TATA

TATA DUCTURA

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Product Brochure

Tata Metaliks DI Pipes Limited

About Tata Metaliks DI Pipes Limited (TMDIPL)

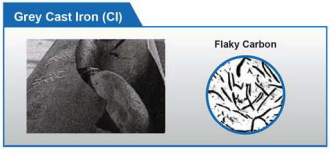
Tata Metaliks DI Pipes Limited, formerly known as **Tata Metaliks Kubota Pipes Limited**, started as a joint venture between Tata Metaliks Limited, Kubota Corporation, Japan and Metal One Corporation, Japan in October 2007. The objective was to set up a plant at Kharagpur, Paschim Midnapur, West Bengal to manufacture and sell Ductile Iron Pressure Pipes (DI Pipes) used for water transmission. The company started its commercial operation in May 2009, with installed capacity of 110,000 tonnes per annum.

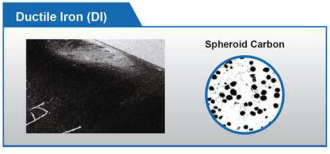
Pursuant to a strategy of obtaining synergy benefit of single value chain i.e. from iron ore to DI Pipes, the company has become a wholly owned subsidiary of Tata Metaliks Limited, a Tata Steel group company, from April 2013. Consequently the company was renamed as Tata Metaliks DI Pipes Limited from January 1st, 2014.

'Tata Ductura', the DI Pipe brand of TMDIPL, carries 'Tata Assurance of Quality'- Commitment to timely delivery, easy installation, technically superior product and ethical business practices.

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.

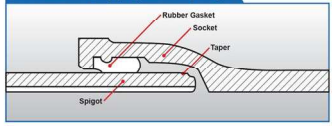




Ductile Iron pipe (DI pipe)

Ductile iron pipes come with socket and spigot ends. A rubber gasket is required as an accessory for all sockets before joining socket and spigot. Ductile iron is known for its longevity. Ductile iron is corrosion resistant and highly durable, which makes it the preferred choice for pipeline networks all over the world.

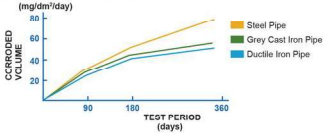
Structure of DI pipe (push-on joint)



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/cm²)	
	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



Availability of flexible joints

When pipeline is required to be deflected, ductile iron pipeline can be deflected by means of deflecting the pipeline at joints within their allowable angular deflection. When ground sinking or ground movement occurs, DI pipe lines can be adjusted to ground movement for the sake of each joint flexibility. TMDIPL ductile iron pipe shows higher angle of deflection than others.

DN	Angle of Deflection
80 - 200	5°
250 - 300	4°
400	3°
500 - 600	3°
700 - 800	2°

Manufacturing process

TMDIPL maintains excellent standards in its manufacturing process. Equipped with modern technology like Magnesium treatment by converter process, TMDIPL ensures high process capability and stringent quality control.

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^2)	1.5 to 1.7 x 10^5	2.1 x 10^5	2.7 to 3.0 x 10^3	1.3 x 10^3	2.1 x 10^5
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^{-5}	1.0 x 10^{-5}	6 to 8 x 10^{-5}	1.3 x 10^{-4}	1.1 x 10^{-5}

Highly durable cement mortar lining

Ductile iron pipe for water supply is lined with cement mortar. The lining is done by centrifugal process. The cement mortar applied to pipe achieves complete setting in a short time when subjected to steam curing. Also, by steam curing, cement mortar lining can be finished uniformly without being affected by the weather or temperature conditions. A dense and uniform lining with a smooth surface is obtained, which offers little resistance to running water and has an excellent flow capability. Tests made on DI Pipes showed very high Hazen-Williams coefficient indicating high level of smoothness of cement mortar lining.

Excellent smooth surface

Usually, cement mortar lining has a rough surface because of thin cement layers called laitance. At TMDIPL, an internal grinding procedure after cement mortar lining is done, and the laitance is ground with a grinding wheel. After the grinding process, the pipes show very smooth surface.

Excellent workability

Jointing of ductile iron pipe is very easy. Only a rubber gasket is required as an accessory to join. DI pipes can be jointed in rainy situations or even high ground level and require no special tool or highly skilled workforce. Unlike other pipe materials, ductile iron pipe has an allowable angle of deflection. This easily helps the alignment work.

In an actual pipe laying site, the pipeline is installed avoiding underground obstacles. And unlike the design stage, actual pipeline is not required to be aligned straight. Ductile iron pipe requires no special sand bed before laying due to its high tensile strength. DI pipes are extremely workable and the ease of laying and jointing of these pipes is less expensive compared to pipes made from other materials.

Product portfolio

Tata Metaliks DI Pipes is committed to exceed customers expectations in product quality, supply and service. The company manufactures ductile iron pipes conforming to:

Nominal Diameter	Class	Standard Length (m)
80, 100, 150, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800	K7, K9 C25, C30, C40	5.5

- **EN 545: 2006** ISO2531:1998
- **EN 545: 2010** ISO2531: 2009
- **EN 598: 2007 + A1:2009** ISO 7186:2011
- **IS 8329:2000**

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

	Pressure Class		Thickness Class		Allowable Operating Pressure (MPa)	
DN	Preferred Class	Nominal Thickness (mm)	Class	Nominal Thickness (mm)	K9	**C - Class
80	C40	4.4	K9	6.0	6.4	4.0
100	C40	4.4	K9	6.0	6.4	4.0
150	C40	4.5	K9	6.0	6.4	4.0
200	C40	4.7	K9	6.3	6.2	4.0
250	C40	5.5	K9	6.8	5.4	4.0
300	C40	6.2	K9	7.2	4.9	4.0
350	C30	6.3	K9	7.7	4.5	3.0
400	C30	6.5	K9	8.1	4.2	3.0
450	C30	6.9	K9	8.6	4.0	3.0
500	C30	7.5	K9	9.0	3.8	3.0
600	C30	8.7	K9	9.9	3.6	3.0
700	C25	8.8	K9	10.8	3.4	2.5
800	C25	9.6	K9	11.7	3.2	2.5

** Preferred 'C' Classes as per ISO 2531 : 2009

Pipe Class	Thickness Class (K7 & K9) and Pressure Class (C40, C30, C25)
Internal Lining	Cement mortar lining as per requirement with Ordinary Portland Cement, Sulphate Resisting Cement and Blast Furnace Slag Cement according to ISO 4179 and High Alumina Cement for waste water application
External Protection	Metallic Zinc (130 gm/m² or 200 gm/m² or 400 gm/m² as per customer requirement) complying to ISO 8179 with a finishing layer of Black Bitumen / Epoxy Coating (minimum thickness 70 micron) or any other special coating as per customer requirement. Zn-Al alloy coating with 400 gm/m² are also offered as per requirement
Type of Joint	Flexible joint type Tyton. Gasket in EPDM material according to EN 681 - 1 and ISO 4633

*Specifications are subjected to change without any prior information / notice.

5

Lauded and Recognized

Perhaps the greatest proof of Tata Metaliks DI Pipes' reputation as the market leader in 'Product Quality' stems from the host of certificates and licenses the company has received from various bodies recognised nationally and internationally.

Some of the certifications it has been awarded with are:-

- **EN 545: 2006 ISO2531:1998**
- **EN 545: 2010 ISO2531: 2009**
- **EN 598: 2007 + A1:2009 ISO 7186:2011**
- **IS 8329:2000**
- **ISO 9001:2008**
- **ISO 14001:2004**
- **OHSAS 18001:2007**

BUREAU VERITAS Certification

Certificate of Conformity

Awarded to

TATA METALIKS DI PIPES LIMITED

HEAD OFFICE
Tata centre, 10th Floor 43, Jawaharlal Nehru Road,
Kolkata 700071 - INDIA

PRODUCTION PLANT:
Samraipur, Kharagpur – District: Paschim Medinipur
721301, West Bengal - 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 800 mm

produced by TATA METALIKS DI PIPES LIMITED
have been evaluated and found in conformity against the requirements of the following standard

EN 545:2006
ISO2531: 1998
Ductile iron pipes, fittings, accessories and their joints for water application

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

Certification according requirements stated in:

RT ACCREDIA 06
GP01P Bureau Veritas Italia S.p.A. rev. 7 07/2012

23/07/2013
13/01/2014
22/07/2016

13/01/2014
744/002A

ACCREDIA

BUREAU VERITAS Certification

Certificate of Conformity

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23/07/2013
13/01/2014
22/07/2016

13/01/2014
744/001A

ACCREDIA

IRCLASS
SYSTEMS AND SOLUTIONS PRIVATE LIMITED

CERTIFICATE OF APPROVAL

Issued by Indian Register Quality Systems
(A Division of IRCLASS Systems and Solutions Private Limited)

This is to certify that the Quality Management System of

Organisation: Tata Metaliks DI Pipes Limited

Address: P.O. Samraipur, Kharagpur,
Dist. Midnapore (West),
Pin Code - 721 301,
West Bengal, India

has been assessed and found conforming to the following requirement

Standard Certified: ISO 9001:2008

Scope: Design & Development, Manufacture and Supply of Centrifugally Cast Ductile Iron Pipes

Certificate No.: IRQS/1510705 granted on: 2nd September 2015

Originally Certified: 02/09/2015 Current Issue Date:02/09/2015 Valid Till Date:01/09/2018

Shashi Nath Mishra
Head IRQS

Head Office: 52A, Adi Shankaracharya Marg,Opp.Powai Lake, Powai, Mumbai - 400 072, India.

IRCLASS
SYSTEMS AND SOLUTIONS PRIVATE LIMITED

CERTIFICATE OF APPROVAL

Issued by Indian Register Quality Systems
(A Division of IRCLASS Systems and Solutions Private Limited)

This is to certify that the Environmental Management System of

Organisation: Tata Metaliks DI Pipes Limited

Address: P.O. Samraipur, Kharagpur,
Dist. Midnapore (West),
Pin Code - 721 301,
West Bengal, India

has been assessed and found conforming to the following requirement

Standard Certified: ISO 14001: 2004

Scope: Design & Development, Manufacture and Supply of Centrifugally Cast Ductile Iron Pipes

Certificate No.: IRQS/1530706 granted on: 2nd September 2015

Originally Certified: 02/09/2015 Current Issue Date: 02/09/2015 Valid Till Date: 01/09/2018

Shashi Nath Mishra
Head IRQS

Head Office: 52A, Adi Shankaracharya Marg,Opp.Powai Lake, Powai, Mumbai - 400 072, India.

Certifications

IRCLASS
SYSTEMS AND SOLUTIONS PRIVATE LIMITED

CERTIFICATE OF APPROVAL

Issued by Indian Register Quality Systems
(A Division of IRCLASS Systems and Solutions Private Limited)

This is to certify that the Occupational Health & Safety Management System of

Organisation: Tata Metaliks DI Pipes Limited

Address: P.O. Samraipur, Kharagpur,
Dist. Midnapore (West),
Pin Code - 721 301,
West Bengal, India

has been assessed and found conforming to the following requirement

Standard Certified: OHSAS 18001:2007

Scope: Design & Development, Manufacture and Supply of Centrifugally Cast Ductile Iron Pipes

Certificate No.: IRQS/1540707 granted on:2[nd] September 2015

Originally Certified: 02/09/2015 Current Issue Date: 02/09/2015 Valid Till Date: 01/09/2018

Indian Register Quality Systems

Shashi Nath Mishra
Head IRQS

Head Office: 52A, Adi Shankaracharya Marg,Opp.Powai Lake, Powai, Mumbai - 400 072, India.

WRAS APPROVED MATERIAL

Approval Number: 1509520

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

28[th] September 2015

Tata Metaliks DI Pipes Ltd
Tata Centre,
Jawaharlal Nehru Road,
Kolkata,
70071,
India

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.

CONCRETE, CEMENT AND MORTAR - PRESSURE PIPES. 5052

TMDIPL Dalmia Sulphate Cement. Pale grey coloured cement, intended to line ductile iron pipes. Cured for 6hrs at 40°C then cure for 666hrs at 35°C. For use with water up to 60°C. This material is only approved for the curing conditions that appear on the approval. If the cure conditions are varied from those specified on the approval then the material is not covered by the scope of the approval.

APPROVAL NUMBER: 1509520
APPROVAL HOLDER: TATA METALIKS DI PIPES LTD.

The Scheme reserves the right to review approval.
Approval 1509520 is valid between September 2015 and September 2020

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.wras.co.uk/directory

Yours faithfully

Jason Furnival
Approvals & Enquiries Manager
Water Regulations Advisory Scheme

Our Ref: HL/M120493
Test Report: MA4358/O

WRAS
Water Regulations Advisory Scheme

17[th] January 2014

Tata Metaliks DI Pipes Ltd.
Ductile Iron Pipe Plant,
Tata Centre,
43 Jawaharlal,
Nehru Road,
Kolkata 700 071,
India

WATER REGULATIONS ADVISORY SCHEME (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 BS 6920-1:2000 '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.

CONCRETE, CEMENT & MORTAR – PRESSURE PIPES 5052

ACC Portland Slag Cement. Grey coloured, factory applied Portland slag cement. Mix and apply as per manufacturer's instructions. Cure for 28 days at 30°C – 36°C. For use with water up to 60°C.

APPROVAL NUMBER: 1203508
APPROVAL HOLDER: TATA METALIKS DI PIPES LTD.

The Scheme reserves the right to review approval. This approval is valid between March 2012 and March 2017.

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.wras.co.uk/directory

Yours faithfully

Jason Furnival
Approvals & Enquiries Manager
Water Regulations Advisory Scheme

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