



# Tata Pipes

For HVAC Applications





## Profile

Located at Jamshedpur, Tata Steel Ltd. was established in 1907 and was the first Integrated Steel Plant in India. It commenced its operations in 1911, with a capacity of 1,00,000 tonnes per annum of ingots and expanded to a million tonnes per annum of saleable steel by the mid fifties.

Presently it has an annual capacity of 6 million tonnes at its Jamshedpur Plant.

The Plant, equipped with the latest steel making facilities such as Basic Oxygen Furnaces, Vacuum Degassing and Continuous Casting Units, presents the very epitome of technological advancement. A whole range of steels addressing the needs of the Construction / Engineering and Automotive sector, testify to Tata Steel's capability. These products have found acceptance not only in the domestic market but all over the world.

## Tata Steel - Tubes Division

The Tubes Division of Tata Steel came into being in 1985, after the merger of the erstwhile Indian Tube Company with Tata Steel. The Division manufactures commercial and precision tubes at its two plants, namely, the Standard Tubes Plant and the Precision Tubes Plant. The Tubes Strategic Business Unit of Tata Steel today is the largest manufacturer of a variety of steel tubes in India with an annual production capacity of around 4,00,000 tonnes and major expansion plans on the anvil to manufacture higher sizes. The SBU has its plants situated in Jamshedpur and has a network of sales offices across the country with the marketing headquarters in Kolkata to provide better customer service.

## Manufacturing Process of Tata Pipes

The Tubes Plant at Jamshedpur boasts of state-of-the-art facilities in tube making, with technology from OTO Mills (Italy), Kusakabe (Japan) and MAIR Research (Italy). Tata Pipes are manufactured by the High Frequency Induction Welding (HFIW) Process. The process, also known as the Cold Process, uses HR strips, which are manufactured at Tata Steel's modern Hot Strip Mill. In the HFIW process, the HR coil goes through the MIG welder, while a steady flow is assured from the horizontal coil accumulator. Cold Stamping is done at this stage with the TATA seal of quality. The tubes then progressively form as the strip passes through successive rolls and is followed by the high frequency induction welding at the edges to complete the weld. External beads due to weld deposition on the outer surface of the tubes is then removed to ensure a smooth surface finish. Following the welding process, an eddy current non-destructive testing machine screens out the imperfectly welded tubes. Tubes that pass the test are cut into required lengths by cold saw, which gives smooth burr less square cutting edge. Tubes are then packed in hexagonal bundles by MAIR Auto-packing machine.

## Quality Control

The quality of our product is controlled during the manufacturing process. It starts with slitting the strip edges, continues with speed and temperature control during the high frequency induction welding process and is followed by non destructive eddy current testing directly after welding. Off-line drift and flattening tests are conducted. This is all within our ISO 9000:2002 quality management system.

# HVAC - An Overview

HVAC stands for Heating, Ventilation, and Air-Conditioning—three closely related fundamental functions with both commercial and residential applications. The concept was coined by Volkart Brothers, being the pioneers in this segment, and was introduced way back in 1950.

The steady growth of the real estate market in India has created opportunities for major developers to promote large format office spaces and associated structures like malls, resorts, hi-tech hospitals, etc. This growth has necessitated in realising the importance of the HVAC and Fire-fighting systems in both residential and commercial structures as a prime essential for safety and health.

HVAC can further be distinguished as two separate segments –

- Commercial Cooling – large spaces of hotels, IT parks, malls, airports etc.
- Process Cooling – for sterilized rooms of pharmaceutical and manufacturing industries.



The primary use of HVAC is to regulate room temperature, humidity, and air flow, ensuring that such elements remain within their acceptable ranges. Effective control of such factors minimizes health-related risks.



## Chillers/Air Conditioners – Standard Procedures

For application of MS Pipes in this segment, details regarding the common practices followed, sizes of steel pipes used, and specifications required are as given below.

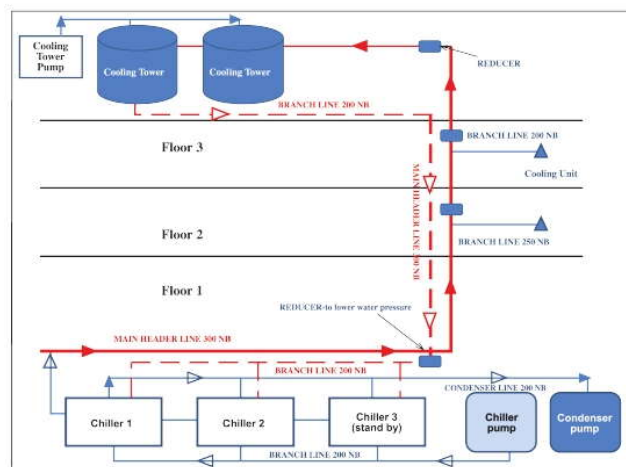
Class of MS Pipes to be used in Air Conditioning and Chiller Systems depends on environmental conditions like proximity to sea, corrosiveness, cooling flow, cooling zone and operating pressure.

- Pipes used in Fan Coil Unit – 25 NB to 32 NB
- Pipes used from chiller header to AHU (Air Handling Unit) – 50 NB to 150 NB
- Pipes used in chiller branch lines – 150 NB to 250 NB
- Pipes used in chiller main lines – 300 NB to 500 NB



Thicknesses of pipes with respect to grades are given below.

| Pipe size       | Material                                | Specification           |
|-----------------|---|-------------------------|
| Up to 40 NB     | MS "C" Class                            | IS 1239: 1973 Part I&II |
| 50 NB-150 NB    | MS "C" Class                            | IS 1239: 1973 Part I&II |
| 200 NB & 250 NB | Welded pipe with minimum 5 mm thickness | IS 3589:1966            |
| 300 NB          | Welded pipe with minimum 6 mm thickness | IS 3589:1966            |
| 300 NB & over   | Welded pipe with minimum 8 mm thickness | IS 3589:1966            |



Schematic diagram for pipe layout in a Chiller System

# Fire-fighting – An Overview

It has evolved as a prime safety parameter for any real estate development. For any construction above 3 floors, irrespective of being residential or commercial and manufacturing units, fire-fighting is now a mandatory requirement.

Tata Pipes have forged market leadership in the Fire-fighting segments by providing a clearly superior performance over competition. Usage in projects throughout India is testimony to Tata Pipes' attention to quality and safety.

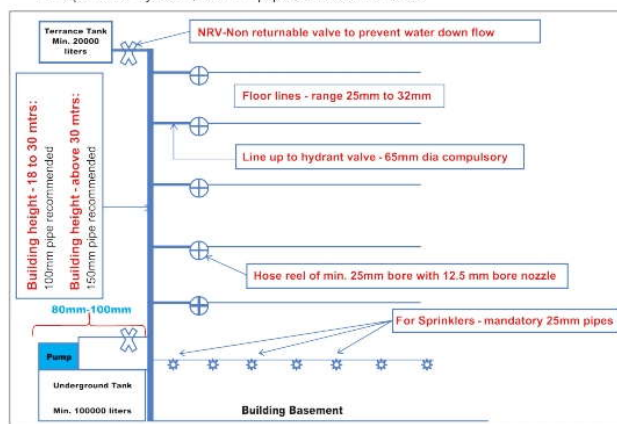
Sizes normally used range from 25 mm to 300 mm NB "C" Class MS Pipes with plain end or socketed conforming to IS: 1239 & IS: 3589 specifications.



## Guidelines For Water Supply Arrangements For Fire-Fighting (IS: 3844 & IS: 9668)

Basic requirements as per standard norms of Fire-Fighting (IS 3844 & IS 9668) in high-rise buildings are as given below –

- For buildings of height of 18 mtrs to 30 mtrs, the risers should not be less than 100mm internal diameter
- For buildings exceeding height of 30 mtrs, the risers should not be less than 150 mm diameter
- The hydrant coupling valve in each floor should be of minimum 65 mm MS Pipe
- Hose reel bore of 25 mm diameter with 8 mm hose should be used
- For effective water jet force, a 12.5 mm bore nozzle should be used
- Overhead tank should not be of capacity less than 20,000 litres
- The underground tank should not be of capacity less than 1,00,000 litres
- Depending on the height of the building, 80mm to 100 mm pipes should be used for line from pump to main hydrant
- For individual floor lines, pipes of diameter 25mm to 32mm should be used
- For sprinkler system, 25mm pipes should be used



Schematic diagram of conventional Fire Fighting hydrant system

## Internal hydrants

In an internal hydrant, the installation comprises of the following elements:

- Riser mains, down-comer mains or external mains to feed water from the source to the required point under pressure
- Fire fighting pump/pumps with all fitments and components and pump control panel, housed in a pump house
- All necessary components like internal hydrants (landing valves) and external hydrants, hose reels, hoses and branch pipes, suitably housed.
- Hydrant valves - to be mounted horizontally to prevent impurity deposition



## External Hydrants

- For external hydrants, piping (water main) should be laid preferably underground, to avoid it getting damaged by moving vehicles, etc
- To avoid rusting, underground pipes should be either of cast iron conforming to IS 1536 or MS/GI conforming to IS 1239, in which case it should be properly treated with a coat of primary paint with two coats of bitumen paint
- The pipes should be properly supported on pedestals - not more than 3 m apart
- Underground pipes should be laid 1 m below to avoid damage during road repair. At road crossings where heavy vehicles are expected to pass, it should pass through RCC pipe for additional protection



## Suction and Delivery Pipe Sizes

The suction and delivery pipes should be of adequate size to meet the functional requirements of the pump, and should not be less than following:

|                             | Suction | Delivery |
|-----------------------------|---------|----------|
| a) 450 l/min terrace pump   | 50 mm   | 50 mm    |
| b) 900 l/min terrace pump   | 75 mm   | 50 mm    |
| c) 1 400 l/min terrace pump | 100 mm  | 100 mm   |
| d) 2 280 l/min fire pump    | 150 mm  | 150 mm   |
| e) 2 850 l/min fire pump    | 200 mm  | 150 mm   |
| f) 4 540 l/min fire pump    | 250 mm  | 200 mm   |

## Risers & Pumps

- The rising mains/down-comer mains should be of galvanized iron pipes conforming to medium class of IS 1239
- The pump should have an alternate source of power supply in case of emergency
- The main fire pump at the underground water tank, with the capacity to discharge 900 litres per minute at 3 bar pressure as measured at the terrace level, should be installed
- Good quality pumps like Lubi or Kirloskar should be used for better fire fighting efficiency

# Advantages of Using Tata Pipes



## Made from pure steel - Longer life:

Our pipes are made from best quality steel from Tata Steel with low levels of Sulphur, Phosphorus and impurities. This results in weld consistency and integrity, extended service life and trouble free performance.

## Strong & Leak proof:

Low levels of Carbon and Manganese combined with controlled rolling of HR strip gives a very beneficial combination of high strength, high ductility and high bendability.



## Confirmation to IS Standards:

Strict adherence to Scheme of Testing and Inspection laid down by Bureau of Indian Standards (BIS) as per licensing norm – the reliability factor.

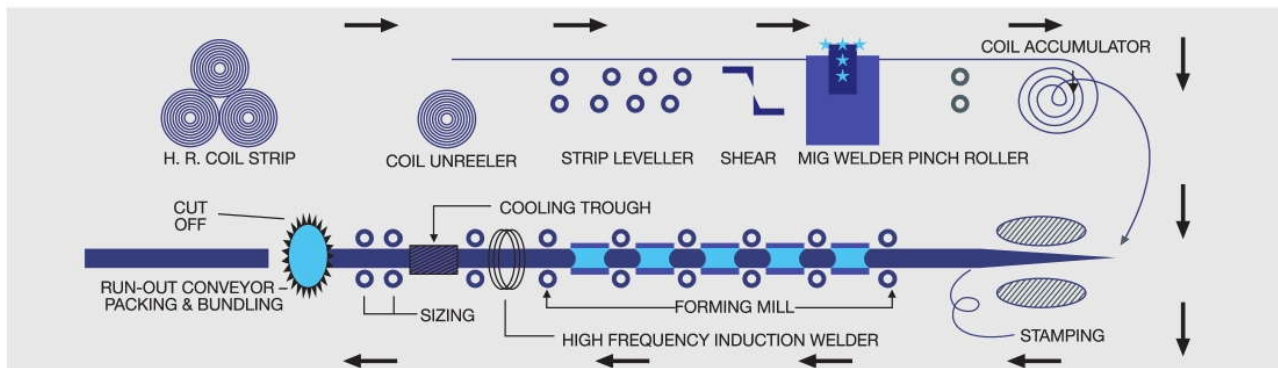
## High Corrosion Resistance:

Consistent and uniform Zinc coating both on the outside and inside of tubes offers greater resistance to corrosion, prevents water contamination and results in increased longevity. Tata Pipes gives higher Zinc coating than required as per specifications.



## Exact Length & Uniform Price:

You can always bank on Tata Pipes to give you the exact length that you require, at the correct price. No chance of being cheated when buying Tata Pipes.



Line diagram depicting the flow of material in HFIW mill



Tubes being manufactured in state-of-the-art HFIW Mill

# Specification of Pipes: IS 1239 & IS 3589

Dimensions and nominal mass of Steel Tubes - Light, Medium & Heavy Conforming to IS : 1239 (part-1) 2004

| Nominal Bore (mm) | Class or Category | Outside diameter (mm) |       | Thickness (mm) | Mass of Tube<br>Black & Galvanised |                         |                     |                              |
|-------------------|-------------------|-----------------------|-------|----------------|------------------------------------|-------------------------|---------------------|------------------------------|
|                   |                   | Max                   | Min   |                | Plain End Kg/m                     | Screwed & Socketed Kg/m | Plain End Metre/Ton | Screwed & Socketed Metre/Ton |
| 15                | L                 | 21.4                  | 21.0  | 2.0            | 0.947                              | 0.956                   | 1056                | 1046                         |
|                   | M                 | 21.8                  | 21.0  | 2.6            | 1.21                               | 1.22                    | 826                 | 820                          |
|                   | H                 | 21.8                  | 21.0  | 3.2            | 1.44                               | 1.45                    | 694                 | 690                          |
| 20                | L                 | 26.9                  | 26.4  | 2.3            | 1.38                               | 1.39                    | 725                 | 719                          |
|                   | M                 | 27.3                  | 26.5  | 2.6            | 1.56                               | 1.57                    | 641                 | 637                          |
|                   | H                 | 27.3                  | 26.5  | 3.2            | 1.87                               | 1.88                    | 535                 | 532                          |
| 25                | L                 | 33.8                  | 33.2  | 2.6            | 1.98                               | 2.00                    | 505                 | 500                          |
|                   | M                 | 34.2                  | 33.3  | 3.2            | 2.41                               | 2.43                    | 415                 | 412                          |
|                   | H                 | 34.2                  | 33.3  | 4.0            | 2.93                               | 2.95                    | 341                 | 339                          |
| 32                | L                 | 42.5                  | 41.9  | 2.6            | 2.54                               | 2.57                    | 394                 | 389                          |
|                   | M                 | 42.9                  | 42.0  | 3.2            | 3.10                               | 3.13                    | 323                 | 319                          |
|                   | H                 | 42.9                  | 42.0  | 4.0            | 3.79                               | 3.82                    | 264                 | 262                          |
| 40                | L                 | 48.4                  | 47.8  | 2.9            | 3.23                               | 3.27                    | 310                 | 306                          |
|                   | M                 | 48.8                  | 47.9  | 3.2            | 3.56                               | 3.60                    | 281                 | 278                          |
|                   | H                 | 48.8                  | 47.9  | 4.0            | 4.37                               | 4.41                    | 229                 | 227                          |
| 50                | L                 | 60.2                  | 59.6  | 2.9            | 4.08                               | 4.15                    | 245                 | 241                          |
|                   | M                 | 60.8                  | 59.7  | 3.6            | 5.03                               | 5.10                    | 199                 | 196                          |
|                   | H                 | 60.8                  | 59.7  | 4.5            | 6.19                               | 6.26                    | 162                 | 160                          |
| 65                | L                 | 76.0                  | 75.2  | 3.2            | 5.71                               | 5.83                    | 175                 | 172                          |
|                   | M                 | 76.6                  | 75.3  | 3.6            | 6.42                               | 6.54                    | 156                 | 153                          |
|                   | H                 | 76.6                  | 75.3  | 4.5            | 7.93                               | 8.05                    | 126                 | 124                          |
| 80                | L                 | 88.7                  | 87.9  | 3.2            | 6.72                               | 6.89                    | 149                 | 145                          |
|                   | M                 | 89.5                  | 88.0  | 4.0            | 8.36                               | 8.53                    | 120                 | 117                          |
|                   | H                 | 89.5                  | 88.0  | 4.8            | 9.90                               | 10.1                    | 101                 | 96                           |
| 100               | L                 | 113.9                 | 113.0 | 3.6            | 9.75                               | 10.0                    | 103                 | 100                          |
|                   | M                 | 115.0                 | 113.1 | 4.5            | 12.2                               | 12.5                    | 82                  | 80                           |
|                   | H                 | 115.0                 | 113.1 | 5.4            | 14.5                               | 14.8                    | 69                  | 68                           |
| 125               | M                 | 140.8                 | 138.5 | 4.8            | 15.9                               | 16.4                    | 63                  | 61                           |
|                   | H                 | 140.8                 | 138.5 | 5.4            | 17.9                               | 18.4                    | 56                  | 54                           |
| 150               | M                 | 166.5                 | 163.9 | 4.8            | 18.9                               | 19.5                    | 53                  | 51                           |
|                   | H                 | 166.5                 | 163.9 | 5.4            | 21.3                               | 21.9                    | 47                  | 46                           |

Large diameter pipes to specifications IS 3589:2001

| TUBES FOR WATER, GAS, AND SEWAGE EXTRACTS from IS:3589:2001 |  |         |         |         |   |                                      |
|---|--|---------|---------|---------|---|--------------------------------------|
| Specification   | Chemicals requirements<br>Ladle Analysis (%) |         |         |         | Physical Properties requirement<br>(Minimum Values) |                                      |
|   | Steel Grade                                  | C (max) | P (max) | S (max) | Tensile Strength MPa (min)                          | % Elongation $5.65 \sqrt{S_0}$ (min) |
| IS : 3589   | Fe330  | 0.17    | 0.055   | 0.055   | 330   | 20                                   |

| Specification | TEST                 |  |  | Permissible Variations |           |   |
|---------------|----------------------|--|--|------------------------|-----------|---|
|               | Hydrostatic Test MPa | Flattening Test  |  | Outside Diameter       | Thickness | Straightness                                |
| IS:3589       | 5                    | No opening shall occur by fracture in the weld until the distance between the plates <75% of OD. For further details see Spec. |  | (±)0.75%               | (±) 10%   | Deviation less than 2% of the total length. |

| Dimensions and Nominal mass of Steel Tubes - Preferred Sizes. |                       |                |                         |                           |
|---|-----------------------|----------------|-------------------------|---------------------------|
| Nominal Bore (mm)   | Outside Diameter (mm) | Thickness (mm) | Mass of Tube (Kg/Mtr.)* | Mass of Tube (Metre/Ton)* |
| 200   | 219.1                 | 4.35           | 23.04                   | 43.40                     |
| 200   | 219.1                 | 5.00           | 26.40                   | 37.88                     |
| 200   | 219.1                 | 6.35           | 33.32                   | 30.01                     |
| 250   | 273.1                 | 5.00           | 33.06                   | 30.25                     |
| 250   | 273.1                 | 6.35           | 41.77                   | 23.94                     |
| 300   | 323.9                 | 5.00           | 39.32                   | 25.43                     |
| 300   | 323.9                 | 6.35           | 49.72                   | 20.11                     |

\* Approximate figures.

Note: The approximate Kg/Mtr. can be calculated using the formula: Kg/Mtr = (D-t) x t x 0.0246615 D = Outside diameter in mm, T = Thickness in mm

Abbreviations:

MPa = Megapascal = N/Sq.mm, N = Newton = kg.m/sq.second, s = second, t = thickness, D = diameter, Uti = Up to and including, YP = specified minimum yield strength (psi), P = test pressure for plain-end pipe, ≥ = means 'greater than or equal to', ≤ = means 'less than or equal to', YS = Yield Strength, TS = Tensil Strength, OD = Outside Diameter, NB = Nominal Bore, L = Light series, M = Medium series, H = Heavy series

# Contact Details

## WORKS

Burma Mines, Jamshedpur-831 007, Telephone: 0657 2270561, Fax: 0657 2270304

## MARKETING HEADQUARTERS

Tata Centre, 43, J. L. Nehru Road, Kolkata-700 071, Telephone: 2288-7051/9251/3061/1851, Fax: 2288-6996

### East zone

### West zone

### North zone

### South zone

#### Bhubaneswar

Tata Steel – Tubes Division  
C/o. Rungta Agencies Pvt. Ltd.  
Cuttack Puri Road, P.O. Rasulgarh,  
Bhubaneswar – 751 010  
Tel: 0674 6450611 Fax: 0674 2580968

#### Kolkata

Tata Steel – Tubes Division  
Eastern Regional Sales Office  
52, J. L. Nehru Road, 2nd Floor,  
Kolkata – 700 071  
Tel: 033 2282 4299/6550 8020/21/23/24  
Fax: 033 2282 4325

#### Guwahati

Tata Steel – Tubes Division  
C/o. Rungta Agencies Pvt. Ltd.  
Meena Bhawan, Kanchan Road,  
Ulubari, Guwahati – 781 007  
Tel: 0361 252 6582 Fax: 0361 252 6582

#### Jamshedpur

Tata Steel – Tubes Division  
P.O. Burma Mines,  
Jamshedpur – 831 007  
Tel: 0657 651 2063 Fax: 0657 227 938

#### Patna

Tata Steel – Tubes Division  
C/o. Jai Basukinath Traders Pvt. Ltd.  
House of Advocate Mr. K.P. Verma  
Near Gasolene Petrol Pump,  
Boring Road, Patna – 800 001  
Tel: 0612 222 8663

#### Siliguri

Tata Steel – Tubes Division  
Sky Star Building, 6th Floor,  
Sevoke Road, Siliguri – 734 401  
Tel: 0353 253 0419 Fax: 0353 253 3527

#### Ahmedabad

Tata Steel – Tubes Division  
Premchand House Annexe  
High Court Way, 17/2, Ashram Road,  
Ahmedabad – 380 009  
Tel: 079 6661 2600/01/02/6544 8895  
Fax: 079 6661 2604

#### Indore

Tata Steel – Tubes Division  
316 & 317 City Centre  
570, M. G. Road, Indore-452 001  
Tel: 0731 645 0891/253 6595  
Fax: 0731 2535951

#### Mumbai

Tata Steel – Tubes Division  
Orient House, 3rd Floor, Adil Marzban Path,  
Ballard Estate, Mumbai – 400 038  
Tel: 022 6838 4511/12  
Fax: 022 2269 5963

#### Nagpur

Tata Steel – Tubes Division  
Museum Road, Civil Lines  
Nagpur – 440 001  
Tel: 0712 645 7677/252 2209  
Fax: 0712 253 7078

#### Pune

Tata Steel – Tubes Division  
The Orion, Office No. 202B, 2nd Floor,  
5 Korigaon Park, Opp. St. Mira's College,  
Pune – 411 001  
Tel: 020 6401 0607  
Fax: 020 6604 8828

#### New Delhi

Tata Steel – Tubes Division  
Jeevan Tara Building, 1st Floor,  
5, Sansad Marg, New Delhi – 110 001  
Tel: 011 2374 8294/8169  
Fax: 011 2334 3196

#### Faridabad

Tata Steel – Tubes Division  
33B, N I T  
Faridabad - 121 001 (Haryana)  
Tel: 0129 409 8314  
Fax: 0129 409 8221

#### Jaipur

Tata Steel – Tubes Division  
C/o. Vjayshree Properties Pvt. Ltd.  
C-84, Prithviraj Road, "C" Scheme,  
Jaipur – 302 001  
Tel: 0141 222 4725  
Fax: 0141 511 2906

#### Kanpur

Tata Steel – Tubes Division  
Navroz Building, M.G. Road,  
Kanpur – 208 001  
Tel: 0512 231 2870/2298/234 8979  
Fax: 0512 231 6631

#### Ludhiana

Tata Steel – Tubes Division  
B-30, 1858/1, Focal Point,  
Ludhiana – 141 010  
Tel: 0161 267 0504  
Fax: 0161 503 1286

#### Chandigarh

Tata Steel – Tubes Division  
SCO 16, 1st Floor  
Sector 26, Madhya Marg  
Chandigarh - 160 019  
Tel: 0172 2791047/2790932

#### Bangalore

Tata Steel – Tubes Division  
Jubilee Building, 2nd Floor,  
45, Museum Road,  
Bangalore – 560 025  
Tel: 080 6695 0017  
Fax: 080 2532 5527

#### Chennai

Tata Steel – Tubes Division  
Eldorado Building, 2nd Floor,  
112 Nungambakkam High Road,  
Chennai – 600 034  
Tel: 044 6696 0008  
Fax: 044 2826 9101

#### Secunderabad

Tata Steel – Tubes Division  
Surya Towers, 6th Floor,  
104/5, Sardar Patel Road,  
Secunderabad – 500 003  
Tel: 040 6626 1020/30  
Fax: 040 2781 2418

January 2009. This supercedes all previous editions.

[www.tatatubes.com](http://www.tatatubes.com)

Care has been taken to ensure that this information is accurate but Tata Steel does not accept responsibility or liability for errors or information which is found to be misleading.



**TATA STEEL**

Tata Steel Limited, 43 Jawaharlal Nehru Road Kolkata 700 071  
Tel: 91 33 2224 8106, 2224 8636, Fax: 91 33 2288 6996  
Website: [www.tatatubes.com](http://www.tatatubes.com)  
Email: [tatapipes@tatasteel.com](mailto:tatapipes@tatasteel.com)

Call our toll free Helpline : 1800 345 8282