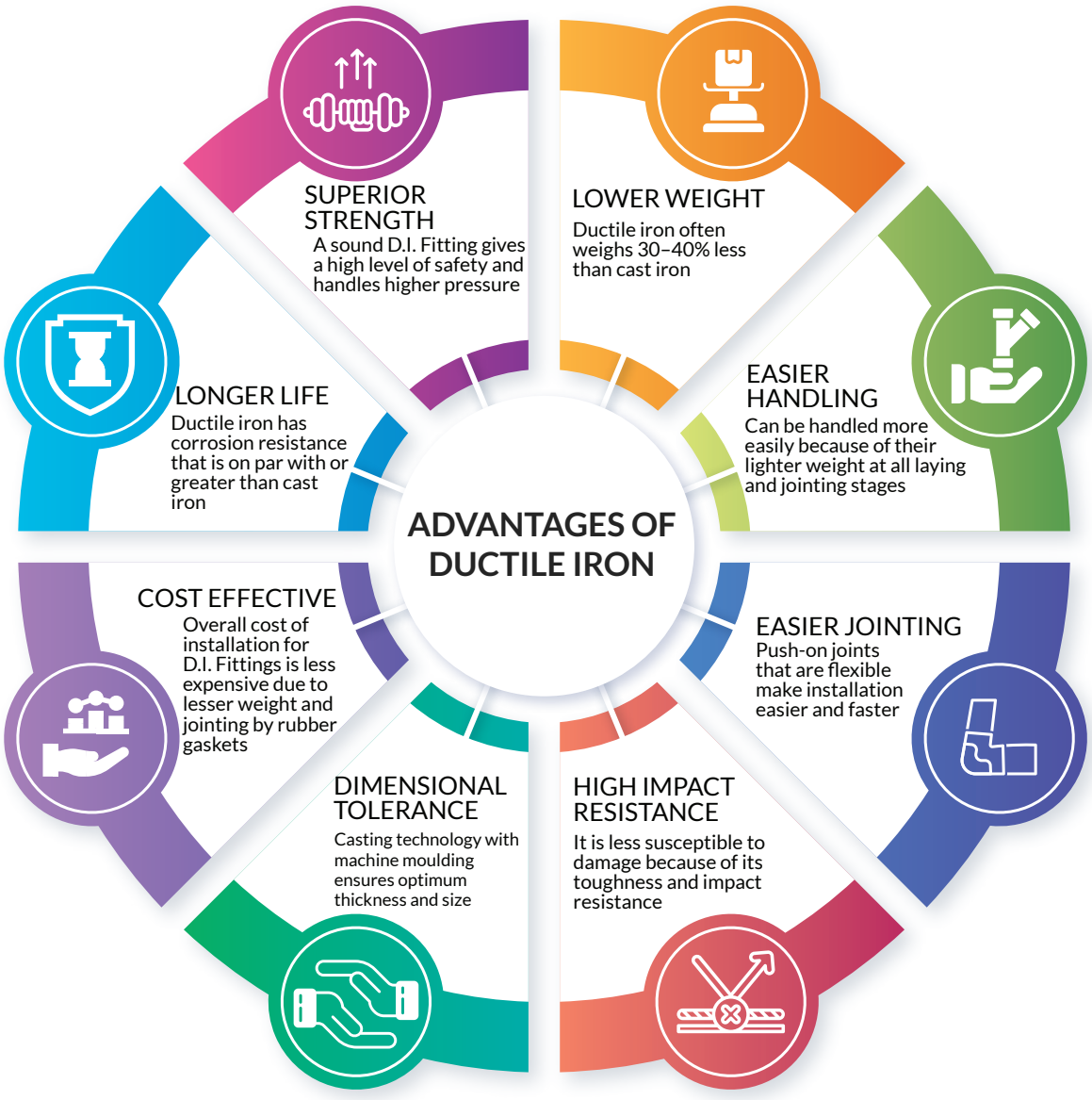


Ductile Iron
Pipes and Fittings

Renowned for our superior quality Ductile Iron Pipes & Fittings, Rashmi Metaliks is the favored choice for water supply and pressure sewerage applications. Our adherence to stringent standards and commitment to quality assurance has garnered us a dominant stand in the market.

To fulfill the growing demand for Ductile Iron Pipes and Fittings, we have elevated our production capacity to a phenomenal 7,70,000 MT per annum for Pipes & 26,000 MT for Fittings. Our adoption of state-of-the-art casting methodologies ensures precision in casting with exact dimensional accuracy, guaranteeing optimal fitment. Additionally, we offer a range of coating and lining options tailored to external and internal conditions, enhancing the durability of our products.

At Rashmi Metaliks, we are dedicated to propelling the industry forward with innovation, quality, and reliability.



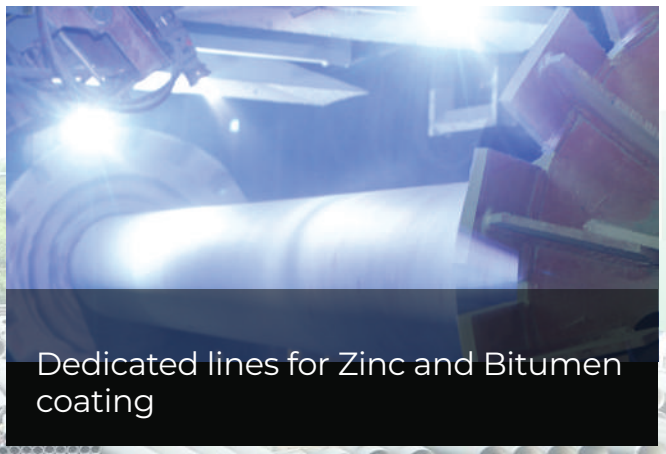
Ductile Iron
Production Facility

2 high-capacity blast furnaces with a combined capacity of 7,70,000 MT annually

20 dedicated induction furnaces

20 horizontal centrifugal casting machines

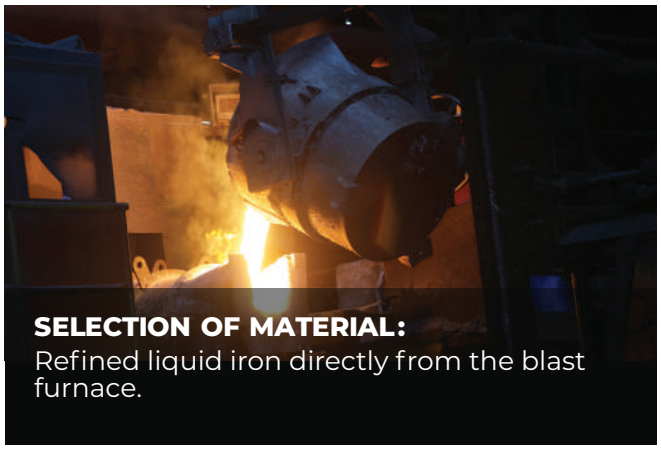
Specialized annealing furnace



Dedicated lines for Zinc and Bitumen coating

Meticulously designed Finishing Lines

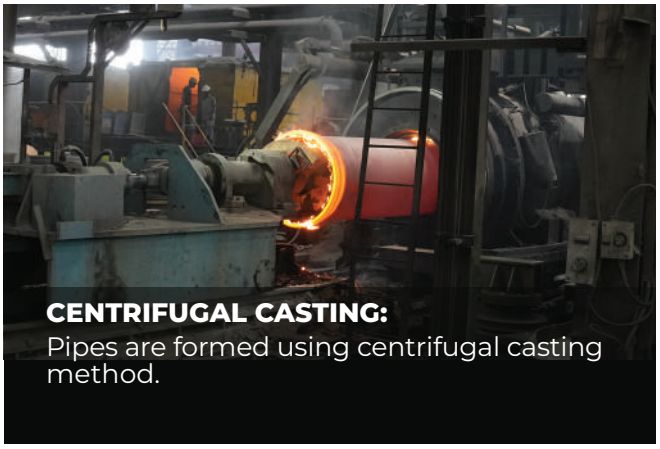
Ductile Iron Pipe
Casting Process



SELECTION OF MATERIAL:
Refined liquid iron directly from the blast furnace.

COMPOSITION ADJUSTMENT:
If the molten iron composition deviates from established standards, it is rectified by introducing alloy and other elements.

MAGNESIUM TREATMENT:
A small quantity of pure magnesium is introduced into the molten iron to foster the development of a spheroidal graphite microstructure.

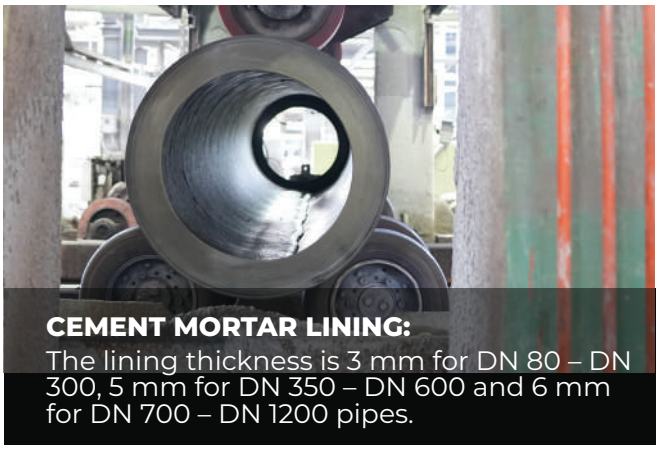


CENTRIFUGAL CASTING:
Pipes are formed using centrifugal casting method.

ANNEALING:
The heat treatment process is employed to enhance the mechanical properties of the pipes.

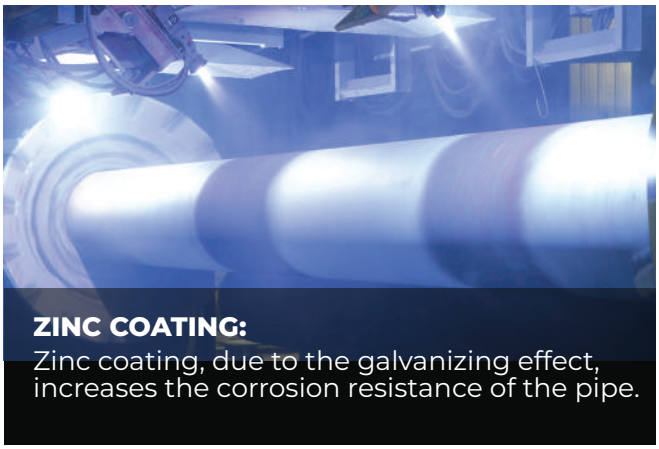
CUTTING AND GRINDING:
Pipes are subjected to spigot end cutting and grinding to attain the required end chamfer. (Applicable for sampling)

HYDROSTATIC PRESSURE TESTING:
To perform the leak test, hydrostatic pressure is applied internally and is steadily maintained for 10 seconds.

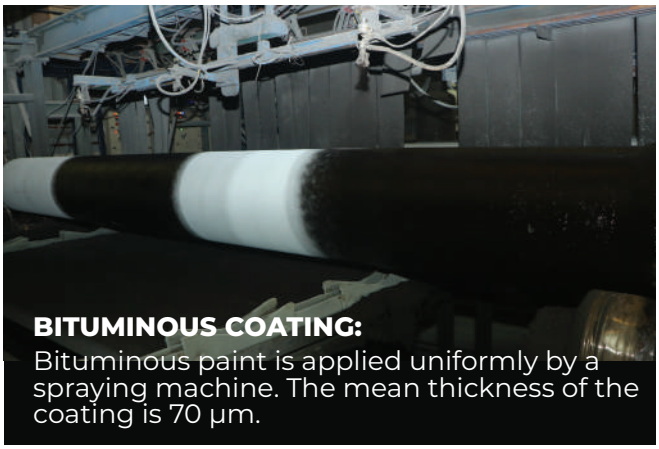


CEMENT MORTAR LINING:
The lining thickness is 3 mm for DN 80 – DN 300, 5 mm for DN 350 – DN 600 and 6 mm for DN 700 – DN 1200 pipes.

Ductile Iron Pipe
Finishing & Despatch



ZINC COATING:
Zinc coating, due to the galvanizing effect, increases the corrosion resistance of the pipe.



BITUMINOUS COATING:
Bituminous paint is applied uniformly by a spraying machine. The mean thickness of the coating is 70 µm.

QUALITY TESTING:
The pipes are rigorously tested on all predefined parameters to ensure the highest quality standards.

STORAGE:
The quality-approved pipes are stacked in a controlled environment and marked for transportation.

TRANSPORT

DI Pipes by **Rashmi Metaliks**

The Ductile Iron Pipes by Rashmi Metaliks have Tremendous Tensile Strength and sustain external static or dynamic loading. The company's impeccable track record of quality assurance has placed it in a commanding position in the market.

Being the largest manufacturer in India, Rashmi Metaliks produces 770,000 MT of Ductile Iron Pipes annually.

The DI Pipes made by Rashmi Metaliks conform to IS 8329 as well as International Product Standards ISO: 2531, BS EN 545, BS EN 598, ISO 7186 and Management Standards ISO 9001, ISO 45001 & ISO 14001. Our dedicated adherence to these parameters has made us win the trust of many domestic and international clients.

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
Types	Push-on Joint, Restrained Joint
Internal Linings	Cement Mortar Lining of OPC / BFSC / SRC / HAC Cement Mortar Lining with Seal Coat Internal Fusion Bond Epoxy Coating Internal Polyurethane Coating
External Coating – 1	Zinc Coating Alloy of Zinc & Aluminium (ZnAl) Bitumen Coating post Zn or ZnAl
External Coating - 2	Blue or Red Epoxy External Fusion Bond Epoxy Coating External Polyurethane Coating
Conforming Specifications	IS 8329/IS 9523, ISO 2531, BS EN 545, ISO 2531, ISO 7186, BS EN 598, ISO 4179 & ISO 8179

* RML also provides customize pipe joint design suitable for Restrained/Anchor Joints as per customer requirement.

Ductile Iron Fittings

Rashmi Metaliks is a leading manufacturer of Ductile Iron Fittings in India. Our fittings are crafted using advanced casting methods like VLFP and High-Pressure Moulding. They provide durability and strength for water, sewage, wastewater, and slurry applications. Our facilities boast top-notch machinery, finishing units, and testing labs.

We offer fittings in diameters DN 80 to DN 1600 mm, with various jointing options, coatings, and linings. To ensure high performance in harsh environments, our fittings are Fusion Bonded Epoxy coated (internally and externally) with a minimum thickness of 250µm. Options include WRAS-approved Black & Blue (Potable water) or Red (Sewerage) in line with EN 545 / EN 598 and EN 14901. Alternative coatings are also available upon request.

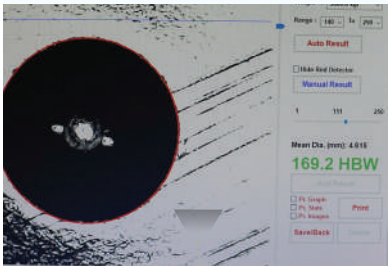
Benefits of DI Fittings :

- Ability to effectively handle consistent alterations in pressure, temperature, and environment.
- Greater strength and resistance than the other material.
- Offers high-quality performance for well over 100 years.
- Much lighter, which makes them easier to lay out in sewer lines than most other Fittings.
- No additional encasements or treatments are needed for their installation.

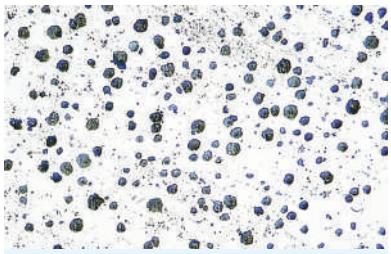
Quality Testing :

Spectrographic Analysis: The composition is assessed through spectrographic analysis.

Assessment of Mechanical Testing: Tensile and hardness tests are conducted.



Final Inspection: Fittings are inspected carefully before shipping.



Examination of Spheroidal Graphite: The spheroidal graphite microstructure is scrutinized through microscopic testing.

Hydrostatic Pressure Test: Every fitting undergoes a hydrostatic test to verify its water leak tightness.

Ductile Iron Fittings Casting Process

Vacuum Lost Foam Process

VLFP (Vacuum Lost Foam Process) uses Polystyrene patterns of the design of the required fittings placed in a sand-filled MS mold box. After compacting with vibration, the molten metal is poured under vacuum pressure.

The next processes involve knockout, shot blasting, and fettling, resulting in the removal of excess material or imperfections from the fittingss. Then the fittings are hydro-tested and forwarded for protective coatings and linings like Zinc Coating, Cement Lining, Bitumen Coating, FBE Coating, and PU Coating, each offering distinct benefits for corrosion resistance and durability. Castings are then marked, packed, and dispatched after undergoing quality assurance processes.

Benefits:

- The vacuum pressure and controlled expansion lead to minimal defects, resulting in high-quality patterns and castings.
- As patterns are formed by joining segments, tooling costs can be reduced compared to traditional methods.
- The process enables faster pattern production and assembly, which can accelerate overall casting production timelines.
- VLFP can be applied to a wide range of alloys and casting sizes, making it adaptable for various applications.
- The process' controlled parameters result in consistent patterns and castings, reducing variations between parts.
- Steam expansion of EPS beads create smooth and uniform patterns, resulting in improved surface finishes on the final castings.

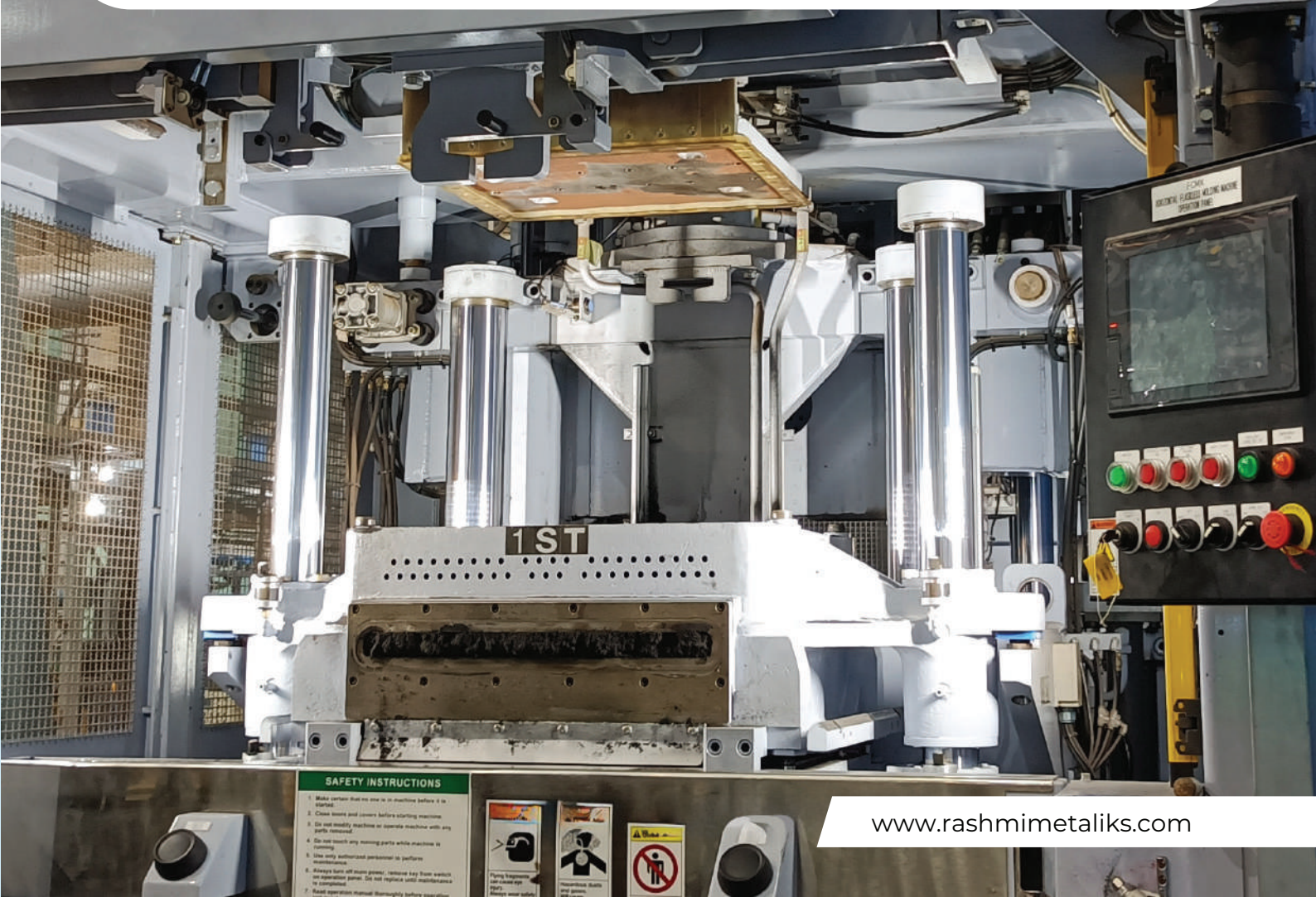
Ductile Iron Fittings
Casting Process

High-Pressure Molding Process

The unique high-pressure molding process creates DN-80 to DN-250mm diameter fittings and accessories. Sand is compacted around a pattern in the High-Pressure Molding Machine to form a mold. The molten metal fills the mold via the pouring line. After solidification, casting is removed via knockout process and then shot blasted to attain the desired quality. After fettling and Zinc Coating, all the fittings are hydro-tested for water leak tightness and then processed through Cement Lining and Bitumen/FBE/PU Coating for corrosion resistance. Castings are then packed, stored, and dispatched after undergoing quality assurance processes.

Benefits:

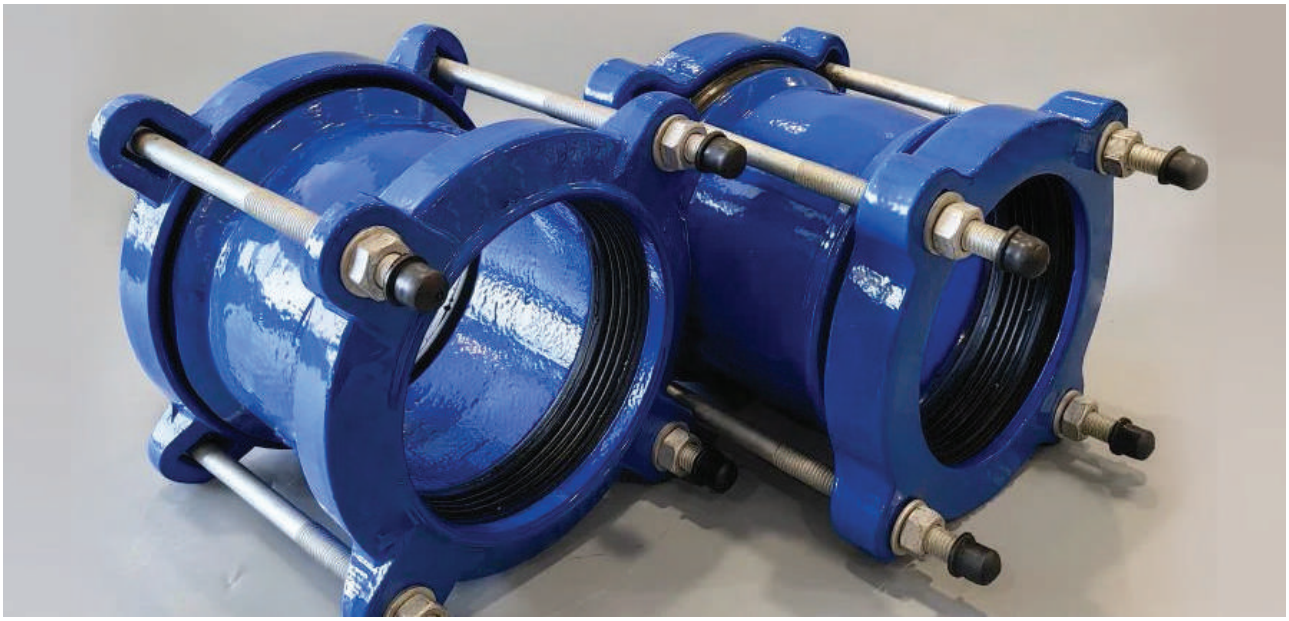
- Ensures precise dimensional accuracy, superior surface finish, and reduced porosity in the final products.
- Enhances mechanical properties, leading to increased durability and strength, vital for reliable water and wastewater systems
- Minimizes material wastage and energy consumption, making it environmentally friendly.
- With shortened production cycles and streamlined operations, High-Pressure Moulding optimizes efficiency and cost-effectiveness, contributing to high-quality DI fittings that meet stringent industry standards.



Range of Fittings

Push-On Joint Fittings: Push-On joints offer the most straightforward assembly method for underground purposes. These joints consist of a rubber gasket, which is placed into a groove within the socket positioned at the bell end of the fittings. Subsequently, by applying lubricant, the beveled end of the fittings is pushed through the gasket, resulting in its compression and the formation of a resilient, pressure-sealed connection.

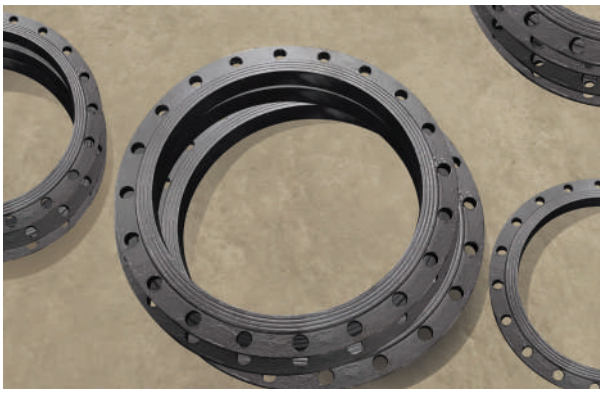
Flanged Fittings: A flanged joint is a type of connection achieved through bolts, where two equal flanges are joined and held together by tightening the bolts. In this arrangement, a unique flat gasket is placed between the flanges, and as the bolts are tightened, the gasket is compressed. The sealing action is accomplished through the compression of a flat elastomer gasket positioned between the two flange



Mechanical Joint Fittings: The mechanical connection relies on the concept of a stuffing box and comprises a bell featuring an integrated flange, a gland made of cast or ductile iron, a rubber seal, and the required bolts and nuts. This design allows for substantial flexing and accommodates both longitudinal expansion and contraction within the pipeline.

Range of Fittings

Welded Flanged Pipes: Flanges are welded on either or both ends of the barrel. As per customer requirement, flanges are sometimes welded on the barrel at a point other than the ends which are called Puddle flanges.



Screwed Flanged Pipes: Flanges are tapped and drilled to be threaded onto ductile iron pipe. The DI pipe is cut to the exact length needed and put into a chaser machine where the threads are cut into the pipe where the flange is attached and tightened.

"As Cast" Flanged Pipes: "As Cast" Flanged Pipes are casted as a single unit advanced Lost Foam Casting technique based on the specific requirements.

Our Ductile Iron Fittings are manufactured following ISO: 2531: 2009, BS EN: 545: 2006, BS EN: 598: 2006, IS: 9523: 2000 and their associated standards.

Ductile Iron Fittings					
Fittings	**DN Range**	**Bends Range**	**Fitting**	**External Coating**	**Internal Lining**
Push-On Joint Fittings	80 to 1600	90^0, 45^0, 22.5^0, 11.25^0	Double Socket Bends, Double Socket Duck Foot Bends, All Socket Tees, Concentric Reducers, Double Socket Flanged Branch Tee, Wash Out Tee, All Socket Y-Tee, All Socket Cross, Push On Collar, Push-on Flanged Socket, Cap, Plug	Zinc Coating followed by Black Bitumen Coating	Cement Lining
				Zinc Coating followed by Blue Epoxy Coating	Cement Lining
				Fusion Bonded Epoxy (FBE)	FBE
Flanged Fittings	80 to 1600	90^0, 45^0, 22.5^0, 11.25^0	Double Flanged Bends, Double Flanged Duck Foot Bends, All Flanged Tees, Flanged Concentric & Eccentric Reducer, All Flanged Cross, Double Flanged Semi Circular Bend, All Flanged Scour Tee, Blank Flange, Flanged Bell Mouth, Screwed & Welded Flange, Push-on Flanged Socket,Flanged Spigot	Zinc Coating followed by Black Bitumen Coating	Cement Lining
				Zinc Coating followed by Blue Epoxy Coating	Cement Lining
				Fusion Bonded Epoxy (FBE)	FBE
Mechanical Join Fittings	80 to 1600	90^0, 45^0, 22.5^0, 11.25^0	MJ Collar, MJ Bend, MJ Flange Socket, MJ All Socket Tee, MJ Double Socket Flange Branch Tee etc.	Zinc Coating followed by Black Bitumen Coating	Cement Lining
				Zinc Coating followed by Blue Epoxy Coating	Cement Lining
				Fusion Bonded Epoxy (FBE)	FBE
DI Special Fittings	80 to 1600	—	Flanged Adaptor & Dismantling Joint	Zinc Coating followed by Black Bitumen Coating	Cement Lining
				Zinc Coating followed by Blue Epoxy Coating	Cement Lining
				Fusion Bonded Epoxy (FBE)	FBE
Restrained Joint Fittings (RASHMI-LOCK)	80 to 1600	—	—	Zinc Coating followed by Black Bitumen Coating	Cement Lining
				Zinc Coating followed by Blue Epoxy Coating	Cement Lining
				Fusion Bonded Epoxy (FBE)	FBE

Ductile Iron Flanged Pipes					
Fittings	**DN Range**	**Bends Range**	**Fitting**	**External Coating**	**Internal Lining**
Welded Flanged Pipes	80 to 1200	—	—	Zinc Coating followed by Black Bitumen Coating	Cement Lining
				Zinc Coating followed by Blue Epoxy Coating	Cement Lining
Screwed Flanged Pipes	80 to 450	—	—	Zinc Coating followed by Black Bitumen Coating	Cement Lining
				Zinc Coating followed by Blue Epoxy Coating	Cement Lining
“As Cast” Flanged Pipes	80 to 1200	—	Length (Under 2 meter)	Zinc Coating followed by Black Bitumen Coating	Cement Lining
				Zinc Coating followed by Blue Epoxy Coating	Cement Lining
				Fusion Bonded Epoxy (FBE)	FBE

Restrained Joint

The RASHMI-LOCK Restrained Jointing system offers a restrained, semi-flexible push-in jointing for Ductile Iron Pipes. It's a self-restrained socket and spigot joint that allows deflection within the designed range. The system transfers internal pressure from fluid flow to the adjacent pipe. This is achieved through weld beads on the spigot and lock segments.

This jointing system eliminates the need for thrust blocks, enabling trenchless laying of pipes. It's suitable for seismic zones, fault crossings, liquefaction zones, connections to structures, floating pipelines, Hydro Power plants, steep slopes, firefighting mains, and dewatering pipelines. Complies with EN545/ISO 2531/ISO10804-1 standards and is available in sizes DN 40-DN 1000.

Technical Specifications

Product Name	RASHMI –LOCK suitable for restrained semi flexible Push-on-Jointing
Size Range	DN 40mm to DN 1000mm
Standard Length	5.5 m or customized length *
Internal Linings	• Sulphate resisting cement • Blast furnace slag cement • Ordinary Portland cement • High Alumina cement • Polyurethane coating • Seal coat
Outside Coatings	• Zinc or Zinc-Aluminium deposition of 130 gm/m² / 200 gm/m² / 400 gm/m² with finishing layer of Blue or Red Epoxy, Bitumen
Coating of Joint Area	Blue or Red Epoxy / Bituminous coating
Conforming Specifications	Design : ISO 10803 Product : ISO 2531; BS EN 545 Joint : ISO 10804 Rubber Gasket : ISO 4633, BS EN 681-1

*Options available only with prior arrangement

Advantages

- Provides a robust pipe system with a simple locking mechanism.
- Ranges from DN 40 to DN 1000 respectively.
- Can withstand pressure surges.
- Saves a great deal of installation time.
- Polyurethane coating and lining provide extraordinarily high C-value.
- The deflection in the jointing system provides flexibility during operation.
- Can be used in regions with elevated earthquake or earth settlement risks.
- Suitable even for laying in complicated and demanding intersections.

RASHMI-LOCK Pipe Dimensions

Size	Dimensions (mm)			P1	WL
DN	DE	Water / Sewerage	High Pressure Application		
		A	A		
100	118	180	180	121	85
150	170	238	238	127	85
200	222	290	290	144	90
250	-	-	-	-	-
300	326	423	423	173	106
350	378	480	480	176	110
400	429	522	522	184	112
450	480	585	585	198	117
500	532	643	643	199	117
600	635	750	750	208	122
700	-	-	-	-	-
750	-	-	-	-	-
800	842	944	944	199	112
900	945	1080	1080	231	129
1000	-	-	-	-	-

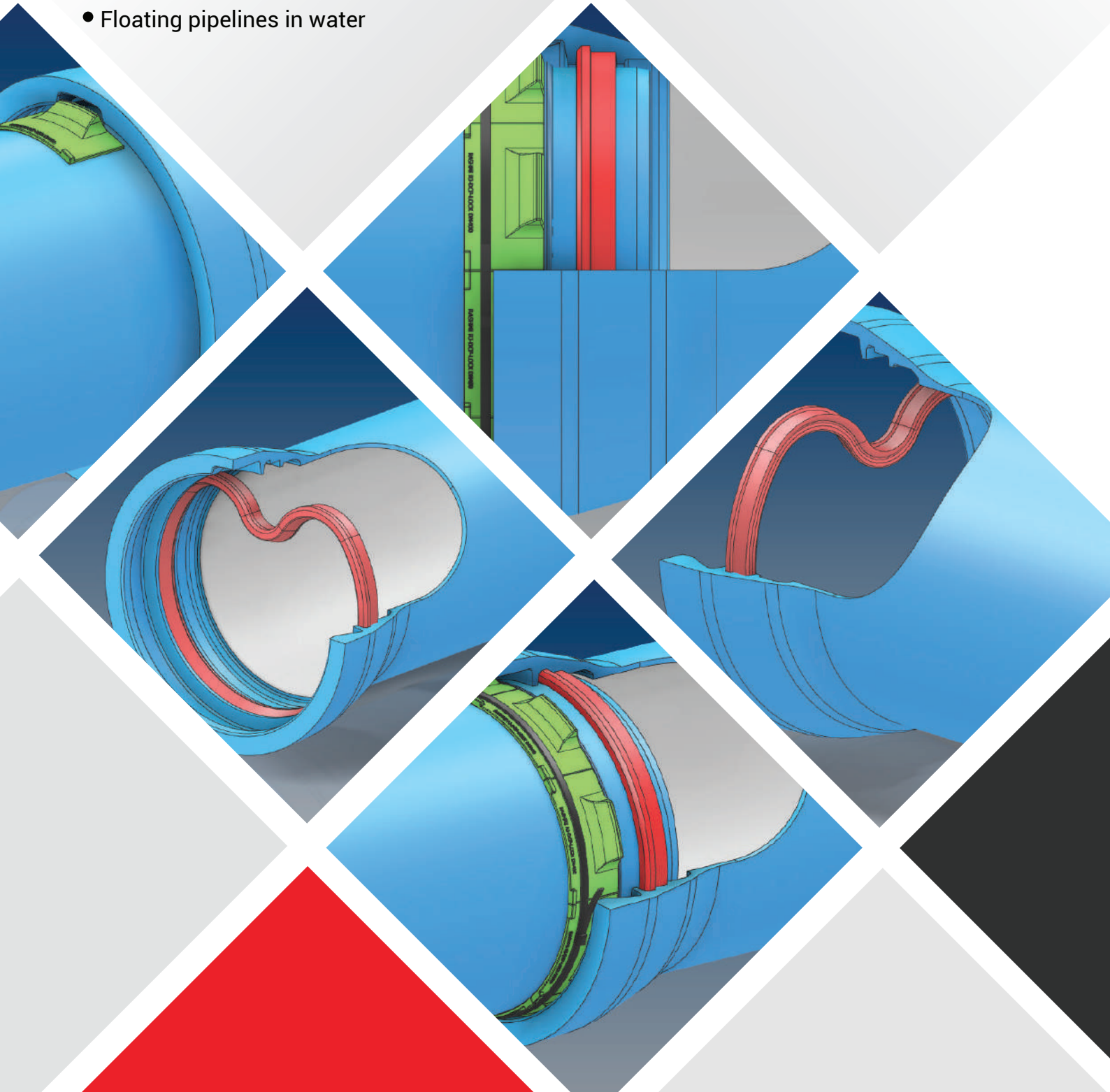
RASHMI-LOCK Allowable Pressure

Size	PFA *(Allowable operating Pressure), bar		Allowable Angular Deflection	No. of Locks
DN	Water / Sewerage	High Pressure Application		
			{0}	(KN)
100	40	100	5	5
150	40	100	5	5
200	40	64	4	8
250	40	64	4	8
300	40	45	4	8
350	30	38	3	8
400	30	35	3	8
500	30	35	3	9
600	35	*	2	10
700	25	*	1.5	10
750	25	*	1.5	10
800	25	*	1.5	10
900	25	*	1.5	12
1000	25	*	1.5	12

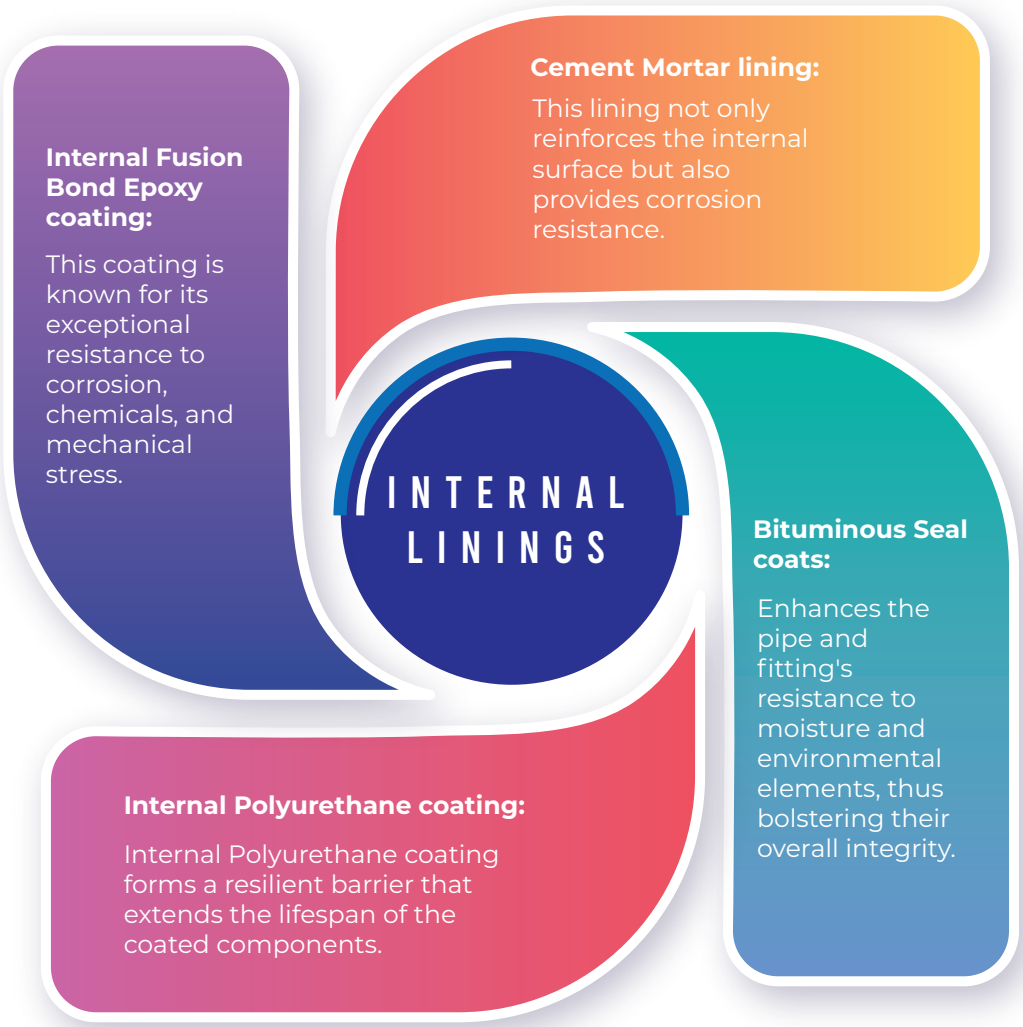
*Details will be made available on request.

Applications

- Trenchless laying of Ductile Iron pipelines
- Laying of Ductile iron pipelines without thrust blocks – for Water Application
- Laying of pipelines on steep slopes
- Hydro-power applications
- Mining applications such as dewatering and temporary water distributions
- Bridge pipelines
- Laying by Horizontal Directional Drilling -Trenchless Application
- Snow-making pipelines
- Firefighting Mains
- District Cooling/Heating Pipelines
- Floating pipelines in water



DI Pipes & Fittings
Linings & Coatings



DI Pipes & Fittings

Internal Protection

Cement Mortar Lining

Rashmi Metaliks' DI Pipes & Fittings are supplied with manually applied cement mortar lining. The lining is composed of cement, sand and water.

Thickness of the Lining

DN (mm)	Thickness (mm)	
	Normal value	Tolerance
100-300	For IS 9523 - 3.0 For BSEN 545 - 4.0 For ISO 2531 - 3.5	For IS 9523 : -1.5 For BSEN 545 : -1.5 For ISO 2531 : -1.0
350-600	5.0	-2.0
700-1200	6.0	-2.5

Seal coat of asphaltic material on Cement Mortar Lining is also done on request.

Bitumen Coating

To protect Pipes & Fittings from external conditions an external layer of min. 70 microns thick bituminous coating, that comply with ISO 2531 / EN 545, is applied to ensure weather-proofing and corrosion resis-tance.

General Specifications

Property	Value	Unit
Coating Thickness	Min. 70	microns
Operating Temperature Range	-10 to 60	°C
Adhesion Strength	500 - 1000	psi
Impact Resistance	10 - 20	inch-lbs
Abrasion Resistance	50 - 100	mg loss
Chemical Resistance	Moderate	
Salt Spray Resistance	500 - 1000	hours
UV Resistance	Yes	
Application Method	Hot-Applied or Cold-Applied	
Coating Color	As per requirement	

DI Pipes & Fittings

Internal Protection

Fusion-Bonded Epoxy (FBE) Coating

Fusion-Bonded Epoxy (FBE) Coating involves application of thermosetting epoxy resin layers to Ductile Iron (DI) Fittings through an electrostatic process. This protective coating serves as an effective corrosion barrier, renowned for its ability to withstand corrosion across a broad temperature spectrum. Additionally, it exhibits exceptional adhesion to the surface of ductile iron.

Specifications of Internal FBE Coating

Property	Value	Unit
Coating Thickness	min. 250	microns
Operating Temperature Range	-30 to 120	°C
Adhesion Strength	3500 - 4500	psi
Impact Resistance	20 - 30	inch-lbs
Abrasion Resistance	50 - 100	mg loss
Chemical Resistance	Excellent	
Salt Spray Resistance	1500 - 2000	hours
Dielectric Strength	1000 - 1500	volts/mil
Flexibility	Yes	
UV Resistance	Yes	
Application Method	Powder Coating	
Cure Temperature	180 - 220	°C
Coating Color	As per requirement	

DI Pipes & Fittings

External Protection

FBE Coating

External Fusion-Bonded Epoxy (FBE) coating on Ductile Iron Fitting increases the fitting's longevity and ensures sustained structural integrity in demanding industrial environments. Its application creates a seamless, resilient shield, safeguarding against chemical and mechanical wear, ensuring top-tier pipeline protection.

Surface Preparation

Parameter	Description
Surface Cleaning	Shotblasting to achieve SA 2.5 or SSPC-SP 10 standard
Surface Profile	40-70 microns (1.5-2.7 mils) roughness (anchor pattern)
Surface Condition	Clean, dry, and free of contaminants
Preheating	Optional, based on substrate and coating thickness

Advantages of Fusion Bond Epoxy Coating

- Excellent Chemical Resistance
- Better Resistance to External Corrosion
- High abrasion and scratch resistance
- Perfect for transporting various liquids
- Excellent adhesion with a glossy and smooth coating
- Different colour options are available based on usage

FBE Coating

External Coating Application and Testing

Parameter	Description
Coating Thickness	Min. 250 microns on the body. Over jointing portion min 150 microns.
Application Method	Electrostatic spray
Application Temperature	200-220°C
Dwell Time	5-10 minutes (may vary with thickness)
Curing Temperature	170-190°C
Inspection	Visual inspection for uniformity, adhesion, and defects
Adhesion Testing	ASTM D4541 or equivalent pull-off test
Holiday Detection	High-voltage spark testing (ASTM G62) or equivalent method
Hardener	ASTM D2517-99, Type I, Grade 2, Class C
Filler Powder	Conforms to manufacturer's recommendations
Preheating Oven	Temperature Range: 270°C - 290°C
Fusion Bond Gun	Conforms to manufacturer's specifications
Blast Equipment	Complies with SA 2.5 or SSPC-SP 10 standard
Operating Temperature	-20°C to + 110°C (Ambient temperature 60°C)
Thickness Testing	ASTM D4138-82 (Dry Film Thickness)
Cure Schedule	Follow manufacturer's recommended cure schedule

Note: All fittings coated with Fusion Bonded Epoxy coating are compliant with European Standard EN 14901

Polyurethane (PU) Coating

A polyurethane coating is applied to the surface of DI Pipes & Fittings to protect it from the inflowing fluids. This coating helps protect fittings from various types of defects such as corrosion, weathering, abrasion, and other deteriorating processes.

Our PU Coated DI Pipes conforms to the international standards EN15655 and EN 15189.

Specifications of PU Coating

Property	Value	Unit
Coating Thickness	800 - 2000	microns
Operating Temperature Range	Upto 45/50	°C
Adhesion Strength	>1450	psi
Impact Resistance	>75	inch-lbs
Abrasion Resistance	<100	mg loss
Chemical Resistance	Yes	
Flexibility	Yes	
Application Method	Spray Coating	
Cure Time	24 - 48 hours	
Coating Color	As per requirement	

PU Coating - Quality Testing

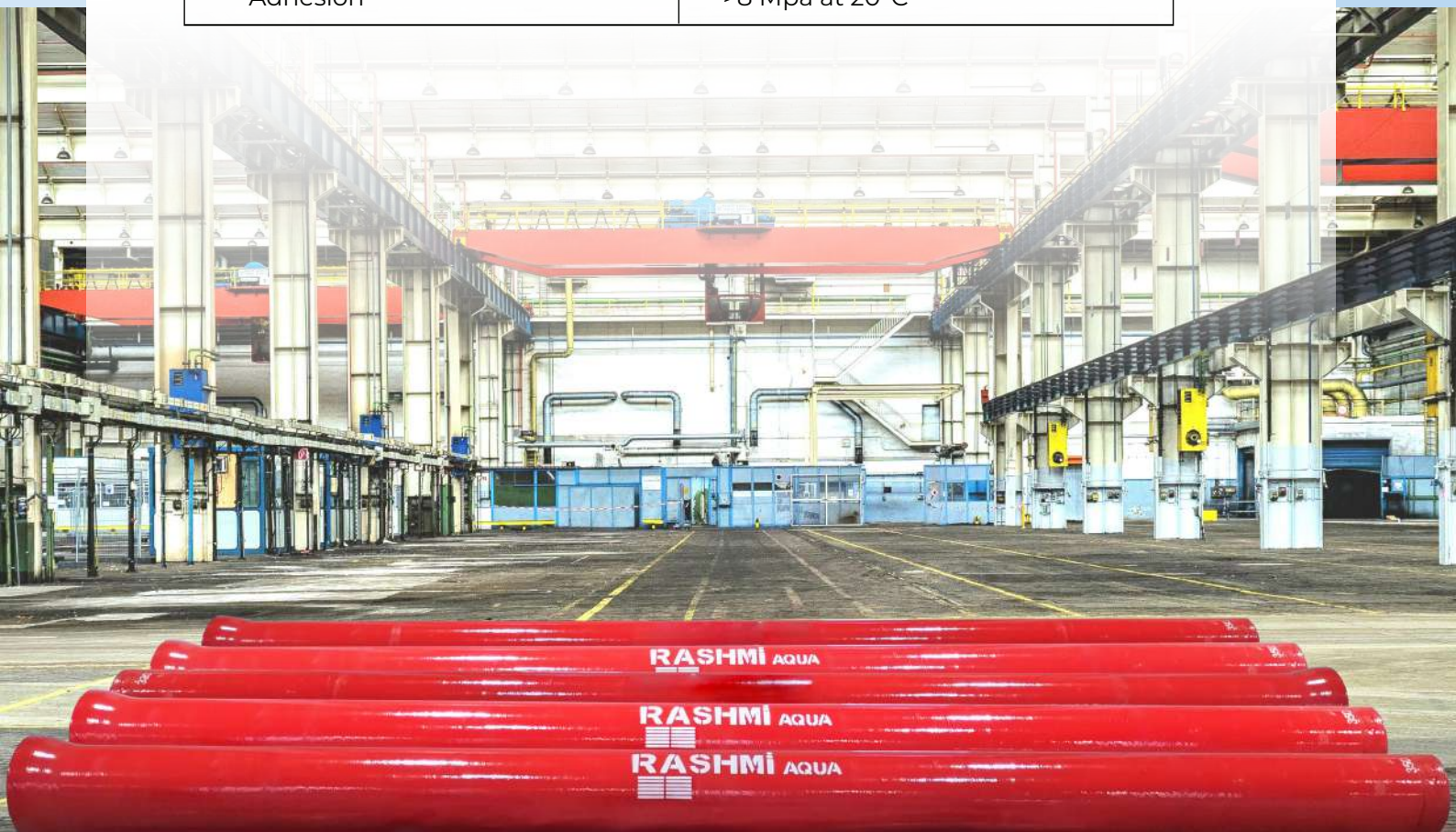
Parameter	Requirement	Clause	Test method	Clause
Chemical Resistance	Less then 15% weight increase after immersion Less then 2% weight loss after drying	6.1	Immersion in deionised water EN ISO 62method 2	7.2.1.1
	Less then 10% weight increase after immersion Less then 4% weight loss after drying		Immersion in diluted sulphuric acid 10% EN ISO 62 method 2	7.2.1.2
Impact Strength	8 J/mm PU-coated pipe barrel 5 J/mm EP-coated spigot end (see EN 14901)	6.2	Dropping weight High voltage test	7.2.2
Indentation Resistance	< 10% at 10 MPa	6.3	Indentation test	7.2.3
Elongation at Break	>2.5%	6.4	Tensile test	7.2.4
Specific Coating Resistance in 0.1 M NaCl	>108 Ωm2	6.5	Resostovotu test towel method or vessel method	7.2.5
Ratio of Coating Resistance	>0.8	6.5	Res.d/res. 70d	7.2.5

DI Pipes & Fittings
External Protection

PU Coating

External polyurethane (PU) coating on DI Pipes & Fittings enhances corrosion resistance. It extends the fittings' service life, providing a durable barrier against harsh environmental conditions while maintaining the integrity of the fluid conveyance system.

Property	Specification
Chemical Structure	Polyurethane
Coating Thickness	800 - 2000 microns
Hardness	>70 Shore D
Density	Typically 1.0 - 1.2 g/cm^3
Elongation at Break	>2.5%
UV Resistance	Yes
Abrasion Resistance	Yes
Curing Time	1 - 48 hours
Dry Film Thickness (microns)	800 - 2000
Adhesion	>8 Mpa at 20°C



PU Coating

Polyurethane Coatings Thickness by Application

Property	Specification (Unit - microns)
Water Distribution Systems	800 - 2000
Sewage and Wastewater Systems	800 - 2000

Advantages of Polyurethane Coating

- Highly resistant to abrasion
- Strong impact resistance
- Chemical resistance
- Suitable for handling heavy flows of fluids
- Provides UV resistance
- Aggressive fluid conveyance
- Protection from corrosion and weathering

Rashmi Metaliks
Quality Assurance

Rashmi Metaliks holds the belief that Quality Control plays a pivotal role in ensuring the creation of flawless Ductile Iron Pipes and Fittings. This commitment to quality control is integrated into every phase of production, beginning with the scrutiny of Raw Materials and culminating in the thorough examination of the Finished Product.

We diligently uphold a regime of in-process inspection and quality control throughout the entirety of the production process. These practices are meticulously recorded and managed according to international standards within our documented Management System.

Design

Design Department

Pattern Shop

Sand Testing

Permeability Meter Universal Strength Machine

Sieve Shaker

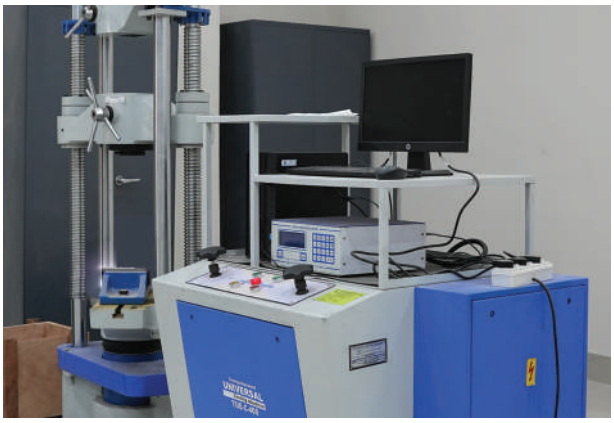
Compactability Tester

Rashmi Metaliks
Quality Assurance

Physical Testing

Spectrometer


Metalsoft microscope


Universal Testing Machine

Hardness Testing Machine

Finishing Facility


Shot Blasting Facility


Fettling

Rashmi Metaliks
Quality Assurance

Dimension Inspection

Dimensional checking

Inspection with Go, No-Go gauge

Machining Facility

Maching being done

Drilling being done

Multi Drilling

Hydrostatic Pressure Testing of Fittings

Machine Shop

Rashmi Metaliks
Quality Policy

Having an integrated iron and steel plant supplying raw materials to Rashmi Metaliks enhances quality control by ensuring consistent material standards and reducing variability. This integration streamlines production processes, lowers transportation costs, and optimizes resource allocation, enabling competitive pricing for ductile iron pipes and fittings while maintaining high quality and reliability.

Key elements of our quality policy include:

Customer Satisfaction: Understanding and fulfilling our customers' needs is our top priority. We strive to consistently deliver products and services that meet or surpass their expectations.

Compliance: We rigorously adhere to industry standards and regulations to ensure the quality and integrity of our manufacturing processes.

Continuous Improvement: We foster a culture of continuous improvement, encouraging innovation and efficiency in our manufacturing methods, products, and services.

Employee Engagement: We empower our team members through training and involvement, encouraging them to take ownership of quality at every stage of production.

Sustainability: We are committed to environmental responsibility, promoting eco-friendly practices to reduce our ecological impact.

Rashmi Metaliks
Quality Certificates

bsi.

Kitemark™ Certificate

This is to certify that: Rashmi Metaliks Limited (DIP Division)
Vill-Gopinathpur
PO-Changual,Kharagpur,
Paschim Medinipur
West Bengal
721301
India

Holds Certificate Number: KM 793698

In respect of:

BS ISO 2531
Ductile iron pipes, fittings, accessories and their joints for water applications

This issues the right and licence to use the Kitemark in accordance with the Kitemark Terms and Conditions governing the use of the Kitemark, as may be updated from time to time by BSI Assurance UK Ltd (the "Conditions"). All defined terms in this Certificate shall have the same meaning as in the Conditions.

The use of the Kitemark is authorized in respect of the Product(s) detailed on this Certificate provided at or from the above address.

For and on behalf of BSI: Shahm Barhom, Group Product Certification Director

First Issued: 2023-09-28 Effective Date: 2023-09-28
Latest Issue: 2023-09-28 Expiry Date: 2026-08-23

Page: 1 of 7

bsi.

Kitemark™ Certificate

This is to certify that: Rashmi Metaliks Limited (DIP Division)
Vill-Gopinathpur
PO-Changual,Kharagpur,
Paschim Medinipur
West Bengal
721301
India

Holds Certificate Number: KM 793696

In respect of:

BS EN 545
Ductile iron pipes, fittings, accessories and their joints for water pipelines

This issues the right and licence to use the Kitemark in accordance with the Kitemark Terms and Conditions governing the use of the Kitemark, as may be updated from time to time by BSI Assurance UK Ltd (the "Conditions"). All defined terms in this Certificate shall have the same meaning as in the Conditions.

The use of the Kitemark is authorized in respect of the Product(s) detailed on this Certificate provided at or from the above address.

For and on behalf of BSI: Shahm Barhom, Group Product Certification Director

First Issued: 2023-09-28 Effective Date: 2023-09-28
Latest Issue: 2023-09-28 Expiry Date: 2026-08-23

Page: 1 of 7

bsi.

Certificate of Registration

ENVIRONMENTAL MANAGEMENT SYSTEM - ISO 14001:2015

This is to certify that: Rashmi Metaliks Limited
Premlata Building, 6th Floor
39, Shakespeare Sarani
Kolkata 700 017
West Bengal
India

Holds Certificate No: **EMS 620622**

and operates an Environmental Management System which complies with the requirements of ISO 14001:2015 for the following scope:

The Manufacture of Various Grades and Sizes of Ductile Iron Pipes for Different Application.

For and on behalf of BSI: Theuns Kotze, Managing Director Assurance - IMETA

Original Registration Date: 2015-01-05 Effective Date: 2023-12-31
Latest Revision Date: 2023-11-27 Expiry Date: 2026-12-30

Page: 1 of 2

...making excellence a habit.

bsi.

Certificate of Registration

OCCUPATIONAL HEALTH & SAFETY MANAGEMENT SYSTEM - ISO 45001:2018

This is to certify that: Rashmi Metaliks Limited
Premlata Building, 6th Floor
39, Shakespeare Sarani
Kolkata 700 017
West Bengal
India

Holds Certificate No: **OHS 620627**

and operates an Occupational Health and Safety Management System which complies with the requirements of ISO 45001:2018 for the following scope:

The Manufacture and Supply of Various Grades and Sizes of Ductile Iron Pipes for Different Application.

[Previously certified to BS OHSAS 18001:2007 since 06-04-2015]

For and on behalf of BSI: Theuns Kotze, Managing Director Assurance - IMETA

Original Registration Date: 2020-12-07 Effective Date: 2024-02-05
Latest Revision Date: 2024-02-05 Expiry Date: 2027-02-04

Page: 1 of 2

...making excellence a habit.

Rashmi Metaliks

Quality Certificates

bsi.

Certificate of Registration

QUALITY MANAGEMENT SYSTEM - ISO 9001:2015

This is to certify that: Rashmi Metaliks Limited
Premlata Building, 6th Floor
39, Shakespeare Sarani
Kolkata 700 017
West Bengal
India

Holds Certificate No: FM 578917

and operates a Quality Management System which complies with the requirements of ISO 9001:2015 for the following scope:

The Design & Development, Manufacture and Supply of Various Grades and Sizes of Ductile Iron Pipes for Different Applications.

For and on behalf of BSI:

Theuns Kotze, Managing Director Assurance - IMETA

Original Registration Date: 2011-09-07
Latest Revision Date: 2023-07-14

Effective Date: 2023-08-24
Expiry Date: 2026-08-23

Page: 1 of 2

...making excellence a habit.

National Accreditation Board for Testing and Calibration Laboratories

NABL

CERTIFICATE OF ACCREDITATION

RASHMI METALIKS LIMITED (DI PIPE DIVISION)
QUALITY CONTROL LABORATORY

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2017

"General Requirements for the Competence of Testing & Calibration Laboratories"

for its facilities at

NH-06,VILL-GOKULPUR P.O SHYAMRAIPUR, KHARAGPUR, MEDINIPUR WEST, WEST BENGAL, INDIA

in the field of

TESTING

Certificate Number: TC-15394

Issue Date: 31/01/2025 Valid Until: 30/01/2029

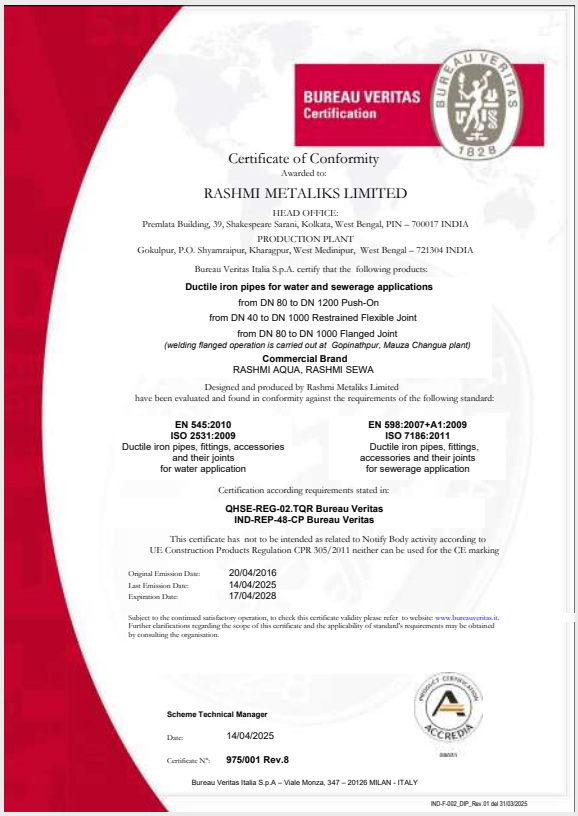
This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the relevant requirements of NABL.
(To see the scope of accreditation of thislaboratory, you may also visit NABL website www.nabl-india.org)

Name of Legal Entity: Rashmi Metaliks Limited

Signed for and on behalf of NABL

Anuja Anand
Director

N. Venkateswaran
Chief Executive Officer



BUREAU VERITAS Certification

Certificate of Conformity

Awarded to:

RASHMI METALIKS LIMITED

HEAD OFFICE:
Premlata Building, 39, Shakespeare Sarani, Kolkata, West Bengal, PIN – 700017 INDIA
PRODUCTION PLANT
Gokulpur, P.O. Shyamraipur, Kharagpur, West Medinipur, West Bengal – 721304 INDIA

Bureau Veritas Italia S.p.A. certify that the following products:

Ductile iron pipes for water and sewerage applications
from DN 80 to DN 1200 Push-On
from DN 40 to DN 1000 Restrained Flexible Joint
from DN 80 to DN 1000 Flanged Joint
(welding flanged operation is carried out at Gopinathpur, Mauza Changua plant)
Commercial Brand
RASHMI AQUA, RASHMI SEWA

Designed and produced by Rashmi Metaliks Limited
have been evaluated and found in conformity against the requirements of the following standard:

EN 545:2010 ISO 2531:2009	EN 598:2007+A1:2009 ISO 7186:2011
Ductile iron pipes, fittings, accessories and their joints for water application	Ductile iron pipes, fittings, accessories and their joints for sewerage application

Certification according requirements stated in:

QHSE-REG-02.TQR Bureau Veritas
IND-REP-48-CP Bureau Veritas

This certificate has not to be intended as related to Notify Body activity according to UE Construction Products Regulation CPR 305/2011 neither can be used for the CE marking

Original Emission Date: 20/04/2016
Last Emission Date: 14/04/2025
Expiration Date: 17/04/2028

Subject to the continued satisfactory operation, to check this certificate validity please refer to website: www.bureauveritas.it.
Further clarifications regarding the scope of this certificate and the applicability of standard's requirements may be obtained by consulting the organisation.

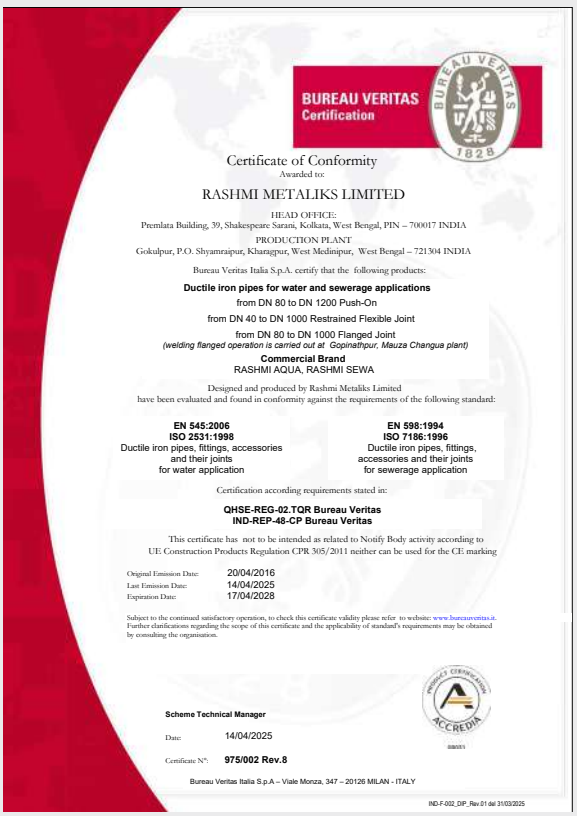
Scheme Technical Manager

Date: 14/04/2025

Certificate N°: **975/001 Rev.8**

Bureau Veritas Italia S.p.A – Viale Monza, 347 – 20126 MILAN - ITALY

IND-F-002_DP_Rev.01 del 31/03/2025



BUREAU VERITAS Certification

Certificate of Conformity

Awarded to:

RASHMI METALIKS LIMITED

HEAD OFFICE:
Premlata Building, 39, Shakespeare Sarani, Kolkata, West Bengal, PIN – 700017 INDIA
PRODUCTION PLANT
Gokulpur, P.O. Shyamraipur, Kharagpur, West Medinipur, West Bengal – 721304 INDIA

Bureau Veritas Italia S.p.A. certify that the following products:

Ductile iron pipes for water and sewerage applications
from DN 80 to DN 1200 Push-On
from DN 40 to DN 1000 Restrained Flexible Joint
from DN 80 to DN 1000 Flanged Joint
(welding flanged operation is carried out at Gopinathpur, Mauza Changua plant)
Commercial Brand
RASHMI AQUA, RASHMI SEWA

Designed and produced by Rashmi Metaliks Limited
have been evaluated and found in conformity against the requirements of the following standard:

EN 545:2006 ISO 2531:1998	EN 598:1994 ISO 7186:1996
Ductile iron pipes, fittings, accessories and their joints for water application	Ductile iron pipes, fittings, accessories and their joints for sewerage application

Certification according requirements stated in:

QHSE-REG-02.TQR Bureau Veritas
IND-REP-48-CP Bureau Veritas

This certificate has not to be intended as related to Notify Body activity according to UE Construction Products Regulation CPR 305/2011 neither can be used for the CE marking

Original Emission Date: 20/04/2016
Last Emission Date: 14/04/2025
Expiration Date: 17/04/2028

Subject to the continued satisfactory operation, to check this certificate validity please refer to website: www.bureauveritas.it.
Further clarifications regarding the scope of this certificate and the applicability of standard's requirements may be obtained by consulting the organisation.

Scheme Technical Manager

Date: 14/04/2025

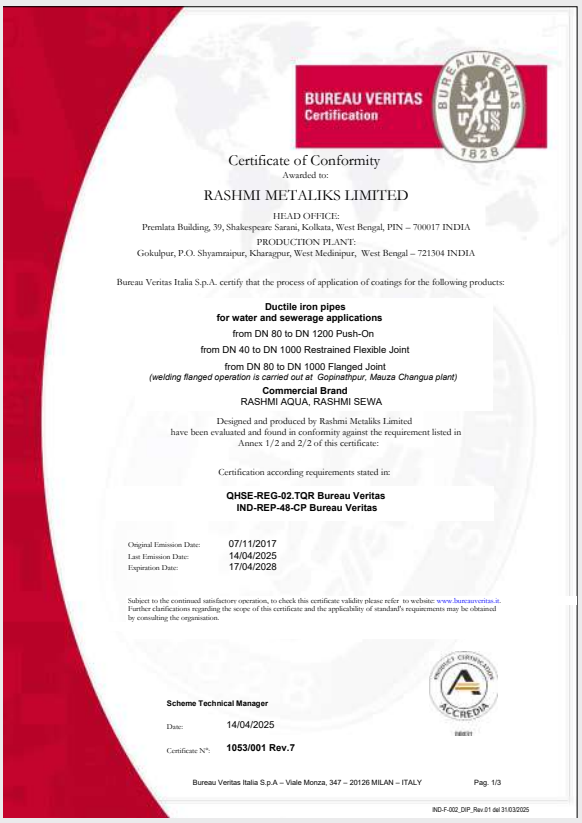
Certificate N°: **975/002 Rev.8**

Bureau Veritas Italia S.p.A – Viale Monza, 347 – 20126 MILAN - ITALY

IND-F-002_DP_Rev.01 del 31/03/2025

Rashmi Metaliks

Quality Certificates



BUREAU VERITAS
Certification

Certificate of Conformity

Awarded to:

RASHMI METALIKS LIMITED

HEAD OFFICE:
Premlata Building, 39, Shakespeare Sarani, Kolkata, West Bengal, PIN – 700017 INDIA
PRODUCTION PLANT:
Gokulpur, P.O. Shyamraipur, Kharagpur, West Medinipur, West Bengal – 721304 INDIA

Bureau Veritas Italia S.p.A. certify that the process of application of coatings for the following products:

Ductile iron pipes
for water and sewerage applications
from DN 80 to DN 1200 Push-On
from DN 40 to DN 1000 Restrained Flexible Joint
from DN 80 to DN 1000 Flanged Joint
(welding flanged operation is carried out at Gopinathpur, Mauza Changua plant)
Commercial Brand
RASHMI AQUA, RASHMI SEWA

Designed and produced by Rashmi Metaliks Limited
have been evaluated and found in conformity against the requirement listed in
Annex 1/2 and 2/2 of this certificate:

Certification according requirements stated in:

QHSE-REG-02.TQR Bureau Veritas
IND-REP-48-CP Bureau Veritas

Original Emission Date: 07/11/2017
Last Emission Date: 14/04/2025
Expiration Date: 17/04/2028

Subject to the continued satisfactory operation, to check this certificate validity please refer to website: www.bureauveritas.it.
Further clarifications regarding the scope of this certificate and the applicability of standard's requirements may be obtained by consulting the organisation.

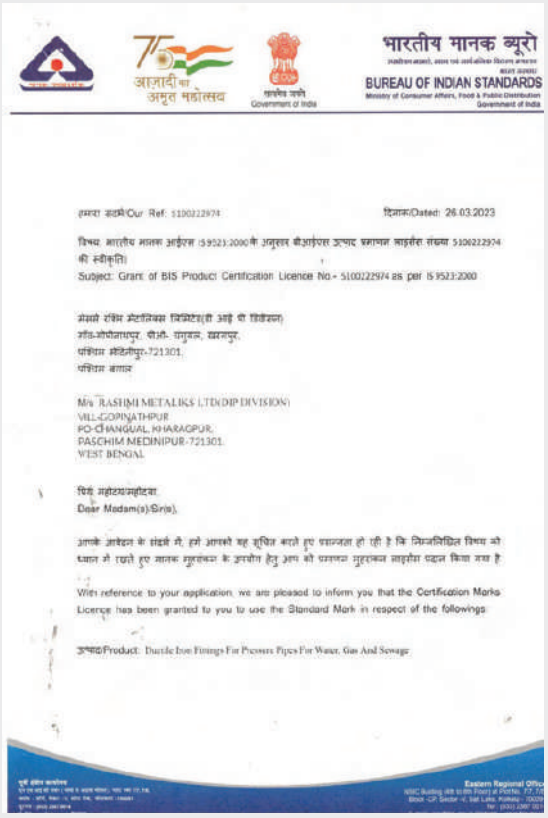
Scheme Technical Manager

Date: 14/04/2025

Certificate N°: **1053/001 Rev.7**

Bureau Veritas Italia S.p.A – Viale Monza, 347 – 20126 MILAN – ITALY Pag. 1/3

IND-F-002_DP_Rev.01 del 31/03/2025



आज़ादी का अमृत महोत्सव

Government of India

भारतीय मानक ब्यूरो

BUREAU OF INDIAN STANDARDS

Ministry of Consumer Affairs, Food & Public Distribution
Government of India

Our Ref: 5100222974 दिनांक/Dated: 26.03.2023

विषय: भारतीय मानक आईएस 9523:2000 के अनुसार बीआईएस उत्पाद प्रमाणन लाइसेंस संख्या 5100222974 की स्वीकृति।
Subject: Grant of BIS Product Certification Licence No.- 5100222974 as per IS 9523:2000

मेसर्स रश्मि मेटालिक्स लिमिटेड(डी आई पी डिवीजन)
ग्राम-गोपीनाथपुर, पी.ओ- चांगुआल, खड़गपुर,
पश्चिम मेदिनीपुर-721301,
पश्चिम बंगाल

M/s RASHMI METALIKS LTD(DIP DIVISION)
VILL-GOPINATHPUR
PO-CHANGUAL, KHARAGPUR,
PASCHIM MEDINIPUR-721301,
WEST BENGAL

प्रिये महोदय/महोदया
Dear Madam(s)/Sir(s),

आपके आवेदन के संदर्भ में, हमें आपको यह सूचित करते हुए प्रसन्नता हो रही है कि निम्नलिखित विषय को ध्यान में रखते हुए मानक गुरुत्वमार्क के उपयोग हेतु आप को प्रमाणन गुरुत्वमार्क लाइसेंस प्रदान किया गया है

With reference to your application, we are pleased to inform you that the Certification Marks Licence has been granted to you to use the Standard Mark in respect of the followings:

उत्पाद/Product: Ductile Iron Fittings For Pressure Pipes For Water, Gas And Sewage

Eastern Regional Office

Approval Number 2109552
Test Report: J-00392658 & J-00392659

26th October 2021

Waheguru Rubber Manufacturing Co. (P) Ltd
732/A, Delhi Road,
Post Office - Beliumki,
Dist. - Hooghly,
West Bengal - 712223,
India

WRAS APPROVED MATERIAL

Water Regulations Approval Scheme Ltd.
Unit 13,
Willow Road,
Pen y Fan Industrial Estate,
Crumlin,
Gwent,
NP11 4EG

WATER REGULATIONS APPROVAL SCHEME LTD. (WRAS)
MATERIAL APPROVAL

The material referred to in this letter is suitable for contact with wholesome water for domestic purposes having met the requirements of BS6920-1:2000 and/or 2014 'Suitability of non-metallic products for use in contact with water intended for human consumption with regard to their effect on the quality of the water'.

The reference relates solely to its effect on the quality of the water with which it may come into contact and does not signify the approval of its mechanical or physical properties for any use.

RUBBERS- ETHYLENE PROPYLENE DIENE MONOMER (EPDM) - MATERIAL ONLY. **5365**

'S/EP-50, S/EP-60, S/EP-70 & S/EP-80'.

Black coloured, compression moulded EPDM materials with a shore hardness of between 50A & 80A. Tested in-radius size 1.05mm.

For use with water up to 65°C.

APPROVAL NUMBER: 2109552
APPROVAL HOLDER: WAHEGURU RUBBER MANUFACTURING CO. (P) LTD

The Scheme reserves the right to review approval.
Approval 2109552 is valid between September 2021 and September 2026

An entry, as above, will accordingly be included in the Water Fittings Directory on-line under the section headed, 'Materials which have passed full tests of effect on water quality'.

The Directory may be found at: www.wrasapprovals.co.uk/approvals-directory/

Yours Faithfully

Ian Hughes
WRAS Approvals Manager

The Water Regulations Approval Scheme Ltd. Registered in England No. 1303284 Registered office: 6D Lowick Close, Hazel Grove, Stockport, SK7 5ED
WRAS App-205F1 ver 2.0 Tel:+44(0)1495 244 666 Fax:+44(0)1495 244 666 Email:info@wrasapprovals.co.uk website:www.wrasapprovals.co.uk Page 1 of 9

Approval Number 2104522
Test Report: MA7254/E

29th April 2021

Rashmi Metaliks Ltd.
Gokulpur,
PO Shyamraipur,
Kharagpur,
Dist. West Midnapore,
West Bengal,
721301,
India

WRAS APPROVED MATERIAL

Water Regulations Advisory Scheme Ltd.
Unit 13,
Willow Road,
Pen y Fan Industrial Estate,
Crumlin,
Gwent,
NP11 4EG

WATER REGULATIONS ADVISORY SCHEME LTD. (WRAS)
MATERIAL APPROVAL

The material referred to in this letter is suitable for contact with wholesome water for domestic purposes having met the requirements of BS6920-1:2000 and/or 2014 'Suitability of non-metallic products for use in contact with water intended for human consumption with regard to their effect on the quality of the water'.

The reference relates solely to its effect on the quality of the water with which it may come into contact and does not signify the approval of its mechanical or physical properties for any use.

COATINGS, PAINTS & LININGS- FACTORY APPLIED PIPE & FITTINGS COATINGS. **5030**

'Parasakti Sulphate Resisting Portland
Cement'.

Factory applied, grey coloured Sulphate Resistant cement mortar.

Mix cement, sand and water in a 1: 1.5: 0.5 ratio. Cure for 28 days@5°C.

For use with water up to 65°C.

This material is only approved for the mixing and curing conditions that appear on the approval. If the mixing and/or curing conditions are varied from those specified on the approval then the materials are not covered by the scope of the approval.

APPROVAL NUMBER: 2104522
APPROVAL HOLDER: RASHMI METALIKS LTD.

The Scheme reserves the right to review approval.
Approval 2104522 is valid between April 2021 and April 2026

An entry, as above, will accordingly be included in the Water Fittings Directory on-line under the section headed, 'Materials which have passed full tests of effect on water quality'.

The Directory may be found at: www.wrasapprovals.co.uk/approvals-directory/

Yours Faithfully

Ian Hughes
WRAS Approvals Manager

The Water Regulations Advisory Scheme Ltd. Registered in England No. 06663930 Registered office: 6D Lowick Close Hazel Grove Stockport SK7 5ED
WRAS App-204F1 ver 1.0 Tel:+44(0)333 207 9030 Fax:+44(0)1495 248 540 Email:info@wras.co.uk website:www.wras.co.uk Page 1 of 2

We Transport **Water** With Responsibility & **Safety**

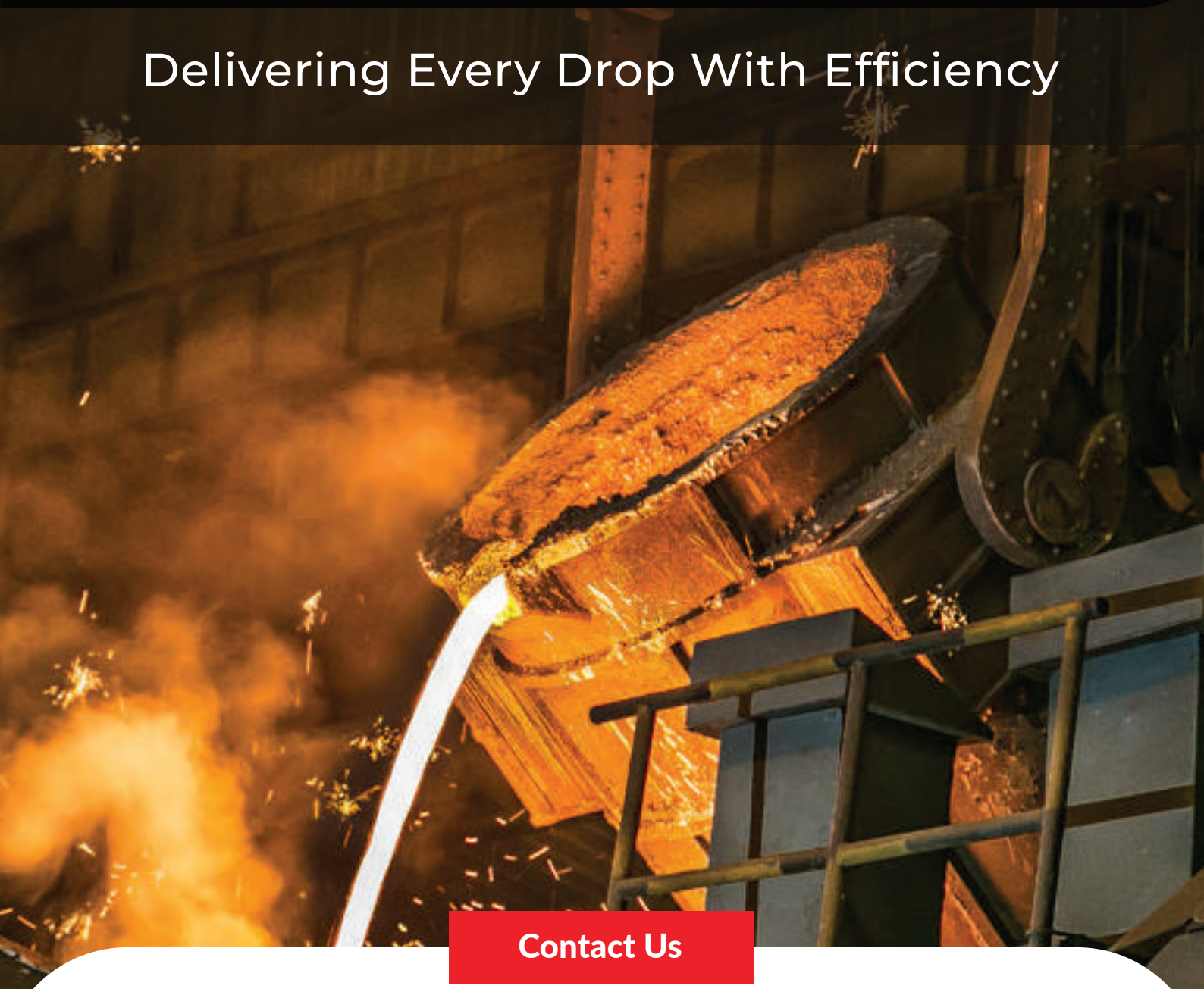
www.rashmimetaliks.com

Rashmi Metaliks
Global Presence

We recognize the significance of embracing a global outlook in an interconnected world. This has driven Rashmi Metaliks to bolster its global footprint through strategic ventures across the world.

Operating in 25 countries and comprising a diverse team representing many nationalities, our global footprint is expanding, particularly in established regions such as India, and more recently, in China and Vietnam.

Delivering Every Drop With Efficiency



Contact Us

Offices

Registered Office
Premlata Building, 39, Shakespeare Sarani, 6th Floor,
Kolkata – 700017 West Bengal, India.

Corporate Office
9, AJC Bose Road, Ideal Center, First Floor, Kolkata – 700017
West Bengal, India.

Factory

Plant 1
Gokulpur, P.O.: Shyamraipur,
Dist.: West Midnapur, West Bengal, India.

Plant 2
Gopinathpur and Jethia A.D.S.R., Khatranga,
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