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# PURVA

— Defining Structures —

## STEEL PIPES & TUBES

FOR A STRONGER NATION

MANUFACTURERS : STEEL PIPES AND TUBES



An ISO 9001:2015 Company

AVAILABLE IN : HR, HRPO, CRCA, CRFH, GP & CORTEN STEEL

PIPE GRADES



|                |                |                |                |                |
|----------------|----------------|----------------|----------------|----------------|
| <b>YST 210</b> | <b>YST 240</b> | <b>YST 310</b> | <b>YST 355</b> | <b>YST 450</b> |
| <b>YST 500</b> | <b>YST 550</b> | <b>YST 600</b> | <b>YST 650</b> | <b>YST 700</b> |



# Introduction

Shri Shiv Kumar Purva is a visionary entrepreneur and the man behind the establishment and phenomenal success of Purva Group in the field of Iron and Steel Business. Purva Group is a professionally managed group, which was established in the year 1993 in Bangalore to provide all items of Iron and Steel Products under one roof at Most Competitive Prices with best service. Purva Group Comprises of Three Operating Companies Each of these Enterprises operates independently with the registered office situated at No.193, 4th Floor, "Shiv Sadan", Marathahalli Outer Ring Road, Opposite to NCC Appt. Next to ICICI Bank, B.Narayanapura, Bangalore - 560016.

● **Shiva Ferric Private Limited (SFPL)**

Trading of All types of Iron and Steel Products which Includes HR Sheets / Plates and Coils, CR Sheets & Coils, Structural Steels like Angles, Channels, Beams, T-Angles TMT Bars etc.

- SFPL is Authorised Distributors of
  - ▶ TATA Steels Limited for Hot Rolled Steel range of products under the Brand name "TATA – ASTRUM"
- SAIL - Steel Authority of India Limited
  - ▶ Hot Rolled Steel Coil / Sheets / Plates
  - ▶ Cold Rolled Steel Coils / Sheets,
  - ▶ Structural Steels like Beams, Joists Channels, Angles etc.,
  - ▶ TMT Bars
  - ▶ GP and GC Sheets
- RINL – Vishakhapatnam Steel Plant
  - ▶ Structural Steels like Beams, Joists Channels, Angles, Bars and Rods etc.
  - ▶ TMT Bars
- Products of All Major Re-Rollers in India

● **Purva Metal Sections Private Limited (PMSPL)**

An ISO 9001:2015 Certified Company having Manufacturing facility at Malur, Near Bangalore Karnataka – Manufacturer of High Frequency Induction Welded (ERW) Steel Pipes and Tubes of following BIS Specifications (ISI Mark).

- IS 1239 : 2004 – Black Steel Tubes for use (Part I) in Water, Non – Hazardous Gas, Steam and Air Lines.
  - IS 3601: 2006 – Steel Tubes for Mechanical and General Engineering Purposes.
  - IS 9295: 1983 – Steel Tubes for Idlers for Belt Conveyors.
  - IS 3074: 2005 – Steel Tubes for Automotive Purposes
  - IS 1161: 2014 – Steel Tubes for Structural Purposes (CHS)
  - IS 4923: 1997 – Hollow Steel Sections for Structural Use (SHS and RHS)
- Apart above standards PMSPL Can Supply
- As Per International Standards.
  - As Per Drawing of Customers for special Shapes Closed Sections.

● **Purva Steel Private Limited (The Integrated Steel Plant)**

Manufacturers of: PURVA STRONG TMT Bars, Grades: Fe500, Fe550, Fe550D (Chemical & Physical Pass as per BIS) Sizes Dia: 8mm to 40mm

Raw Materials Sourcing :

| Shape           | Minimum Size in mm | Maximum Size in mm | Thickness Range In mm |
|-----------------|--------------------|--------------------|-----------------------|
| Round (CHS)     |                    | PP                 | WR                    |
| Square (SHS)    | ;                  | [                  | WR                    |
| Rectangle (RHS) | ;                  | PP                 | WR                    |



## AVAILABLE IN : HR, HRPO, CRCA, CRFH, GP & CORTEN STEEL

### PIPE GRADES



|                |                |                |                |                |
|----------------|----------------|----------------|----------------|----------------|
| <b>YST 210</b> | <b>YST 240</b> | <b>YST 310</b> | <b>YST 355</b> | <b>YST 450</b> |
| <b>YST 500</b> | <b>YST 550</b> | <b>YST 600</b> | <b>YST 650</b> | <b>YST 700</b> |



# Purva Metal Sections Private Limited - Plant



AVAILABLE IN : HR, HRPO, CRCA, CRFH, GP & CORTEN STEEL

## PIPE GRADES

|                |                |                |                |                |
|----------------|----------------|----------------|----------------|----------------|
| <b>YST 210</b> | <b>YST 240</b> | <b>YST 310</b> | <b>YST 355</b> | <b>YST 450</b> |
| <b>YST 500</b> | <b>YST 550</b> | <b>YST 600</b> | <b>YST 650</b> | <b>YST 700</b> |



**PURVA**

Defining Structures

**STEEL PIPES & TUBES**

FOR A STRONGER NATION

## Manufacturing Process

ERW Steel Pipes & Tubes are manufactured by High frequency induction welding process from Hot Rolled / Cold Rolled / GP / Steel Coils produced at the Steel Plants. The Raw materials to Manufacture ERW Steel Pipes & Tubes are procured in Wide Coils form, which are tested for chemical and mechanical properties. After testing of coils, subject to quality acceptance, these wide coils are slit in slitting line to the desired narrow width roughly equal to the perimeter of the Steel Pipes and Tubes Sizes.

The Narrow Coils passes through a sequence of pre aligned forming and fin rolls of high profile hardened and tempered top and bottom rolls. The Strip Gradually attains the circular shape in various stages, which will be getting welded by High frequency Induction Welding. There is no extra filler material used for welding.

The outside bead is trimmed off with a tungsten carbide tool in all cases. The welded pipe passed through a coolant chamber and sized by the sequence of rolls through sizing Stands. The pipes will be cut off automatically in flying Cold Saw machine as per the set length. This Pipes & Tubes are transferred for quality inspections and testing like, Hydro Testing machines Universal testing machine for testing quality of welding, Mechanical Testing of Pipes etc, and finally these products are bundled for dispatch / storage.

### Testing and Quality Control Facilities

Steel Pipes and Tubes products are tested in accordance with the Indian Standard Specification No. IS:1239, IS:3074, IS:1161, IS:3601, IS:4923, IS:9295. The tests are comprised of chemical analysis of the product, determination of tensile strength etc.

During production, online Eddy current testing and visual inspection is carried out for surface defects, Dimensional accuracy, Straightness & Twists, Lengths. At regular intervals, Sample pieces are taken as per Specifications to carry out following tests

Thickness

Dimensions

Weight (Mass)

Tensile Test

Bend Test

Flattening Test

Crushing Test

Drift Expansion Test

Individual pipes are finally taken for hydro testing, visually inspected for the parameters specified in the specification before dispatch / storing.

**AVAILABLE IN : HR, HRPO, CRCA, CRFH, GP & CORTEN STEEL**



### PIPE GRADES

**YST 210**

**YST 240**

**YST 310**

**YST 355**

**YST 450**

**YST 500**

**YST 550**

**YST 600**

**YST 650**

**YST 700**



# General Application of Steel Pipes and Tubes

## IS 1161 and IS 4923

- General Construction like,
  - Industrial Buildings
  - Residential Buildings
  - Warehouse Complex
  - Airports Terminal, Railway Platforms, Malls, convention halls, Stadiums.
  - Canopies, Glass curtain wall frames, Partition frames, space frames, Guard Rails and staircases.
  - Bridges, Foot Bridges, Signage Structures, Hoardings.
  - Green houses, Poultry Sheds, etc.
- Construction equipments, Truck Bodies, Bus Bodies, defence equipments
- Agricultural Equipments, Implements
- Ships, Boats, Vessels etc
- Industrial Furnitures, Storage Racks, Mezzanine storage solutions.
- Falsework, Frame work or Formwork (Scaffolding, etc)
- Material Handling equipments
- Shipping Containers
- Structures for all kinds of Plants like, Steel Plants, Power Plants, Solar Power Plants etc.



## IS 3601

- General Engineering
- Arms and ammunition, Agricultural Implements, Tractors, Tillers, Intercultivation equipments,
- Electrical and Hand tools like Dibble Iron, various levers
- Home appliances
- Agriculture equipments



## IS 3704

- Two wheelers, Three wheelers.
- Cars, Jeeps, Pickups,
- Trucks, Buses, Tractors, Tillers, Tippers
- Automobile Seats

## IS 9295

- Idlers for Conveyors

## IS 1239

- Sanitary Pipes work, Plumbing and drainage systems
- Fire hydrants and Fire fighting systems
- Oil and Gas Furnace
- LPG Pipe line works
- Fire safety in petroleum refineries, fertiliser plants, sugar plants etc.



## IS 9537

- Conduits for Electrical installations



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### PIPE GRADES

|                |                |                |                |                |
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**PURVA**  
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**STEEL PIPES & TUBES**  
 FOR A STRONGER NATION

# Product Range of Precision Tubes

## Precision Tubes (CR & GP)

### ROUND TUBES (CHS) in CR and GP

Weight Per Mtr.

| Outer Dia Size<br>in mm | Thickness in mm |       |       |       |       |       |       |       |       |       |       |       |       |
|-------------------------|-----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                         | 0.50            | 0.60  | 0.70  | 0.80  | 0.90  | 1.00  | 1.20  | 1.60  | 1.80  | 2.00  | 2.20  | 2.50  | 2.80  |
| 8.00                    | 0.092           | 0.109 | 0.126 | 0.142 | 0.158 | 0.173 | 0.201 |       |       |       |       |       |       |
| 9.52                    | 0.111           | 0.132 | 0.152 | 0.172 | 0.191 | 0.210 | 0.246 | 0.313 |       |       |       |       |       |
| 12.00                   | 0.142           | 0.169 |       | 0.221 | 0.246 | 0.271 | 0.320 | 0.410 | 0.453 |       |       |       |       |
| 12.70                   | 0.150           | 0.179 | 0.207 | 0.235 | 0.262 | 0.289 | 0.340 | 0.438 | 0.484 | 0.528 |       |       |       |
| 15.87                   | 0.190           | 0.226 | 0.262 | 0.297 | 0.332 | 0.367 | 0.434 | 0.563 | 0.625 | 0.684 |       |       |       |
| 19.05                   | 0.229           | 0.273 | 0.317 | 0.360 | 0.403 | 0.445 | 0.528 | 0.689 | 0.766 | 0.841 |       |       |       |
| 22.23                   | 0.268           | 0.320 | 0.372 | 0.423 | 0.473 | 0.524 | 0.622 | 0.814 | 0.907 | 0.998 |       |       |       |
| 25.40                   | 0.307           | 0.367 | 0.426 | 0.485 | 0.544 | 0.602 | 0.716 | 0.939 | 1.048 | 1.154 | 1.259 | 1.412 | 1.561 |
| 31.75                   | 0.385           | 0.461 | 0.536 | 0.611 | 0.685 | 0.758 | 0.904 | 1.190 | 1.330 | 1.467 | 1.603 | 1.803 | 1.999 |
| 38.10                   |                 | 0.555 | 0.646 | 0.736 | 0.826 | 0.915 | 1.092 | 1.440 | 1.611 | 1.781 | 1.948 | 2.195 | 2.438 |
| 48.30                   |                 |       |       |       | 1.052 | 1.166 | 1.394 | 1.843 | 2.064 | 2.284 | 2.501 | 2.824 | 3.142 |
| 50.80                   |                 |       |       |       |       |       | 1.468 | 1.941 | 2.175 | 2.407 | 2.637 | 2.978 | 3.315 |
| 60.30                   |                 |       |       |       |       |       |       | 2.316 | 2.597 | 2.876 | 3.152 | 3.564 | 3.971 |
| 63.50                   |                 |       |       |       |       |       |       | 2.442 | 2.739 | 3.033 | 3.326 | 3.761 | 4.191 |
| 76.20                   |                 |       |       |       |       |       |       | 2.944 | 3.303 | 3.660 | 4.015 | 4.544 | 5.068 |
| 88.90                   |                 |       |       |       |       |       |       | 3.445 | 3.866 | 4.286 | 4.704 | 5.327 | 5.945 |
| 101.60                  |                 |       |       |       |       |       |       | 3.946 | 4.430 | 4.913 | 5.393 | 6.110 | 6.822 |
| 127.00                  |                 |       |       |       |       |       |       |       | 5.558 | 6.165 | 6.771 | 7.676 | 8.576 |

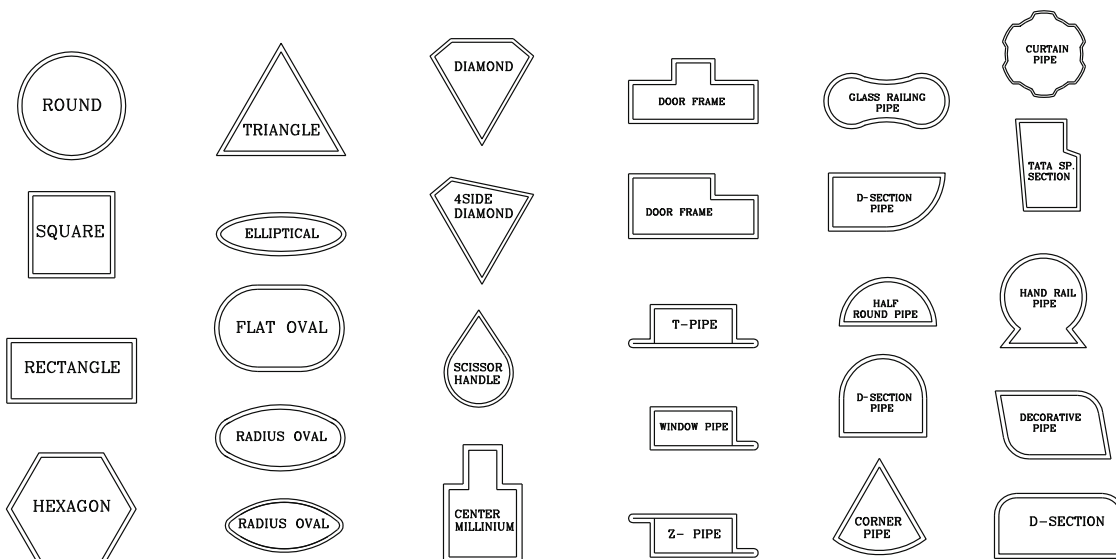
### SQUARE HOLLOW SECTIONS (SHS) in CR and GP

| in mm       | Thickness in mm |       |       |       |       |       |       |       |       |       |       |       |       |
|-------------|-----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|             | 0.50            | 0.60  | 0.70  | 0.80  | 0.90  | 1.00  | 1.20  | 1.60  | 1.80  | 2.00  | 2.20  | 2.50  | 2.80  |
| 7.5 x 7.5   | 0.111           | 0.132 | 0.152 | 0.172 | 0.191 | 0.210 | 0.246 | 0.313 |       |       |       |       |       |
| 10 x 10     | 0.150           | 0.179 | 0.207 | 0.235 | 0.262 | 0.289 | 0.340 | 0.438 | 0.484 |       |       |       |       |
| 12.5 x 12.5 | 0.190           | 0.226 | 0.262 | 0.297 | 0.332 | 0.367 | 0.434 | 0.563 | 0.625 | 0.684 |       |       |       |
| 15 x 15     | 0.229           | 0.273 | 0.317 | 0.360 | 0.403 | 0.445 | 0.528 | 0.689 | 0.766 | 0.841 |       |       |       |
| 19 x 19     | 0.292           | 0.348 | 0.405 | 0.461 | 0.516 | 0.571 | 0.679 | 0.890 | 0.992 | 1.093 |       |       |       |
| 20 x 20     | 0.307           | 0.367 | 0.426 | 0.485 | 0.544 | 0.602 | 0.716 | 0.939 | 1.048 | 1.154 | 1.259 | 1.412 | 1.561 |
| 25 x 25     | 0.385           | 0.461 | 0.536 | 0.611 | 0.685 | 0.758 | 0.904 | 1.190 | 1.330 | 1.467 | 1.603 | 1.803 | 1.999 |
| 30 x 30     |                 | 0.555 | 0.646 | 0.736 | 0.826 | 0.915 | 1.092 | 1.440 | 1.611 | 1.781 | 1.948 | 2.195 | 2.438 |
| 38 x 38     |                 |       |       |       | 1.052 | 1.166 | 1.394 | 1.843 | 2.064 | 2.284 | 2.501 | 2.824 | 3.142 |
| 40 x 40     |                 |       |       |       |       |       | 1.468 | 1.941 | 2.175 | 2.407 | 2.637 | 2.978 | 3.315 |
| 50 x 50     |                 |       |       |       |       |       |       | 2.442 | 2.739 | 3.033 | 3.326 | 3.761 | 4.191 |
| 60 x 60     |                 |       |       |       |       |       |       | 2.944 | 3.303 | 3.660 | 4.015 | 4.544 | 5.068 |
| 72 x 72     |                 |       |       |       |       |       |       | 3.445 | 3.866 | 4.286 | 4.704 | 5.327 | 5.945 |
| 80 x 80     |                 |       |       |       |       |       |       | 3.946 | 4.430 | 4.913 | 5.393 | 6.110 | 6.822 |
| 100 x 100   |                 |       |       |       |       |       |       |       | 5.558 | 6.165 | 6.771 | 7.676 | 8.576 |

### RECTANGLE HOLLOW SECTIONS (RHS) in CR and GP

| in mm    | Thickness in mm |       |       |       |       |       |       |       |       |       |       |       |       |
|----------|-----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|          | 0.50            | 0.60  | 0.70  | 0.80  | 0.90  | 1.00  | 1.20  | 1.60  | 1.80  | 2.00  | 2.20  | 2.50  | 2.80  |
| 10 x 5   | 0.111           | 0.132 | 0.152 | 0.172 | 0.191 | 0.210 | 0.246 | 0.313 |       |       |       |       |       |
| 13 x 7   | 0.150           | 0.179 | 0.207 | 0.235 | 0.262 | 0.289 | 0.340 | 0.438 | 0.484 |       |       |       |       |
| 15 x 10  | 0.190           | 0.226 | 0.262 | 0.297 | 0.332 | 0.367 | 0.434 | 0.563 | 0.625 |       |       |       |       |
| 25 x 15  | 0.307           | 0.367 | 0.426 | 0.485 | 0.544 | 0.602 | 0.716 | 0.939 | 1.048 | 1.154 | 1.259 | 1.412 | 1.561 |
| 30 x 10  | 0.307           | 0.367 | 0.426 | 0.485 | 0.544 | 0.602 | 0.716 | 0.939 | 1.048 | 1.154 | 1.259 | 1.412 | 1.561 |
| 30 x 20  | 0.385           | 0.461 | 0.536 | 0.611 | 0.685 | 0.758 | 0.904 | 1.190 | 1.330 | 1.467 | 1.603 | 1.803 | 1.999 |
| 35 x 25  |                 | 0.555 | 0.646 | 0.736 | 0.826 | 0.915 | 1.092 | 1.440 | 1.611 | 1.781 | 1.948 | 2.195 | 2.438 |
| 40 x 20  |                 | 0.555 | 0.646 | 0.736 | 0.826 | 0.915 | 1.092 | 1.440 | 1.611 | 1.781 | 1.948 | 2.195 | 2.438 |
| 50 x 25  |                 |       |       |       | 1.052 | 1.166 | 1.394 | 1.843 | 2.064 | 2.284 | 2.501 | 2.824 | 3.142 |
| 50 x 30  |                 |       |       |       |       |       | 1.468 | 1.941 | 2.175 | 2.407 | 2.637 | 2.978 | 3.315 |
| 60 x 20  |                 |       |       |       |       |       | 1.468 | 1.941 | 2.175 | 2.407 | 2.637 | 2.978 | 3.315 |
| 60 x 40  |                 |       |       |       |       |       |       | 2.442 | 2.739 | 3.033 | 3.326 | 3.761 | 4.191 |
| 75 x 25  |                 |       |       |       |       |       |       | 2.442 | 2.739 | 3.033 | 3.326 | 3.761 | 4.191 |
| 80 x 40  |                 |       |       |       |       |       |       | 2.944 | 3.303 | 3.660 | 4.015 | 4.544 | 5.068 |
| 96 x 48  |                 |       |       |       |       |       |       | 3.445 | 3.866 | 4.286 | 4.704 | 5.327 | 5.945 |
| 100 x 20 |                 |       |       |       |       |       |       | 2.944 | 3.303 | 3.660 | 4.015 | 4.544 | 5.068 |

## Pipes / Tubes Shapes



| Products Portfolio   |         | HR / HRPO / CRFH / CRCA / GP |          |         |         |         |        |
|--|---------|------------------------------|----------|---------|---------|---------|--------|
| We Can Manufacture :- ANY Outer Dia in Round , ANY Sizes in Square & Rectangle , ANY Other Shapes , ANY Customise Items , ANY Open Formed Sections |         |                              |          |         |         |         |        |
| Pipes and Tubes Grades Are   | YST 170 | YST 240                      | YST 350  | YST 400 | YST 500 | YST 600 | BSK 46 |
|  | YST 210 | YST 310                      | YST 350C | YST 450 | YST 550 | YST 700 |        |
| BIS Standards  | IS 1161 | IS 1239                      | IS 3601  | IS 4923 | IS 9295 |         |        |

| CHS (Circular Hollow Section), NB Series ( Nominal Bore), Round Pipes, Thickness 0.28 to 10mm |                    |                    |                  |                    |                    |                  | Sizes - 16 |
|---|--------------------|--------------------|------------------|--------------------|--------------------|------------------|------------|
| 15 NB (21.30 OD)  | 20 NB (26.90 OD)   | 25 NB (33.70 OD)   | 32 NB (42.40 OD) | 40 NB (48.30 OD)   | 50 NB (60.30 OD )  | 65 NB (76.10 OD) |            |
| 80 NB (88.90 OD)  | 90 NB (101.60 OD ) | 100 NB (114.30 OD) | 110 NB (127 OD)  | 125 NB (139.50 OD) | 150 NB (165.10 OD) | 165 NB (173 OD)  |            |
| 175 NB (193 OD)   | 200 NB (219.10 OD) |                    |                  |                    |                    |                  |            |

| CHS (Circular Hollow Section), OD Series (Outer Diameter), Round Tubes, Thickness 0.28 to 10mm |          |           |          |          |           |           | Sizes - 34 |
|--|----------|-----------|----------|----------|-----------|-----------|------------|
| 9.52 mm  | 12 mm    | 12.7 mm   | 15.88 mm | 18 mm    | 18.5 mm   | 19.05 mm  |            |
| 22.23 mm   | 24.15 mm | 25.4 mm   | 28.58 mm | 31.75 mm | 34.9 mm   | 35 mm     |            |
| 38.1 mm  | 39 mm    | 40 mm     | 42 mm    | 44.45 mm | 50.8 mm   | 57.15 mm  |            |
| 63.5 mm  | 70 mm    | 80.8 mm   | 82.7 mm  | 95.5 mm  | 107.95 mm | 120.65 mm |            |
| 133 mm   | 152.4 mm | 158.75 mm | 168.3 mm | 173 mm   | 203.2 mm  |           |            |

| SHS (Square Hollow Section) Dimension in MM, Thickness 0.28 to 10mm |         |             |         |         |           |         | Sizes - 41 |
|---|---------|-------------|---------|---------|-----------|---------|------------|
| 7.5x7.5   | 10x10   | 12x12       | 15x15   | 19x19   | 20x20     | 21x21   |            |
| 22x22   | 25x25   | 30x30       | 32x32   | 33x33   | 35x35     | 38x38   |            |
| 40x40   | 45x45   | 48x48       | 50x50   | 55x55   | 60x60     | 65x65   |            |
| 70x70   | 72x72   | 75x75       | 80x80   | 90x90   | 91.5x91.5 | 100x100 |            |
| 104x104   | 110x110 | 113.5x113.5 | 120x120 | 125x125 | 130x130   | 132x132 |            |
| 140x140   | 150x150 | 160x160     | 172x172 | 175x175 | 180x180   |         |            |

| SHS (Square Hollow Section) Dimension in Imperial (INCHES) Thickness 0.28 to 10mm |               |               |               |               |               |             | Sizes - 27 |
|---|---------------|---------------|---------------|---------------|---------------|-------------|------------|
| 12.7x12.7   | 19.05x19.05   | 25.4x25.4     | 31.75x31.75   | 38.1x38.1     | 44.45x44.45   | 50.8x50.8   |            |
| 57.15x57.15   | 63.5x63.5     | 69.85x69.85   | 76.2x76.2     | 82.55x82.55   | 88.9x88.9     | 95.25x95.25 |            |
| 101.6x101.6   | 107.95x107.95 | 114.3x114.3   | 120.65x120.65 | 127x127       | 133.35x133.35 | 139.7x139.7 |            |
| 146x146   | 152.4x152.4   | 158.75x158.75 | 165.1x165.1   | 171.45x171.45 | 177.8x177.8   |             |            |

| RHS ( Rectangle Hollow Section ) Dimension in MM, Thickness 0.28 to 10mm |         |         |         |         |         |         | Sizes - 201 |
|--|---------|---------|---------|---------|---------|---------|-------------|
| 12x8   | 15x10   | 20x10   | 20x15   | 25x10   | 25x12.5 | 25x15   |             |
| 25x20  | 30x10   | 30x12.5 | 30x15   | 30x20   | 30x25   | 32x20   |             |
| 35x10  | 35x15   | 35x20   | 35x25   | 35x30   | 38x22   | 40x10   |             |
| 40x12  | 40x15   | 40x20   | 40x25   | 40x27   | 40x30   | 40x35   |             |
| 45x10  | 45x15   | 45x20   | 45x25   | 45x30   | 45x35   | 48x12.5 |             |
| 48x15  | 48x32   | 50x10   | 50x12.5 | 50x15   | 50x20   | 50x25   |             |
| 50x30  | 50x40   | 50x45   | 58x38   | 60x10   | 60x12   | 60x15   |             |
| 60x20  | 60x30   | 60x35   | 60x40   | 62x38   | 65x10   | 65x15   |             |
| 65x25  | 65x30   | 65x35   | 66x33   | 70x10   | 70x20   | 70x25   |             |
| 70x30  | 70x40   | 70x50   | 70x60   | 75x15   | 75x20   | 75x25   |             |
| 75x30  | 75x35   | 75x45   | 75x50   | 80x10   | 80x15   | 80x20   |             |
| 80x30  | 80x40   | 80x50   | 80x60   | 82x38   | 85x25   | 85x75   |             |
| 90x10  | 90x20   | 90x30   | 90x40   | 90x50   | 90x60   | 90x70   |             |
| 92x48  | 94x46   | 95x25   | 95x30   | 95x35   | 96x48   | 100x20  |             |
| 100x30   | 100x40  | 100x50  | 100x60  | 100x75  | 100x80  | 102x76  |             |
| 110x50   | 110x70  | 112x48  | 114x46  | 115x60  | 115x69  | 120x40  |             |
| 120x50   | 120x60  | 120x80  | 120x100 | 122x61  | 125x75  | 125x80  |             |
| 125x90   | 125x100 | 125x120 | 127x51  | 128x51  | 130x50  | 130x70  |             |
| 130x80   | 130x90  | 132x27  | 132x48  | 134x46  | 140x40  | 140x60  |             |
| 140x70   | 140x75  | 140x80  | 145x82  | 150x40  | 150x50  | 150x60  |             |
| 150x70   | 150x75  | 150x90  | 150x92  | 150x100 | 150x110 | 150x125 |             |
| 152x48   | 154x48  | 157x100 | 160x90  | 160x80  | 160x90  | 160x120 |             |
| 170x90   | 170x100 | 171x48  | 172x92  | 173x46  | 175x75  | 175x90  |             |
| 175x100  | 175x125 | 175x150 | 180x48  | 180x50  | 180x60  | 180x80  |             |
| 180x92   | 180x100 | 180x120 | 180x140 | 190x50  | 192x72  | 200x40  |             |
| 200x50   | 200x60  | 200x65  | 200x75  | 200x80  | 200x100 | 200x120 |             |
| 200x125  | 200x150 | 220x80  | 220x100 | 225x80  | 225x100 | 225x120 |             |
| 235x110  | 235x125 | 236x116 | 240x60  | 240x110 | 240x120 | 245x100 |             |
| 250x50   | 250x70  | 250x75  | 250x80  | 250x100 |         |         |             |

| RHS ( Rectangle Hollow Section ) Dimension in INCHES, Thickness 0.28 to 10mm |            |             |             |             |             |             | Sizes - 32 |
|--|------------|-------------|-------------|-------------|-------------|-------------|------------|
| 25.4x12.7  | 50.8x25.4  | 50.8x38.1   | 63.5x38.1   | 76.2x38.1   | 76.2x50.8   | 101.6x50.8  |            |
| 101.6x76.2   | 127x50.80  | 127x76.2    | 127x88.9    | 127x95.25   | 127x101.6   | 127x114.3   |            |
| 152.4x76.2   | 152.4x88.9 | 152.4x95.25 | 152.4x101.6 | 152.4x114.3 | 152.4x127   | 177.8x95.25 |            |
| 177.8x101.6  | 177.8x127  | 177.8x152.4 | 203.2x50.80 | 203.2x76.2  | 203.2x101.6 | 203.2x127   |            |
| 203.2x152.4  | 254x50.80  | 254x76.2    | 254x101.6   |             |             |             |            |

| D Shape, Ellipse, Elliptical, Flat Oval, Form Work Section, Thickness 0.28 to 6mm |                      |                       |                       |                 |                              |                     | Sizes - 30 |
|---|----------------------|-----------------------|-----------------------|-----------------|------------------------------|---------------------|------------|
| D Shape 26x13   | Ellipse 54x34        | Ellipse 60x40         | Elliptical 56.24x11.4 | Flat Oval 25x15 | Flat Oval 25.4x12.7          | Flat Oval 27.2x12.5 |            |
| Flat Oval 29x16.5   | Flat Oval 30x15      | Flat Oval 31x16       | Flat Oval 32x12       | Flat Oval 33x12 | Flat Oval 35x15              | Flat Oval 36x38     |            |
| Flat Oval 38x20 (TM3)   | Flat Oval 38x21.5    | Flat Oval 38x22 (TM3) | Flat Oval 38x22       | Flat Oval 40x20 | Flat Oval 48x22              | Flat Oval 50x25     |            |
| Flat Oval 50x30   | Flat Oval 58x38      | Flat Oval 60x30       | Flat Oval 73x47       | Flat Oval 78x39 | Form Work Section 85x20x12.5 | Rectangle D 43x22   |            |
| Butterfly Tube 59.3x59.3  | Butterfly Tube 89x68 |                       |                       |                 |                              |                     |            |

| Triangle, Trirectangular, Thickness 0.28 to 6mm |                              |                   |                   |                   |                         | Sizes - 6 |
|---|------------------------------|-------------------|-------------------|-------------------|-------------------------|-----------|
| Trirectangular 62.5+51.8+77.9                   | Trirectangular 63.5+58+50+16 | Triangle 40+40+55 | Triangle 40+40+60 | Triangle 60+60+80 | Trirectangular 90+60+40 |           |

# Approximate Section Weight Chart as per OD & Thickness for 1.00 mtr

| PIPE/TUBE SIZE | OD in MM | Square       | Rectangle    | Others           | Weight (kg/m) |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|----------------|----------|--------------|--------------|------------------|---------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                |          |              |              |                  | 0.30          | 0.35  | 0.40  | 0.50  | 0.60  | 0.70  | 0.75  | 0.80  | 0.85  | 0.90  | 0.95  | 1.00  | 1.20  | 1.40  | 1.50  | 1.60  | 1.80  | 2.00  | 2.20  | 2.50  |
| 3/8"           | 8.00     |              |              |                  | 0.062         | 0.072 | 0.083 | 0.103 | 0.123 | 0.143 | 0.162 | 0.182 | 0.201 | 0.228 | 0.261 | 0.277 | 0.293 | 0.323 | 0.352 | 0.380 | 0.420 |       |       |       |
| 1/2" OD        | 12.00    | 7.5 x 7.5    | 10 x 5       |                  | 0.073         | 0.086 | 0.098 | 0.121 | 0.145 | 0.169 | 0.191 | 0.215 | 0.227 | 0.238 | 0.273 | 0.313 | 0.333 | 0.353 | 0.391 | 0.428 | 0.463 | 0.513 |       |       |
| 3/4" OD        | 15.87    | 10x10        | 13x7         |                  | 0.097         | 0.113 | 0.129 | 0.161 | 0.192 | 0.224 | 0.259 | 0.271 | 0.286 | 0.302 | 0.317 | 0.367 | 0.423 | 0.451 | 0.478 | 0.532 | 0.585 | 0.636 | 0.710 |       |
| 1" OD          | 18.00    | 12.5x12.5    | 15x10        |                  | 0.120         | 0.140 | 0.160 | 0.200 | 0.239 | 0.279 | 0.298 | 0.318 | 0.337 | 0.357 | 0.376 | 0.395 | 0.461 | 0.533 | 0.569 | 0.604 | 0.673 | 0.741 | 0.808 | 0.905 |
| 1 1/4" OD      | 18.50    |              |              |                  | 0.136         | 0.159 | 0.181 | 0.226 | 0.271 | 0.315 | 0.338 | 0.360 | 0.382 | 0.404 | 0.426 | 0.448 | 0.524 | 0.607 | 0.647 | 0.688 | 0.768 | 0.846 | 0.924 | 1.037 |
| 1 1/2" OD      | 19.05    | 15x15        | 20x10        |                  | 0.144         | 0.168 | 0.192 | 0.239 | 0.286 | 0.334 | 0.357 | 0.381 | 0.404 | 0.427 | 0.451 | 0.474 | 0.555 | 0.643 | 0.686 | 0.729 | 0.815 | 0.898 | 0.981 | 1.102 |
| 1 3/4" OD      | 22.23    | 25x10        |              |                  | 0.168         | 0.195 | 0.223 | 0.278 | 0.334 | 0.389 | 0.416 | 0.443 | 0.471 | 0.498 | 0.525 | 0.552 | 0.649 | 0.753 | 0.804 | 0.855 | 0.956 | 1.055 | 1.153 | 1.288 |
| 2" OD          | 24.15    | 19x19        | 25.4x12.7    | 25x12.5          | 0.182         | 0.212 | 0.242 | 0.302 | 0.362 | 0.422 | 0.452 | 0.481 | 0.511 | 0.541 | 0.570 | 0.600 | 0.719 | 0.825 | 0.875 | 0.931 | 1.041 | 1.150 | 1.258 | 1.417 |
| 2 1/2" OD      | 25.40    | 20x20        | 25x15        | 30x10            | 0.191         | 0.223 | 0.254 | 0.318 | 0.381 | 0.443 | 0.475 | 0.506 | 0.537 | 0.568 | 0.600 | 0.631 | 0.743 | 0.862 | 0.922 | 0.980 | 1.097 | 1.212 | 1.326 | 1.494 |
| 3" OD          | 29.00    |              |              |                  | 0.218         | 0.254 | 0.290 | 0.362 | 0.434 | 0.506 | 0.541 | 0.577 | 0.613 | 0.648 | 0.684 | 0.720 | 0.850 | 0.987 | 1.055 | 1.123 | 1.257 | 1.390 | 1.521 | 1.716 |
| 3 1/2" OD      | 31.75    | 30x30        | 40x20, 45x15 | Ellip 56.24x11.4 | 0.227         | 0.263 | 0.299 | 0.369 | 0.441 | 0.522 | 0.552 | 0.582 | 0.612 | 0.642 | 0.672 | 0.717 | 0.861 | 1.004 | 1.072 | 1.139 | 1.273 | 1.406 | 1.539 | 1.776 |
| 4" OD          | 40.00    | 48x15        | 50x25        | 50x12.5          | 0.285         | 0.333 | 0.380 | 0.474 | 0.569 | 0.663 | 0.710 | 0.757 | 0.804 | 0.851 | 0.898 | 0.944 | 1.120 | 1.302 | 1.382 | 1.462 | 1.661 | 1.829 | 2.016 | 2.278 |
| 4 1/2" OD      | 44.45    | 35x35        | 40x30        | 40x30            | 0.299         | 0.349 | 0.399 | 0.498 | 0.597 | 0.696 | 0.745 | 0.794 | 0.844 | 0.893 | 0.942 | 0.991 | 1.176 | 1.367 | 1.462 | 1.557 | 1.746 | 1.933 | 2.119 | 2.395 |
| 5" OD          | 47.80    | 40x40        | 48x32, 50x30 | Ellip 54x34      | 0.361         | 0.421 | 0.481 | 0.600 | 0.720 | 0.839 | 0.899 | 0.958 | 1.018 | 1.077 | 1.137 | 1.196 | 1.422 | 1.654 | 1.770 | 1.885 | 2.115 | 2.343 | 2.570 | 2.908 |
| 5 1/2" OD      | 57.15    | 45x45        | 50x40        | 50x25            | 0.357         | 0.416 | 0.476 | 0.594 | 0.712 | 0.831 | 0.890 | 0.949 | 1.007 | 1.066 | 1.125 | 1.184 | 1.407 | 1.637 | 1.751 | 1.865 | 2.093 | 2.318 | 2.543 | 2.877 |
| 6" OD          | 60.30    | 50x50        | 58x38        | 60x20            | 0.426         | 0.497 | 0.568 | 0.710 | 0.851 | 0.992 | 1.063 | 1.133 | 1.204 | 1.274 | 1.344 | 1.415 | 1.684 | 1.960 | 2.098 | 2.235 | 2.508 | 2.780 | 3.051 | 3.454 |
| 6 1/2" OD      | 63.50    | 60x40, 65x35 | 75x25        | 75x25            | 0.473         | 0.552 | 0.631 | 0.788 | 0.945 | 1.102 | 1.171 | 1.241 | 1.311 | 1.381 | 1.451 | 1.693 | 1.972 | 2.063 | 2.153 | 2.343 | 2.533 | 2.723 | 2.913 | 3.249 |
| 7" OD          | 70.00    | 55x55        | 80x30        | Diam 65.5x16     | 0.522         | 0.608 | 0.695 | 0.865 | 1.041 | 1.214 | 1.301 | 1.387 | 1.473 | 1.560 | 1.646 | 1.732 | 2.065 | 2.405 | 2.574 | 2.743 | 3.079 | 3.415 | 3.749 | 4.247 |
| 7 1/2" OD      | 76.20    | 60x60        | 80x40        | 75x45, 100x20    | 0.567         | 0.662 | 0.756 | 0.945 | 1.133 | 1.322 | 1.416 | 1.510 | 1.604 | 1.698 | 1.791 | 1.885 | 2.249 | 2.619 | 2.803 | 2.988 | 3.355 | 3.721 | 4.086 | 4.630 |
| 8" OD          | 82.70    | 65x65        | 80x50        | 90x40            | 0.616         | 0.718 | 0.820 | 1.025 | 1.230 | 1.434 | 1.536 | 1.638 | 1.740 | 1.842 | 1.944 | 2.046 | 2.441 | 2.844 | 3.044 | 3.244 | 3.644 | 4.042 | 4.439 | 5.032 |

| PIPE/TUBE SIZE | OD in MM | Square       | Rectangle      | Others         | Weight (kg/m) |       |       |       |       |       |       |       |       |       |       |       |       |       |        |        |        |        |        |        |        |        |        |        |        |       |
|----------------|----------|--------------|----------------|----------------|---------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|
|                |          |              |                |                | 1.60          | 1.80  | 2.00  | 2.50  | 3.00  | 3.30  | 3.50  | 3.60  | 3.80  | 4.00  | 4.50  | 4.80  | 5.00  | 5.50  | 6.00   | 6.30   | 7.00   | 7.50   | 8.00   | 10.00  |        |        |        |        |        |       |
| 1 1/2" NB      | 15       |              |                |                | 0.818         | 0.915 | 1.009 | 1.149 | 1.241 | 1.286 | 1.375 | 1.420 | 1.428 | 1.510 | 1.669 | 1.746 | 1.821 | 2.002 | 2.106  | 2.139  | 2.373  | 2.502  | 2.654  | 3.007  |        |        |        |        |        |       |
| 1" OD          | 21.30    | 19x19        | 25x12.5        | F.Oval 25x15   | 0.931         | 1.041 | 1.150 | 1.311 | 1.417 | 1.469 | 1.573 | 1.624 | 1.639 | 1.735 | 1.922 | 2.013 | 2.103 | 2.319 | 2.444  | 2.484  | 2.825  | 2.962  | 3.011  | 3.275  | 3.541  | 3.797  | 4.011  |        |        |       |
| 3/4" NB        | 25.40    | 20x20        | 25x15          | F.Oval 32x12   | 0.980         | 1.097 | 1.212 | 1.382 | 1.494 | 1.549 | 1.659 | 1.713 | 1.732 | 1.834 | 2.034 | 2.131 | 2.226 | 2.458 | 2.592  | 2.636  | 2.979  | 2.848  | 2.831  | 3.051  | 3.090  | 3.205  | 3.495  | 3.788  | 4.075  | 4.320 |
| 2" OD          | 26.90    | 25x20        | 30x15          | F.Oval 35x15   | 1.040         | 1.163 | 1.286 | 1.467 | 1.598 | 1.646 | 1.763 | 1.821 | 1.843 | 1.953 | 2.167 | 2.271 | 2.374 | 2.625 | 2.770  | 2.817  | 3.264  | 3.048  | 3.170  | 3.370  | 3.312  | 3.439  | 3.758  | 4.084  | 4.408  | 4.690 |
| 1 1/4" OD      | 31.75    | 28x25        | 30x20          | F.Oval 38x22   | 1.231         | 1.379 | 1.526 | 1.743 | 1.886 | 1.957 | 2.098 | 2.168 | 2.202 | 2.336 | 2.588 | 2.727 | 2.854 | 3.164 | 3.345  | 3.404  | 3.963  | 3.695  | 3.826  | 4.052  | 4.144  | 4.281  | 4.781  | 5.105  | 5.428  | 5.688 |
| 1" NB          | 33.70    | 32x32        | 35x30, 40x25   | F.Oval 40x20   | 1.308         | 1.468 | 1.622 | 1.854 | 2.008 | 2.082 | 2.233 | 2.308 | 2.347 | 2.490 | 2.771 | 2.910 | 3.040 | 3.380 | 3.576  | 3.640  | 4.280  | 4.320  | 4.487  | 4.850  | 4.920  | 5.200  | 5.688  | 6.066  | 6.389  | 6.666 |
| 1 1/2" OD      | 34.90    | 38x38        | 45x10          | F.Oval 48x22   | 1.366         | 1.519 | 1.671 | 1.922 | 2.080 | 2.159 | 2.316 | 2.394 | 2.436 | 2.585 | 2.878 | 3.022 | 3.165 | 3.514 | 3.718  | 3.785  | 4.435  | 4.415  | 4.545  | 4.938  | 4.984  | 5.268  | 5.852  | 6.231  | 6.555  | 6.882 |
| 2" NB          | 40.80    | 45x45        | 50x40          | 50x20, 60x10   | 1.589         | 1.781 | 1.973 | 2.257 | 2.445 | 2.538 | 2.724 | 2.816 | 2.873 | 3.051 | 3.403 | 3.576 | 3.748 | 4.169 | 4.417  | 4.489  | 5.881  | 5.601  | 5.690  | 6.195  | 6.331  | 6.831  | 7.497  | 8.123  | 8.750  | 9.377 |
| 1 1/4" NB      | 42.40    | 50x25        | 55x30, 40x25   | 60x12          | 1.652         | 1.852 | 2.052 | 2.346 | 2.543 | 2.641 | 2.835 | 2.931 | 2.991 | 3.178 | 3.545 | 3.726 | 3.905 | 4.347 | 4.607  | 4.683  | 6.178  | 5.116  | 5.282  | 5.828  | 5.609  | 6.205  | 6.875  | 7.547  | 8.181  |       |
| 1 1/2" NB      | 44.45    | 50x25        | 45x30          | 60x15          | 1.733         | 1.942 | 2.151 | 2.464 | 2.670 | 2.782 | 2.976 | 3.078 | 3.143 | 3.340 | 3.727 | 3.918 | 4.104 | 4.575 | 4.850  | 4.941  | 6.503  | 5.389  | 5.565  | 6.207  | 6.004  | 6.603  | 7.282  | 7.961  | 8.640  |       |
| 2" OD          | 47.80    | 50x40        | 48x22, 50x30   | 65x15          | 1.885         | 2.093 | 2.318 | 2.654 | 2.877 | 2.998 | 3.208 | 3.318 | 3.392 | 3.604 | 4.025 | 4.233 | 4.439 | 4.947 | 5.247  | 5.346  | 6.929  | 6.029  | 6.315  | 7.000  | 6.801  | 7.422  | 8.104  | 8.783  | 9.462  |       |
| 2 1/2" OD      | 57.15    | 60x30, 70x20 | 60x35, 65x30   | 70x25          | 1.885         | 2.115 | 2.343 | 2.683 | 2.988 | 3.020 | 3.242 | 3.353 | 3.429 | 3.644 | 4.069 | 4.280 | 4.488 | 5.003 | 5.306  | 5.407  | 7.000  | 6.029  | 6.315  | 7.000  | 6.801  | 7.422  | 8.104  | 8.783  | 9.462  |       |
| 3" OD          | 60.30    | 60x40        | 65x45, 58x38   | 80x50          | 1.984         | 2.226 | 2.466 | 2.825 | 3.062 | 3.162 | 3.415 | 3.532 | 3.614 | 3.841 | 4.292 | 4.514 | 4.735 | 5.281 | 5.603  | 5.709  | 7.500  | 6.443  | 6.732  | 7.500  | 7.291  | 7.912  | 8.594  | 9.275  | 9.956  |       |
| 3 1/2" OD      | 63.00    | 68x33        | 75x45, 65x38   | 90x50          | 2.235         | 2.508 | 2.780 | 3.166 | 3.454 | 3.588 | 3.854 | 3.987 | 4.084 | 4.343 | 4.856 | 5.110 | 5.363 | 5.986 | 6.355  | 6.478  | 8.500  | 7.322  | 7.611  | 8.485  | 8.276  | 8.897  | 9.578  | 10.259 | 10.940 |       |
| 4" OD          | 67.00    | 75x75        | 80x50, 82x38   | 100x50         | 2.466         | 2.768 | 3.069 | 3.518 | 3.815 | 3.994 | 4.259 | 4.406 | 4.518 | 4.802 | 5.376 | 5.659 | 5.941 | 6.636 | 7.049  | 7.186  | 9.250  | 8.073  | 8.362  | 9.340  | 9.131  | 9.752  | 10.433 | 11.114 | 11.795 |       |
| 4 1/2" OD      | 70.00    | 80x50        | 80x60, 100x40  | 120x50         | 2.486         | 2.790 | 3.094 | 3.546 | 3.843 | 3.996 | 4.294 | 4.442 | 4.555 | 4.845 | 5.421 | 5.706 | 5.990 | 6.692 | 7.108  | 7.246  | 9.300  | 8.123  | 8.412  | 9.390  | 9.181  | 9.802  | 10.483 | 11.164 | 11.845 |       |
| 5" OD          | 76.20    | 88x80        | 96x48, 94x46   | 130x80         | 2.743         | 3.079 | 3.415 | 3.915 | 4.247 | 4.422 | 4.743 | 4.908 | 5.036 | 5.359 | 5.959 | 6.316 | 6.632 | 7.414 | 7.819  | 8.033  | 10.100 | 8.925  | 9.214  | 10.192 | 9.983  | 10.604 | 11.285 | 11.966 | 12.647 |       |
| 5 1/2" OD      | 82.70    | 95x95        | 100x60, 112x48 | 150x50, 150x40 | 2.984         | 3.351 | 3.716 | 4.262 | 4.624 | 4.805 | 5.165 | 5.344 | 5.488 | 5.841 | 6.511 | 6.889 | 7.285 | 8.092 | 8.602  | 8.771  | 10.850 | 9.675  | 9.964  | 10.942 | 10.733 | 11.354 | 12.035 | 12.716 | 13.397 |       |
| 6" OD          | 88.90    | 100x100      | 100x80, 110x60 | 170x80, 150x60 | 3.244         | 3.644 | 4.042 | 4.637 | 5.032 | 5.228 | 5.621 | 5.817 | 5.974 | 6.342 | 7.128 | 7.508 | 7.887 | 8.826 | 9.336  | 9.505  | 11.580 | 10.405 | 10.694 | 11.672 | 11.463 | 12.084 | 12.765 | 13.446 | 14.127 |       |
| 6 1/2" OD      | 95.50    | 100x80       | 100x60, 112x48 | 180x80, 150x60 | 3.489         | 3.920 | 4.348 | 4.988 | 5.414 | 5.627 | 6.050 | 6.261 | 6.437 | 6.822 | 7.679 | 8.059 | 8.439 | 9.515 | 10.119 | 10.300 | 12.375 | 11.200 | 11.490 | 12.468 | 12.259 | 12.880 | 13.561 | 14.242 | 14.923 |       |
| 7" OD          | 101.60   | 114x90       | 122x61, 128x51 | 200x100        | 3.750         | 4.213 | 4.674 | 5.364 | 5.822 | 6.040 |       |       |       |       |       |       |       |       |        |        |        |        |        |        |        |        |        |        |        |       |



**Steel Tubes for Automotive Purposes - As per IS 3074:2013**  
**Size and Weight of Steel Tubes for Automotive Purposes - As per IS 5429:2013**

| Outside Diameter<br>in mm | Weight in kg/meter (Theoretical) |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |       |       |       |       |       |       |       |       |       |      |  |  |
|---------------------------|----------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|--|--|
|                           | 0.50                             | 0.80 | 0.90 | 1.00 | 1.20 | 1.50 | 1.60 | 1.80 | 2.00 | 2.20 | 2.30 | 2.50 | 2.60 | 2.80 | 2.90 | 3.00 | 3.20 | 3.50  | 3.60  | 4.00  | 4.50  | 5.40  | 5.60  | 6.00  | 6.30  | 7.00  | 8.00 |  |  |
| 5.00                      | 0.06                             | 0.08 | 0.09 | 0.10 |      |      |      |      |      |      |      |      |      |      |      |      |      |       |       |       |       |       |       |       |       |       |      |  |  |
| 6.00                      | 0.07                             | 0.10 | 0.11 | 0.12 |      |      |      |      |      |      |      |      |      |      |      |      |      |       |       |       |       |       |       |       |       |       |      |  |  |
| 8.00                      | 0.09                             | 0.14 | 0.16 | 0.17 |      |      |      |      |      |      |      |      |      |      |      |      |      |       |       |       |       |       |       |       |       |       |      |  |  |
| 9.52                      | 0.11                             | 0.17 | 0.19 | 0.21 |      |      |      |      |      |      |      |      |      |      |      |      |      |       |       |       |       |       |       |       |       |       |      |  |  |
| 10.00                     | 0.12                             | 0.18 | 0.20 | 0.22 |      |      |      |      |      |      |      |      |      |      |      |      |      |       |       |       |       |       |       |       |       |       |      |  |  |
| 12.00                     | 0.14                             | 0.22 | 0.25 | 0.27 |      |      |      |      |      |      |      |      |      |      |      |      |      |       |       |       |       |       |       |       |       |       |      |  |  |
| 12.70                     | 0.15                             | 0.23 | 0.26 | 0.29 |      |      |      |      |      |      |      |      |      |      |      |      |      |       |       |       |       |       |       |       |       |       |      |  |  |
| 13.50                     |                                  | 0.25 | 0.28 | 0.31 | 0.36 | 0.44 | 0.47 | 0.52 | 0.57 |      |      |      |      |      |      |      |      |       |       |       |       |       |       |       |       |       |      |  |  |
| 15.88                     |                                  | 0.30 | 0.33 | 0.37 | 0.43 | 0.53 | 0.56 | 0.63 | 0.68 |      |      |      |      |      |      |      |      |       |       |       |       |       |       |       |       |       |      |  |  |
| 17.46                     |                                  | 0.33 | 0.37 | 0.41 | 0.48 | 0.59 | 0.63 | 0.70 | 0.76 | 0.83 | 0.86 |      |      |      |      |      |      |       |       |       |       |       |       |       |       |       |      |  |  |
| 18.00                     |                                  | 0.34 | 0.38 | 0.42 | 0.50 | 0.61 | 0.65 | 0.72 | 0.79 | 0.86 | 0.89 | 0.96 | 0.99 |      |      |      |      |       |       |       |       |       |       |       |       |       |      |  |  |
| 18.50                     |                                  | 0.35 | 0.39 | 0.43 | 0.51 | 0.63 | 0.67 | 0.74 | 0.81 | 0.88 | 0.92 | 0.99 | 1.02 |      |      |      |      |       |       |       |       |       |       |       |       |       |      |  |  |
| 19.05                     |                                  | 0.36 | 0.40 | 0.45 | 0.53 | 0.65 | 0.69 | 0.77 | 0.84 | 0.91 | 0.95 | 1.02 | 1.05 |      |      |      |      |       |       |       |       |       |       |       |       |       |      |  |  |
| 22.23                     |                                  | 0.42 | 0.47 | 0.52 | 0.62 | 0.77 | 0.81 | 0.91 | 1.00 | 1.09 | 1.13 | 1.21 | 1.26 | 1.34 | 1.38 | 1.42 | 1.50 |       |       |       |       |       |       |       |       |       |      |  |  |
| 23.42                     |                                  | 0.45 | 0.50 | 0.55 | 0.66 | 0.81 | 0.86 | 0.96 | 1.06 | 1.15 | 1.20 | 1.29 | 1.33 | 1.42 | 1.47 | 1.51 | 1.60 |       |       |       |       |       |       |       |       |       |      |  |  |
| 25.40                     |                                  | 0.49 | 0.54 | 0.60 | 0.72 | 0.88 | 0.94 | 1.05 | 1.15 | 1.26 | 1.31 | 1.41 | 1.46 | 1.56 | 1.61 | 1.66 | 1.75 |       |       |       |       |       |       |       |       |       |      |  |  |
| 28.60                     |                                  | 0.55 | 0.61 | 0.68 | 0.81 | 1.00 | 1.07 | 1.19 | 1.31 | 1.43 | 1.49 | 1.61 | 1.67 | 1.78 | 1.84 | 1.89 | 2.00 | 2.17  |       |       |       |       |       |       |       |       |      |  |  |
| 31.75                     |                                  | 0.61 | 0.68 | 0.76 | 0.90 | 1.12 | 1.19 | 1.33 | 1.47 | 1.60 | 1.67 | 1.80 | 1.87 | 2.00 | 2.06 | 2.13 | 2.25 | 2.44  | 2.50  |       |       |       |       |       |       |       |      |  |  |
| 33.70                     |                                  |      | 0.81 | 0.96 | 1.19 | 1.27 | 1.42 | 1.56 | 1.71 | 1.78 | 1.92 | 1.99 | 2.13 | 2.20 | 2.27 | 2.41 | 2.61 | 2.67  | 2.93  |       |       |       |       |       |       |       |      |  |  |
| 34.00                     |                                  |      | 0.81 | 0.97 | 1.20 | 1.28 | 1.43 | 1.58 | 1.73 | 1.80 | 1.94 | 2.01 | 2.15 | 2.22 | 2.29 | 2.43 | 2.63 | 2.70  | 2.96  |       |       |       |       |       |       |       |      |  |  |
| 38.10                     |                                  |      | 0.91 | 1.09 | 1.35 | 1.44 | 1.61 | 1.78 | 1.95 | 2.03 | 2.19 | 2.28 | 2.44 | 2.52 | 2.60 | 2.75 | 2.99 | 3.06  | 3.36  | 3.73  | 4.35  |       |       |       |       |       |      |  |  |
| 41.28                     |                                  |      | 0.99 | 1.19 | 1.47 | 1.57 | 1.75 | 1.94 | 2.12 | 2.21 | 2.39 | 2.48 | 2.66 | 2.74 | 2.83 | 3.01 | 3.26 | 3.35  | 3.68  | 4.08  | 4.78  |       |       |       |       |       |      |  |  |
| 42.00                     |                                  |      | 1.01 | 1.21 | 1.50 | 1.59 | 1.78 | 1.97 | 2.16 | 2.25 | 2.44 | 2.53 | 2.71 | 2.80 | 2.89 | 3.06 | 3.32 | 3.41  | 3.75  | 4.16  | 4.87  |       |       |       |       |       |      |  |  |
| 42.70                     |                                  |      | 1.03 | 1.23 | 1.52 | 1.62 | 1.82 | 2.01 | 2.20 | 2.29 | 2.48 | 2.57 | 2.76 | 2.85 | 2.94 | 3.12 | 3.38 | 3.47  | 3.82  | 4.24  | 4.97  |       |       |       |       |       |      |  |  |
| 44.45                     |                                  |      | 1.07 | 1.28 | 1.59 | 1.69 | 1.89 | 2.09 | 2.29 | 2.39 | 2.59 | 2.68 | 2.88 | 2.97 | 3.07 | 3.26 | 3.53 | 3.63  | 3.99  | 4.43  | 5.20  |       |       |       |       |       |      |  |  |
| 48.30                     |                                  |      | 1.17 | 1.39 | 1.73 | 1.84 | 2.06 | 2.28 | 2.50 | 2.61 | 2.82 | 2.93 | 3.14 | 3.25 | 3.35 | 3.56 | 3.87 | 3.97  | 4.37  | 4.86  | 5.71  | 5.90  | 6.26  | 6.53  | 7.13  |       |      |  |  |
| 50.80                     |                                  |      | 1.23 | 1.47 | 1.82 | 1.94 | 2.18 | 2.41 | 2.64 | 2.75 | 2.98 | 3.09 | 3.31 | 3.43 | 3.54 | 3.76 | 4.08 | 4.19  | 4.62  | 5.14  | 6.05  | 6.24  | 6.63  | 6.91  | 7.56  |       |      |  |  |
| 57.15                     |                                  |      | 1.38 | 1.66 | 2.06 | 2.19 | 2.46 | 2.72 | 2.98 | 3.11 | 3.37 | 3.50 | 3.75 | 3.88 | 4.01 | 4.26 | 4.63 | 4.75  | 5.24  | 5.84  | 6.89  | 7.12  | 7.57  | 7.90  | 8.66  |       |      |  |  |
| 60.30                     |                                  |      |      | 1.75 | 2.18 | 2.32 | 2.60 | 2.88 | 3.15 | 3.29 | 3.56 | 3.70 | 3.97 | 4.11 | 4.24 | 4.51 | 4.90 | 5.03  | 5.55  | 6.19  | 7.31  | 7.55  | 8.03  | 8.39  | 9.20  |       |      |  |  |
| 63.50                     |                                  |      |      | 1.84 | 2.29 | 2.44 | 2.74 | 3.03 | 3.33 | 3.47 | 3.76 | 3.90 | 4.19 | 4.33 | 4.48 | 4.76 | 5.18 | 5.32  | 5.87  | 6.55  | 7.74  | 8.00  | 8.51  | 8.89  | 9.75  |       |      |  |  |
| 69.85                     |                                  |      |      | 2.03 | 2.53 | 2.69 | 3.02 | 3.35 | 3.67 | 3.83 | 4.15 | 4.31 | 4.63 | 4.79 | 4.95 | 5.26 | 5.73 | 5.88  | 6.50  | 7.25  | 8.58  | 8.87  | 9.45  | 9.87  | 10.85 |       |      |  |  |
| 70.00                     |                                  |      |      | 2.04 | 2.53 | 2.70 | 3.03 | 3.35 | 3.68 | 3.84 | 4.16 | 4.32 | 4.64 | 4.80 | 4.96 | 5.27 | 5.74 | 5.90  | 6.51  | 7.27  | 8.60  | 8.89  | 9.47  | 9.90  | 10.88 |       |      |  |  |
| 76.20                     |                                  |      |      | 2.22 | 2.76 | 2.94 | 3.30 | 3.66 | 4.01 | 4.19 | 4.54 | 4.72 | 5.07 | 5.24 | 5.42 | 5.76 | 6.28 | 6.45  | 7.12  | 7.96  | 9.43  | 9.75  | 10.39 | 10.86 | 11.95 | 13.46 |      |  |  |
| 81.20                     |                                  |      |      |      | 3.14 | 3.52 | 3.91 | 4.29 | 4.48 | 4.85 | 5.04 | 5.41 | 5.60 | 5.79 | 6.16 | 6.71 | 6.89 | 7.62  | 8.51  | 10.09 | 10.44 | 11.13 | 11.64 | 12.81 | 14.44 |       |      |  |  |
| 82.50                     |                                  |      |      |      | 3.19 | 3.58 | 3.97 | 4.36 | 4.55 | 4.93 | 5.12 | 5.50 | 5.69 | 5.88 | 6.26 | 6.82 | 7.00 | 7.74  | 8.66  | 10.27 | 10.62 | 11.32 | 11.84 | 13.03 | 14.70 |       |      |  |  |
| 88.90                     |                                  |      |      |      | 3.44 | 3.87 | 4.29 | 4.70 | 4.91 | 5.33 | 5.53 | 5.95 | 6.15 | 6.36 | 6.76 | 7.37 | 7.57 | 8.38  | 9.37  | 11.12 | 11.50 | 12.27 | 12.83 | 14.14 | 15.96 |       |      |  |  |
| 101.60                    |                                  |      |      |      | 3.95 | 4.43 | 4.91 | 5.39 | 5.63 | 6.11 | 6.35 | 6.82 | 7.06 | 7.29 | 7.77 | 8.47 | 8.70 | 9.63  | 10.78 | 12.81 | 13.26 | 14.15 | 14.81 | 16.33 | 18.47 |       |      |  |  |
| 108.00                    |                                  |      |      |      | 4.20 | 4.71 | 5.23 | 5.74 | 6.00 | 6.50 | 6.76 | 7.26 | 7.52 | 7.77 | 8.27 | 9.02 | 9.27 | 10.26 | 11.49 | 13.66 | 14.14 | 15.09 | 15.80 | 17.44 | 19.73 |       |      |  |  |
| 114.30                    |                                  |      |      |      | 4.45 | 4.99 | 5.54 | 6.08 | 6.35 | 6.89 | 7.16 | 7.70 | 7.97 | 8.23 | 8.77 | 9.56 | 9.83 | 10.88 | 12.19 | 14.50 | 15.01 | 16.03 | 16.78 | 18.52 | 20.97 |       |      |  |  |

**AVAILABLE IN : HR, HRPO, CRCA, CRFH, GP & CORTEN STEEL**

**PIPE GRADES**

|                |                |                |                |                |
|----------------|----------------|----------------|----------------|----------------|
| <b>YST 210</b> | <b>YST 240</b> | <b>YST 310</b> | <b>YST 355</b> | <b>YST 450</b> |
| <b>YST 500</b> | <b>YST 550</b> | <b>YST 600</b> | <b>YST 650</b> | <b>YST 700</b> |



# Specification for Steel Tubes for Structural Purposes

## Conforming to IS 4923 / 1997 Dimensions and Properties of Square Hollow Sections

| Designation<br>in<br>mm | Thickness<br>in<br>mm | Depth<br>or width<br>in mm | Weight<br>in<br>kg/ meter | Area of<br>Section<br>cm <sup>2</sup> | Moment<br>of Inertia<br>cm <sup>4</sup> | Radius<br>of Gyration<br>cm | Elastic<br>Modulus<br>cm <sup>3</sup> | Plastic<br>Modulus<br>cm <sup>3</sup> |
|-------------------------|-----------------------|----------------------------|---------------------------|---------------------------------------|---|-----------------------------|---------------------------------------|---------------------------------------|
| 25x25                   | 2.6                   | 25                         | 1.69                      | 2.16                                  | 1.72                                    | 0.89                        | 1.38                                  | 1.76                                  |
|                         | 3.2                   | 25                         | 1.98                      | 2.53                                  | 1.89                                    | 0.86                        | 1.51                                  | 1.98                                  |
| 30x30                   | 2.6                   | 30                         | 2.10                      | 2.68                                  | 3.23                                    | 1.10                        | 2.15                                  | 2.68                                  |
|                         | 3.2                   | 30                         | 2.49                      | 3.17                                  | 3.62                                    | 1.07                        | 2.41                                  | 3.08                                  |
|                         | 4                     | 30                         | 2.94                      | 3.75                                  | 3.97                                    | 1.03                        | 2.64                                  | 3.50                                  |
| 32x32                   | 2.6                   | 32                         | 2.26                      | 2.88                                  | 4.02                                    | 1.18                        | 2.51                                  | 3.11                                  |
|                         | 3.2                   | 32                         | 2.69                      | 3.42                                  | 4.54                                    | 1.15                        | 2.84                                  | 3.59                                  |
|                         | 4                     | 32                         | 3.19                      | 4.07                                  | 5.02                                    | 1.11                        | 3.14                                  | 4.11                                  |
| 38x38                   | 2.6                   | 38                         | 2.75                      | 3.51                                  | 7.14                                    | 1.43                        | 3.76                                  | 4.57                                  |
|                         | 2.9                   | 38                         | 3.03                      | 3.86                                  | 7.68                                    | 1.41                        | 4.04                                  | 4.97                                  |
|                         | 3.2                   | 38                         | 3.29                      | 4.19                                  | 8.18                                    | 1.40                        | 4.30                                  | 5.34                                  |
|                         | 3.6                   | 38                         | 3.63                      | 4.62                                  | 8.76                                    | 1.38                        | 4.61                                  | 5.80                                  |
|                         | 4                     | 38                         | 3.95                      | 5.03                                  | 9.26                                    | 1.36                        | 4.87                                  | 6.22                                  |
| 40x40                   | 2.6                   | 40                         | 2.92                      | 3.72                                  | 8.45                                    | 1.51                        | 4.22                                  | 5.12                                  |
|                         | 3.2                   | 40                         | 3.49                      | 4.45                                  | 9.72                                    | 1.48                        | 4.86                                  | 6.01                                  |
|                         | 3.6                   | 40                         | 3.85                      | 4.91                                  | 10.45                                   | 1.46                        | 5.22                                  | 6.53                                  |
|                         | 4                     | 40                         | 4.20                      | 5.35                                  | 11.07                                   | 1.44                        | 5.54                                  | 7.01                                  |
| 49.5x49.5               | 2.9                   | 49.5                       | 4.07                      | 5.19                                  | 18.37                                   | 1.88                        | 7.42                                  | 8.93                                  |
|                         | 3.6                   | 49.5                       | 4.93                      | 6.28                                  | 21.42                                   | 1.85                        | 8.66                                  | 10.60                                 |
|                         | 4.5                   | 49.5                       | 5.95                      | 7.58                                  | 24.64                                   | 1.80                        | 9.96                                  | 12.47                                 |
| 72x72                   | 3.2                   | 72                         | 6.71                      | 8.54                                  | 66.32                                   | 2.79                        | 18.42                                 | 21.80                                 |
|                         | 4                     | 72                         | 8.22                      | 10.47                                 | 79.03                                   | 2.75                        | 21.95                                 | 26.32                                 |
|                         | 4.8                   | 72                         | 9.66                      | 12.31                                 | 90.31                                   | 2.71                        | 25.09                                 | 30.49                                 |
| 91.5x91.5               | 3.6                   | 91.5                       | 9.67                      | 12.32                                 | 156.49                                  | 3.56                        | 34.21                                 | 40.24                                 |
|                         | 4.5                   | 91.5                       | 11.88                     | 15.14                                 | 187.57                                  | 3.52                        | 41.00                                 | 48.79                                 |
|                         | 5.4                   | 91.5                       | 14.01                     | 17.85                                 | 215.68                                  | 3.48                        | 47.14                                 | 56.77                                 |
| 100x100                 | 4                     | 100                        | 11.73                     | 14.95                                 | 226.35                                  | 3.89                        | 45.27                                 | 53.30                                 |
|                         | 5                     | 100                        | 14.41                     | 18.36                                 | 271.10                                  | 3.84                        | 54.22                                 | 64.59                                 |
|                         | 6                     | 100                        | 16.98                     | 21.63                                 | 311.47                                  | 3.79                        | 62.29                                 | 75.10                                 |
| 113.5x113.5             | 4.5                   | 113.5                      | 14.99                     | 19.10                                 | 372.88                                  | 4.42                        | 65.71                                 | 77.33                                 |
|                         | 4.8                   | 113.5                      | 15.92                     | 20.28                                 | 393.31                                  | 4.40                        | 69.30                                 | 81.81                                 |
|                         | 5.4                   | 113.5                      | 17.74                     | 22.60                                 | 432.58                                  | 4.38                        | 76.23                                 | 90.55                                 |
|                         | 6                     | 113.5                      | 19.53                     | 24.87                                 | 469.81                                  | 4.35                        | 82.79                                 | 98.96                                 |
| 132x132                 | 4.8                   | 132                        | 18.71                     | 23.83                                 | 634.39                                  | 5.16                        | 96.12                                 | 112.69                                |
|                         | 5.4                   | 132                        | 20.88                     | 26.59                                 | 700.11                                  | 5.13                        | 106.08                                | 125.02                                |
|                         | 6                     | 132                        | 23.01                     | 29.31                                 | 762.98                                  | 5.10                        | 115.60                                | 136.98                                |
| 150x150                 | 5                     | 150                        | 22.26                     | 28.36                                 | 982.12                                  | 5.89                        | 130.95                                | 152.98                                |
|                         | 6                     | 150                        | 26.40                     | 33.63                                 | 1145.91                                 | 5.84                        | 152.79                                | 179.88                                |
|                         | 4                     | 180                        | 21.90                     | 27.90                                 | 1434.00                                 | 7.17                        | 159.00                                | 184.00                                |
| 180x180                 | 5                     | 180                        | 27.20                     | 34.60                                 | 1755.00                                 | 7.12                        | 195.00                                | 226.00                                |
|                         | 6                     | 180                        | 32.05                     | 40.83                                 | 2036.00                                 | 7.06                        | 226.00                                | 280.00                                |
|                         | 8                     | 180                        | 42.50                     | 54.10                                 | 2633.00                                 | 6.98                        | 293.00                                | 346.00                                |

*“We have always  
pursued the critical path with  
determined deliverables”*

**AVAILABLE IN : HR, HRPO, CRCA, CRFH, GP & CORTEN STEEL**



### PIPE GRADES

|                |                |                |                |                |
|----------------|----------------|----------------|----------------|----------------|
| <b>YST 210</b> | <b>YST 240</b> | <b>YST 310</b> | <b>YST 355</b> | <b>YST 450</b> |
| <b>YST 500</b> | <b>YST 550</b> | <b>YST 600</b> | <b>YST 650</b> | <b>YST 700</b> |



# Specification for Steel Tubes for Structural Purposes

## Conforming to IS 4923 / 1997 Dimensions and Properties of Rectangular Hollow Sections

| Designation | Thickness | Depth of | Width of | Weight    | Area            | Moment of       |                 | Radius of |       | Elastic Modulus |                 | Plastic Modulus |                 |
|-------------|-----------|----------|----------|-----------|-----------------|-----------------|-----------------|-----------|-------|-----------------|-----------------|-----------------|-----------------|
|             |           | Section  | Section  |           | of              | Inertia about   | Gyration about  | About     | About | X-X             | Y-Y             | X-X             | Y-Y             |
| in mm       | in mm     | D        | B        | in        | Section         | X-X             | Y-Y             | X-X       | Y-Y   | X-X             | Y-Y             | X-X             | Y-Y             |
|             |           | in mm    | in mm    | kg/ meter | cm <sup>2</sup> | cm <sup>4</sup> | cm <sup>4</sup> | cm        | cm    | cm <sup>3</sup> | cm <sup>3</sup> | cm <sup>3</sup> | cm <sup>3</sup> |
| 50x25       | 2.9       | 50       | 25       | 2.98      | 3.80            | 10.93           | 3.60            | 1.70      | 0.97  | 4.37            | 2.88            | 5.72            | 3.48            |
|             | 3.2       | 50       | 25       | 3.24      | 4.13            | 11.63           | 3.80            | 1.68      | 0.96  | 4.65            | 3.04            | 6.14            | 3.73            |
| 60x40       | 2.9       | 60       | 40       | 4.12      | 5.25            | 24.74           | 13.11           | 2.17      | 1.58  | 8.25            | 6.56            | 10.25           | 7.73            |
|             | 2.9       | 66       | 33       | 4.07      | 5.19            | 27.33           | 9.12            | 2.29      | 1.33  | 8.28            | 5.53            | 10.59           | 6.49            |
| 66x33       | 3.6       | 66       | 33       | 4.93      | 6.28            | 31.87           | 10.52           | 2.25      | 1.29  | 9.66            | 6.37            | 12.56           | 7.66            |
|             | 4.5       | 66       | 33       | 5.95      | 7.58            | 36.64           | 11.93           | 2.20      | 1.25  | 11.10           | 7.23            | 14.77           | 8.94            |
| 80x40       | 2.9       | 80       | 40       | 5.03      | 6.41            | 50.87           | 17.11           | 2.82      | 1.63  | 12.72           | 8.56            | 16.07           | 9.88            |
|             | 3.2       | 80       | 40       | 5.50      | 7.01            | 54.94           | 18.41           | 2.80      | 1.62  | 13.74           | 9.21            | 17.46           | 10.72           |
|             | 4         | 80       | 40       | 6.71      | 8.55            | 64.79           | 21.49           | 2.75      | 1.59  | 16.20           | 10.74           | 20.91           | 12.77           |
| 96x48       | 3.2       | 96       | 48       | 6.71      | 8.54            | 98.61           | 33.28           | 3.40      | 1.97  | 20.54           | 13.87           | 25.85           | 15.91           |
|             | 4         | 96       | 48       | 8.22      | 10.47           | 117.54          | 39.32           | 3.55      | 1.94  | 24.49           | 16.30           | 31.21           | 19.14           |
|             | 4.8       | 96       | 48       | 9.66      | 12.31           | 134.35          | 44.55           | 3.30      | 1.90  | 27.99           | 18.56           | 36.13           | 22.08           |
| 122x61      | 3.6       | 122      | 61       | 9.67      | 12.32           | 232.61          | 78.83           | 4.34      | 2.35  | 38.13           | 25.84           | 47.71           | 29.42           |
|             | 4.5       | 122      | 61       | 11.88     | 15.14           | 278.94          | 93.78           | 4.29      | 2.49  | 45.73           | 30.75           | 57.85           | 35.56           |
|             | 5.4       | 122      | 61       | 14.01     | 17.85           | 320.83          | 107.03          | 4.24      | 2.45  | 52.60           | 35.09           | 67.29           | 41.22           |
| 145x82      | 4.8       | 145      | 82       | 15.92     | 20.28           | 555.16          | 228.50          | 5.23      | 3.36  | 76.57           | 55.73           | 94.93           | 63.93           |
|             | 5.4       | 145      | 82       | 17.74     | 22.60           | 610.85          | 250.59          | 5.20      | 3.33  | 84.26           | 61.12           | 105.07          | 70.66           |
| 172x92      | 4.8       | 172      | 92       | 18.71     | 23.83           | 917.13          | 346.91          | 6.20      | 3.82  | 106.64          | 75.41           | 132.08          | 85.61           |
|             | 5.4       | 172      | 92       | 20.88     | 26.59           | 1012.47         | 381.74          | 6.17      | 3.79  | 117.73          | 82.99           | 146.55          | 94.86           |
| 200x100     | 4         | 200      | 100      | 18.01     | 22.95           | 1199.71         | 410.78          | 7.23      | 4.23  | 119.97          | 82.16           |                 |                 |
|             | 5         | 200      | 100      | 22.26     | 28.36           | 1459.28         | 496.94          | 7.17      | 4.19  | 145.93          | 99.39           |                 |                 |
|             | 6         | 200      | 100      | 26.40     | 33.63           | 1703.34         | 576.92          | 7.12      | 4.14  | 170.33          | 115.38          |                 |                 |
|             | 8         | 200      | 100      | 34.38     | 43.79           | 2146.27         | 719.19          | 7.00      | 4.05  | 214.62          | 143.84          |                 |                 |
| 240x120     | 4         | 240      | 120      | 21.78     | 27.75           | 2110.72         | 725.35          | 8.72      | 5.11  | 175.89          | 120.89          |                 |                 |
|             | 5         | 240      | 120      | 26.97     | 34.36           | 2597.67         | 882.47          | 8.67      | 5.07  | 214.97          | 147.08          |                 |                 |
|             | 6         | 240      | 120      | 32.05     | 40.83           | 3025.91         | 1030.45         | 8.61      | 5.02  | 252.16          | 171.74          |                 |                 |
|             | 8         | 240      | 120      | 41.91     | 53.39           | 3851.50         | 1299.95         | 8.55      | 4.93  | 320.99          | 216.66          |                 |                 |

### Tolerances

|                             |   |
|-----------------------------|---|
| Thickness all sizes         | : ± 10%   |
| Outside Dimensions of sides | : ± 1 % with a minimum of + / - 0.5 mm            |
| Weight                      |   |
| On Individual Lengths       | : + 10 %  |
|                             | : - 8 %   |
| On Lots of 10 Tonnes, min   | : ± 7.5 %   |
| Squareness of corner        | : 90 Deg ± 2 Deg                                  |
| Radii of corners - Outside  | 3 t, Max where t is the thickness of the sections |
| Length                      | : ± 6 mm  |

| Grade   | Tensile  | Yield    | Elongation, |      |
|---------|----------|----------|-------------|------|
|         | Strength | Stress   | 25.4 and    | Over |
|         | Min, mPa | Min, mPa | under       | 25.4 |
| Yst 210 | 330      | 210      | 12          | 20   |
| Yst 240 | 410      | 240      | 10          | 15   |
| Yst 310 | 450      | 310      | 8           | 10   |

Customised length ranging from 4 mtr to 15 mtr may be supplied

Tensile Properties of Hollow Sections

AVAILABLE IN : HR, HRPO, CRCA, CRFH, GP & CORTEN STEEL

### PIPE GRADES

|         |         |         |         |         |
|---------|---------|---------|---------|---------|
| YST 210 | YST 240 | YST 310 | YST 355 | YST 450 |
| YST 500 | YST 550 | YST 600 | YST 650 | YST 700 |



**PURVA**

Defining Structures

**STEEL PIPES & TUBES**  
FOR A STRONGER NATION



# Specification for Steel Tubes for Structural Purposes

## Conforming to IS 1161 / 2014

| NB<br>Nominal<br>Bore in mm | Outside<br>Diameter<br>in (mm) | Thickness<br>(WT)<br>in mm | Weight<br>(Mass)<br>kg/Mtr | Area of Cross<br>Section<br>cm <sup>2</sup> | Internal<br>Volume<br>cm <sup>3</sup> /m | Surface                        |                                | Moment<br>of Inertia<br>cm <sup>4</sup> /m | Modulus<br>of Section<br>cm <sup>3</sup> | Radius<br>of Gyration<br>cm | Square of Radius<br>of Gyration<br>cm <sup>2</sup> |
|-----------------------------|--------------------------------|----------------------------|----------------------------|---|--|--------------------------------|--------------------------------|--|--|-----------------------------|--|
|                             |                                |                            |                            |   |  | External<br>cm <sup>2</sup> /m | Internal<br>cm <sup>2</sup> /m |  |  |                             |  |
| 15                          | 21.3                           | 2                          | 0.952                      | 1.21  | 235                                      | 669                            | 543                            | 0.57                                       | 0.54                                     | 0.69                        | 0.47   |
|                             | 21.3                           | 2.6                        | 1.20                       | 1.53  | 204                                      | 669                            | 506                            | 0.68                                       | 0.64                                     | 0.67                        | 0.45   |
|                             | 21.3                           | 3.2                        | 1.43                       | 1.82  | 174                                      | 669                            | 468                            | 0.77                                       | 0.72                                     | 0.65                        | 0.42   |
| 20                          | 26.9                           | 2.3                        | 1.40                       | 1.78  | 391                                      | 845                            | 701                            | 1.36                                       | 1.01                                     | 0.87                        | 0.76   |
|                             | 26.9                           | 2.6                        | 1.56                       | 1.98  | 370                                      | 845                            | 682                            | 1.48                                       | 1.10                                     | 0.86                        | 0.75   |
|                             | 26.9                           | 3.2                        | 1.87                       | 2.38  | 330                                      | 845                            | 644                            | 1.70                                       | 1.27                                     | 0.85                        | 0.71   |
| 25                          | 33.7                           | 2.6                        | 1.99                       | 2.54  | 638                                      | 1059                           | 895                            | 3.09                                       | 1.84                                     | 1.10                        | 1.22   |
|                             | 33.7                           | 3.2                        | 2.41                       | 3.07  | 585                                      | 1059                           | 858                            | 3.60                                       | 2.14                                     | 1.08                        | 1.18   |
|                             | 33.7                           | 4                          | 2.93                       | 3.73  | 519                                      | 1059                           | 807                            | 4.19                                       | 2.49                                     | 1.06                        | 1.12   |
| 32                          | 42.4                           | 2.6                        | 2.55                       | 3.25  | 1087                                     | 1332                           | 1169                           | 6.46                                       | 3.05                                     | 1.41                        | 1.99   |
|                             | 42.4                           | 3.2                        | 3.09                       | 3.94  | 1018                                     | 1332                           | 1131                           | 7.62                                       | 3.59                                     | 1.39                        | 1.93   |
|                             | 42.4                           | 4                          | 3.79                       | 4.83  | 929                                      | 1332                           | 1081                           | 8.99                                       | 4.24                                     | 1.36                        | 1.86   |
| 40                          | 48.3                           | 2.9                        | 3.25                       | 4.14  | 1419                                     | 1517                           | 1335                           | 10.70                                      | 4.43                                     | 1.61                        | 2.59   |
|                             | 48.3                           | 3.2                        | 3.56                       | 4.53  | 1379                                     | 1517                           | 1316                           | 11.59                                      | 4.80                                     | 1.60                        | 2.56   |
|                             | 48.3                           | 4                          | 4.37                       | 5.57  | 1276                                     | 1517                           | 1266                           | 13.77                                      | 5.70                                     | 1.57                        | 2.47   |
| 50                          | 60.3                           | 2.9                        | 4.11                       | 5.23  | 2333                                     | 1894                           | 1712                           | 21.59                                      | 7.16                                     | 2.03                        | 4.13   |
|                             | 60.3                           | 3.6                        | 5.03                       | 6.41  | 2215                                     | 1894                           | 1668                           | 25.87                                      | 8.58                                     | 2.01                        | 4.02   |
|                             | 60.3                           | 4.5                        | 6.19                       | 7.89  | 2067                                     | 1894                           | 1612                           | 30.90                                      | 10.25                                    | 1.98                        | 3.92   |
| 65                          | 76.1                           | 2.9                        | 5.24                       | 6.67  | 3882                                     | 2391                           | 2209                           | 44.74                                      | 11.76                                    | 2.59                        | 6.71   |
|                             | 76.1                           | 3.6                        | 6.44                       | 8.20  | 3728                                     | 2391                           | 2165                           | 54.01                                      | 14.19                                    | 2.57                        | 6.59   |
|                             | 76.1                           | 4.5                        | 7.95                       | 10.12                                       | 3536                                     | 2391                           | 2108                           | 65.12                                      | 17.11                                    | 2.54                        | 6.43   |
| 80                          | 88.9                           | 3.2                        | 6.76                       | 8.62  | 5346                                     | 2793                           | 2592                           | 79.21                                      | 17.82                                    | 3.03                        | 9.19   |
|                             | 88.9                           | 4                          | 8.38                       | 10.67                                       | 5140                                     | 2793                           | 2542                           | 96.34                                      | 21.67                                    | 3.00                        | 9.03   |
|                             | 88.9                           | 4.8                        | 9.96                       | 12.68                                       | 4939                                     | 2793                           | 2491                           | 112.49                                     | 25.31                                    | 2.98                        | 8.87   |
| 90                          | 101.6                          | 3.6                        | 8.70                       | 11.08                                       | 6999                                     | 3192                           | 2966                           | 133.24                                     | 26.23                                    | 3.47                        | 12.02  |
|                             | 101.6                          | 4                          | 9.63                       | 12.26                                       | 6881                                     | 3192                           | 2941                           | 146.28                                     | 28.80                                    | 3.45                        | 11.93  |
|                             | 101.6                          | 4.8                        | 11.46                      | 14.60                                       | 6648                                     | 3192                           | 2890                           | 171.39                                     | 33.74                                    | 3.43                        | 11.74  |
| 100                         | 114.3                          | 3.6                        | 9.83                       | 12.52                                       | 9009                                     | 3591                           | 3365                           | 191.98                                     | 33.59                                    | 3.92                        | 15.33  |
|                             | 114.3                          | 4.5                        | 12.19                      | 15.52                                       | 8709                                     | 3591                           | 3308                           | 234.32                                     | 41.00                                    | 3.89                        | 15.10  |
|                             | 114.3                          | 5.4                        | 14.50                      | 18.47                                       | 8413                                     | 3591                           | 3252                           | 274.54                                     | 48.04                                    | 3.85                        | 14.86  |
| 110                         | 127                            | 4.5                        | 13.59                      | 17.32                                       | 10936                                    | 3990                           | 3707                           | 325.29                                     | 51.23                                    | 4.33                        | 18.78  |
|                             | 127                            | 4.8                        | 14.47                      | 18.43                                       | 10825                                    | 3990                           | 3688                           | 344.50                                     | 54.25                                    | 4.32                        | 18.69  |
|                             | 127                            | 5.4                        | 16.19                      | 20.63                                       | 10605                                    | 3990                           | 3651                           | 382.04                                     | 60.16                                    | 4.30                        | 18.52  |
| 125                         | 139.7                          | 4.5                        | 15.00                      | 19.11                                       | 13417                                    | 4389                           | 4106                           | 437.20                                     | 62.59                                    | 4.78                        | 22.87  |
|                             | 139.7                          | 4.8                        | 15.97                      | 20.34                                       | 13295                                    | 4389                           | 4087                           | 463.33                                     | 66.33                                    | 4.77                        | 22.78  |
|                             | 139.7                          | 5.4                        | 17.89                      | 22.78                                       | 13050                                    | 4389                           | 4050                           | 514.50                                     | 73.66                                    | 4.75                        | 22.58  |
| 135                         | 152.4                          | 4.5                        | 16.41                      | 20.91                                       | 16151                                    | 4788                           | 4505                           | 572.24                                     | 75.10                                    | 5.23                        | 27.37  |
|                             | 152.4                          | 4.8                        | 17.47                      | 22.26                                       | 16016                                    | 4788                           | 4486                           | 606.76                                     | 79.63                                    | 5.22                        | 27.26  |
|                             | 152.4                          | 5.4                        | 19.58                      | 24.94                                       | 15748                                    | 4788                           | 4448                           | 674.51                                     | 88.52                                    | 5.20                        | 27.05  |
| 150                         | 165.1                          | 4.5                        | 17.82                      | 22.70                                       | 19138                                    | 5187                           | 4904                           | 732.57                                     | 88.74                                    | 5.68                        | 32.27  |
|                             | 165.1                          | 4.8                        | 18.98                      | 24.17                                       | 18991                                    | 5187                           | 4885                           | 777.13                                     | 94.14                                    | 5.67                        | 32.15  |
|                             | 165.1                          | 5.4                        | 21.27                      | 27.09                                       | 18699                                    | 5187                           | 4847                           | 864.70                                     | 104.75                                   | 5.65                        | 31.92  |
|                             | 165.1                          | 5.9                        | 23.20                      | 29.50                                       | 18465                                    | 5189                           | 4818                           | 970.00                                     | 113.40                                   | 5.63                        | 31.72  |
|                             | 165.1                          | 6.3                        | 24.67                      | 31.43                                       | 18265                                    | 5187                           | 4791                           | 992.28                                     | 120.20                                   | 5.62                        | 31.57  |
|                             | 165.1                          | 8                          | 30.99                      | 39.48                                       | 17460                                    | 5187                           | 4684                           | 1221.25                                    | 147.94                                   | 5.56                        | 30.93  |
| 150                         | 168.3                          | 4.5                        | 18.18                      | 23.16                                       | 19931                                    | 5287                           | 5005                           | 777.22                                     | 92.36                                    | 5.79                        | 33.56  |
|                             | 168.3                          | 4.8                        | 19.35                      | 24.66                                       | 19781                                    | 5287                           | 4986                           | 824.57                                     | 97.99                                    | 5.78                        | 33.44  |
|                             | 168.3                          | 5.4                        | 21.69                      | 27.64                                       | 19483                                    | 5287                           | 4948                           | 917.69                                     | 109.05                                   | 5.76                        | 33.21  |
|                             | 168.3                          | 6.3                        | 25.17                      | 32.06                                       | 19040                                    | 5287                           | 4891                           | 1053.42                                    | 125.18                                   | 5.73                        | 32.85  |
|                             | 168.3                          | 8                          | 31.63                      | 40.29                                       | 18218                                    | 5287                           | 4785                           | 1297.27                                    | 154.16                                   | 5.67                        | 32.20  |
| 175                         | 193.7                          | 4.8                        | 22.36                      | 28.49                                       | 26619                                    | 6085                           | 5784                           | 1271.39                                    | 131.27                                   | 6.68                        | 44.63  |
|                             | 193.7                          | 5.4                        | 25.08                      | 31.94                                       | 26273                                    | 6085                           | 5746                           | 1416.97                                    | 146.31                                   | 6.66                        | 44.36  |
|                             | 193.7                          | 5.9                        | 27.33                      | 34.81                                       | 25987                                    | 6085                           | 5715                           | 1536.13                                    | 158.61                                   | 6.64                        | 44.13  |
|                             | 193.7                          | 6.3                        | 29.12                      | 37.09                                       | 25759                                    | 6085                           | 5689                           | 1630.05                                    | 168.31                                   | 6.63                        | 43.95  |
|                             | 193.7                          | 8                          | 36.64                      | 46.67                                       | 24801                                    | 6085                           | 5583                           | 2015.54                                    | 208.11                                   | 6.57                        | 43.19  |
| 200                         | 219.1                          | 4.8                        | 25.37                      | 32.32                                       | 34471                                    | 6883                           | 6582                           | 1856.03                                    | 169.42                                   | 7.58                        | 57.43  |
|                             | 219.1                          | 5.6                        | 29.49                      | 37.56                                       | 33947                                    | 6883                           | 6531                           | 2141.61                                    | 195.49                                   | 7.55                        | 57.02  |
|                             | 219.1                          | 5.9                        | 31.02                      | 39.52                                       | 33751                                    | 6883                           | 6513                           | 2247.01                                    | 205.11                                   | 7.54                        | 56.86  |
|                             | 219.1                          | 6.3                        | 33.06                      | 42.12                                       | 33491                                    | 6883                           | 6487                           | 2386.14                                    | 217.81                                   | 7.53                        | 56.65  |
|                             | 219.1                          | 8                          | 41.65                      | 53.06                                       | 32397                                    | 6883                           | 6381                           | 2959.63                                    | 270.16                                   | 7.47                        | 55.78  |

### Mechanical Properties

| Tensile<br>Properties | Tensile<br>Strength | Yield<br>Strength | Elongation on<br>Gauge Length                   |
|-----------------------|---------------------|-------------------|---|
|                       | Min<br>MPa          | Min<br>MPa        | 5.65 <sup>s</sup> S <sub>0</sub><br>Min Percent |
| Yst 210               | 330                 | 210               | 20  |
| Yst 240               | 410                 | 240               | 17  |
| Yst 310               | 450                 | 310               | 14  |
| Yst 355               | 490                 | 355               | 10  |

### Tolerances

| Outside Diameter             |                      | Thickness<br>± 10<br>percent |
|------------------------------|----------------------|------------------------------|
| Up to & Including<br>48.3 mm | ± 0.4 mm<br>- 0.8 mm |                              |
| Over 48.3 mm                 | ± 1.0 percent        |                              |

### Notes

- 1 MPa = 1N/mm<sup>2</sup> = 0.102 kgf/mm<sup>2</sup>
2. Elongation percent for tube up to and including 25 mm nominal bore for all grades shall be 12 minimum

**AVAILABLE IN : HR, HRPO, CRCA, CRFH, GP & CORTEN STEEL**

### PIPE GRADES



|                |                |                |                |                |
|----------------|----------------|----------------|----------------|----------------|
| <b>YST 210</b> | <b>YST 240</b> | <b>YST 310</b> | <b>YST 355</b> | <b>YST 450</b> |
| <b>YST 500</b> | <b>YST 550</b> | <b>YST 600</b> | <b>YST 650</b> | <b>YST 700</b> |



# Specification for Steel Tubes for Mechanical and General Engineering Purposes

Conforming to IS 3601 / 2006

| Outside Diameter | Thickness (WT) | Mass     | Area of Cross-Section | Moment of Inertia | Modulus of Sections | Radius of Gyration |
|------------------|----------------|----------|-----------------------|-------------------|---------------------|--------------------|
| mm               | mm             | kg / Mtr | cm <sup>2</sup>       | cm <sup>4</sup>   | cm <sup>3</sup>     | cm                 |
| 21.3             | 1.8            | 0.866    | 1.10                  | 0.53              | 0.50                | 0.69               |
|                  | 2.0            | 0.952    | 1.21                  | 0.57              | 0.54                | 0.69               |
|                  | 2.6            | 1.20     | 1.53                  | 0.68              | 0.64                | 0.67               |
|                  | 3.2            | 1.43     | 1.82                  | 0.77              | 0.72                | 0.65               |
|                  | 4.0            | 1.71     | 2.17                  | 0.86              | 0.81                | 0.63               |
| 26.9             | 1.8            | 1.11     | 1.42                  | 1.12              | 0.83                | 0.89               |
|                  | 2.0            | 1.23     | 1.56                  | 1.22              | 0.91                | 0.88               |
|                  | 2.3            | 1.40     | 1.78                  | 1.36              | 1.01                | 0.87               |
|                  | 2.6            | 1.56     | 1.98                  | 1.48              | 1.10                | 0.86               |
|                  | 3.2            | 1.87     | 2.38                  | 1.70              | 1.27                | 0.85               |
| 33.7             | 4.0            | 2.26     | 2.88                  | 1.95              | 1.45                | 0.82               |
|                  | 2.0            | 1.56     | 1.99                  | 2.51              | 1.49                | 1.12               |
|                  | 2.3            | 1.78     | 2.27                  | 2.81              | 1.67                | 1.11               |
|                  | 2.6            | 1.99     | 2.54                  | 3.09              | 1.84                | 1.10               |
|                  | 3.2            | 2.41     | 3.07                  | 3.60              | 2.14                | 1.08               |
| 42.4             | 4.0            | 2.93     | 3.73                  | 4.19              | 2.49                | 1.06               |
|                  | 4.5            | 3.24     | 4.13                  | 4.51              | 2.68                | 1.05               |
|                  | 2.3            | 2.27     | 2.90                  | 5.85              | 2.76                | 1.42               |
|                  | 2.6            | 2.55     | 3.25                  | 6.46              | 3.05                | 1.41               |
|                  | 3.2            | 3.09     | 3.94                  | 7.62              | 3.59                | 1.39               |
| 48.3             | 3.6            | 3.44     | 4.39                  | 8.33              | 3.93                | 1.38               |
|                  | 4.0            | 3.79     | 4.83                  | 8.90              | 4.24                | 1.36               |
|                  | 5.0            | 4.61     | 5.87                  | 10.45             | 4.93                | 1.33               |
|                  | 2.3            | 2.61     | 3.32                  | 8.80              | 3.64                | 1.63               |
|                  | 2.6            | 2.93     | 3.73                  | 9.77              | 4.05                | 1.62               |
| 60.3             | 2.9            | 3.25     | 4.14                  | 10.70             | 4.43                | 1.61               |
|                  | 3.2            | 3.56     | 4.53                  | 11.59             | 4.80                | 1.60               |
|                  | 3.6            | 3.97     | 5.05                  | 12.69             | 5.25                | 1.59               |
|                  | 4.0            | 4.37     | 5.57                  | 13.77             | 5.70                | 1.57               |
|                  | 4.9            | 5.24     | 6.64                  | 15.99             | 6.63                | 1.55               |
| 76.1             | 5.0            | 5.34     | 6.80                  | 16.15             | 6.69                | 1.54               |
|                  | 2.3            | 3.29     | 4.19                  | 17.65             | 5.85                | 2.05               |
|                  | 2.6            | 3.70     | 4.71                  | 19.64             | 6.51                | 2.04               |
|                  | 2.9            | 4.11     | 5.23                  | 21.59             | 7.16                | 2.03               |
|                  | 3.2            | 4.51     | 5.74                  | 23.47             | 7.78                | 2.02               |
| 88.9             | 3.6            | 5.03     | 6.41                  | 25.87             | 8.58                | 2.01               |
|                  | 4.0            | 5.55     | 7.07                  | 28.15             | 9.34                | 2.00               |
|                  | 4.5            | 6.19     | 7.89                  | 30.90             | 10.20               | 1.98               |
|                  | 5.0            | 6.82     | 8.70                  | 33.48             | 11.10               | 1.96               |
|                  | 2.6            | 4.71     | 6.00                  | 40.57             | 10.66               | 2.60               |
| 101.6            | 2.9            | 5.23     | 6.67                  | 44.74             | 11.76               | 2.59               |
|                  | 3.2            | 5.75     | 7.33                  | 48.78             | 12.80               | 2.58               |
|                  | 3.6            | 6.44     | 8.20                  | 54.01             | 14.20               | 2.57               |
|                  | 4.5            | 7.95     | 10.10                 | 65.12             | 17.10               | 2.54               |
|                  | 5.0            | 8.77     | 11.16                 | 70.87             | 18.63               | 2.52               |
| 114.3            | 2.9            | 6.15     | 7.83                  | 72.47             | 16.30               | 3.04               |
|                  | 3.2            | 6.76     | 8.62                  | 79.21             | 17.80               | 3.03               |
|                  | 4.0            | 8.38     | 10.70                 | 96.34             | 21.70               | 3.00               |
|                  | 5.0            | 10.30    | 13.20                 | 116.40            | 26.20               | 2.97               |
|                  | 5.4            | 11.10    | 14.00                 | 123.80            | 27.80               | 2.97               |
| 127.0            | 5.6            | 11.50    | 14.65                 | 127.64            | 28.72               | 2.95               |
|                  | 6.3            | 12.80    | 16.20                 | 141.20            | 31.80               | 2.93               |
|                  | 8.0            | 16.00    | 20.32                 | 167.86            | 37.76               | 2.87               |
|                  | 3.6            | 8.70     | 11.10                 | 133.20            | 26.20               | 3.47               |
|                  | 4.0            | 9.63     | 12.30                 | 146.20            | 28.80               | 3.45               |
| 143.0            | 5.0            | 11.90    | 15.20                 | 177.50            | 34.90               | 3.42               |
|                  | 3.2            | 8.77     | 11.16                 | 172.33            | 30.15               | 3.93               |
|                  | 3.6            | 9.83     | 12.50                 | 192.00            | 33.60               | 3.92               |
|                  | 4.5            | 12.20    | 15.50                 | 234.30            | 41.00               | 3.89               |
|                  | 5.4            | 14.50    | 18.50                 | 274.50            | 48.00               | 3.86               |
| 168.3            | 6.3            | 16.80    | 21.20                 | 315.00            | 55.10               | 3.83               |
|                  | 8.0            | 21.00    | 26.30                 | 377.60            | 66.00               | 3.78               |
|                  | 4.5            | 13.60    | 17.30                 | 325.30            | 51.20               | 4.33               |
|                  | 5.0            | 15.00    | 19.20                 | 357.10            | 56.20               | 4.32               |
|                  | 5.4            | 16.20    | 20.60                 | 302.00            | 60.20               | 4.30               |

| Outside Diameter | Thickness (WT) | Mass     | Area of Cross-Section | Moment of Inertia | Modulus of Sections | Radius of Gyration |
|------------------|----------------|----------|-----------------------|-------------------|---------------------|--------------------|
| mm               | mm             | kg / Mtr | cm <sup>2</sup>       | cm <sup>4</sup>   | cm <sup>3</sup>     | cm                 |
| 139.7            | 3.6            | 12.10    | 15.38                 | 356.36            | 51.02               | 4.81               |
|                  | 4.0            | 13.40    | 17.04                 | 392.57            | 56.20               | 4.80               |
|                  | 4.5            | 15.00    | 19.10                 | 437.20            | 62.60               | 4.78               |
|                  | 5.0            | 16.60    | 21.20                 | 480.50            | 68.80               | 4.77               |
|                  | 5.4            | 17.90    | 22.80                 | 514.50            | 73.70               | 4.75               |
|                  | 6.3            | 20.70    | 26.30                 | 591.00            | 84.70               | 4.73               |
|                  | 8.0            | 26.00    | 32.50                 | 716.00            | 103.00              | 4.71               |
| 152.4            | 4.5            | 16.40    | 20.90                 | 572.20            | 75.10               | 5.23               |
|                  | 5.0            | 18.20    | 23.20                 | 629.50            | 82.60               | 5.21               |
|                  | 5.4            | 19.60    | 24.90                 | 674.50            | 88.50               | 5.20               |
| 165.1            | 4.5            | 17.80    | 22.70                 | 732.60            | 88.70               | 5.68               |
|                  | 5.0            | 19.70    | 25.10                 | 806.60            | 97.70               | 5.66               |
|                  | 5.4            | 21.20    | 27.10                 | 864.70            | 105.00              | 5.65               |
| 168.3            | 6.3            | 24.80    | 31.40                 | 992.00            | 120.00              | 5.63               |
|                  | 4.0            | 16.20    | 20.64                 | 696.87            | 82.81               | 5.81               |
|                  | 4.5            | 18.20    | 23.20                 | 777.20            | 98.40               | 5.79               |
|                  | 5.0            | 20.10    | 25.70                 | 855.80            | 102.00              | 5.78               |
|                  | 5.4            | 21.70    | 27.60                 | 917.70            | 109.00              | 5.76               |
|                  | 6.3            | 25.20    | 32.10                 | 1053.00           | 125.00              | 5.70               |
|                  | 7.1            | 28.20    | 35.94                 | 1169.66           | 139.00              | 5.73               |
| 193.7            | 8.0            | 31.60    | 39.70                 | 1288.00           | 153.00              | 5.69               |
|                  | 5.0            | 23.30    | 29.60                 | 1320.00           | 136.00              | 6.67               |
|                  | 5.4            | 25.10    | 31.90                 | 1417.00           | 146.00              | 6.66               |
|                  | 5.9            | 27.30    | 34.80                 | 1536.00           | 159.00              | 6.64               |
|                  | 6.3            | 29.10    | 37.00                 | 1600.00           | 165.00              | 6.60               |
|                  | 8.0            | 36.60    | 46.30                 | 2004.00           | 207.00              | 6.57               |
|                  | 219.1          | 4.5      | 23.80                 | 30.32             | 1746.18             | 159.40             |
| 5.0              |                | 26.40    | 33.60                 | 1928.00           | 176.00              | 7.57               |
| 5.6              |                | 29.50    | 37.60                 | 2142.00           | 195.00              | 7.56               |
| 6.3              |                | 33.10    | 42.00                 | 2404.00           | 219.00              | 7.54               |
| 8.0              |                | 41.60    | 52.00                 | 1940.00           | 268.00              | 7.52               |

| Over mm | Outside Diameter Up to and Including mm | Tolerance on Outside Diameter mm | Thickness | Straightness    |
|---------|---|----------------------------------|-----------|-----------------|
| -       | 25.40                                   | ± 0.15                           |           |                 |
| 25.40   | 51.00                                   | ± 0.18                           |           |                 |
| 51.00   | 63.50                                   | ± 0.25                           |           |                 |
| 63.50   | 76.10                                   | ± 0.25                           |           |                 |
| 76.10   | 88.90                                   | ± 0.31                           | ± 10 %    | Less than 1/600 |
| 88.90   | 101.60                                  | ± 0.36                           |           |                 |
| 101.60  | 114.30                                  | ± 0.43                           |           |                 |
| 114.30  | 152.40                                  | ± 0.58                           |           |                 |
| 152.40  | 168.30                                  | ± 0.65                           |           |                 |
| 168.30  | -                                       | ± 0.75                           |           |                 |

| Types and Grades | Tensile Strength Min | Yield Stress Min | Elongation Percent                           |                                  |
|------------------|----------------------|------------------|--|----------------------------------|
|                  |                      |                  | As Welded (less than or equal to 33.7 mm OD) | As Welded (More Than 33.7 mm OD) |
| WT 160           | 310                  | 160              | 15   | 22                               |
| WT 210           | 330                  | 210              | 12   | 20                               |
| WT 240           | 410                  | 240              | 10   | 15                               |
| WT 310           | 450                  | 310              | 6  | 10                               |

AVAILABLE IN : HR, HRPO, CRCA, CRFH, GP & CORTEN STEEL

PIPE GRADES

|         |         |         |         |         |
|---------|---------|---------|---------|---------|
| YST 210 | YST 240 | YST 310 | YST 355 | YST 450 |
| YST 500 | YST 550 | YST 600 | YST 650 | YST 700 |



# Specification for Black Steel Tubes for use in Water, Non-hazardous Gas, Steam and Air Lines

## Conforming to IS 1239 (Part - 1) : 2004

| Nominal Bore |         | Series | Outside Diameter |         | Wall Thickness (T) |          | Nominal Mass of Tube |                         |
|--------------|---------|--------|------------------|---------|--------------------|----------|----------------------|-------------------------|
|              |         |        | Maximum          | Minimum | in mm              | in Gauge | kg/Mtr               | Plain End<br>Mtrs/M.Ton |
| in mm        | in Inch |        | in mm            | in mm   | in mm              |          |                      |                         |
| 15           | 0.50    | Light  | 21.4             | 21.0    | 2.00               | 14       | 0.947                | 1056                    |
|              |         | Medium | 21.8             | 21.0    | 2.60               | 12       | 1.210                | 826                     |
|              |         | Heavy  | 21.8             | 21.0    | 3.20               | 10       | 1.440                | 694                     |
| 20           | 0.75    | Light  | 26.9             | 26.4    | 2.30               | 13       | 1.380                | 725                     |
|              |         | Medium | 27.3             | 26.5    | 2.60               | 12       | 1.560                | 641                     |
|              |         | Heavy  | 27.3             | 26.5    | 3.20               | 10       | 1.870                | 535                     |
| 25           | 1.00    | Light  | 33.8             | 33.2    | 2.60               | 12       | 1.980                | 505                     |
|              |         | Medium | 34.2             | 33.3    | 3.20               | 10       | 2.410                | 415                     |
|              |         | Heavy  | 34.2             | 33.3    | 4.00               | 8        | 2.930                | 341                     |
| 32           | 1.25    | Light  | 42.5             | 41.9    | 2.60               | 12       | 2.540                | 394                     |
|              |         | Medium | 42.9             | 42.0    | 3.20               | 10       | 3.100                | 323                     |
|              |         | Heavy  | 42.9             | 42.0    | 4.00               | 8        | 3.790                | 264                     |
| 40           | 1.50    | Light  | 48.4             | 47.8    | 2.90               | 11       | 3.230                | 310                     |
|              |         | Medium | 48.8             | 47.9    | 3.20               | 10       | 3.560                | 281                     |
|              |         | Heavy  | 48.8             | 47.9    | 4.00               | 8        | 4.370                | 229                     |
| 50           | 2.00    | Light  | 60.2             | 59.6    | 2.90               | 11       | 4.080                | 245                     |
|              |         | Medium | 60.8             | 59.7    | 3.60               | 9        | 5.030                | 199                     |
|              |         | Heavy  | 60.8             | 59.7    | 4.50               | 7        | 6.190                | 162                     |
| 65           | 2.50    | Light  | 76.0             | 75.2    | 3.20               | 10       | 5.710                | 175                     |
|              |         | Medium | 76.6             | 75.3    | 3.60               | 9        | 6.420                | 156                     |
|              |         | Heavy  | 76.6             | 75.3    | 4.50               | 7        | 7.930                | 126                     |
| 80           | 3.00    | Light  | 88.7             | 87.9    | 3.20               | 10       | 6.720                | 149                     |
|              |         | Medium | 89.5             | 88.0    | 4.00               | 8        | 8.360                | 120                     |
|              |         | Heavy  | 89.5             | 88.0    | 4.80               | 6        | 9.900                | 101                     |
| 100          | 4.00    | Light  | 113.9            | 113.0   | 3.60               | 9        | 9.750                | 103                     |
|              |         | Medium | 115.0            | 113.1   | 4.50               | 7        | 12.200               | 82                      |
|              |         | Heavy  | 115.0            | 113.1   | 5.40               | 5        | 14.500               | 69                      |
| 125          | 5.00    | Medium | 140.8            | 138.5   | 4.80               | 6        | 15.900               | 63                      |
|              |         | Heavy  | 140.8            | 138.5   | 5.40               | 5        | 17.900               | 56                      |
| 150          | 6.00    | Medium | 166.5            | 163.9   | 4.80               | 6        | 18.900               | 53                      |
|              |         | Heavy  | 166.5            | 163.9   | 5.40               | 5        | 21.300               | 47                      |

### tolerance on Thickness and Mass

| Class          | Thickness                     | Mass (Weight) |                             |
|----------------|-------------------------------|---------------|-----------------------------|
|                |                               | Single Tube   | Per Load of<br>10 Mton Min. |
| Light          | + Not Limited                 | + 10 percent  | + 7.5 percent               |
|                | - 8 percent                   | - 8 percent   | - 5 percent                 |
| Medium & Heavy | + Not Limited<br>- 10 percent | ± 10 percent  | ± 7.5 percent               |

**AVAILABLE IN : HR, HRPO, CRCA, CRFH, GP & CORTEN STEEL**

### PIPE GRADES

**YST 210**

**YST 240**

**YST 310**

**YST 355**

**YST 450**

**YST 500**

**YST 550**

**YST 600**

**YST 650**

**YST 700**



# Specification for Steel Tubes for Idlers for Belt Conveyors

Conforming to IS 9295/1983

| Outside Diameter<br>in mm | Thickness<br>(T)<br>in mm | Weight Mass |            |
|---------------------------|---------------------------|-------------|------------|
|                           |                           | Kg/ Mtr     | Mtr/ Tonne |
| 63.5                      | 3.65                      | 5.39        | 186        |
|                           | 4.5                       | 6.55        | 153        |
| 76.1                      | 3.65                      | 6.52        | 153        |
|                           | 4.5                       | 7.95        | 126        |
| 88.9                      | 4.05                      | 8.47        | 118        |
|                           | 4.85                      | 10.05       | 100        |
|                           | 6.3                       | 12.83       | 78         |
| 101.6                     | 4.05                      | 9.74        | 103        |
|                           | 4.85                      | 11.57       | 86         |
|                           | 6.3                       | 14.81       | 68         |
| 114.3                     | 4.5                       | 12.19       | 82         |
|                           | 5.4                       | 14.50       | 69         |
|                           | 6.3                       | 16.78       | 60         |
| 127                       | 4.5                       | 13.60       | 74         |
|                           | 4.85                      | 14.61       | 68         |
|                           | 5.4                       | 16.10       | 62         |
|                           | 6.3                       | 18.75       | 53         |
| 139.7                     | 4.5                       | 15.00       | 67         |
|                           | 4.85                      | 16.13       | 62         |
|                           | 5.4                       | 17.89       | 56         |
|                           | 6.3                       | 20.73       | 48         |
| 165.1                     | 4.5                       | 17.80       | 56         |
|                           | 4.85                      | 19.17       | 52         |
|                           | 5.4                       | 21.27       | 47         |
|                           | 6.3                       | 24.67       | 41         |
| 168.3                     | 4.5                       | 18.20       | 55         |
|                           | 4.85                      | 19.55       | 51         |
|                           | 5.4                       | 21.69       | 46         |
| 193.7                     | 6.3                       | 25.17       | 40         |
|                           | 5.4                       | 25.10       | 40         |
|                           | 6.3                       | 29.12       | 34         |
| 219.1                     | 7.1                       | 32.67       | 31         |
|                           | 5.4                       | 28.50       | 35         |
|                           | 6.3                       | 33.06       | 30         |
|                           | 7.1                       | 37.12       | 27         |

## Mechanical Properties

| Tube Designation | Tensile Strength<br>Mpa<br>min | Yield Stress<br>Mpa<br>min | Elongation<br>percent<br>min |
|------------------|--------------------------------|----------------------------|------------------------------|
| ERW 210          | 330                            | 210                        | 20                           |
| ERW 240          | 410                            | 240                        | 18                           |
| ERW 310          | 450                            | 310                        | 15                           |

|                  |   |                   |
|------------------|---|-------------------|
| Ovality          | Below 168.30<br>Including 168.3 and Above | 0.5 mm<br>1.0 mm  |
| Mass             | Single Tube<br>Per Load of 10 Tonne       | ± 10 %<br>± 7.5 % |
| Eccentricity     |   | 5% Max            |
| Outside Diameter |   | ± 0.8 %           |
| Thickness        |   | ± 10 %            |
| Length           |   | + 6 mm<br>- 0 mm  |

AVAILABLE IN : HR, HRPO, CRCA, CRFH, GP & CORTEN STEEL

### PIPE GRADES

|         |         |         |         |         |
|---------|---------|---------|---------|---------|
| YST 210 | YST 240 | YST 310 | YST 355 | YST 450 |
| YST 500 | YST 550 | YST 600 | YST 650 | YST 700 |



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### PURVA METAL SECTIONS PVT. LTD. (INDIA)

Regd. Office:

#193, 4th Floor, "SHIV SADAN"  
Marathahalli Outer Ring Road,  
B. Narayanapura, Bangalore - 560 016.  
Tele: +91 80-71011505(30 Lines)  
E-mail: sales@purvamedal.com  
Dhanesh Purva: +91 96113 70062

Factory:

Sy.No. 26/1, 26/2, Chickakunthuru Village, Sy.No.52, 53  
Kodaginabele Village, Malur-Bangarpete Road,  
Byatrayanahalli, Railway Station, Malur - 563130.  
Tele: +91 80-71011580 / 81  
E-mail: info@purvamedal.com  
Vedha: +91 94806 77995

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