

JINDAL
D.P. JINDAL GROUP

SEAMLESS & ERW

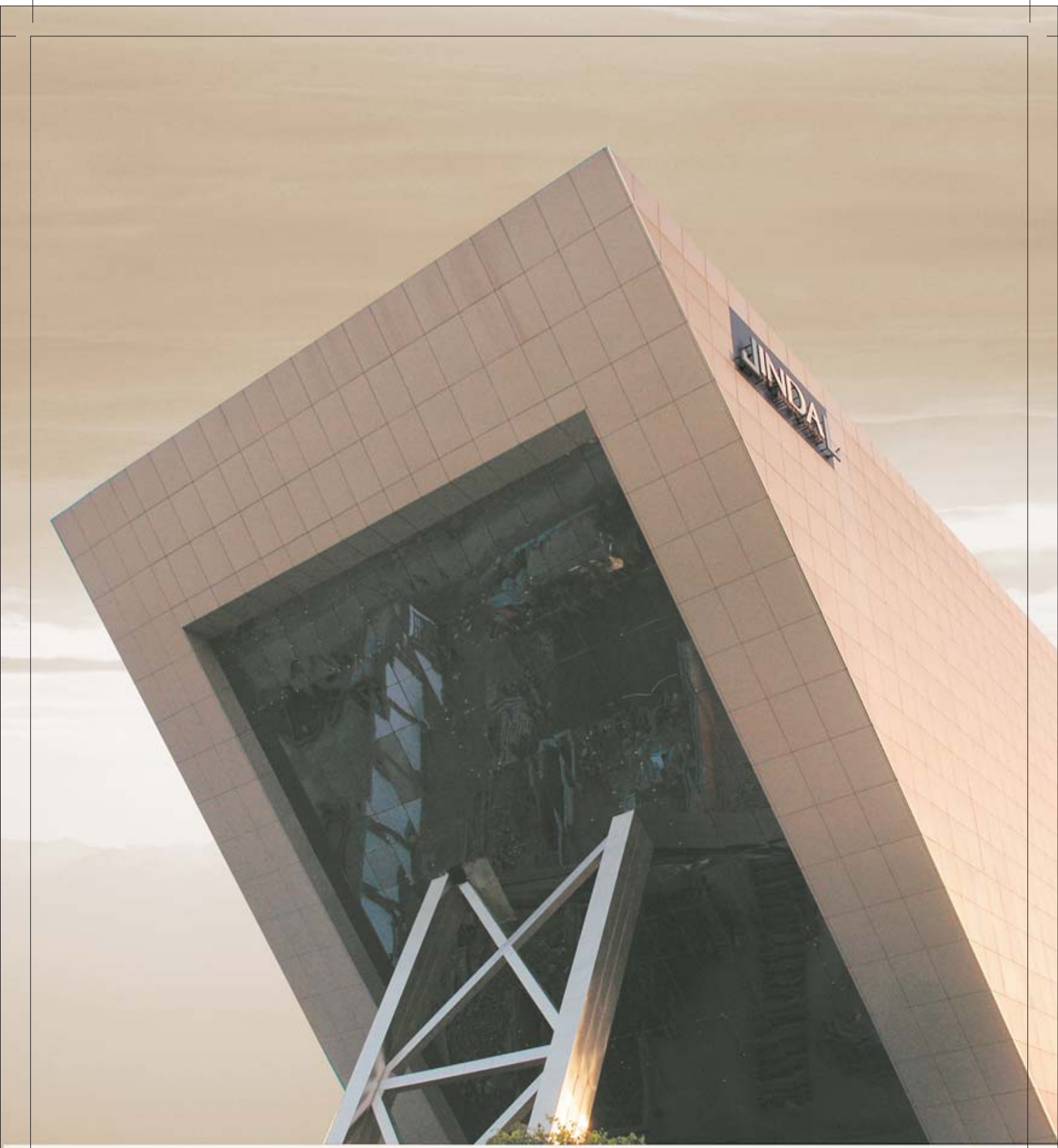
Pipes & Tubes



MAHARASHTRA SEAMLESS LIMITED
An ISO 9001:2008 Company

JINDAL PIPES LIMITED
An ISO 9001:2008 Company

GROUP/PIPE/AUGUST-2013



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Our Vision

To sustain our position as the largest manufacturer of Seamless & ERW steel pipes and tubes in India while creating value for the Indian economy and our stakeholders.

Our Mission

Our mission is to accentuate growth in the economy and improve general quality of life. We are committed to provide products and services of high-quality and enrich the lives of people associated with us.

D.P. Jindal Group

ERW and Seamless Pipes & Tubes



Power



Offshore Drilling



Where exceeding expectations is a tradition and gaining precocious success is an art applied to work, such culture is the identity of D.P. Jindal Group. With its strong conviction, the business conglomerate has reserved its rightful position in the market as the largest Seamless & ERW steel pipes and tubes manufacturer of the country.

D.P. Jindal Group since its very inception has pursued an unstinted path of growth despite national and international competition, reaching an annual turnover of Rs. 4000 cr. Taking its futuristic approach forward, the Group has ventured into the power sector to generate renewable energies such as wind and solar, ensuring a cleaner and greener environment.

The company has time and again pushed limits to discover and rediscover the various grades and applications of steel pipes and tubes for sectors like Oil & Gas, Hydrocarbon, Power, Agriculture, Housing, Infrastructure to name a few. The product range comprises of ERW Pipes & Tubes (Black & Galvanized) and Seamless Pipes & Tubes (Hot finished, Cold drawn and Pilgered).

The Group has a highly experienced talent team, contemporary technology, efficiency-oriented environment and state-of-the-art production capacity to help foster further growth of the organization as well as the economy of the nation.

Jindal Pipes Limited (JPL)

Jindal Pipes Ltd. (JPL) was incorporated in 1970 with a production capacity of 3000 TPA for manufacturing of steel Pipes & Tubes. Since then, the company has brought phenomenal development in pipe manufacturing process through many innovative measures. Today, it has an annual turnover of approx. Rs. 700 Crores.

Backed by state-of-the-art technology know-how and highly motivated & skilled workforce, the company has achieved significant growth. Its production capacity has grown to 2,50,000 TPA.

JPL is now India's one of the best and largest manufacturers of ERW, Black and Galvanized Steel Pipes & Tubes in different thickness from 2.00mm to 9.50mm having an Outer Diameter (OD) ranging from 1/2" to 14" NB conforming to various national and international standards.

Recently the company has started manufacturing RHS & SHS Pipes of various sizes which are to be used for different applications i.e. Architectural and Industrial.



Our constant endeavour is to produce pipes of highest quality and sustainability. To achieve this, we stick to strict quality standards, continuous in-house evaluations and training of our workforce.

Our company has been constantly executing regular as well as customised orders for pipes to meet the requirements of sectors like Agriculture, Oil & Gas, Public Health, Housing, Irrigation, Engineering, etc.



5 MW Captive Power Plant, Ghaziabad (UP)

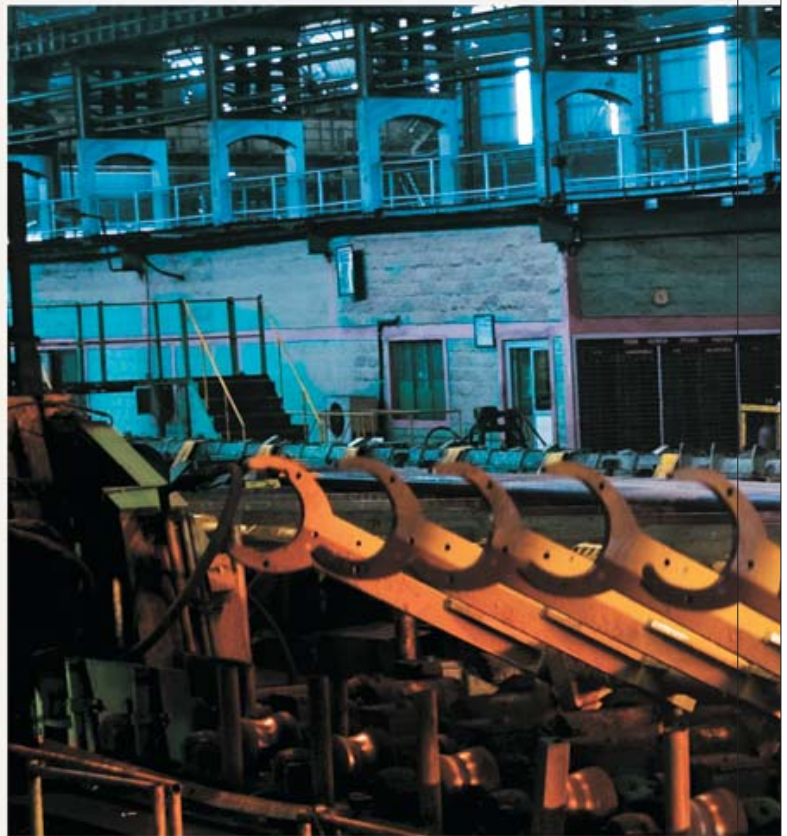
Maharashtra Seamless Limited (MSL)

Situated at Raigad, Maharashtra, MSL's plant is equipped with the latest machinery capable of producing wide range of Seamless Pipes and Tubes both in HOT FINISHED and COLD DRAWN/ COLD PILGERED condition.

A wide product range with varied sizes and specifications caters to diverse application areas like Oil & Gas sector, Hydrocarbon industry, Boilers & Heat Exchangers, Automotive, Bearing and General Engineering industries, etc.

The company has expanded its production facilities, using PLUG MILL technology supported by World Class Reelers, to manufacture seamless pipes of larger diameter upto 20" and wall thickness upto 40mm for the first time in India.

Besides, a brand new ultra modern Coating Plant has been installed for FBE, 3LPE & 3LPP coating with capacity to cater pipes from 1" to 48" OD.



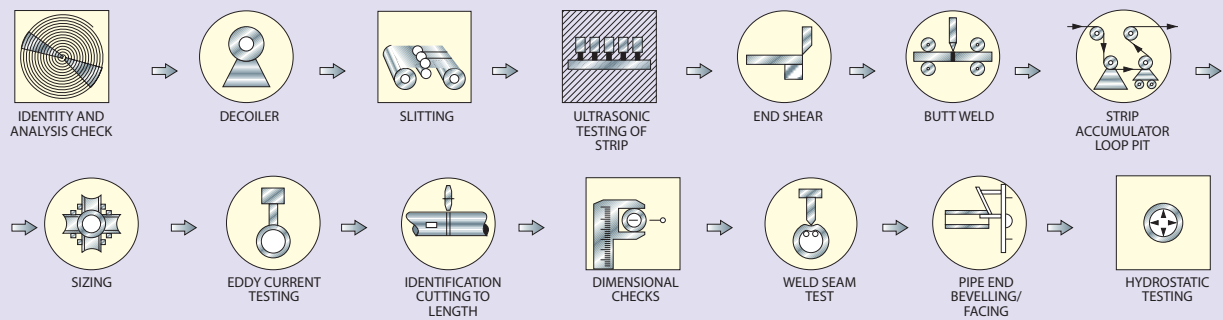
Maharashtra Seamless Limited, the flagship Company of the D.P. Jindal Group, is the largest manufacturer of Seamless Steel Pipes & Tubes in India with a production capacity of over 5,50,000 metric tons per year.



ERW Black & Galvanized Pipes

at Ghaziabad facility: Pipes ranging from 1/2" to 14" NB and 2.00mm to 9.50mm in wall thickness.

MANUFACTURING AND TESTING FLOW DIAGRAM ELECTRIC RESISTANCE WELDED BLACK



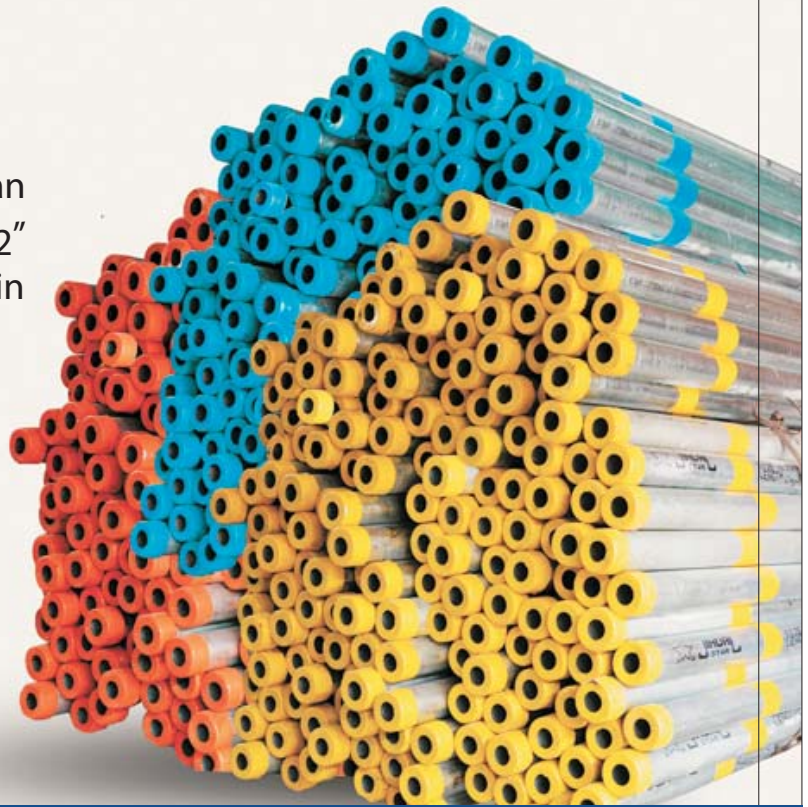
FOR BOILER TUBES

FOR GALVANIZED TUBES

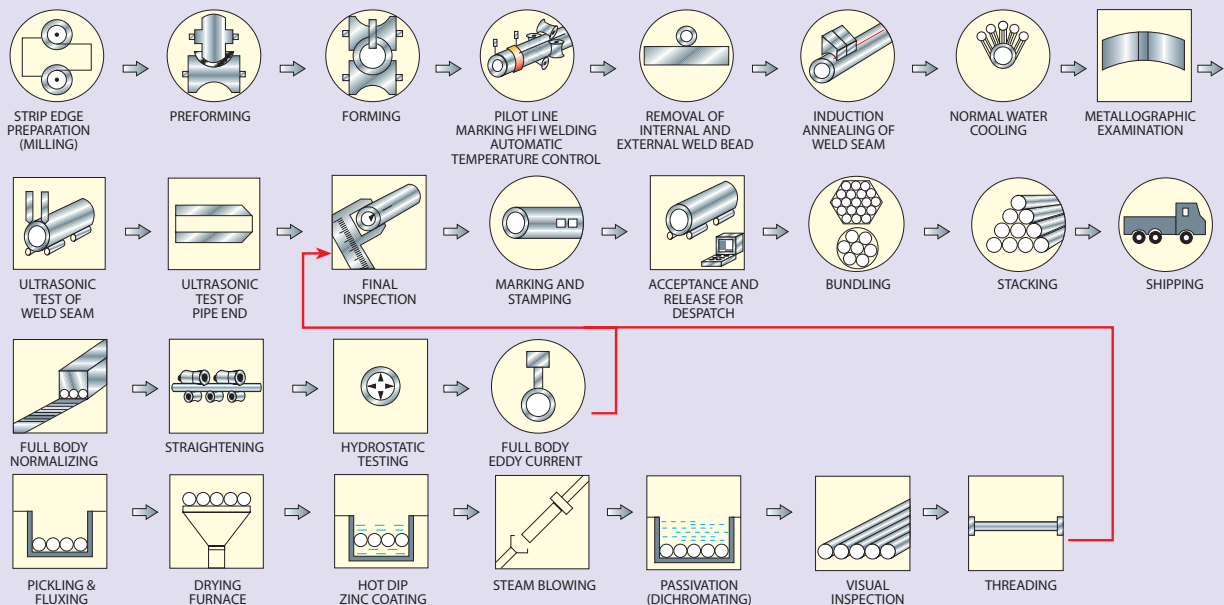
JINDAL PIPES LIMITED (JPL) has pioneered in introducing state-of-the-art technology & full-fledged R&D unit amongst the pipe manufacturers in the industry since 1970. The company is now equipped with one of the

India's best ERW pipe manufacturing facilities that can produce pipes ranging from 1/2" to 14" NB and 2mm to 9.5mm in wall thickness.

Since its inception, JPL has been serving the core development sectors in the country like - Agriculture, Oil & Gas, Refineries, Public Health, Housing, Engineering and Infrastructure.



OF HIGH FREQUENCY INDUCTION WELDED / AND GALVANIZED PIPES/TUBES

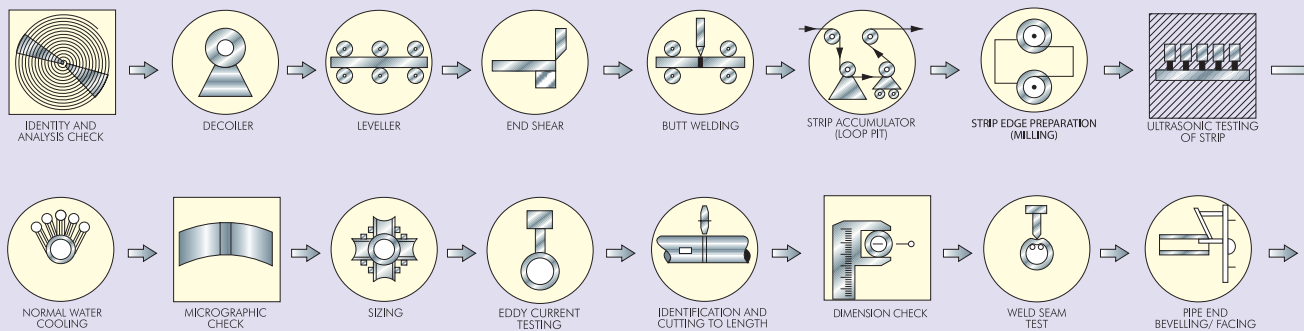


20" ERW Pipes

facility at Nagothane, Raigad (Maharashtra)



MANUFACTURING AND TESTING FLOW DIAGRAM OF HIGH

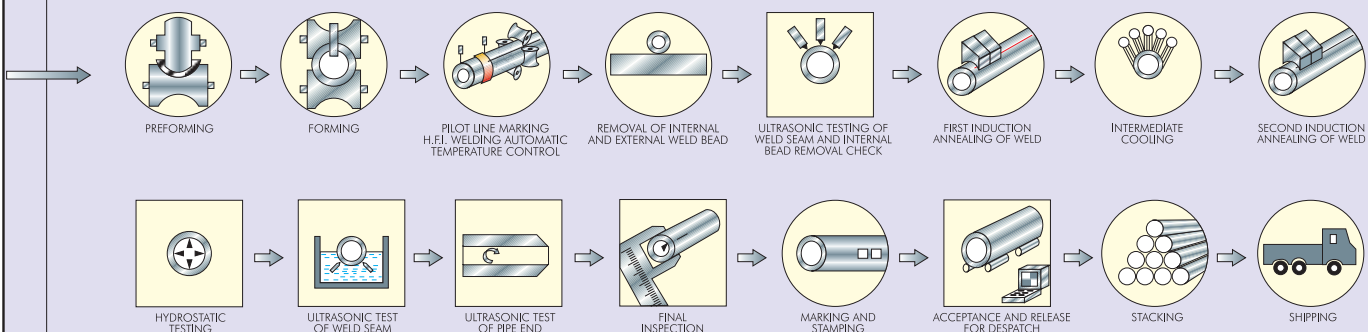


MSL has diversified into manufacturing of large diameter ERW pipes from size range 6" to 20" and wall thickness from 3.2mm to 16.00mm.

MSL's state-of-the-art ERW Plant from MANNESMANN, Germany, is India's first and par excellence ERW pipe manufacturing facility. Today, the company is one of the largest outside diameter ERW pipes manufacturers of the country.



FREQUENCY INDUCTION WELDED/ELECTRIC RESISTANCE WELDED PIPES



CPE Technology

7" Seamless Pipes & Tubes

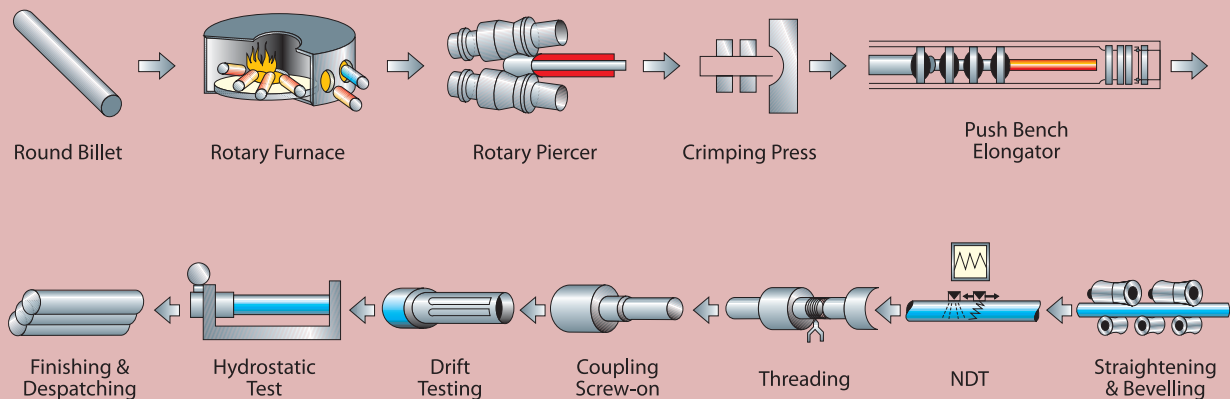
facility at Nagothane, Raigad (Maharashtra)

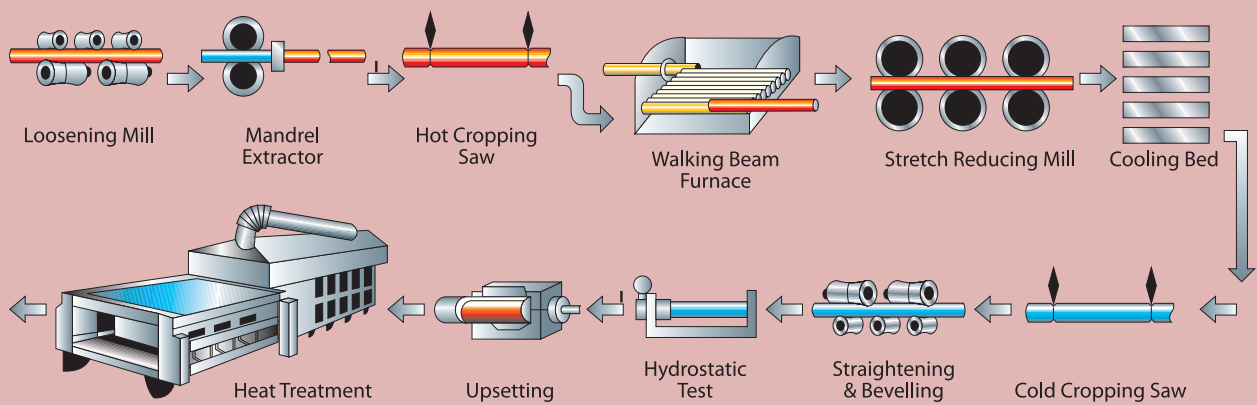
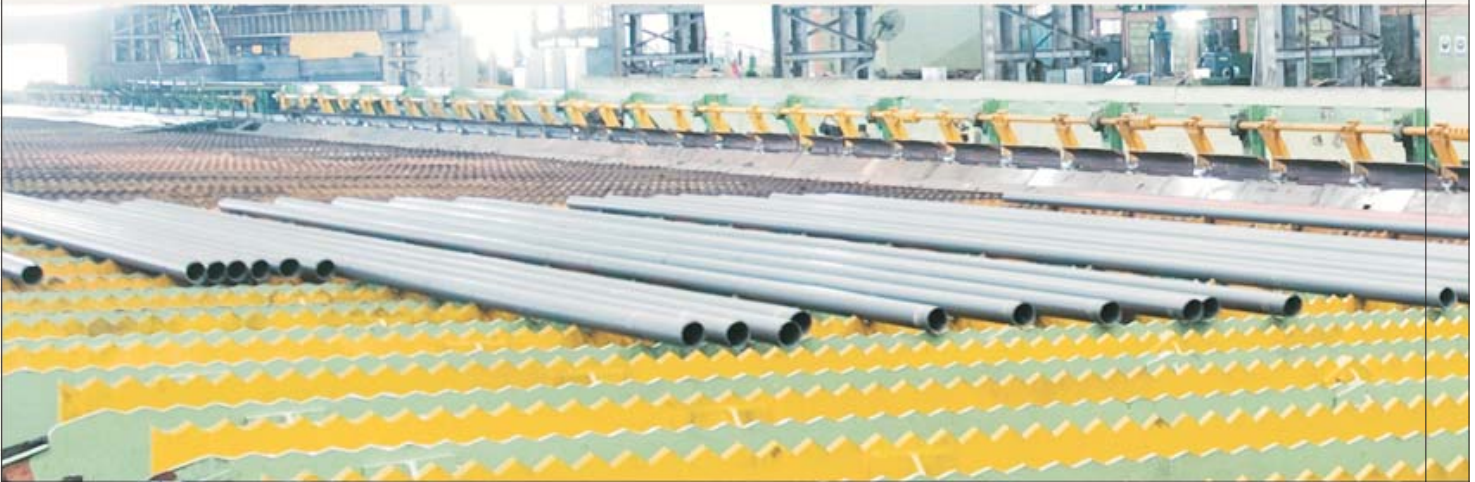
Our state-of-the-art plant uses world renowned CPE Technology acquired through technical know-how from German giant **MANNESMANN DEMAG HUTTENSTECHNIK GmbH**.

The CPE (Cross Roll Piercing and Elongation) process begins with the piercing of a hot billet on the piercer, followed by crimping and then elongation on the push-bench and finally the dimensions are controlled within specified variation on the Stretch Reducing Mill (SRM).

This process minimises longitudinal and transverse defects in pipes and tubes. It also ensures better control over wall thickness variation as compared to other manufacturing processes.

CPE PROCESS FLOW CHART





Plug Mill Technology

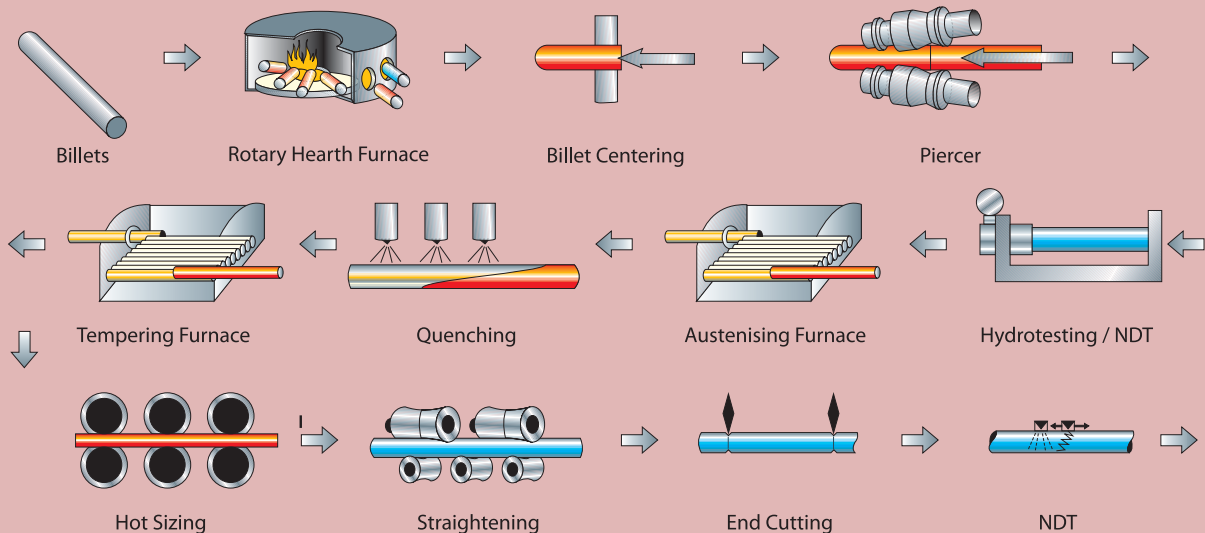
20" Seamless Pipes & Tubes

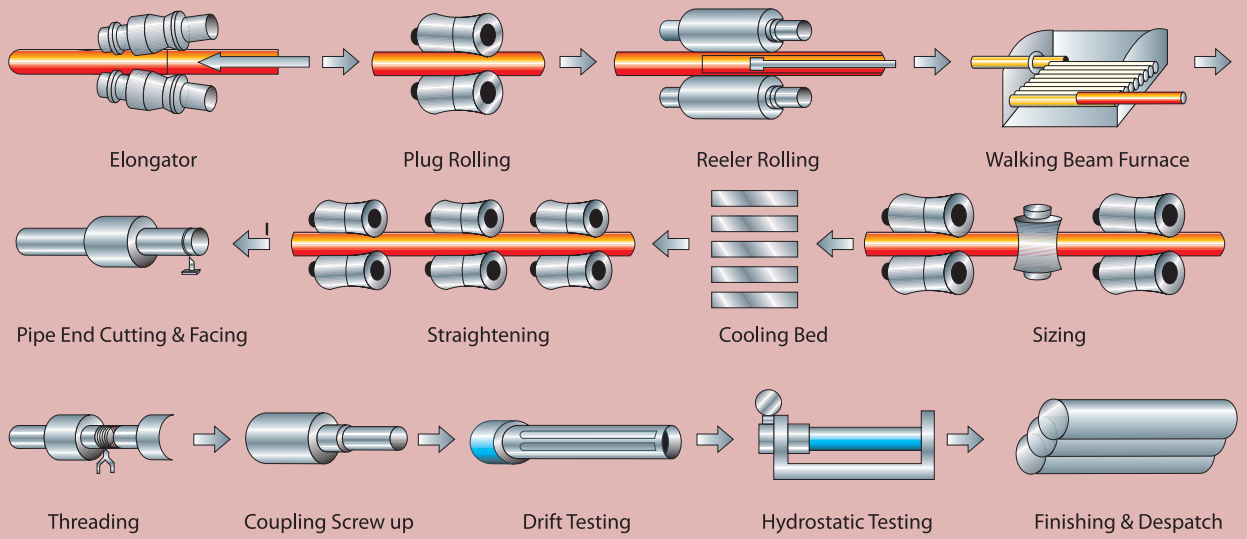
facility at Nagothane, Raigad (Maharashtra)

Plug Mill process is a proven process for manufacturing of higher diameter Seamless pipes by heating round billets up to the plastic stage of steel and piercing in a Cross Roll Piercer. Further elongation is achieved through a Plug Mill in which the thick wall hot hollow is rolled through a pair of Top and Bottom Rolls with a plug inside to control the ID and achieve better internal surface finish.

World Class Reelers are used to improve the wall thickness circumferentially, to achieve close tolerance on the Wall Thickness. As the OD and the ID are controlled by external and internal toolings during hot rolling in Plug Mill and Reeler, the pipe will have close tolerance, to cater to the requirements of OCTG and other applications.

PLUG MILL PROCESS FLOW CHART





MPM Technology

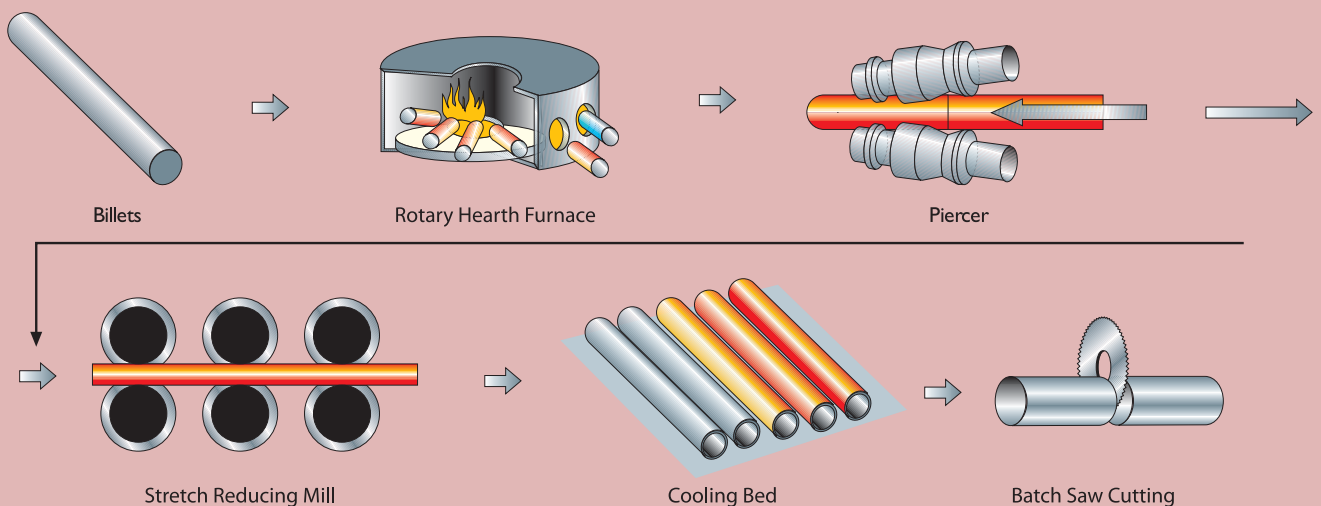
6" Seamless Pipes & Tubes

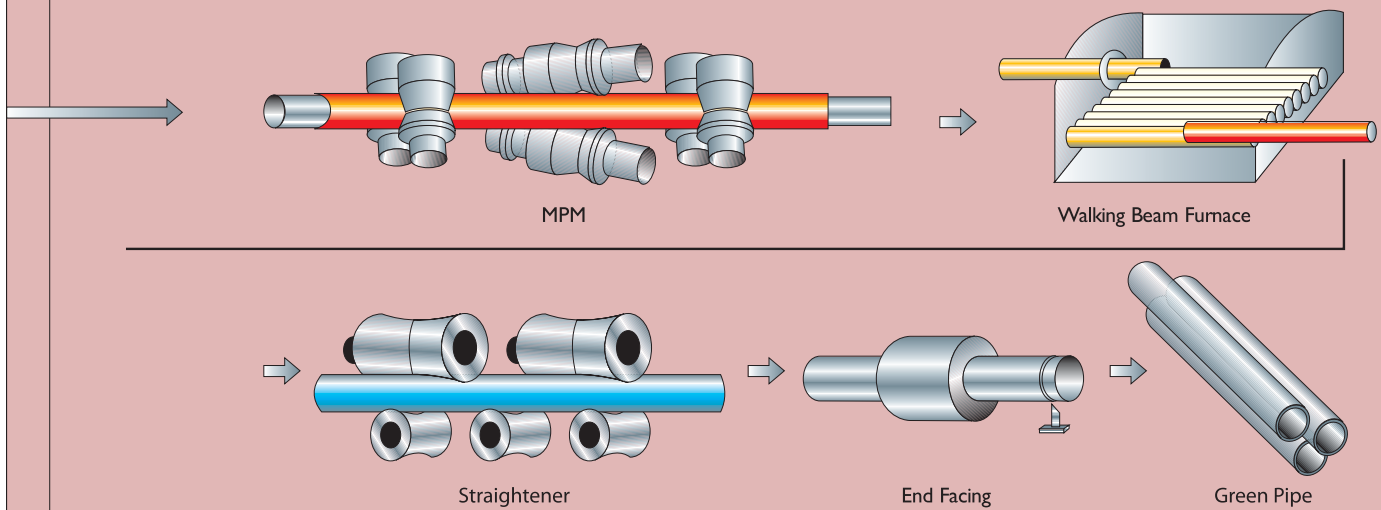
facility at Mangaon (Maharashtra)

MPM is the state-of-the-art manufacturing process for high quality Seamless Pipes and Tubes. In this process, pierced hollow is further elongated by 6 stand continuous rolling mill, where a high precision mandrel inside the hollow moves along with pipe during rolling, which ensures smooth internal surface finish of the pipe.

Each stand is equipped with Hydraulic gauge control, which ensures uniform thickness throughout the length. The deformation of hot metal is in longitudinal direction, which gives better mechanical properties. No torsional stress is induced during hot rolling, which ensures defect-free product.

MPM PROCESS FLOW CHART





Relentless Pursuit of Quality



Quality is the hallmark of D.P. Jindal Group. Strict adherence to the policy of "No Compromise with Quality" is demonstrated by its stringent control over procurement of raw material, process control, streamlined distribution network and fast delivery of finished products.

We are holding Quality Management System Certification of ISO 9001: 2008. Similarly, we are holding Integrated Management System Certification for

Environmental Management System ISO 14001:2004 and Occupational Health and Safety Management System OHSAS 18001:2007.

We are also certified to use API Monogram for casing, tubing and line pipes from American Petroleum Institute. Similarly, we are holding Certificate of Approval as Well Known Pipe and Tube Maker from Central Boiler Board.

Our in-house R&D activities and adherence to the stringent Quality Standards using sophisticated inspection facilities which include Hydrostatic Testing, NDT facilities viz. Electro Magnetic Inspection, Ultrasonic, MPI & Eddy Current Testing and Laboratory Inspection/ Testing facilities like Spectrometer, Metallurgical Microscope, UTM, Impact Testing and Hardness Testers etc. have helped MSL to benchmark itself, amongst the best pipe manufacturers in the world.



Our manufacturing /inspection facilities and product quality have approval from all leading International Inspection agencies such as Lloyds, DNV, BVQI, EIL, TUV, PDIL, SGS and many others, who are regularly inspecting our finished products for their esteemed clients.

Our products are in use by quality conscious sector of Indian Industry and our clientele includes customers like ONGC, OIL, IOCL, HPCL, BPCL, GAIL, Reliance, Cairn, ESSAR, BG Exploration, BHEL, NTPC, L&T, Punj Lloyd, ALSTOM, Thermax,

SAIL, Vedanta, TATA, Aditya Birla, Adani, Mahindra, JSW, JSPL, NALCO, Coal India, Indian Railways and Ordnance factories.



Our products, also, have exposure to major International markets and we enjoy a large number of satisfied customers in MIDDLE EAST, ASIA, FAR EAST and USA, including various Oil Companies Worldwide.

CSR, Environment & Human Resources



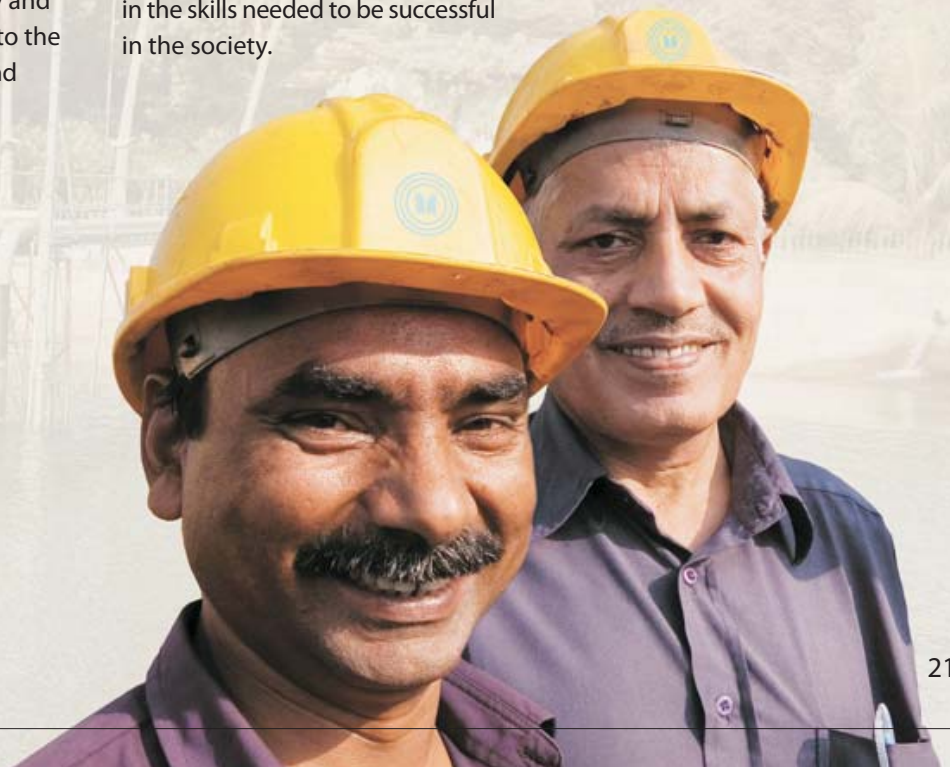


D.P. Jindal Group's strong belief in Corporate Social Responsibility is inspired through its commitment to take care of Environment, Health and Safety of its employees and neighbourhood.

A well equipped B.C. Jindal Charitable Hospital near the plant has been rendering primary and emergency health services to the employees, their families and nearby villagers.

Jindal Mount Litera Zee School near the plant is an initiative in nurturing young minds in the field of education. The curriculum includes a highly interactive skill-based programme, which uses developmentally appropriate and collaborative learning strategies to help students achieve competency in the skills needed to be successful in the society.

With our goal of becoming the leader in the industry, our aim in human resource management is at par with the industry. It is our continuous endeavour to reform our organizational structure to maintain an optimum level of human resource for better productivity and performance.



Applications & Specifications:

OIL & GAS SECTOR



API 5L/ ISO 3183
IS/ ISO 3183
API 5CT
API 5DP

HYDROCARBON PROCESS INDUSTRY



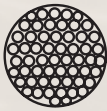
ASTM : A-53, A-333, A-334, A-335
BS : 3602 (Pt-I), 3603
IS : 6286

AUTOMOTIVE INDUSTRY



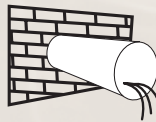
ASTM : A-519
SAE : 1010, 1012, 1020, 1040, 1518, 4130
DIN : 2391, 1629
BS : 980, 6323 (Pt-V)
IS : 3601, 3074

BOILER, HEAT EXCHANGER, SUPER HEATER & CONDENSER



ASTM : A-106, A-178, A-179, A-192, A-209, A-210, A-213, A-214
BS : 3059 (Pt-I & Pt-II), EN 10216 (Pt-I & Pt-II) 3602 (Pt-1)
IS : 1914, 2416, 11714, 4923
DIN : 17175

WATER & SEWAGE



IS : 1239 (Pt-I), 3589, IS 4270
BS : 1387
DIN : 2440, 2441

MECHANICAL, STRUCTURAL, & GENERAL ENGINEERING



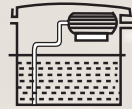
ASTM : A-500, A-501, A-519
DIN : 1629, 1630, 2391, 17100, 17200
BS : 980, 1775, 3601, 6323
IS : 1161, 3601, 9295

RAILWAYS



IS : 1239 (Pt-I), 1161
BS : 980
RDSO : ETI / OHE / 11

WATER WELL



IS : 4270
ASTM : A-589

HYDRAULIC CYLINDER



SAE : 1026, 1518
IS : 6631
DIN : 1629

BEARING INDUSTRY



SAE : 52100
DIN : 100 Cr6

Certifications:



Product Range - ERW

| | |
|---|---|
| I) Pipe Size Range | 21.30 - 508.00mm OD |
| II) Galvanized Pipes | 21.30 - 355.60mm OD |
| III) Boiler Tubes | 33.40 - 355.60mm OD |
| IV) Oil Country Tubular Goods (OCTG) | |
| A) Size Range: | |
| Line Pipes | Plain End from 88.9 - 508.0mm OD Threaded & Coupled with API Round Threads from 88.90 - 323.90mm OD |
| Casing | From 114.3 - 244.48mm Outside Diameter Plain End / Threaded and Coupled with STC, LTC & BTC Threads |
| B) Grades: | |
| Line Pipes (API 5L) | Upto Gr. X-70 (PSL-1 and PSL-2) |
| Casing & Tubing (API 5CT) | J-55 and K-55 |
| V) Sectional Pipes | |
| Square Hollow Sections | 25 x 25 to 250 x 250mm |
| Rectangular Sections | 50 x 25 to 300 x 200mm |

ERW BOILER, SUPER HEATER, HEAT EXCHANGER, CONDENSER & AIR HEATER TUBES & PIPES

| Outside Diameter mm | Conforming to BS 3059 (Pt-I & II), ASTM A-178, A-214, A-333, IS:1914 (Pt-IV), IS:2416 (Pt-IV), IS:11714 (Pt-III) | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------|--|------|------|------|------|------|------|------|------|------|-------|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|
| | 2.03 | 2.34 | 2.64 | 2.95 | 3.25 | 3.38 | 3.56 | 3.66 | 3.68 | 3.91 | 4.06 | 4.50 | 5.16 | 5.49 | 5.74 | 6.02 | 6.35 | 6.55 | 7.04 | 7.11 | 7.80 | 7.92 | 8.18 | 8.38 | 9.27 | 9.52 |
| 33.4/33.7 | 1.59 | 1.81 | 2.02 | 2.24 | 2.44 | 2.53 | - | 2.71 | - | - | 2.97 | 3.24 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 38.0 | 1.80 | 2.06 | 2.30 | 2.55 | 2.79 | - | - | 3.10 | - | - | 3.40 | 3.72 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 42.2/42.4 | - | 2.31 | 2.59 | 2.87 | 3.14 | - | 3.41 | 3.50 | - | - | 3.84 | 4.21 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 44.5 | - | 2.43 | 2.73 | 3.02 | 3.31 | - | - | 3.69 | - | - | 4.05 | 4.44 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 48.3 | - | 2.65 | 2.97 | 3.30 | 3.61 | - | - | 4.03 | 4.05 | - | 4.43 | 4.86 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 50.8 | - | 2.80 | 3.14 | 3.48 | 3.81 | - | - | 4.25 | - | - | 4.68 | 5.14 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 57.2 | - | - | 3.55 | 3.95 | 4.32 | - | - | 4.83 | - | - | 5.32 | 5.85 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 60.3 | - | - | 3.75 | 4.17 | 4.57 | - | - | 5.11 | - | 5.44 | 5.63 | 6.19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 63.5 | - | - | 3.96 | 4.40 | 4.83 | - | - | 5.40 | - | - | 5.95 | 6.55 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 73.0 | - | - | - | - | - | - | - | - | - | - | - | - | 8.63 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 76.1 | - | - | - | 5.32 | 5.84 | - | - | 6.54 | - | - | 7.21 | 7.95 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 88.9 | - | - | - | - | 6.86 | - | - | 7.69 | - | - | 8.49 | 9.37 | - | 11.29 | - | - | - | - | - | - | - | - | - | - | - | - |
| 101.6 | - | - | - | - | - | - | - | 8.84 | - | - | 9.77 | 10.78 | - | - | 13.57 | - | - | - | - | - | - | - | - | - | - | - |
| 114.3 | - | - | - | - | - | - | - | - | - | - | 11.04 | 12.18 | - | - | - | 16.07 | - | - | - | - | - | - | - | - | - | - |
| 127.0 | - | - | - | - | - | - | - | - | - | - | - | 13.59 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 141.3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 21.77 | - | - | - | - | - | - | - | - |
| 168.3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 28.26 | - | - | - | - | - | - |
| 219.1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 33.31 | - | 36.81 | - | - | - | - | 42.55 | - | - |
| 273.0 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 41.75 | - | - | - | 51.01 | - | - | - | 60.29 | - |
| 323.8 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 49.71 | - | - | - | - | - | - | 65.18 | - | 73.78 |
| 355.6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 54.69 | - | - | - | - | - | 67.90 | - | - | 81.25 |

Note :Hydrostatic Test / NDT Test, as per specification requirements.

Weld-On Connectors- **ERW**

MSL, now offers weldable Box and Pin Multi Start Thread Connectors, suitable to be girth welded with ERW Pipes as per Specification API 5L. Weld-On Connectors are designed for Offshore and Onshore applications, where environmental conditions call for fast connector make-up combined with superior performance.

MSL uses Leopard Connectors which combine the advantages of a preloaded thread-type connector with the rapid make up, desired for offshore operations.

The Leopard Connectors have high cone angle and is available in twin on four start thread. When stabbed, the box swallows approximately 90% of the pin length. The stabbing guide prevents cross-threading. Full make-up is achieved in less than half a turn with a four start thread and less than one turn for a two start thread.

Leopard Connectors have following features:

- Multi Start Threads for fast make-up
- Low torque make-up with rig tongs less than one turn make-up
- Integral 4 point anti-rotation provision
- Suitable for piling
- Reversible and reusable
- Visual indication of make-up
- Preloaded for fatigue

Weld-On Connectors are available as per following details:

Specification : API 5L
Grade : Gr. B through Gr. X-70
Pipe Size : Upto 508.00mm (20")
Wall Thickness : 15.87mm (max.)

Product Range - Seamless

- I) Hot Finished Pipes and Tubes
 - Carbon & Alloy Steel:
 - Outside Diameter (OD) 26mm - 508.0mm
 - Wall Thickness (WT) 2.8mm - 40mm
- II) Cold Pilgered / Cold Drawn Tubes
 - Carbon & Alloy Steel:
 - Outside Diameter (OD) 10mm - 101mm
 - Wall Thickness (WT) 1mm - 10mm
- III) OIL Country Tubular Goods (OCTG)
 - A) Size Range
 - Line Pipes
 - Plain End Upto 20" (508 mm) Outside Diameter
 - Threaded and Coupled with API Line
 - Pipe threads upto 12" (323.9 mm) Outside Diameter
 - Casing
 - Upto 13³/₈" (339.72 mm) Outside Diameter Plain End / Threaded and Coupled with STC, LTC & BTC Threads
 - Tubing
 - NUE / EUE upto 4¹/₂" Outside Diameter Plain End or Threaded & Coupled with API Round Threads
 - Drill Pipes
 - Internal Upset (IU)
 - 3¹/₂" to 4¹/₂"
 - External Upset (EU)
 - 2⁷/₈" to 4¹/₂"
 - Internal - External Upset (IEU)
 - 4¹/₂" to 5"
 - B) Grades
 - Line Pipes (API - 5L) All Grades upto X-70 / X-70Q
 - Casing & Tubing (API 5CT)

| Yield Strength (ksi) | 40 | 55 | 65 | 80 | 90 | 95 | 110 | 125 |
|----------------------|------|--------------|------|------|------|--------------|-------|------|
| Group 1 | H 40 | J 55 K 55 | | N 80 | | | | |
| Group 2 | | | M 65 | L 80 | C 90 | R 95 T 95 | C 110 | |
| Group 3 | | | | | | | P 110 | |
| Group 4 | | | | | | | | Q125 |

- Proprietary Grades
 - High Collapse Casing MAHA HC L80
MAHA HC P110
- Drill Pipes (API 5DP) Gr. E, X,G,S
- Sour Service NACE (MR - 0175)

ASTM SCHEDULED SIZES

| DIMENSION AND WEIGHT | | | | | | | | | | | | | | | |
|---------------------------|--------|--|--------|--------|--------|--------|--------|--------|--------|--------|---------|---------|---------|---------|--------|
| Nominal Pipe Size mm/inch | OD mm | SCHEDULE WALL THICKNESS (mm) / WEIGHT (kg/m) | | | | | | | | | | | | | |
| | | Sch 5 | Sch 10 | Sch 20 | Sch 30 | STD | Sch 40 | XS | Sch 60 | Sch 80 | Sch 100 | Sch 120 | Sch 140 | Sch 160 | XXS |
| 6 | 10.3 | - | 1.24 | - | - | 1.73 | 1.73 | 2.41 | - | 2.41 | - | - | - | - | - |
| 1/8 | | - | 0.28 | - | - | 0.37 | 0.37 | 0.47 | - | 0.47 | - | - | - | - | - |
| 8 | 13.7 | - | 1.65 | - | - | 2.24 | 2.24 | 3.02 | - | 3.02 | - | - | - | - | - |
| 1/4 | | - | 0.49 | - | - | 0.63 | 0.63 | 0.80 | - | 0.80 | - | - | - | - | - |
| 10 | 17.1 | - | 1.65 | - | - | 2.31 | 2.31 | 3.20 | - | 3.20 | - | - | - | - | - |
| 3/8 | | - | 0.63 | - | - | 0.84 | 0.84 | 1.10 | - | 1.10 | - | - | - | - | - |
| 15 | 21.3 | 1.65 | 2.11 | - | - | 2.77 | 2.77 | 3.73 | - | 3.73 | - | - | - | 4.78 | 7.47 |
| 1/2 | | 0.80 | 1.00 | - | - | 1.27 | 1.27 | 1.62 | - | 1.62 | - | - | - | 1.95 | 2.55 |
| 20 | 26.7 | 1.65 | 2.11 | - | - | 2.87 | 2.87 | 3.91 | - | 3.91 | - | - | - | 5.56 | 7.82 |
| 3/4 | | 1.03 | 1.28 | - | - | 1.69 | 1.69 | 2.20 | - | 2.20 | - | - | - | 2.90 | 3.64 |
| 25 | 33.4 | 1.65 | 2.77 | - | - | 3.38 | 3.38 | 4.55 | - | 4.55 | - | - | - | 6.35 | 9.09 |
| 1 | | 1.29 | 2.09 | - | - | 2.50 | 2.50 | 3.24 | - | 3.24 | - | - | - | 4.24 | 5.45 |
| 32 | 42.2 | 1.65 | 2.77 | - | - | 3.56 | 3.56 | 4.85 | - | 4.85 | - | - | - | 6.35 | 9.70 |
| 1 1/4 | | 1.65 | 2.69 | - | - | 3.39 | 3.39 | 4.47 | - | 4.47 | - | - | - | 5.61 | 7.77 |
| 40 | 48.3 | 1.65 | 2.77 | - | - | 3.68 | 3.68 | 5.08 | - | 5.08 | - | - | - | 7.14 | 10.15 |
| 1 1/2 | | 1.90 | 3.11 | - | - | 4.05 | 4.05 | 5.41 | - | 5.41 | - | - | - | 7.25 | 9.55 |
| 50 | 60.3 | 1.65 | 2.77 | - | - | 3.91 | 3.91 | 5.54 | - | 5.54 | - | - | - | 8.74 | 11.07 |
| 2 | | 2.39 | 3.93 | - | - | 5.44 | 5.44 | 7.48 | - | 7.48 | - | - | - | 11.11 | 13.44 |
| 65 | 73.0 | 2.11 | 3.05 | - | - | 5.16 | 5.16 | 7.01 | - | 7.01 | - | - | - | 9.53 | 14.02 |
| 2 1/2 | | 3.69 | 5.26 | - | - | 8.63 | 8.63 | 11.41 | - | 11.41 | - | - | - | 14.92 | 20.39 |
| 80 | 88.9 | 2.11 | 3.05 | - | - | 5.49 | 5.49 | 7.62 | - | 7.62 | - | - | - | 11.13 | 15.24 |
| 3 | | 4.52 | 6.46 | - | - | 11.29 | 11.29 | 15.27 | - | 15.27 | - | - | - | 21.35 | 27.68 |
| 90 | 101.6 | 2.11 | 3.05 | - | - | 5.74 | 5.74 | 8.08 | - | 8.08 | - | - | - | - | - |
| 3 1/2 | | 5.18 | 7.41 | - | - | 13.57 | 13.57 | 18.64 | - | 18.64 | - | - | - | - | - |
| 100 | 114.3 | 2.11 | 3.05 | - | - | 6.02 | 6.02 | 8.56 | - | 8.56 | - | 11.13 | - | 13.49 | 17.12 |
| 4 | | 5.84 | 8.37 | - | - | 16.08 | 16.08 | 22.32 | - | 22.32 | - | 28.32 | - | 33.54 | 41.03 |
| 125 | 141.3 | 2.77 | 3.40 | - | - | 6.55 | 6.55 | 9.53 | - | 9.53 | - | 12.70 | - | 15.88 | 19.05 |
| 5 | | 9.46 | 11.56 | - | - | 21.77 | 21.77 | 30.97 | - | 30.97 | - | 40.28 | - | 49.12 | 57.43 |
| 150 | 168.30 | 2.77 | 3.40 | - | - | 7.11 | 7.11 | 10.97 | - | 10.97 | - | 14.27 | - | 18.26 | 21.95 |
| 6 | | 11.31 | 13.83 | - | - | 28.26 | 28.26 | 42.56 | - | 42.56 | - | 54.21 | - | 67.57 | 79.22 |
| 200 | 219.10 | - | - | 6.35 | 7.04 | 8.18 | 8.18 | 12.70 | 10.31 | 12.70 | 15.09 | 18.26 | 20.62 | 23.01 | 22.23 |
| 8 | | - | - | 33.32 | 36.82 | 42.55 | 42.55 | 64.64 | 53.09 | 64.64 | 75.92 | 90.44 | 100.93 | 111.27 | 107.93 |
| 250 | 273.00 | 3.40 | 4.19 | 6.35 | 7.80 | 9.27 | 9.27 | 12.70 | 12.70 | 15.09 | 18.26 | 21.44 | 25.40 | 28.58 | 25.40 |
| 10 | | 22.61 | 27.78 | 41.76 | 51.01 | 60.29 | 60.29 | 81.53 | 81.53 | 95.98 | 114.71 | 133.01 | 155.10 | 172.27 | 155.10 |
| 300 | 323.80 | - | - | - | 8.38 | 9.53 | 10.31 | 12.70 | 14.27 | 17.48 | 21.44 | 25.40 | 28.58 | 33.32 | 25.40 |
| 12 | | - | - | - | 65.19 | 73.86 | 79.71 | 97.44 | 108.93 | 132.05 | 159.87 | 186.92 | 208.08 | 238.69 | 186.92 |
| 350 | 355.60 | - | - | - | 9.53 | 9.53 | 11.13 | 12.70 | 15.09 | 19.05 | 23.83 | 27.79 | 31.75 | 35.71 | - |
| 14 | | - | - | - | 81.33 | 81.33 | 94.55 | 107.40 | 126.72 | 158.11 | 194.98 | 224.66 | 253.58 | 281.72 | - |
| 400 | 406.40 | - | - | - | 9.53 | 9.53 | 12.70 | 12.70 | 16.66 | 21.44 | - | - | - | - | - |
| 16 | | - | - | - | 93.27 | 93.27 | 123.31 | 123.31 | 160.12 | 203.54 | - | - | - | - | - |
| 450 | 457.00 | - | - | 9.53 | 11.13 | 9.53 | 14.27 | 12.70 | 19.05 | 23.83 | - | - | - | - | - |
| 18 | | - | - | 105.17 | 122.38 | 105.17 | 155.81 | 139.16 | 205.75 | 254.57 | - | - | - | - | - |
| 500 | 508.00 | - | - | 9.53 | 12.70 | 9.53 | 15.09 | 12.70 | 20.62 | 26.19 | - | - | - | - | - |
| 20 | | - | - | 117.15 | 155.13 | 117.15 | 183.43 | 155.13 | 247.84 | 311.19 | - | - | - | - | - |

NOTE : Special sizes made to order.

BOILER AND HEAT-EXCHANGER TUBES

| Outside Diameter | | Wall Thickness | | | | | | | | | | | | | | | | |
|------------------|--------|----------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| | | 16 swg | 15 swg | 14 swg | 13 swg | 12 swg | 11 swg | 10 swg | 9 swg | 8 swg | 7 swg | 6 swg | 5 swg | 4 swg | 1/4" | 5/16" | 3/8" | 1/2" |
| | | 1.63 mm | 1.83 mm | 2.03 mm | 2.34 mm | 2.64 mm | 2.95 mm | 3.25 mm | 3.66 mm | 4.06 mm | 4.47 mm | 4.88 mm | 5.39 mm | 5.89 mm | 6.35 mm | 7.94 mm | 9.53 mm | 12.7 mm |
| In | mm | Weight with nominal thk (kg/mtr) | | | | | | | | | | | | | | | | |
| | | Weight with minimum thk (kg/mtr) | | | | | | | | | | | | | | | | |
| 0.75 | 19.05 | 0.70 | 0.78 | 0.85 | 0.96 | 1.07 | 1.17 | 1.27 | | | | | | | | | | |
| | | 0.74 | 0.82 | 0.89 | 1.01 | 1.12 | 1.23 | 1.33 | | | | | | | | | | |
| 1.00 | 25.40 | 0.96 | 1.06 | 1.17 | 1.33 | 1.48 | 1.63 | 1.78 | | | | | | | | | | |
| | | 1.00 | 1.12 | 1.23 | 1.40 | 1.56 | 1.71 | 1.86 | | | | | | | | | | |
| 1.25 | 31.75 | | | | 1.70 | 1.90 | 2.10 | 2.28 | 2.54 | 2.77 | | | | | | | | |
| | | | | | 1.78 | 1.99 | 2.20 | 2.40 | 2.66 | 2.91 | | | | | | | | |
| 1.50 | 38.10 | | | | | | | 2.79 | 3.11 | 3.41 | 3.71 | 4.00 | 4.35 | 4.68 | 4.97 | | | |
| | | | | | | | | 3.07 | 3.42 | 3.75 | 4.08 | 4.40 | 4.57 | 4.91 | 5.22 | | | |
| 1.75 | 44.45 | | | | | | | 3.30 | 3.68 | 4.04 | 4.41 | 4.76 | 5.19 | 5.60 | 5.97 | | | |
| | | | | | | | | 3.63 | 4.05 | 4.45 | 4.85 | 5.24 | 5.71 | 5.88 | 6.26 | | | |
| 2.00 | 50.80 | | | | | | | 3.81 | 4.25 | 4.68 | 5.11 | 5.53 | 6.04 | 6.52 | 6.96 | | | |
| | | | | | | | | 4.19 | 4.68 | 5.15 | 5.62 | 6.08 | 6.64 | 7.18 | 7.66 | | | |
| 2.25 | 57.15 | | | | | | | 4.32 | 4.83 | 5.32 | 5.81 | 6.29 | 6.88 | 7.45 | 7.96 | 9.64 | | |
| | | | | | | | | 4.75 | 5.31 | 5.85 | 6.39 | 6.92 | 7.57 | 8.19 | 8.75 | 10.60 | | |
| 2.50 | 63.50 | | | | | | | 4.83 | 5.40 | 5.95 | 6.51 | 7.05 | 7.72 | 8.37 | 8.95 | 10.88 | 12.68 | |
| | | | | | | | | 5.31 | 5.94 | 6.55 | 7.16 | 7.76 | 8.50 | 9.21 | 9.84 | 11.97 | 13.95 | |
| 2.75 | 69.85 | | | | | | | 5.34 | 5.97 | 6.59 | 7.21 | 7.82 | 8.57 | 9.29 | 9.94 | 12.12 | 14.18 | |
| | | | | | | | | 5.87 | 6.57 | 7.25 | 7.93 | 8.60 | 9.43 | 10.22 | 10.94 | 13.34 | 15.59 | |
| 3.00 | 76.20 | | | | | | | 5.85 | 6.55 | 7.22 | 7.91 | 8.58 | 9.41 | 10.21 | 10.94 | 13.37 | 15.67 | |
| | | | | | | | | 6.43 | 7.20 | 7.95 | 8.70 | 9.44 | 10.35 | 11.23 | 12.03 | 14.70 | 17.24 | |
| 3.25 | 82.55 | | | | | | | 6.36 | 7.12 | 7.86 | 8.61 | 9.35 | 10.26 | 11.14 | 11.93 | 14.61 | 17.16 | |
| | | | | | | | | 6.99 | 7.83 | 8.64 | 9.47 | 10.28 | 11.28 | 12.25 | 13.13 | 16.07 | 18.88 | |
| 3.50 | 88.90 | | | | | | | 6.86 | 7.69 | 8.49 | 9.31 | 10.11 | 11.10 | 12.06 | 12.93 | 15.85 | 18.65 | |
| | | | | | | | | 7.55 | 8.46 | 9.34 | 10.24 | 11.12 | 12.21 | 13.26 | 14.22 | 17.44 | 20.52 | |
| 3.75 | 95.25 | | | | | | | | | 9.13 | 10.01 | 10.88 | 11.94 | 12.98 | 13.92 | 17.10 | 20.15 | |
| | | | | | | | | | | 10.04 | 11.01 | 11.96 | 13.14 | 14.28 | 15.31 | 18.81 | 22.16 | |
| 4.00 | 101.60 | | | | | | | | | 9.77 | 10.71 | 11.64 | 12.79 | 13.90 | 14.92 | 18.34 | 21.64 | |
| | | | | | | | | | | 10.74 | 11.78 | 12.80 | 14.07 | 15.29 | 16.41 | 20.17 | 23.80 | |
| 4.25 | 107.95 | | | | | | | | | 10.40 | 11.41 | 12.40 | 13.63 | 14.82 | 15.91 | 19.58 | 23.13 | 29.83 |
| | | | | | | | | | | 11.44 | 12.55 | 13.64 | 15.00 | 16.31 | 17.50 | 21.54 | 25.44 | 32.82 |
| 4.50 | 114.30 | | | | | | | | | 11.04 | 12.11 | 13.17 | 14.48 | 15.75 | 16.91 | 20.83 | 24.62 | 31.82 |
| | | | | | | | | | | 12.14 | 13.32 | 14.49 | 15.92 | 17.32 | 18.60 | 22.91 | 27.09 | 35.00 |
| 4.75 | 120.65 | | | | | | | | | 11.67 | 12.81 | 13.93 | 15.32 | 16.67 | 17.90 | 22.07 | 26.12 | 33.81 |
| | | | | | | | | | | 12.84 | 14.09 | 15.33 | 16.85 | 18.34 | 19.69 | 24.28 | 28.73 | 37.19 |
| 5.00 | 127.00 | | | | | | | | | 12.31 | 13.51 | 14.70 | 16.17 | 17.59 | 18.89 | 23.31 | 27.61 | 35.80 |
| | | | | | | | | | | 13.54 | 14.86 | 16.17 | 17.78 | 19.35 | 20.78 | 25.64 | 30.37 | 39.38 |
| 5.25 | 133.35 | | | | | | | | | 12.95 | 14.21 | 15.46 | 17.01 | 18.51 | 19.89 | 24.56 | 29.10 | 37.79 |
| | | | | | | | | | | 14.24 | 15.63 | 17.01 | 18.71 | 20.37 | 21.88 | 27.01 | 32.01 | 41.57 |
| 5.50 | 139.70 | | | | | | | | | | | | 17.85 | 19.44 | 20.88 | 25.80 | 30.59 | 39.78 |
| | | | | | | | | | | | | | 19.64 | 21.38 | 22.97 | 28.38 | 33.65 | 43.75 |
| 6.00 | 152.40 | | | | | | | | | | | | 19.54 | 21.28 | 22.87 | 28.29 | 33.58 | 43.75 |
| | | | | | | | | | | | | | 21.50 | 23.41 | 25.16 | 31.12 | 36.94 | 48.13 |
| 6.50 | 165.10 | | | | | | | | | | | | 21.23 | 23.13 | 24.86 | 30.77 | 36.56 | 47.73 |
| | | | | | | | | | | | | | 23.35 | 25.44 | 27.35 | 33.85 | 40.22 | 52.51 |

NOTE : Special sizes made to orders.

OCTG: API LINE PIPES

| Dimensions, Weights and Test Pressures for Sizes 0.840" through 20" (SI Units) | | | | | | | | | | | | | | | | |
|--|----------------------------|--------------------------|----------------------------------|----------------------------|-----------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-----|
| Size | Specified Outside Diameter | Specified Wall Thickness | Plain-end Weight per Unit Length | Calculated Inside Diameter | Minimum Test Pressure (kPa x 100) | | | | | | | | | | Type | |
| | D | t | Wpe | d | Grade | Grade | Grade | Grade | Grade | Grade | Grade | Grade | Grade | Grade | | |
| | (mm) | (mm) | (Kg/m) | (mm) | A25 | A | B | X-42 | X-46 | X-52 | X-56 | X-60 | X-65 | X-70 | | S/E |
| 0.840 | 21.3 | 2.8 | 1.28 | 15.7 | 48 | 48 | 48 | - | - | - | - | - | - | - | S | |
| 0.840 | 21.3 | 3.7 | 1.61 | 13.9 | 59 | 59 | 59 | - | - | - | - | - | - | - | S | |
| 1.050 | 26.7 | 2.9 | 1.70 | 20.9 | 48 | 48 | 48 | - | - | - | - | - | - | - | S | |
| 1.050 | 26.7 | 3.9 | 2.19 | 18.9 | 59 | 59 | 59 | - | - | - | - | - | - | - | S | |
| 1.315 | 33.4 | 3.4 | 2.52 | 26.6 | 48 | 48 | 48 | - | - | - | - | - | - | - | S | |
| 1.315 | 33.4 | 4.5 | 3.21 | 24.4 | 59 | 59 | 59 | - | - | - | - | - | - | - | S | |
| 1.660 | 42.2 | 3.6 | 3.43 | 35.0 | 69 | 83 | 90 | - | - | - | - | - | - | - | S | |
| 1.660 | 42.2 | 4.9 | 4.51 | 32.4 | 90 | 124 | 131 | - | - | - | - | - | - | - | S | |
| 1.900 | 48.3 | 3.7 | 4.07 | 40.9 | 69 | 83 | 90 | - | - | - | - | - | - | - | S | |
| 1.900 | 48.3 | 5.1 | 5.43 | 38.1 | 90 | 124 | 131 | - | - | - | - | - | - | - | S | |
| 2 3/8" | 60.3 | 3.6 | 5.03 | 53.1 | 69 | 150 | 170 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S | |
| | 60.3 | 3.9 | 5.42 | 52.5 | 69 | 163 | 170 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S | |
| | 60.3 | 4.4 | 6.07 | 51.5 | 76 | 170 | 170 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S | |
| | 60.3 | 4.8 | 6.57 | 50.7 | 83 | 170 | 170 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S | |
| | 60.3 | 5.5 | 7.43 | 49.3 | 90 | 170 | 170 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S | |
| | 60.3 | 6.4 | 8.51 | 47.5 | 96 | 170 | 170 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S | |
| 2 7/8" | 60.3 | 7.1 | 9.31 | 46.1 | 96 | 170 | 170 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S | |
| | 73.0 | 4.0 | 6.81 | 65.0 | 69 | 138 | 161 | 191 | 205 | 205 | 205 | 205 | 205 | 205 | S | |
| | 73.0 | 4.4 | 7.44 | 64.2 | 69 | 152 | 170 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S | |
| | 73.0 | 4.8 | 8.07 | 63.4 | 69 | 166 | 170 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S | |
| | 73.0 | 5.2 | 8.69 | 62.6 | 69 | 170 | 170 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S | |
| | 73.0 | 5.5 | 9.16 | 62.0 | 76 | 170 | 170 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S | |
| 3 1/2" | 73.0 | 6.4 | 10.51 | 60.2 | 83 | 170 | 170 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S | |
| | 73.0 | 7.0 | 11.39 | 59.0 | 90 | 170 | 170 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S | |
| | 3 1/2" | 88.9 | 3.2 | 6.76 | 82.5 | 69 | 91 | 106 | 125 | 138 | 156 | 168 | 179 | 194 | 205 | E |
| | | 88.9 | 3.6 | 7.57 | 81.7 | 69 | 102 | 119 | 141 | 156 | 175 | 190 | 201 | 205 | 205 | E |
| | 88.9 | 4.0 | 8.37 | 80.9 | 69 | 113 | 132 | 157 | 173 | 194 | 205 | 205 | 205 | 205 | S/E | |
| | 88.9 | 4.4 | 9.17 | 80.1 | 69 | 125 | 146 | 172 | 190 | 205 | 205 | 205 | 205 | 205 | 205 | S/E |
| 88.9 | 4.8 | 9.95 | 79.3 | 69 | 136 | 159 | 188 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S/E | |
| 88.9 | 5.5 | 11.31 | 77.9 | 69 | 156 | 170 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S/E | |
| 88.9 | 6.4 | 13.02 | 76.1 | - | 170 | 170 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S | |
| 88.9 | 7.1 | 14.32 | 74.7 | - | 170 | 170 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S | |
| 88.9 | 7.6 | 15.24 | 73.7 | 90 | 170 | 170 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S | |
| 4" | 101.6 | 3.2 | 7.76 | 95.2 | - | 79 | 93 | 110 | 121 | 136 | 147 | 157 | 170 | 183 | E | |
| | 101.6 | 3.6 | 8.70 | 94.4 | 55 | 89 | 104 | 123 | 136 | 153 | 166 | 177 | 191 | 205 | E | |
| | 101.6 | 4.0 | 9.63 | 93.6 | - | 99 | 116 | 137 | 151 | 170 | 184 | 196 | 205 | 205 | S/E | |
| | 101.6 | 4.4 | 10.55 | 92.8 | 69 | 109 | 127 | 151 | 166 | 187 | 203 | 205 | 205 | 205 | S/E | |
| 101.6 | 4.8 | 11.46 | 92.0 | 83 | 119 | 139 | 164 | 181 | 204 | 205 | 205 | 205 | 205 | S/E | | |

S:Seamless S/E
 E:ERW

OCTG: API LINE PIPES

| Dimensions, Weights and Test Pressures for Sizes 0.840" through 20" (SI Units) | | | | | | | | | | | | | | | |
|--|----------------------------|--------------------------|----------------------------------|----------------------------|-----------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|
| Size | Specified Outside Diameter | Specified Wall Thickness | Plain-end Weight per Unit Length | Calculated Inside Diameter | Minimum Test Pressure (kPa x 100) | | | | | | | | | | Type |
| | D | t | Wpe | d | Grade | Grade | Grade | Grade | Grade | Grade | Grade | Grade | Grade | Grade | |
| | (mm) | (mm) | (Kg/m) | (mm) | A25 | A | B | X-42 | X-46 | X-52 | X-56 | X-60 | X-65 | X-70 | |
| | 101.6 | 5.7 | 13.48 | 90.2 | 83 | 141 | 165 | 195 | 205 | 205 | 205 | 205 | 205 | 205 | S/E |
| | 101.6 | 6.4 | 15.02 | 88.8 | - | 159 | 185 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S/E |
| | 101.6 | 7.1 | 16.55 | 87.4 | - | 176 | 190 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S |
| | 101.6 | 8.1 | 18.68 | 85.4 | 117 | 190 | 190 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S |
| 4 1/2" | 114.3 | 3.2 | 8.77 | 107.9 | 55 | 71 | 82 | 97 | 108 | 121 | 131 | 139 | 151 | 163 | E |
| | 114.3 | 3.6 | 9.83 | 107.1 | - | 79 | 93 | 110 | 121 | 136 | 147 | 157 | 170 | 183 | E |
| | 114.3 | 4.0 | 10.88 | 106.3 | 69 | 88 | 103 | 122 | 134 | 151 | 164 | 174 | 189 | 204 | S/E |
| | 114.3 | 4.4 | 11.92 | 105.5 | - | 97 | 113 | 134 | 148 | 166 | 180 | 192 | 205 | 205 | S/E |
| | 114.3 | 4.8 | 12.96 | 104.7 | 83 | 106 | 123 | 146 | 161 | 181 | 197 | 205 | 205 | 205 | S/E |
| | 114.3 | 5.2 | 13.99 | 103.9 | - | 115 | 134 | 158 | 175 | 197 | 205 | 205 | 205 | 205 | S/E |
| | 114.3 | 5.6 | 15.01 | 103.1 | 83 | 123 | 144 | 170 | 188 | 205 | 205 | 205 | 205 | 205 | S/E |
| | 114.3 | 6.0 | 16.02 | 102.3 | 83 | 132 | 154 | 183 | 202 | 205 | 205 | 205 | 205 | 205 | S/E |
| | 114.3 | 6.4 | 17.03 | 101.5 | - | 141 | 165 | 195 | 205 | 205 | 205 | 205 | 205 | 205 | S/E |
| | 114.3 | 7.1 | 18.77 | 100.1 | - | 157 | 183 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S |
| | 114.3 | 7.9 | 20.73 | 98.5 | - | 174 | 190 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S |
| | 114.3 | 8.6 | 22.42 | 97.1 | 117 | 190 | 190 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S |
| | 114.3 | 11.1 | 28.25 | 92.1 | - | 190 | 190 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S |
| | 114.3 | 13.5 | 33.56 | 87.3 | - | 190 | 190 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S |
| | 114.3 | 17.1 | 40.99 | 80.1 | - | 190 | 190 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S |
| 5 9/16" | 141.3 | 3.2 | 10.90 | 134.9 | 46 | 57 | 67 | 79 | 87 | 98 | 106 | 113 | 122 | 132 | E |
| | 141.3 | 4.0 | 13.54 | 133.3 | 58 | 71 | 83 | 99 | 109 | 122 | 132 | 141 | 153 | 165 | E |
| | 141.3 | 4.8 | 16.16 | 131.7 | 70 | 86 | 100 | 118 | 130 | 147 | 159 | 169 | 183 | 198 | E |
| | 141.3 | 5.6 | 18.74 | 130.1 | 81 | 100 | 117 | 138 | 152 | 171 | 185 | 197 | 205 | 205 | S/E |
| | 141.3 | 6.6 | 21.92 | 128.1 | 83 | 118 | 137 | 163 | 179 | 202 | 205 | 205 | 205 | 205 | S/E |
| | 141.3 | 7.1 | 23.50 | 127.1 | 105 | 127 | 148 | 175 | 193 | 205 | 205 | 205 | 205 | 205 | S |
| | 141.3 | 7.9 | 25.99 | 125.5 | 116 | 141 | 164 | 195 | 205 | 205 | 205 | 205 | 205 | 205 | S |
| | 141.3 | 8.7 | 28.45 | 123.9 | 128 | 155 | 181 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S |
| | 141.3 | 9.5 | 30.88 | 122.3 | 139 | 169 | 190 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S |
| | 141.3 | 12.7 | 40.28 | 115.9 | 186 | 190 | 190 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S |
| | 141.3 | 15.9 | 49.17 | 109.5 | 193 | 190 | 190 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S |
| 6 5/8" | 168.3 | 3.2 | 13.03 | 161.9 | - | 48 | 56 | 83 | 91 | 103 | 111 | 118 | 128 | 138 | E |
| | 168.3 | 3.6 | 14.62 | 161.1 | - | 54 | 63 | 93 | 103 | 116 | 125 | 133 | 144 | 156 | E |
| | 168.3 | 4.0 | 16.21 | 160.3 | - | 60 | 70 | 103 | 114 | 128 | 139 | 148 | 160 | 173 | E |
| | 168.3 | 4.4 | 17.78 | 159.5 | - | 66 | 77 | 114 | 125 | 141 | 153 | 163 | 176 | 190 | E |
| | 168.3 | 4.8 | 19.35 | 158.7 | - | 72 | 84 | 124 | 137 | 154 | 167 | 178 | 193 | 205 | E |
| | 168.3 | 5.2 | 20.91 | 157.9 | - | 78 | 91 | 134 | 148 | 167 | 181 | 192 | 205 | 205 | S/E |
| | 168.3 | 5.6 | 22.47 | 157.1 | - | 84 | 98 | 145 | 160 | 180 | 195 | 205 | 205 | 205 | S/E |

S:Seamless S/E
 E:ERW

OCTG: API LINE PIPES

| Dimensions, Weights and Test Pressures for Sizes 0.840" through 20" (SI Units) | | | | | | | | | | | | | | | |
|--|----------------------------|--------------------------|----------------------------------|----------------------------|-----------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|
| Size | Specified Outside Diameter | Specified Wall Thickness | Plain-end Weight per Unit Length | Calculated Inside Diameter | Minimum Test Pressure (kPa x 100) | | | | | | | | | | Type |
| | D | t | Wpe | d | Grade | Grade | Grade | Grade | Grade | Grade | Grade | Grade | Grade | Grade | |
| | (mm) | (mm) | (Kg/m) | (mm) | A25 | A | B | X-42 | X-46 | X-52 | X-56 | X-60 | X-65 | X-70 | |
| | 168.3 | 6.4 | 25.55 | 155.5 | - | 96 | 112 | 165 | 183 | 205 | 205 | 205 | 205 | 205 | S/E |
| | 168.3 | 7.1 | 28.22 | 154.1 | - | 106 | 124 | 184 | 202 | 205 | 205 | 205 | 205 | 205 | S/E |
| | 168.3 | 7.9 | 31.25 | 152.5 | - | 118 | 138 | 204 | 205 | 205 | 205 | 205 | 205 | 205 | S |
| | 168.3 | 8.7 | 34.24 | 150.9 | - | 130 | 152 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S |
| | 168.3 | 9.5 | 37.20 | 149.3 | - | 142 | 166 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S |
| | 168.3 | 11.0 | 42.67 | 146.3 | - | 165 | 190 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S |
| | 168.3 | 12.7 | 48.73 | 142.9 | - | 190 | 190 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S |
| | 168.3 | 14.3 | 54.31 | 139.7 | - | 190 | 190 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S |
| | 168.3 | 15.9 | 59.76 | 136.5 | - | 190 | 190 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S |
| | 168.3 | 18.3 | 67.69 | 131.7 | - | 190 | 190 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S |
| | 168.3 | 19.1 | 70.27 | 130.1 | - | 190 | 190 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S |
| 8 5/8" | 219.1 | 4.0 | 21.22 | 211.1 | - | 46 | 54 | 79 | 88 | 99 | 107 | 114 | 123 | 133 | E |
| | 219.1 | 4.8 | 25.37 | 209.5 | - | 55 | 64 | 95 | 105 | 118 | 128 | 136 | 148 | 159 | E |
| | 219.1 | 5.2 | 27.43 | 208.7 | - | 60 | 70 | 103 | 114 | 128 | 139 | 148 | 160 | 173 | E |
| | 219.1 | 5.6 | 29.48 | 207.9 | - | 64 | 75 | 111 | 123 | 138 | 150 | 159 | 173 | 186 | E |
| | 219.1 | 6.4 | 33.57 | 206.3 | - | 74 | 86 | 127 | 140 | 158 | 171 | 182 | 197 | 205 | S/E |
| | 219.1 | 7.0 | 36.61 | 205.1 | - | 81 | 94 | 139 | 153 | 173 | 187 | 199 | 205 | 205 | S/E |
| | 219.1 | 7.9 | 41.14 | 203.3 | - | 91 | 106 | 157 | 173 | 195 | 205 | 205 | 205 | 205 | S/E |
| | 219.1 | 8.2 | 42.65 | 202.7 | - | 94 | 110 | 163 | 180 | 202 | 205 | 205 | 205 | 205 | S/E |
| | 219.1 | 8.7 | 45.14 | 201.7 | - | 100 | 117 | 173 | 191 | 205 | 205 | 205 | 205 | 205 | S/E |
| | 219.1 | 9.5 | 49.10 | 200.1 | - | 109 | 127 | 189 | 205 | 205 | 205 | 205 | 205 | 205 | S/E |
| | 219.1 | 11.1 | 56.94 | 196.9 | - | 128 | 149 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S/E |
| | 219.1 | 12.7 | 64.64 | 193.7 | - | 146 | 170 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S/E |
| | 219.1 | 14.3 | 72.22 | 190.5 | - | 164 | 190 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S |
| | 219.1 | 15.9 | 79.67 | 187.3 | - | 183 | 190 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S |
| | 219.1 | 18.3 | 90.62 | 182.5 | - | 190 | 190 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S |
| | 219.1 | 19.1 | 94.20 | 180.9 | - | 190 | 190 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S |
| | 219.1 | 20.6 | 100.84 | 177.9 | - | 190 | 190 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S |
| | 219.1 | 22.2 | 107.79 | 174.7 | - | 190 | 190 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S |
| | 219.1 | 25.4 | 121.33 | 168.3 | - | 190 | 190 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S |
| 10 3/4" | 273.1 | 4.0 | 26.54 | 265.1 | - | 37 | 43 | 72 | 80 | 90 | 97 | 103 | 112 | 121 | E |
| | 273.1 | 4.8 | 31.76 | 263.5 | - | 44 | 52 | 87 | 96 | 108 | 117 | 124 | 134 | 145 | E |
| | 273.1 | 5.2 | 34.35 | 262.7 | - | 48 | 56 | 94 | 104 | 117 | 126 | 134 | 146 | 157 | E |
| | 273.1 | 5.6 | 36.94 | 261.9 | - | 52 | 60 | 101 | 112 | 125 | 136 | 145 | 157 | 169 | E |
| | 273.1 | 6.4 | 42.09 | 260.3 | - | 59 | 69 | 116 | 127 | 143 | 155 | 165 | 179 | 193 | E |
| | 273.1 | 7.1 | 46.57 | 258.9 | - | 66 | 76 | 128 | 141 | 159 | 172 | 183 | 199 | 205 | S/E |

S:Seamless S/E
 E:ERW

OCTG: API LINE PIPES

| Dimensions, Weights and Test Pressures for Sizes 0.840" through 20" (SI Units) | | | | | | | | | | | | | | | | | |
|--|----------------------------|--------------------------|----------------------------------|----------------------------|-----------------------------------|------|--------|------|-------|-------|-------|-------|-------|-------|------|-------|-------|
| Size | Specified Outside Diameter | Specified Wall Thickness | Plain-end Weight per Unit Length | Calculated Inside Diameter | Minimum Test Pressure (kPa x 100) | | | | | | | | | | Type | | |
| | | | | | D | t | Wpe | d | Grade | Grade | Grade | Grade | Grade | Grade | | Grade | Grade |
| | | | | | (mm) | (mm) | (Kg/m) | (mm) | A25 | A | B | X-42 | X-46 | X-52 | | X-56 | X-60 |
| | 273.1 | 7.8 | 51.03 | 257.5 | - | 72 | 84 | 141 | 155 | 175 | 189 | 201 | 205 | 205 | S/E | | |
| | 273.1 | 8.7 | 56.72 | 255.7 | - | 80 | 94 | 157 | 173 | 195 | 205 | 205 | 205 | 205 | S/E | | |
| | 273.1 | 9.3 | 60.50 | 254.5 | - | 86 | 100 | 168 | 185 | 205 | 205 | 205 | 205 | 205 | S/E | | |
| | 273.1 | 11.1 | 71.72 | 250.9 | - | 102 | 119 | 200 | 205 | 205 | 205 | 205 | 205 | 205 | S/E | | |
| | 273.1 | 12.7 | 81.55 | 247.7 | - | 117 | 137 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S/E | | |
| | 273.1 | 14.3 | 91.26 | 244.5 | - | 132 | 154 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S | | |
| | 273.1 | 15.9 | 100.85 | 241.3 | - | 147 | 171 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S | | |
| | 273.1 | 18.3 | 114.99 | 236.5 | - | 169 | 190 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S | | |
| | 273.1 | 20.6 | 128.27 | 231.9 | - | 190 | 190 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S | | |
| | 273.1 | 22.2 | 137.36 | 228.7 | - | 190 | 190 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S | | |
| | 273.1 | 23.8 | 146.32 | 225.5 | - | 190 | 190 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S | | |
| | 273.1 | 25.4 | 155.15 | 222.3 | - | 190 | 190 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S | | |
| | 273.1 | 31.8 | 189.22 | 209.5 | - | 190 | 190 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S | | |
| 12 3/4" | 323.9 | 4.4 | 34.67 | 315.1 | - | 34 | 40 | 67 | 74 | 83 | 90 | 96 | 104 | 112 | E | | |
| | 323.9 | 4.8 | 37.77 | 314.3 | - | 37 | 44 | 73 | 81 | 91 | 98 | 105 | 113 | 122 | E | | |
| | 323.9 | 5.2 | 40.87 | 313.5 | - | 40 | 47 | 79 | 87 | 98 | 106 | 113 | 123 | 132 | E | | |
| | 323.9 | 5.6 | 43.96 | 312.7 | - | 44 | 51 | 85 | 94 | 106 | 115 | 122 | 132 | 143 | E | | |
| | 323.9 | 6.4 | 50.11 | 311.1 | - | 50 | 58 | 97 | 107 | 121 | 131 | 139 | 151 | 163 | E | | |
| | 323.9 | 7.1 | 55.47 | 309.7 | - | 55 | 64 | 108 | 119 | 134 | 145 | 155 | 168 | 181 | S/E | | |
| | 323.9 | 7.9 | 61.56 | 308.1 | - | 61 | 72 | 120 | 133 | 149 | 162 | 172 | 187 | 201 | S/E | | |
| | 323.9 | 8.4 | 65.35 | 307.1 | - | 65 | 76 | 128 | 141 | 159 | 172 | 183 | 198 | 205 | S/E | | |
| | 323.9 | 8.7 | 67.62 | 306.5 | - | 68 | 79 | 132 | 146 | 164 | 178 | 189 | 205 | 205 | S/E | | |
| | 323.9 | 9.5 | 73.65 | 304.9 | - | 74 | 86 | 145 | 160 | 179 | 194 | 205 | 205 | 205 | S/E | | |
| | 323.9 | 10.3 | 79.65 | 303.3 | - | 80 | 93 | 157 | 173 | 195 | 205 | 205 | 205 | 205 | S/E | | |
| | 323.9 | 11.1 | 85.62 | 301.7 | - | 86 | 101 | 169 | 186 | 205 | 205 | 205 | 205 | 205 | S/E | | |
| | 323.9 | 12.7 | 97.46 | 298.5 | - | 99 | 115 | 193 | 205 | 205 | 205 | 205 | 205 | 205 | S/E | | |
| | 323.9 | 14.3 | 109.18 | 295.3 | - | 111 | 130 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S | | |
| | 323.9 | 15.9 | 120.76 | 292.1 | - | 124 | 144 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S | | |
| | 323.9 | 17.5 | 132.23 | 288.9 | - | 136 | 159 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S | | |
| | 323.9 | 19.1 | 143.56 | 285.7 | - | 149 | 173 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S | | |
| | 323.9 | 20.6 | 154.08 | 282.7 | - | 160 | 187 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S | | |
| | 323.9 | 22.2 | 165.17 | 279.5 | - | 173 | 190 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S | | |
| | 323.9 | 23.8 | 176.13 | 276.3 | - | 185 | 190 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S | | |
| | 323.9 | 25.4 | 186.97 | 273.1 | - | 190 | 190 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S | | |
| | 323.9 | 27.0 | 197.68 | 269.9 | - | 190 | 190 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S | | |
| | 323.9 | 28.6 | 208.27 | 266.7 | - | 190 | 190 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S | | |
| | 323.9 | 31.8 | 229.06 | 260.3 | - | 190 | 190 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S | | |

S:Seamless S/E
 E:ERW

OCTG: API LINE PIPES

| Dimensions, Weights and Test Pressures for Sizes 0.840" through 20" (SI Units) | | | | | | | | | | | | | | | |
|--|----------------------------|--------------------------|----------------------------------|----------------------------|-----------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|
| Size | Specified Outside Diameter | Specified Wall Thickness | Plain-end Weight per Unit Length | Calculated Inside Diameter | Minimum Test Pressure (kPa x 100) | | | | | | | | | | Type |
| | D | t | Wpe | d | Grade | Grade | Grade | Grade | Grade | Grade | Grade | Grade | Grade | Grade | |
| | (mm) | (mm) | (Kg/m) | (mm) | A25 | A | B | X-42 | X-46 | X-52 | X-56 | X-60 | X-65 | X-70 | |
| 14" | 355.6 | 4.8 | 41.52 | 346.0 | - | 34 | 40 | 67 | 73 | 83 | 89 | 95 | 103 | 111 | E |
| | 355.6 | 5.2 | 44.93 | 345.2 | - | 37 | 43 | 72 | 80 | 89 | 97 | 103 | 112 | 121 | E |
| | 355.6 | 5.3 | 45.78 | 345.0 | - | 38 | 44 | 74 | 81 | 91 | 99 | 105 | 114 | 123 | E |
| | 355.6 | 5.6 | 48.33 | 344.4 | - | 40 | 46 | 78 | 86 | 96 | 104 | 111 | 121 | 130 | E |
| | 355.6 | 6.4 | 55.11 | 342.8 | - | 45 | 53 | 89 | 98 | 110 | 119 | 127 | 138 | 148 | E |
| | 355.6 | 7.1 | 61.02 | 341.4 | - | 50 | 59 | 98 | 109 | 122 | 132 | 141 | 153 | 165 | E |
| | 355.6 | 7.9 | 67.74 | 339.8 | - | 56 | 65 | 110 | 121 | 136 | 147 | 156 | 170 | 183 | E |
| | 355.6 | 8.7 | 74.42 | 338.2 | - | 62 | 72 | 121 | 133 | 150 | 162 | 173 | 187 | 202 | E |
| | 355.6 | 9.5 | 81.08 | 336.6 | - | 67 | 79 | 132 | 145 | 163 | 177 | 188 | 204 | 205 | S/E |
| | 355.6 | 10.3 | 87.71 | 335.0 | - | 73 | 85 | 143 | 158 | 177 | 192 | 204 | 205 | 205 | S/E |
| | 355.6 | 11.1 | 94.30 | 333.4 | - | 79 | 92 | 154 | 170 | 191 | 205 | 205 | 205 | 205 | S/E |
| | 355.6 | 11.9 | 100.86 | 331.8 | - | 84 | 98 | 165 | 182 | 205 | 205 | 205 | 205 | 205 | S/E |
| | 355.6 | 12.7 | 107.39 | 330.2 | - | 90 | 105 | 176 | 194 | 205 | 205 | 205 | 205 | 205 | S/E |
| | 355.6 | 14.3 | 120.36 | 327.0 | - | 101 | 118 | 198 | 205 | 205 | 205 | 205 | 205 | 205 | S |
| | 355.6 | 15.9 | 133.19 | 323.8 | - | 113 | 131 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S |
| | 355.6 | 17.5 | 145.91 | 320.6 | - | 124 | 145 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S |
| | 355.6 | 19.1 | 158.49 | 317.4 | - | 135 | 158 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S |
| | 355.6 | 20.6 | 170.18 | 314.4 | - | 146 | 170 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S |
| | 355.6 | 22.2 | 182.52 | 311.2 | - | 157 | 184 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S |
| | 355.6 | 23.8 | 194.74 | 308.0 | - | 169 | 190 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S |
| 355.6 | 25.4 | 206.83 | 304.8 | - | 180 | 190 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S | |
| 355.6 | 27.0 | 218.79 | 301.6 | - | 190 | 190 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S | |
| 355.6 | 28.6 | 230.63 | 298.4 | - | 190 | 190 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S | |
| 355.6 | 31.8 | 253.92 | 292.0 | - | 190 | 190 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S | |
| 16" | 406.4 | 4.8 | 47.54 | 396.8 | - | 30 | 35 | 58 | 64 | 72 | 78 | 83 | 90 | 97 | E |
| | 406.4 | 5.2 | 51.45 | 396.0 | - | 32 | 38 | 63 | 70 | 78 | 85 | 90 | 98 | 106 | E |
| | 406.4 | 5.6 | 55.35 | 395.2 | - | 35 | 41 | 68 | 75 | 84 | 91 | 97 | 105 | 114 | E |
| | 406.4 | 6.4 | 63.13 | 393.6 | - | 40 | 46 | 78 | 86 | 96 | 104 | 111 | 120 | 130 | E |
| | 406.4 | 7.1 | 69.91 | 392.2 | - | 44 | 51 | 86 | 95 | 107 | 116 | 123 | 134 | 144 | E |
| | 406.4 | 7.9 | 77.63 | 390.6 | - | 49 | 57 | 96 | 106 | 119 | 129 | 137 | 149 | 160 | E |
| | 406.4 | 8.7 | 85.32 | 389.0 | - | 54 | 63 | 106 | 117 | 131 | 142 | 151 | 164 | 177 | E |
| | 406.4 | 9.5 | 92.99 | 387.4 | - | 59 | 69 | 115 | 127 | 143 | 155 | 165 | 179 | 193 | S/E |
| | 406.4 | 10.3 | 100.61 | 385.8 | - | 64 | 75 | 125 | 138 | 155 | 168 | 179 | 194 | 205 | E |
| | 406.4 | 11.1 | 108.20 | 384.2 | - | 69 | 80 | 135 | 149 | 167 | 181 | 193 | 205 | 205 | E |
| 406.4 | 11.9 | 115.77 | 382.6 | - | 74 | 86 | 144 | 159 | 179 | 194 | 205 | 205 | 205 | E | |
| 406.4 | 12.7 | 123.31 | 381.0 | - | 79 | 92 | 154 | 170 | 191 | 205 | 205 | 205 | 205 | S/E | |

S:Seamless S/E
 E:ERW

OCTG: API LINE PIPES

| Dimensions, Weights and Test Pressures for Sizes 0.840" through 20" (SI Units) | | | | | | | | | | | | | | | |
|--|----------------------------|--------------------------|----------------------------------|----------------------------|-----------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|
| Size | Specified Outside Diameter | Specified Wall Thickness | Plain-end Weight per Unit Length | Calculated Inside Diameter | Minimum Test Pressure (kPa x 100) | | | | | | | | | | Type |
| | D | t | Wpe | d | Grade | Grade | Grade | Grade | Grade | Grade | Grade | Grade | Grade | Grade | |
| | (mm) | (mm) | (Kg/m) | (mm) | A25 | A | B | X-42 | X-46 | X-52 | X-56 | X-60 | X-65 | X-70 | |
| 18" | 406.4 | 21.4 | 203.19 | 363.6 | - | 133 | 155 | 205 | 205 | 322 | 205 | 205 | 205 | 205 | S |
| | 457.0 | 4.8 | 53.53 | 447.4 | - | 27 | 31 | 52 | 57 | 64 | 70 | 74 | 80 | 87 | E |
| | 457.0 | 5.6 | 62.34 | 445.8 | - | 31 | 36 | 60 | 67 | 75 | 81 | 87 | 94 | 101 | E |
| | 457.0 | 6.4 | 71.12 | 444.2 | - | 35 | 41 | 69 | 76 | 85 | 93 | 99 | 107 | 116 | E |
| | 457.0 | 7.1 | 78.77 | 442.8 | - | 39 | 46 | 77 | 85 | 95 | 103 | 110 | 119 | 128 | E |
| | 457.0 | 7.9 | 87.49 | 441.2 | - | 44 | 51 | 85 | 94 | 106 | 115 | 122 | 132 | 143 | E |
| | 457.0 | 8.7 | 96.18 | 439.6 | - | 48 | 56 | 94 | 104 | 117 | 126 | 134 | 146 | 157 | E |
| | 457.0 | 9.5 | 104.84 | 438.0 | - | 52 | 61 | 102 | 113 | 127 | 138 | 147 | 159 | 171 | S/E |
| | 457.0 | 10.3 | 113.46 | 436.4 | - | 57 | 66 | 111 | 123 | 138 | 149 | 159 | 172 | 186 | E |
| | 457.0 | 11.1 | 122.06 | 434.8 | - | 61 | 71 | 120 | 132 | 149 | 161 | 171 | 186 | 200 | S/E |
| | 457.0 | 11.9 | 130.62 | 433.2 | - | 66 | 77 | 128 | 142 | 159 | 173 | 184 | 199 | 205 | E |
| | 457.0 | 12.7 | 139.16 | 431.6 | - | 70 | 82 | 137 | 151 | 170 | 184 | 196 | 205 | 205 | S/E |
| | 457.0 | 14.3 | 156.12 | 428.4 | - | 79 | 92 | 154 | 170 | 192 | 205 | 205 | 205 | 205 | S |
| | 457.0 | 19.1 | 206.27 | 418.8 | - | 105 | 123 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S |
| 457.0 | 23.8 | 254.26 | 409.4 | - | 131 | 153 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S | |
| 20" | 508.0 | 5.6 | 69.38 | 496.8 | - | 28 | 32 | 58 | 64 | 71 | 77 | 82 | 89 | 96 | E |
| | 508.0 | 6.4 | 79.16 | 495.2 | - | 32 | 37 | 66 | 73 | 81 | 88 | 94 | 102 | 110 | E |
| | 508.0 | 7.1 | 87.70 | 493.8 | - | 35 | 41 | 73 | 81 | 91 | 98 | 104 | 113 | 122 | E |
| | 508.0 | 7.9 | 97.43 | 492.2 | - | 39 | 46 | 81 | 90 | 101 | 109 | 116 | 126 | 136 | E |
| | 508.0 | 8.7 | 107.12 | 490.6 | - | 43 | 50 | 89 | 99 | 111 | 120 | 128 | 139 | 150 | E |
| | 508.0 | 9.5 | 116.79 | 489.0 | - | 47 | 55 | 92 | 102 | 114 | 124 | 132 | 143 | 154 | S/E |
| | 508.0 | 10.3 | 126.41 | 487.4 | - | 51 | 60 | 106 | 117 | 131 | 142 | 152 | 164 | 177 | E |
| | 508.0 | 11.1 | 136.01 | 485.8 | - | 55 | 64 | 114 | 126 | 142 | 153 | 163 | 177 | 191 | E |
| | 508.0 | 11.9 | 145.58 | 484.2 | - | 59 | 69 | 122 | 135 | 152 | 164 | 175 | 190 | 205 | E |
| | 508.0 | 12.7 | 155.13 | 482.6 | - | 63 | 74 | 123 | 136 | 153 | 166 | 176 | 191 | 205 | S/E |
| | 508.0 | 15.1 | 183.55 | 477.8 | - | 75 | 87 | 147 | 162 | 182 | 197 | 205 | 205 | 205 | S |
| | 508.0 | 20.6 | 247.61 | 466.8 | - | 102 | 119 | 200 | 205 | 205 | 205 | 205 | 205 | 205 | S |
| | 508.0 | 26.2 | 311.31 | 455.6 | - | 130 | 152 | 205 | 205 | 205 | 205 | 205 | 205 | 205 | S |

S:Seamless S/E
 E:ERW

OCTG: API TUBING

| DIMENSIONS, WEIGHTS AND END FINISH | | | | | | | | | | | | | | | | |
|------------------------------------|--------|-----------------|--------|--------------------|--------|----------------|-------|-------------|--------|-------------|-----|--------------------|-----|-----------|---------------|---------------------|
| Outside Diameter | | Nominal Weights | | | | Wall Thickness | | Coupling OD | | Thread Type | | Type of End Finish | | | | Type |
| | | Non Upset T&C | | External Upset T&C | | | | NUE | EUE | API Round | | Grade | | | | |
| In. | mm. | lb/ft. | kg/mtr | lb/ft. | kg/mtr | In. | mm. | | | mm. | mm. | TPI | TPI | H-40 J-55 | N-80 Type-1,Q | L-80 C-90 R-95 T-95 |
| 1.900 | 48.26 | 2.40 | 3.57 | - | - | 0.125 | 3.18 | - | - | - | - | P | - | - | - | S |
| 1.900 | 48.26 | 2.75 | 4.09 | 2.90 | 4.32 | 0.145 | 3.68 | 55.88 | 63.50 | 10 | 10 | PNU | PNU | PNU | - | S |
| 1.900 | 48.26 | 3.65 | 5.43 | 3.73 | 5.55 | 0.200 | 5.08 | - | 63.50 | - | 10 | PU | PU | PU | PU | S |
| 1.900 | 48.26 | 4.42 | 6.58 | - | - | 0.250 | 6.35 | - | - | - | - | - | - | P | - | S |
| 1.900 | 48.26 | 5.15 | 7.66 | - | - | 0.300 | 7.62 | - | - | - | - | - | - | P | - | S |
| 2.063 | 52.40 | 3.24 | 4.82 | - | - | 0.156 | 3.96 | - | - | - | - | P | P | P | - | S |
| 2.063 | 52.40 | 4.50 | 6.70 | - | - | 0.225 | 5.72 | - | - | - | - | P | P | P | P | S |
| 2 3/8 | 60.32 | 4.00 | 5.95 | - | - | 0.167 | 4.24 | 73.02 | - | 10 | - | PN | PN | PN | - | S |
| 2 3/8 | 60.32 | 4.60 | 6.85 | 4.70 | 6.99 | 0.190 | 4.83 | 73.02 | 77.80 | 10 | 8 | PNU | PNU | PNU | PNU | S |
| 2 3/8 | 60.32 | 5.80 | 8.63 | 5.95 | 8.85 | 0.254 | 6.45 | 73.02 | 77.80 | 10 | 8 | - | PNU | PNU | PNU | S |
| 2 3/8 | 60.32 | 6.60 | 9.82 | - | - | 0.295 | 7.49 | - | - | - | - | - | - | P | - | S |
| 2 3/8 | 60.32 | 7.35 | 10.94 | 7.45 | 11.09 | 0.336 | 8.53 | - | 77.80 | - | 8 | - | - | PU | - | S |
| 2 7/8 | 73.02 | 6.40 | 9.52 | 6.50 | 9.67 | 0.217 | 5.51 | 88.90 | 93.17 | 10 | 8 | PNU | PNU | PNU | PNU | S/E* |
| 2 7/8 | 73.02 | 7.80 | 11.61 | 7.90 | 11.76 | 0.276 | 7.01 | 88.90 | 93.17 | 10 | 8 | - | PNU | PNU | PNU | S |
| 2 7/8 | 73.02 | 8.60 | 12.80 | 8.70 | 12.95 | 0.308 | 7.82 | 88.90 | 93.17 | 10 | 8 | - | PNU | PNU | PNU | S |
| 2 7/8 | 73.02 | 9.35 | 13.91 | 9.45 | 14.06 | 0.340 | 8.64 | - | 93.17 | - | 8 | - | - | PU | - | S |
| 2 7/8 | 73.02 | 10.50 | 15.63 | - | - | 0.392 | 9.96 | - | - | - | - | - | - | P | - | S |
| 2 7/8 | 73.02 | 11.50 | 17.11 | - | - | 0.440 | 11.18 | - | - | - | - | - | - | P | - | S |
| 3 1/2 | 88.90 | 7.70 | 11.46 | - | - | 0.216 | 5.49 | 107.95 | - | 10 | - | PN | PN | PN | - | S/E* |
| 3 1/2 | 88.90 | 9.20 | 13.69 | 9.30 | 13.84 | 0.254 | 6.45 | 107.95 | 114.30 | 10 | 8 | PNU | PNU | PNU | PNU | S |
| 3 1/2 | 88.90 | 10.20 | 15.18 | - | - | 0.289 | 7.34 | 107.95 | - | 10 | - | PN | PN | PN | - | S |
| 3 1/2 | 88.90 | 12.70 | 18.90 | 12.95 | 19.27 | 0.375 | 9.52 | 107.95 | 114.30 | 10 | 8 | - | PNU | PNU | PNU | S |
| 3 1/2 | 88.90 | 14.30 | 21.28 | - | - | 0.430 | 10.92 | - | - | - | - | - | - | P | - | S |
| 3 1/2 | 88.90 | 15.50 | 23.07 | - | - | 0.476 | 12.09 | - | - | - | - | - | - | P | - | S |
| 3 1/2 | 88.90 | 17.00 | 25.30 | - | - | 0.530 | 13.46 | - | - | - | - | - | - | P | - | S |
| 4 | 101.60 | 9.50 | 14.14 | - | - | 0.226 | 5.74 | 120.65 | - | 8 | - | PN | PN | PN | - | S/E* |
| 4 | 101.60 | 10.70 | 15.92 | 11.00 | 16.37 | 0.262 | 6.65 | - | 127.00 | - | 8 | PU | PU | PU | - | S |
| 4 | 101.60 | 13.20 | 19.64 | - | - | 0.330 | 8.38 | - | - | - | - | - | - | P | - | S |
| 4 | 101.60 | 16.10 | 23.96 | - | - | 0.415 | 10.54 | - | - | - | - | - | - | P | - | S |
| 4 | 101.60 | 18.90 | 28.13 | - | - | 0.500 | 12.70 | - | - | - | - | - | - | P | - | S |
| 4 | 101.60 | 22.20 | 33.04 | - | - | 0.610 | 15.49 | - | - | - | - | - | - | P | - | S |
| 4 1/2 | 114.30 | 12.60 | 18.75 | 12.75 | 18.97 | 0.271 | 6.88 | 132.08 | 141.30 | 8 | 8 | PNU | PNU | PNU | - | S/E* |
| 4 1/2 | 114.30 | 15.20 | 22.62 | - | - | 0.337 | 8.56 | - | - | - | - | - | - | P | - | S |
| 4 1/2 | 114.30 | 17.00 | 25.30 | - | - | 0.380 | 9.65 | - | - | - | - | - | - | P | - | S |
| 4 1/2 | 114.30 | 18.90 | 28.13 | - | - | 0.430 | 10.92 | - | - | - | - | - | - | P | - | S |
| 4 1/2 | 114.30 | 21.50 | 32.00 | - | - | 0.500 | 12.70 | - | - | - | - | - | - | P | - | S |
| 4 1/2 | 114.30 | 23.70 | 35.27 | - | - | 0.560 | 14.22 | - | - | - | - | - | - | P | - | S |
| 4 1/2 | 114.30 | 26.10 | 38.84 | - | - | 0.630 | 16.00 | - | - | - | - | - | - | P | - | S |

* Available only in J-55

S:Seamless S/E
E:ERW

OCTG: API CASING

| DIMENSIONS, WEIGHTS AND END FINISH | | | | | | | | | | | | | | | | | | | | |
|------------------------------------|--------|-------------------|--------|-------------------------|--------|----------------|-------|----------------------|-----------|------|-----------|---------------|-----------|-------|-------|-------------|------------------|---------|------|-------|
| Outside Diameter | | Normal Weight T&C | | Normal Weight Plain-end | | Wall Thickness | | TYPE OF FINISH GRADE | | | | | | | | COUPLING OD | THREAD TYPES TPI | | TYPE | |
| In. | mm | lb/ft. | Kg/mtr | lb/ft. | Kg/mtr | Inch | mm | H-40 | J-55 K-55 | M 65 | L-80 R-95 | N-80 Type-1,Q | C-90 T-95 | C-110 | P-110 | Q-125 | mm | STC LTC | BTC | S / E |
| 4 1/2 | 114.30 | 9.50 | 14.14 | 9.42 | 14.02 | 0.205 | 5.21 | PS | PS | PS | - | - | - | - | - | - | 127.00 | 8 | - | S |
| 4 1/2 | 114.30 | 10.50 | 15.63 | 10.24 | 15.24 | 0.224 | 5.69 | - | PSB | PSB | - | - | - | - | - | - | 127.00 | 8 | 5 | S |
| 4 1/2 | 114.30 | 11.60 | 17.26 | 11.36 | 16.91 | 0.250 | 6.35 | - | PSLB | PLB | PLB | PLB | PLB | P | PLB | - | 127.00 | 8 | 5 | S |
| 4 1/2 | 114.30 | 13.50 | 20.09 | 13.06 | 19.44 | 0.290 | 7.37 | - | - | PLB | PLB | PLB | PLB | P | PLB | - | 127.00 | 8 | 5 | S |
| 4 1/2 | 114.30 | 15.10 | 22.47 | 15.00 | 22.32 | 0.337 | 8.56 | - | - | - | - | - | - | - | PLB | PLB | 127.00 | 8 | 5 | S |
| 5 | 127.00 | 11.50 | 17.11 | 11.25 | 16.74 | 0.220 | 5.59 | - | PS | PS | - | - | - | - | - | - | 141.30 | 8 | - | S |
| 5 | 127.00 | 13.00 | 19.35 | 12.85 | 19.12 | 0.253 | 6.43 | - | PSLB | PSLB | - | - | - | - | - | - | 141.30 | 8 | 5 | S |
| 5 | 127.00 | 15.00 | 22.32 | 14.89 | 22.16 | 0.296 | 7.52 | - | PSLB | PLB | PLB | PLB | PLB | P | PLB | - | 141.30 | 8 | 5 | S |
| 5 | 127.00 | 18.00 | 26.79 | 17.94 | 26.70 | 0.362 | 9.19 | - | - | PLB | PLB | PLB | PLB | P | PLB | PLB | 141.30 | 8 | 5 | S |
| 5 | 127.00 | 21.40 | 31.85 | 21.32 | 31.73 | 0.437 | 11.10 | - | - | PLB | PLB | PLB | PLB | P | PLB | PLB | 141.30 | 8 | 5 | S |
| 5 | 127.00 | 23.20 | 34.53 | 23.11 | 34.39 | 0.478 | 12.14 | - | - | - | PLB | PLB | PLB | P | PLB | PLB | 141.30 | 8 | 5 | S |
| 5 | 127.00 | 24.10 | 35.87 | 24.05 | 35.80 | 0.500 | 12.70 | - | - | - | PLB | PLB | PLB | P | PLB | PLB | 141.30 | 8 | 5 | S |
| 5 1/2 | 139.70 | 14.00 | 20.84 | 13.72 | 20.41 | 0.244 | 6.20 | PS | PS | PS | - | - | - | - | - | - | 153.67 | 8 | - | S |
| 5 1/2 | 139.70 | 15.50 | 23.07 | 15.35 | 22.85 | 0.275 | 6.98 | - | PSLB | PSLB | - | - | - | - | - | - | 153.67 | 8 | 5 | S |
| 5 1/2 | 139.70 | 17.00 | 25.30 | 16.88 | 25.13 | 0.304 | 7.72 | - | PSLB | PLB | PLB | PLB | PLB | P | PLB | - | 153.67 | 8 | 5 | S |
| 5 1/2 | 139.70 | 20.00 | 29.76 | 19.83 | 29.52 | 0.361 | 9.17 | - | - | PLB | PLB | PLB | PLB | P | PLB | - | 153.67 | 8 | 5 | S |
| 5 1/2 | 139.70 | 23.00 | 34.23 | 22.56 | 33.57 | 0.415 | 10.54 | - | - | PLB | PLB | PLB | PLB | P | PLB | PLB | 153.67 | 8 | 5 | S |
| 5 1/2 | 139.70 | 26.80 | 39.88 | 26.73 | 39.78 | 0.500 | 12.70 | - | - | - | - | - | P | P | - | - | - | - | - | S |
| 5 1/2 | 139.70 | 29.70 | 44.20 | 29.66 | 44.14 | 0.562 | 14.27 | - | - | - | - | - | P | P | - | - | - | - | - | S |
| 5 1/2 | 139.70 | 32.60 | 48.52 | 32.58 | 48.49 | 0.625 | 15.88 | - | - | - | - | - | P | P | - | - | - | - | - | S |
| 6 5/8 | 168.28 | 20.00 | 29.76 | 19.52 | 29.06 | 0.288 | 7.32 | PS | PSLB | PSLB | - | - | - | - | - | - | 187.71 | 8 | 5 | S/E* |
| 6 5/8 | 168.28 | 24.00 | 35.72 | 23.61 | 35.13 | 0.352 | 8.94 | - | PSLB | PLB | PLB | PLB | PLB | P | PLB | - | 187.71 | 8 | 5 | S/E* |
| 6 5/8 | 168.28 | 28.00 | 41.67 | 27.67 | 41.18 | 0.417 | 10.59 | - | - | PLB | PLB | PLB | PLB | P | PLB | - | 187.71 | 8 | 5 | S/E* |
| 6 5/8 | 168.28 | 32.00 | 47.62 | 31.22 | 46.46 | 0.475 | 12.06 | - | - | - | PLB | PLB | PLB | P | PLB | PLB | 187.71 | 8 | 5 | S/E* |
| 7 | 177.80 | 20.00 | 29.76 | 19.57 | 29.12 | 0.272 | 6.91 | PS | PS | PS | - | - | - | - | - | - | 200.03 | 8 | - | S/E* |
| 7 | 177.80 | 23.00 | 34.23 | 22.64 | 33.70 | 0.317 | 8.05 | - | PSLB | PLB | PLB | PLB | PLB | - | - | - | 200.03 | 8 | 5 | S/E* |
| 7 | 177.80 | 26.00 | 38.69 | 25.68 | 38.21 | 0.362 | 9.19 | - | PSLB | PLB | PLB | PLB | PLB | P | PLB | - | 200.03 | 8 | 5 | S/E* |
| 7 | 177.80 | 29.00 | 43.16 | 28.75 | 42.78 | 0.408 | 10.36 | - | - | PLB | PLB | PLB | PLB | P | PLB | - | 200.03 | 8 | 5 | S/E* |
| 7 | 177.80 | 32.00 | 47.62 | 31.72 | 47.20 | 0.453 | 11.51 | - | - | PLB | PLB | PLB | PLB | P | PLB | - | 200.03 | 8 | 5 | S/E* |
| 7 | 177.80 | 35.00 | 52.09 | 34.62 | 51.52 | 0.498 | 12.65 | - | - | - | PLB | PLB | PLB | P | PLB | PLB | 200.03 | 8 | 5 | S/E* |
| 7 | 177.80 | 38.00 | 56.55 | 37.30 | 55.52 | 0.540 | 13.72 | - | - | - | PLB | PLB | PLB | P | PLB | PLB | 200.03 | 8 | 5 | S |
| 7 5/8 | 193.68 | 24.00 | 35.72 | 23.49 | 34.96 | 0.300 | 7.62 | PS | - | - | - | - | - | - | - | - | 215.90 | 8 | - | S |
| 7 5/8 | 193.68 | 26.40 | 39.29 | 25.59 | 38.08 | 0.328 | 8.33 | - | PSLB | PSLB | PLB | PLB | PLB | P | - | - | 215.90 | 8 | 5 | S |
| 7 5/8 | 193.68 | 29.70 | 44.20 | 29.05 | 43.24 | 0.375 | 9.52 | - | - | PLB | PLB | PLB | PLB | P | PLB | - | 215.90 | 8 | 5 | S |
| 7 5/8 | 193.68 | 33.70 | 50.15 | 33.07 | 49.22 | 0.430 | 10.92 | - | - | PLB | PLB | PLB | PLB | P | PLB | - | 215.90 | 8 | 5 | S |
| 7 5/8 | 193.68 | 39.00 | 58.04 | 38.09 | 56.68 | 0.500 | 12.70 | - | - | - | PLB | PLB | PLB | P | PLB | PLB | 215.90 | 8 | 5 | S |
| 7 5/8 | 193.68 | 42.80 | 63.70 | 42.43 | 63.14 | 0.562 | 14.27 | - | - | - | PLB | PLB | PLB | P | PLB | PLB | 215.90 | 8 | 5 | S |
| 7 5/8 | 193.68 | 45.30 | 67.42 | 44.71 | 66.54 | 0.595 | 15.11 | - | - | - | PLB | PLB | PLB | P | PLB | PLB | 215.90 | 8 | 5 | S |
| 7 5/8 | 193.68 | 47.10 | 70.10 | 46.79 | 69.63 | 0.625 | 15.88 | - | - | - | PLB | PLB | PLB | P | PLB | PLB | 215.90 | 8 | 5 | S |
| 7 3/4 | 196.85 | 46.10 | 68.61 | 45.51 | 67.72 | 0.595 | 15.11 | - | - | - | - | P | P | P | P | P | - | - | - | S |
| 8 5/8 | 219.08 | 24.00 | 35.72 | 23.61 | 35.14 | 0.264 | 6.71 | - | PS | PS | - | - | - | - | - | - | 244.48 | 8 | - | S/E* |
| 8 5/8 | 219.08 | 28.00 | 41.67 | 27.04 | 40.24 | 0.304 | 7.72 | PS | - | PS | - | - | - | - | - | - | 244.48 | 8 | - | S/E* |
| 8 5/8 | 219.08 | 32.00 | 47.62 | 31.13 | 46.33 | 0.352 | 8.94 | PS | PSLB | PSLB | - | - | - | - | - | - | 244.48 | 8 | 5 | S/E* |

* Available only in J-55 & K-55

OCTG: API CASING

| DIMENSIONS, WEIGHTS AND END FINISH | | | | | | | | | | | | | | | | | | | | |
|------------------------------------|--------|-------------------|--------|-------------------------|--------|----------------|--------|----------------------|-----------|------|-----------|---------------|-----------|-------|-------|-------------|------------------|---------|------|-------|
| Outside Diameter | | Normal Weight T&C | | Normal Weight Plain-end | | Wall Thickness | | TYPE OF FINISH GRADE | | | | | | | | COUPLING OD | THREAD TYPES TPI | | TYPE | |
| In. | mm | lb/ft. | Kg/mtr | lb/ft. | Kg/mtr | Inch | mm | H-40 | J-55 K-55 | M 65 | L-80 R-95 | N-80 Type-1,Q | C-90 T-95 | C-110 | P-110 | Q-125 | mm | STC LTC | BTC | S / E |
| 85/8 | 219.08 | 36.00 | 53.58 | 35.17 | 52.35 | 0.400 | 10.16 | - | PSLB | PSLB | PLB | PLB | PLB | P | - | - | 244.48 | 8 | 5 | S/E* |
| 85/8 | 219.08 | 40.00 | 59.53 | 39.33 | 58.53 | 0.450 | 11.43 | - | - | PLB | PLB | PLB | PLB | P | PLB | - | 244.48 | 8 | 5 | S/E* |
| 85/8 | 219.08 | 44.00 | 65.48 | 43.43 | 64.64 | 0.500 | 12.70 | - | - | - | PLB | PLB | PLB | P | PLB | - | 244.48 | 8 | 5 | S/E* |
| 85/8 | 219.08 | 49.00 | 72.92 | 48.05 | 71.51 | 0.557 | 14.15a | - | - | - | PLB | PLB | PLB | P | PLB | PLB | 244.48 | 8 | 5 | S |
| 95/8 | 244.48 | 32.30 | 48.07 | 31.05 | 46.20 | 0.312 | 7.92 | PS | - | - | - | - | - | - | - | - | 269.88 | 8 | - | S/E* |
| 95/8 | 244.48 | 36.00 | 53.58 | 34.89 | 51.93 | 0.352 | 8.94 | PS | PSLB | PSLB | - | - | - | - | - | - | 269.88 | 8 | 5 | S/E* |
| 95/8 | 244.48 | 40.00 | 59.53 | 38.97 | 57.99 | 0.395 | 10.03 | - | PSLB | PSLB | PLB | PLB | PLB | P | - | - | 269.88 | 8 | 5 | S/E* |
| 95/8 | 244.48 | 43.50 | 64.74 | 42.74 | 63.61 | 0.435 | 11.05 | - | - | PLB | PLB | PLB | PLB | P | PLB | - | 269.88 | 8 | 5 | S/E* |
| 95/8 | 244.48 | 47.00 | 69.95 | 46.19 | 68.75 | 0.472 | 11.99 | - | - | PLB | PLB | PLB | PLB | P | PLB | PLB | 269.88 | 8 | 5 | S/E* |
| 95/8 | 244.48 | 53.50 | 79.62 | 52.90 | 78.72 | 0.545 | 13.84 | - | - | - | PLB | PLB | PLB | P | PLB | PLB | 269.88 | 8 | 5 | S |
| 95/8 | 244.48 | 58.40 | 86.91 | 57.43 | 85.47 | 0.595 | 15.11 | - | - | - | PLB | PLB | PLB | P | PLB | PLB | 269.88 | 8 | 5 | S |
| 103/4 | 273.05 | 32.75 | 48.74 | 31.25 | 46.50 | 0.279 | 7.09 | PS | - | - | - | - | - | - | - | - | 298.45 | 8 | - | S/E* |
| 103/4 | 273.05 | 40.50 | 60.27 | 38.92 | 57.91 | 0.350 | 8.89 | PS | PSB | PSB | - | - | - | - | - | - | 298.45 | 8 | 5 | S/E* |
| 103/4 | 273.05 | 45.50 | 67.71 | 44.26 | 65.87 | 0.400 | 10.16 | - | PSB | PSB | - | - | - | - | - | - | 298.45 | 8 | 5 | S/E* |
| 103/4 | 273.05 | 51.00 | 75.90 | 49.55 | 73.75 | 0.450 | 11.43 | - | PSB | PSB | PSB | PSB | PSB | P | PSB | - | 298.45 | 8 | 5 | S/E* |
| 103/4 | 273.05 | 55.50 | 82.60 | 54.26 | 80.75 | 0.495 | 12.57 | - | - | PSB | PSB | PSB | PSB | P | PSB | - | 298.45 | 8 | 5 | S/E* |
| 103/4 | 273.05 | 60.70 | 90.33 | 59.45 | 88.47 | 0.545 | 13.84 | - | - | - | - | - | PSB | P | PSB | PSB | 298.45 | 8 | 5 | S |
| 103/4 | 273.05 | 65.70 | 97.78 | 64.59 | 96.12 | 0.595 | 15.11 | - | - | - | - | - | PSB | P | PSB | PSB | 298.45 | 8 | 5 | S |
| 113/4 | 298.45 | 42.00 | 62.51 | 40.65 | 60.50 | 0.333 | 8.46 | PS | - | - | - | - | - | - | - | - | 323.85 | 8 | - | S |
| 113/4 | 298.45 | 47.00 | 69.95 | 45.63 | 67.90 | 0.375 | 9.53 | - | PSB | PSB | - | - | - | - | - | - | 323.85 | 8 | 5 | S |
| 113/4 | 298.45 | 54.00 | 80.36 | 52.63 | 78.32 | 0.435 | 11.05 | - | PSB | PSB | - | - | - | - | - | - | 323.85 | 8 | 5 | S |
| 113/4 | 298.45 | 60.00 | 89.29 | 58.87 | 87.61 | 0.489 | 12.42 | - | PSB | PSB | PSB | PSB | PSB | P | PSB | PSB | 323.85 | 8 | 5 | S |
| 113/4 | 298.45 | 65.00 | 96.73 | 64.02 | 95.27 | 0.534 | 13.56 | - | - | - | P | P | P | P | P | P | - | - | - | S |
| 113/4 | 298.45 | 71.00 | 105.66 | 69.48 | 103.40 | 0.582 | 14.78 | - | - | - | P | P | P | P | P | P | - | - | - | S |
| 133/8 | 339.72 | 48.00 | 71.43 | 46.01 | 68.48 | 0.330 | 8.38 | PS | - | - | - | - | - | - | - | - | 365.12 | 8 | - | S/E* |
| 133/8 | 339.72 | 54.50 | 81.11 | 52.78 | 78.55 | 0.380 | 9.65 | - | PSB | PSB | - | - | - | - | - | - | 365.12 | 8 | 5 | S/E* |
| 133/8 | 339.72 | 61.00 | 90.78 | 59.50 | 88.55 | 0.430 | 10.92 | - | PSB | PSB | - | - | - | - | - | - | 365.12 | 8 | 5 | S/E* |
| 133/8 | 339.72 | 68.00 | 101.20 | 66.16 | 98.46 | 0.480 | 12.19 | - | PSB | PSB | PSB | PSB | PSB | P | PSB | - | 365.12 | 8 | 5 | S/E* |
| 133/8 | 339.72 | 72.00 | 107.15 | 70.70 | 105.21 | 0.514 | 13.06 | - | - | - | PSB | PSB | PSB | P | PSB | PSB | 365.12 | 8 | 5 | S |

* Available only in J-55 & K-55

S:Seamless S/E

E:ERW

Pup Joints, Coupling and Coupling Stock

Pup Joints

Pup Joints of Tubing (EUE / NUE) and Casing are available in length of 2 feet, 3 feet, 4 feet, 6 feet, 8 feet, 10 feet etc.

Coupling Stock

Coupling Stocks for all sizes of Casing and Tubing are available in the length of 3.0 to 12.0 mtrs.

Dimensions of the Coupling Stock and Couplings

I) CASING ROUND - THREAD COUPLING DIMENSIONS :

| Size Outside Diameter | Major Diameter mm | Coupling | | | | |
|-----------------------------|-------------------------|---------------|----------------|------------|-------------|------------|
| | | Outside mm | Minimum Length | | Weight | |
| | | | Short mm | Long mm | Short kg | Long kg |
| Inch | mm | mm | Short mm | Long mm | Short kg | Long kg |
| 4 1/2 | 114.30 | 127.00 | 158.75 | 177.80 | 3.62 | 4.15 |
| 5 | 127.00 | 141.30 | 165.10 | 196.85 | 4.66 | 5.75 |
| 5 1/2 | 139.70 | 153.67 | 171.45 | 203.20 | 5.23 | 6.42 |
| 6 5/8 | 168.28 | 187.71 | 184.15 | 222.25 | 9.12 | 11.34 |
| 7 | 177.80 | 200.03 | 184.15 | 228.60 | 8.39 | 10.83 |
| 7 5/8 | 193.70 | 215.90 | 190.50 | 234.95 | 12.30 | 15.63 |
| 8 5/8 | 219.08 | 244.48 | 196.85 | 254.00 | 16.23 | 21.67 |
| 9 5/8 | 244.48 | 269.88 | 196.85 | 266.70 | 18.03 | 25.45 |
| 10 3/4 | 273.05 | 298.45 | 203.20 | - | 20.78 | - |
| 11 3/4 | 298.45 | 323.85 | 203.20 | - | 22.64 | - |
| 13 3/8 | 339.72 | 365.12 | 203.20 | - | 25.66 | - |

Note :

- i) The size designation for the coupling is the same as the size designation for the pipe on which the coupling is used.
- ii) API Group 1, 2 and 3 - Tolerance on Coupling outside diameter, $\pm 1\%$ but not greater than $\pm 3.18\text{mm}$.
- iii) API Group 4 - Tolerance on Coupling outside diameter, $\pm 1\%$ but not greater than $+3.18\text{mm}$, -1.59mm .

II) BUTTRESS THREAD CASING COUPLING DIMENSIONS:

| Size | Major Diameter | Coupling | | | |
|--------|----------------|------------------|----------------|------------|------------------|
| | | Outside Diameter | Minimum Length | Weight | |
| | | | | Regular kg | Sp. Clearance kg |
| Inch | mm | mm | mm | kg | kg |
| 4 1/2 | 114.30 | 127.00 | 225.42 | 4.55 | 3.48 |
| 5 | 127.00 | 141.30 | 231.78 | 5.85 | 4.00 |
| 5 1/2 | 139.70 | 153.67 | 234.95 | 6.36 | 4.47 |
| 6 5/8 | 168.28 | 187.71 | 244.48 | 11.01 | 5.65 |
| 7 | 177.80 | 200.03 | 254.00 | 10.54 | 6.28 |
| 7 5/8 | 193.68 | 215.90 | 263.52 | 15.82 | 9.29 |
| 8 5/8 | 219.08 | 244.48 | 269.88 | 20.86 | 10.80 |
| 9 5/8 | 244.48 | 269.88 | 269.88 | 23.16 | 12.02 |
| 10 3/4 | 273.05 | 298.45 | 269.88 | 25.74 | 13.39 |
| 11 3/4 | 298.45 | 323.85 | 269.88 | 28.03 | - |
| 13 3/8 | 339.72 | 365.12 | 269.88 | 31.77 | - |

Note :

- i) The size designation for the coupling is the same as the size designation for the pipe on which the coupling is used.
- ii) API Group 1, 2 and 3 - Tolerance on Coupling outside diameter, $\pm 1\%$ but not greater than $\pm 3.18\text{mm}$.
- iii) API Group 4 - Tolerance on Coupling outside diameter, $\pm 1\%$ but not greater than $+3.18\text{mm}$, $- 1.59\text{mm}$.

III) NON UPSET TUBING COUPLING DIMENSIONS :

| Size | Major Diameter | Coupling | | |
|-------|----------------|------------------|----------------|--------|
| | | Outside Diameter | Minimum Length | Weight |
| | | | | kg |
| Inch | mm | mm | mm | kg |
| 2 3/8 | 60.32 | 73.02 | 107.95 | 1.28 |
| 2 7/8 | 73.02 | 88.90 | 130.18 | 2.34 |
| 3 1/2 | 88.90 | 107.95 | 142.88 | 3.71 |
| 4 | 101.60 | 120.65 | 146.05 | 4.35 |
| 4 1/2 | 114.30 | 132.08 | 155.58 | 4.89 |

- i) The size designation for the coupling is the same as the size designation for the pipe on which the coupling is used.
- ii) Tolerance on coupling outside diameter, $\pm 1\%$.

IV) EXTERNAL UPSET TUBING COUPLING DIMENSIONS :

| Size | Outside Diameter | Coupling | | | | |
|-------|------------------|------------------|-------------------|----------------|---------|-------------------|
| | | Outside Diameter | | Minimum Length | Weight | |
| | | Regular | Special Clearance | | Regular | Special Clearance |
| Inch | mm | mm | mm | mm | Kg | Kg |
| 2 3/8 | 60.32 | 77.80 | 73.91 | 123.82 | 1.55 | 1.07 |
| 2 7/8 | 73.02 | 93.17 | 87.88 | 133.35 | 2.40 | 1.55 |
| 3 1/2 | 88.90 | 114.30 | 106.17 | 146.05 | 4.10 | 2.38 |
| 4 | 101.60 | 127.00 | - | 152.40 | 4.82 | - |
| 4 1/2 | 114.30 | 141.30 | - | 158.75 | 6.05 | - |

- i) The size designation for the coupling is the same as the size designation for the pipe on which the coupling is used.
- ii) Tolerance on Coupling outside diameter (Regular) $\pm 1\%$
- iii) Tolerance on Coupling outside diameter (Special Clearance) $\pm 0.38\text{ mm}$.

DRILL PIPES

Drill Pipes are Seamless Steel Tubulars with Weld-On Tool Joints that are used to connect a drill rig's surface equipment with its drilling equipment at the bottom of a well. Drill Pipes are manufactured to withstand severe internal and external pressure, distortion, bending and vibration. Every weld is monitored, tested and recorded.



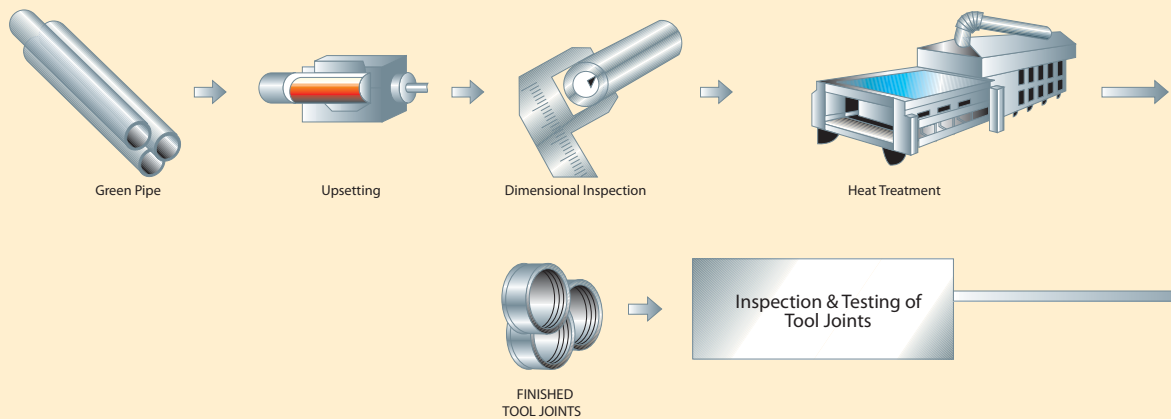
Upset Drill Pipes with Weld-On Tool Joints

Dimensions and Weights :

I) Grade E

| Size (inch) | Nominal Weight | | OD | | WT | | Tool Joint |
|--|----------------|--------|-------|--------|-------|-------|-----------------|
| | (lb / ft) | kg/mtr | inch | mm | inch | mm | |
| Internal Upset (IU) | | | | | | | |
| 4 | 14.00 | 20.84 | 4.00 | 101.60 | 0.330 | 8.38 | NC 40 |
| 4 1/2 | 13.75 | 20.46 | 4.50 | 114.30 | 0.271 | 6.88 | NC 46 |
| External Upset (EU) | | | | | | | |
| 2 3/8 | 6.65 | 9.90 | 2.375 | 60.32 | 0.280 | 7.11 | NC 26 |
| 2 7/8 | 10.40 | 15.48 | 2.875 | 73.02 | 0.362 | 9.19 | NC 31 |
| 3 1/2 | 9.50 | 14.14 | 3.500 | 88.90 | 0.254 | 6.45 | NC 38 |
| 3 1/2 | 13.30 | 19.79 | 3.500 | 88.90 | 0.368 | 9.35 | NC 38 |
| 3 1/2 | 15.50 | 23.07 | 3.500 | 88.90 | 0.449 | 11.40 | NC 38 |
| 4 | 14.00 | 20.84 | 4.000 | 101.60 | 0.330 | 8.38 | NC 46 |
| 4 1/2 | 13.75 | 20.46 | 4.500 | 114.30 | 0.271 | 6.88 | NC 50 |
| 4 1/2 | 16.60 | 24.70 | 4.500 | 114.30 | 0.337 | 8.56 | NC 50 |
| 4 1/2 | 20.00 | 29.76 | 4.500 | 114.30 | 0.430 | 10.92 | NC 50 |
| Internal - External Upset (IEU) | | | | | | | |
| 4 1/2 | 16.60 | 24.70 | 4.500 | 114.30 | 0.337 | 8.56 | NC 46 |
| 4 1/2 | 20.00 | 29.76 | 4.500 | 114.30 | 0.430 | 10.92 | NC 46 |
| 5 | 19.50 | 29.04 | 5.000 | 127.00 | 0.362 | 9.19 | NC 50, 5 1/2 FH |
| 5 | 25.60 | 38.10 | 5.000 | 127.00 | 0.500 | 12.70 | NC 50, 5 1/2 FH |
| 5 1/2 | 21.90 | 32.59 | 5.500 | 139.70 | 0.361 | 9.17 | 5 1/2 FH |
| | 24.70 | 36.76 | 5.500 | 139.70 | 0.415 | 10.54 | 5 1/2 FH |
| 6 5/8 | 25.20 | 37.50 | 6.625 | 168.28 | 0.330 | 8.38 | 6 5/8 FH |
| | 27.70 | 41.22 | 6.625 | 168.28 | 0.362 | 9.19 | 6 5/8 FH |

DRILL PIPE PROCESS FLOW CHART



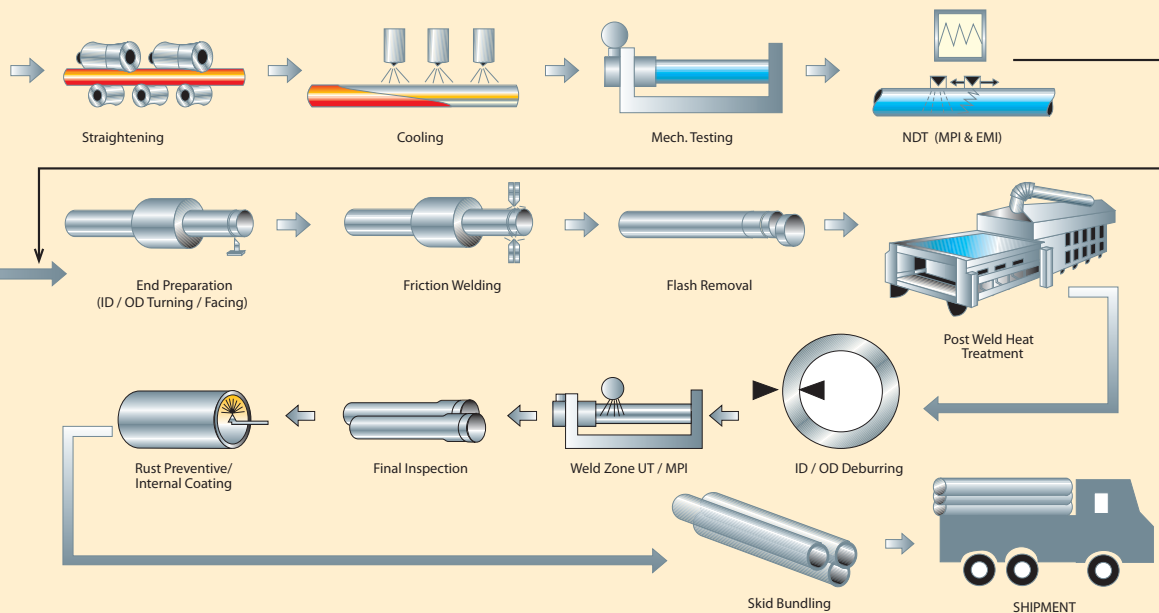
Upset Drill Pipes with Weld-On Tool Joints

II) Grade X, G, S

| Size (inch) | Nominal Weight | | OD | | WT | | Tool Joint |
|--|----------------|--------|-------|--------|-------|-------|-----------------|
| | (lb / ft) | kg/mtr | inch | mm | inch | mm | |
| Internal Upset (IU) | | | | | | | |
| 3 1/2 | 13.30 | 19.79 | 3.50 | 88.90 | 0.368 | 9.35 | - |
| 4 | 14.00 | 20.84 | 4.00 | 101.60 | 0.330 | 8.38 | NC 40 |
| External Upset (EU) | | | | | | | |
| 2 3/8 | 6.65 | 9.90 | 2.375 | 60.32 | 0.280 | 7.11 | NC 26 |
| 2 7/8 | 10.40 | 15.48 | 2.875 | 73.02 | 0.362 | 9.19 | NC 31 |
| 3 1/2 | 13.30 | 19.79 | 3.500 | 88.90 | 0.368 | 9.35 | NC 38 |
| 3 1/2 | 15.50 | 23.07 | 3.500 | 88.90 | 0.449 | 11.40 | NC 38 / NC 40 |
| 4 | 14.00 | 20.84 | 4.000 | 101.60 | 0.330 | 8.38 | NC 46 |
| 4 1/2 | 16.60 | 24.70 | 4.500 | 114.30 | 0.337 | 8.56 | NC 50 |
| 4 1/2 | 20.00 | 29.76 | 4.500 | 114.30 | 0.430 | 10.92 | NC 50 |
| Internal - External Upset (IEU) | | | | | | | |
| 4 1/2 | 16.60 | 24.70 | 4.500 | 114.30 | 0.337 | 8.56 | NC 46 |
| 4 1/2 | 20.00 | 29.76 | 4.500 | 114.30 | 0.430 | 10.92 | NC 46 |
| 5 | 19.50 | 29.02 | 5.000 | 127.00 | 0.362 | 9.19 | NC 50, 5 1/2 FH |
| 5 | 25.60 | 38.10 | 5.000 | 127.00 | 0.500 | 12.70 | NC 50, 5 1/2 FH |
| 5 1/2 | 21.90 | 32.59 | 5.500 | 139.70 | 0.361 | 9.17 | 5 1/2 FH |
| 5 1/2 | 24.70 | 36.76 | 5.500 | 139.70 | 0.415 | 10.54 | 5 1/2 FH |
| 6 5/8 | 25.20 | 37.50 | 6.625 | 168.28 | 0.330 | 8.38 | 6 5/8 FH |
| 6 5/8 | 27.70 | 41.22 | 6.625 | 168.28 | 0.362 | 9.19 | 6 5/8 FH |

CHEMICAL COMPOSITION & MECHANICAL PROPERTIES

| Grade | Chemical Composition (%) | | Mechanical Properties | | |
|-------|--------------------------|----------|-----------------------|------|------------------------|
| | P Max | S Max | Yield Strength (MPa) | | Tensile Strength (Mpa) |
| | | | Min | Max | Min |
| E | 0.03 | 0.02 | 517 | 724 | 689 |
| X | 0.02 | 0.015 | 655 | 862 | 724 |
| G | 0.02 | 0.015 | 724 | 931 | 793 |
| S | 0.02 | 0.015 | 931 | 1138 | 1000 |



Tenaris Hydril Premium Connections

for demanding environment

Tenaris Hydril offers outstanding premium connection design and technology. The comprehensive range of high-performance products has been designed to meet the requirements of the most challenging applications.

Tenaris Hydril 3SB premium connections are available in Threaded & Coupled configurations with metal-to-metal seal.



Premium Connections

Main Structural Differences :

The premium connections have 3 main features which separate them from the API connections :

- Presence of shoulder,
- Presence of metal seal
- And a different thread form.

These premium connections are used when there are following requirements:

- High performance in combined loads
- High torsional strengths
- Metal-to-Metal sealing
- High galling resistance & controlled stress levels
- Tight clearance situations

Quality & Manufacturing

Tenaris Hydril Premium Connections are manufactured to same quality standards under the Quality Management System that Tenaris uses throughout its global manufacturing system.

By manufacturing Premium Connections, as part of an Integrated process of pipe manufacturing of D.P. Jindal Group, we assure highest quality products.

We are well equipped to adopt and execute change in required specifications and other unexpected conditions in less turnaround time, while maintaining the highest quality standards expected by the industry.

APPLICATIONS GUIDE :

| SIZES (IN INCHES) | INTERMEDIATE CASING | PRODUCTION CASING, TUBING |
|--------------------------------------|-------------------------------|---------------------------|
| 2 7/8 inch to 13 3/8 inch TSH 3SB | Threaded & Coupled TSH 3SB | Threaded & Coupled |



Square & Rectangular Hollow Sections



Applications :

Architectural

Shopping Malls
Canopies / Atriums
Glass Curtains
Wall Frames
Partition Frames
Space Frames
Guard Rails & Staircases

Industrial

Industrial Sheds, Trusses
Columns and Purlins
Material Storage Racks
Mine Roof Support Systems
(Cogs, Props)
Pallets, Pipe Racks, Conveyors
Gantries, Trestles, Drilling Rigs

Infrastructural

Airport Terminal Buildings
Bridges, Bus Stands
Signage Supporting Structures
Pedestrian Walkovers (Footbridge)
Sports Galleries
Railways Platform/
Foot Overbridges

General Engineering

Automobile Chassis
Green House Structures
Truck and Bus Body Members
Hoarding Structures
Amusement Park & Playground
Equipments
Exhibition Stalls, Scaffoldings, Furnitures

Technical Specifications and Dimensional Tolerances

STEEL SECTIONS CONFORMING TO IS:4923

We can also supply sections as per ASTM A 500 specification.

Square pipe : Hf SHS (Hot formed square hollow section)
(manufacture processes : Seamless & ERW)

Specification: (Indian Standards: Hollow steel section for structural use)

| |
|------------------------|
| IS 4923 : 1997 YSt 210 |
| IS 4923 : 1997 YSt 240 |
| IS 4923 : 1997 YSt 310 |

Chemical Composition

| |
|---------------------------|
| Sulphur = 0.050 % max. |
| Phosphorus = 0.050 % max. |

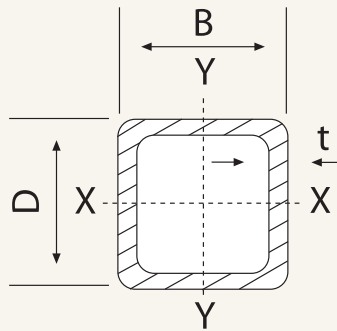
Tensile Properties of Hot formed section:

| Grade | Tensile strength (MPa) min | Yield strength (MPa) min | Elongation (%) Min |
|---------|----------------------------|--------------------------|--------------------|
| Yst 210 | 330 | 210 | 20 |
| Yst 240 | 410 | 240 | 15 |
| Yst 310 | 450 | 310 | 10 |

Dimensional Tolerances

| | | Seamless | ERW |
|---|---|---|---|
| A | Thickness | ±17.5%, -12.5% | +/-10% |
| B | Outside Dimension | +/-1% length of side to be measured with a minimum of +/-0.50 mm. | +/-1% length of side to be measured with a minimum of +/-0.50 mm. |
| C | Weight 1. On individual lengths 2. On lots of 10 tonnes | +10%, -8% ±7.5% | +10%, -8% +/-7.5% |
| D | Squareness of corner | 90° ± 2° | 90° ± 2° |
| E | Radii of corner | 3t max Where t is the thickness of section | 3t max Where t is the thickness of section |
| F | Length 1. Exact Length 2. Random Length | ±6mm As per agreement Between Manufacturer & Purchaser | ±6mm As per agreement Between Manufacturer & Purchaser |
| G | End Finish | Plain End - Mill cut finish | Plain End - Mill cut finish |

Product Range

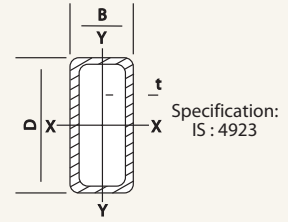


Specification:
IS : 4923

Product Range: Square Hollow Sections (SHS)

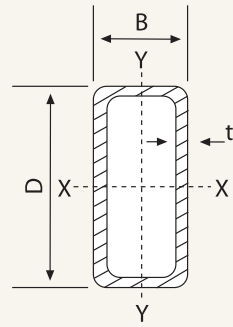
| | | Thickness (mm) = t | | | | | | | | | | | | | | | | | |
|--------------|-------|--------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|--|
| Section Size | B | D | 2.0 | 2.6 | 2.9 | 3.2 | 3.6 | 4.0 | 4.5 | 4.8 | 5.0 | 5.4 | 6.0 | 8.0 | 9.0 | 10.0 | 11.0 | 12.0 | |
| | 25 | 25 | | | | | | | | | | | | | | | | | |
| | 32 | 32 | | | | | | | | | | | | | | | | | |
| | 38 | 38 | | | | | | | | | | | | | | | | | |
| | 40 | 40 | | | | | | | | | | | | | | | | | |
| | 50 | 50 | | | | | | | | | | | | | | | | | |
| | 60 | 60 | | | | | | | | | | | | | | | | | |
| | 72 | 72 | | | | | | | | | | | | | | | | | |
| | 80 | 80 | | | | | | | | | | | | | | | | | |
| | 91.5 | 91.5 | | | | | | | | | | | | | | | | | |
| | 100 | 100 | | | | | | | | | | | | | | | | | |
| | 113.5 | 113.5 | | | | | | | | | | | | | | | | | |
| | 132 | 132 | | | | | | | | | | | | | | | | | |
| | 150 | 150 | | | | | | | | | | | | | | | | | |
| | 180 | 180 | | | | | | | | | | | | | | | | | |
| | 200 | 200 | | | | | | | | | | | | | | | | | |
| | 220 | 220 | | | | | | | | | | | | | | | | | |
| | 250 | 250 | | | | | | | | | | | | | | | | | |

Rectangular Hollow Sections



| RHS D X B mm | Thick- ness mm | Sec Area A cm ² | Unit W kg/m | Moment of Inertia | | Radius of Gyration | | Elastic Modulus | | Torsional Constants | | Outer Surface |
|-----------------|----------------------|----------------------------------|-------------------|------------------------------------|------------------------------------|-----------------------|-----------------------|------------------------------------|------------------------------------|----------------------|----------------------|--------------------------------|
| | | | | I _{xx} cm ⁴ | I _{yy} cm ⁴ | r _{xx} cm | r _{yy} cm | Z _{xx} cm ³ | Z _{yy} cm ³ | J cm ⁴ | B cm ³ | Area Per mm ² |
| 50 x 25 | 2.00 | 2.74 | 2.15 | 8.38 | 2.81 | 1.75 | 1.01 | 3.35 | 2.25 | 6.79 | 3.79 | 0.142 |
| | 2.60 | 3.46 | 2.71 | 10.16 | 3.36 | 1.71 | 0.99 | 4.06 | 2.69 | 8.27 | 4.53 | 0.137 |
| | 3.20 | 4.13 | 3.24 | 11.63 | 3.80 | 1.68 | 0.96 | 4.65 | 3.04 | 9.52 | 5.12 | 0.134 |
| | 4.00 | 4.95 | 3.88 | 13.13 | 4.23 | 1.63 | 0.92 | 5.25 | 3.38 | 10.86 | 5.69 | 0.129 |
| 60 x 40 | 2.60 | 4.76 | 3.73 | 22.76 | 12.09 | 2.19 | 1.59 | 7.59 | 6.05 | 25.59 | 9.83 | 0.187 |
| | 2.90 | 5.25 | 4.12 | 24.74 | 13.11 | 2.17 | 1.58 | 8.25 | 6.56 | 28.02 | 10.66 | 0.185 |
| | 3.60 | 6.35 | 4.98 | 28.90 | 15.23 | 2.13 | 1.55 | 9.63 | 7.62 | 33.30 | 12.41 | 0.181 |
| | 4.50 | 7.67 | 6.02 | 33.31 | 17.44 | 2.08 | 1.51 | 11.10 | 8.72 | 39.34 | 14.29 | 0.177 |
| 66 x 33 | 2.60 | 4.70 | 3.69 | 25.15 | 8.43 | 2.31 | 1.34 | 7.62 | 5.11 | 20.75 | 8.71 | 0.185 |
| | 2.90 | 5.19 | 4.07 | 27.33 | 9.12 | 2.29 | 1.33 | 8.28 | 5.53 | 22.65 | 9.43 | 0.183 |
| | 3.60 | 6.28 | 4.93 | 31.87 | 10.52 | 2.25 | 1.29 | 9.66 | 6.37 | 26.71 | 10.90 | 0.179 |
| | 4.50 | 7.58 | 5.95 | 36.64 | 11.93 | 2.20 | 1.25 | 11.10 | 7.23 | 31.21 | 12.43 | 0.175 |
| 80 x 40 | 2.60 | 5.80 | 4.55 | 46.58 | 15.74 | 2.84 | 1.65 | 11.65 | 7.87 | 38.50 | 13.46 | 0.227 |
| | 3.20 | 7.01 | 5.50 | 54.94 | 18.41 | 2.80 | 1.62 | 13.74 | 9.21 | 45.83 | 15.78 | 0.224 |
| | 4.00 | 8.55 | 6.71 | 64.79 | 21.49 | 2.75 | 1.59 | 16.20 | 10.74 | 54.77 | 18.49 | 0.219 |
| | 4.80 | 10.01 | 7.85 | 73.22 | 24.03 | 2.71 | 1.55 | 18.30 | 12.02 | 62.81 | 20.79 | 0.215 |
| 96 x 48 | 3.20 | 8.54 | 6.71 | 98.61 | 33.28 | 3.40 | 1.97 | 20.54 | 13.87 | 82.13 | 23.82 | 0.272 |
| | 4.00 | 10.47 | 8.22 | 117.54 | 39.32 | 3.35 | 1.94 | 24.49 | 16.38 | 99.11 | 28.24 | 0.267 |
| | 4.80 | 12.31 | 9.66 | 134.35 | 44.55 | 3.30 | 1.90 | 27.99 | 18.56 | 114.80 | 32.14 | 0.263 |
| 122 x 61 | 3.60 | 12.32 | 9.67 | 232.61 | 78.83 | 4.34 | 2.53 | 38.13 | 25.84 | 193.91 | 44.50 | 0.347 |
| | 4.50 | 15.14 | 11.88 | 278.94 | 93.78 | 4.29 | 2.49 | 45.73 | 30.75 | 235.39 | 53.13 | 0.343 |
| | 5.40 | 17.85 | 14.01 | 320.83 | 107.03 | 4.24 | 2.45 | 52.60 | 35.09 | 274.29 | 60.89 | 0.338 |
| 145 x 82 | 4.80 | 20.28 | 15.92 | 555.16 | 228.50 | 5.23 | 3.36 | 76.57 | 55.73 | 534.27 | 94.45 | 0.429 |
| | 5.40 | 22.60 | 17.74 | 610.85 | 250.59 | 5.20 | 3.33 | 84.26 | 61.12 | 592.70 | 103.81 | 0.426 |
| 172 x 92 | 4.80 | 23.83 | 18.71 | 917.13 | 346.91 | 6.20 | 3.82 | 106.64 | 75.41 | 826.04 | 128.85 | 0.503 |
| | 5.40 | 26.59 | 20.88 | 1012.47 | 381.74 | 6.17 | 3.79 | 117.73 | 82.99 | 918.10 | 142.04 | 0.500 |
| 200 x 100 | 4.00 | 22.95 | 18.01 | 1199.71 | 410.78 | 7.23 | 4.23 | 119.97 | 82.16 | 991.47 | 141.46 | 0.579 |
| | 5.00 | 28.36 | 22.26 | 1459.25 | 496.94 | 7.17 | 4.19 | 145.93 | 99.39 | 1216.96 | 171.53 | 0.574 |
| | 6.00 | 33.63 | 26.40 | 1703.31 | 576.91 | 7.12 | 4.14 | 170.33 | 115.38 | 1434.03 | 199.68 | 0.569 |
| | 8.00 | 43.79 | 34.38 | 2146.21 | 719.19 | 7.00 | 4.05 | 214.62 | 143.84 | 1843.86 | 250.68 | 0.559 |
| 220 x 140 | 4.00 | 27.75 | 21.78 | 1892.62 | 947.66 | 8.26 | 5.84 | 172.06 | 135.38 | 2004.80 | 223.74 | 0.699 |
| | 5.00 | 34.36 | 26.97 | 2313.45 | 1155.23 | 8.21 | 5.80 | 210.31 | 165.04 | 2468.51 | 272.71 | 0.694 |
| | 6.00 | 40.83 | 32.05 | 2714.10 | 1351.70 | 8.15 | 5.75 | 246.74 | 193.10 | 2914.71 | 318.93 | 0.689 |
| | 8.00 | 53.39 | 41.91 | 3456.31 | 1712.25 | 8.05 | 5.66 | 314.21 | 244.61 | 3270.10 | 378.40 | 0.679 |
| 240 x 120 | 4.00 | 27.75 | 21.78 | 2110.72 | 725.35 | 8.72 | 5.11 | 175.89 | 120.89 | 1736.39 | 208.03 | 0.699 |
| | 5.00 | 34.36 | 26.97 | 2579.67 | 882.47 | 8.67 | 5.07 | 214.97 | 147.08 | 2138.48 | 253.55 | 0.694 |
| | 6.00 | 40.83 | 32.05 | 3025.91 | 1030.45 | 8.61 | 5.02 | 252.16 | 171.74 | 2528.39 | 296.7 | 0.689 |
| | 8.00 | 53.39 | 41.91 | 3851.84 | 1299.95 | 8.49 | 4.93 | 320.99 | 216.66 | 3272.9 | 376.29 | 0.679 |
| 260 x 180 | 6.00 | 50.43 | 39.59 | 4855.87 | 2763.43 | 9.81 | 7.40 | 373.53 | 307.05 | 5619.50 | 501.06 | 0.849 |
| | 8.00 | 66.19 | 51.96 | 6238.69 | 3538.10 | 9.71 | 7.31 | 479.90 | 393.12 | 6821.23 | 620.13 | 0.839 |
| | 10.00 | 81.43 | 63.92 | 7509.51 | 4244.26 | 9.60 | 7.22 | 577.65 | 471.58 | 8972.14 | 760.42 | 0.834 |
| 300 x 150 | 12.00 | 96.14 | 75.47 | 8672.42 | 4884.94 | 9.50 | 7.13 | 667.11 | 542.77 | 10150.39 | 875.12 | 0.829 |
| | 6.00 | 51.63 | 40.53 | 6073.51 | 2079.57 | 10.85 | 6.35 | 404.90 | 277.28 | 5034.64 | 478.20 | 0.869 |
| | 8.00 | 67.79 | 53.22 | 7808.95 | 2654.12 | 10.73 | 6.26 | 520.53 | 353.88 | 6559.05 | 612.64 | 0.859 |
| | 10.00 | 83.43 | 65.49 | 9403.90 | 3173.71 | 10.62 | 6.17 | 626.93 | 423.16 | 8011.67 | 736.01 | 0.848 |
| 300 x 200 | 12.00 | 98.54 | 77.35 | 10866.10 | 3641.00 | 10.50 | 6.08 | 724.41 | 485.48 | 9110.72 | 829.98 | 0.838 |
| | 6.00 | 57.65 | 45.24 | 7370.23 | 3962.19 | 11.31 | 8.29 | 491.34 | 396.22 | 8186.02 | 650.85 | 0.969 |
| | 8.00 | 75.79 | 59.50 | 9513.66 | 5097.04 | 11.20 | 8.20 | 634.24 | 509.70 | 10722.83 | 839.54 | 0.959 |
| | 10.00 | 93.43 | 73.34 | 11507.24 | 6144.30 | 11.10 | 8.11 | 767.15 | 614.43 | 13169.70 | 1015.43 | 0.948 |
| 300 x 200 | 12.00 | 110.54 | 86.77 | 13355.84 | 7107.43 | 10.99 | 8.02 | 890.39 | 710.43 | 15215.03 | 1160.24 | 0.938 |

Product Range



Specification:
IS : 4923

Product Range: Rectangular Hollow Sections (RHS)

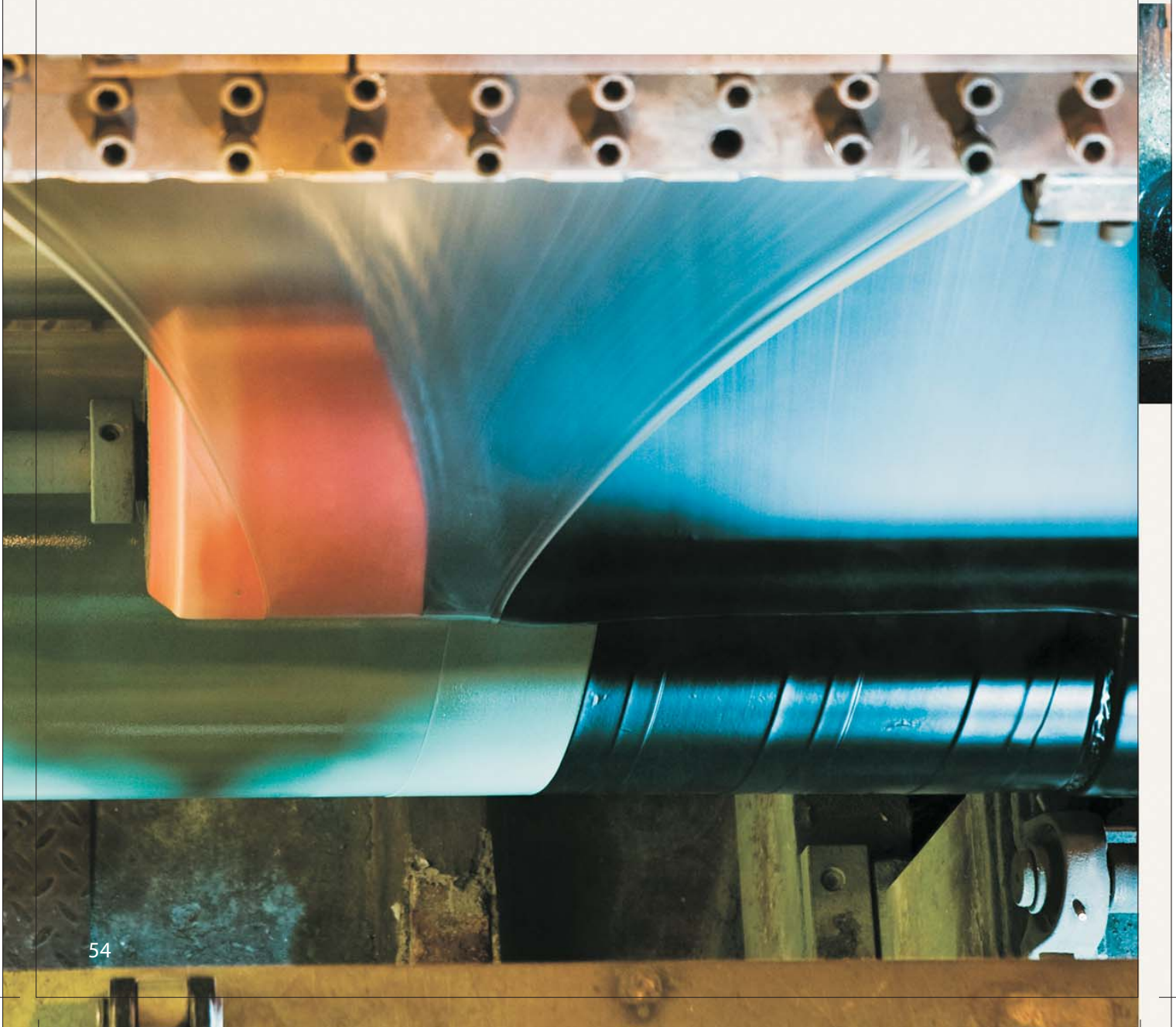
| | | Thickness (mm) = t | | | | | | | | | | | | | | | |
|--------------|-----|--------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|--|
| Section Size | D | B | 2.0 | 2.6 | 2.9 | 3.2 | 3.6 | 4.0 | 4.5 | 4.8 | 5.0 | 5.4 | 6.0 | 8.0 | 10.0 | 12.0 | |
| | 50 | 25 | | | | | | | | | | | | | | | |
| | 60 | 40 | | | | | | | | | | | | | | | |
| | 66 | 33 | | | | | | | | | | | | | | | |
| | 80 | 40 | | | | | | | | | | | | | | | |
| | 96 | 48 | | | | | | | | | | | | | | | |
| | 122 | 61 | | | | | | | | | | | | | | | |
| | 145 | 82 | | | | | | | | | | | | | | | |
| | 172 | 92 | | | | | | | | | | | | | | | |
| | 200 | 100 | | | | | | | | | | | | | | | |
| | 220 | 140 | | | | | | | | | | | | | | | |
| | 240 | 120 | | | | | | | | | | | | | | | |
| | 260 | 180 | | | | | | | | | | | | | | | |
| | 300 | 150 | | | | | | | | | | | | | | | |
| | 300 | 200 | | | | | | | | | | | | | | | |

Pipe Coating Facility

3L PE/PP, FBE, DFBE and Internal Coating (Liquid Epoxy)

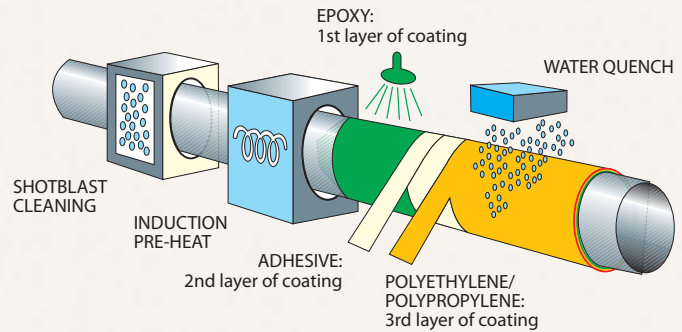
3 LPE / 3 LPP Coating is anti-corrosive coating of 3 layers of epoxy, adhesive and PE / PP respectively on pipes, as per following details

- 1st Layer is of Epoxy coating which acts as Anti-Corrosive Layer.
- 2nd Layer is of Adhesive coating which acts as Tie layer between Epoxy and PE/PP.
- 3rd Layer is of Polyethylene / Polypropylene coating which provides mechanical strength to the coating.



Advantages of Coated Pipes:

The coat begins on Bare Pipe with surface preparation by abrasive blast cleaning, phosphoric acid treatment, chromate treatment prior to the application of coat followed by electrostatic fusion bonded epoxy layer as primer, adhesive as tie layer, followed by high density Polyethylene/ Polypropylene layer as top coat.



- Strong protective layer
- Long term chemical and mechanical resistance
- High mechanical impact strength and penetration resistance
- Increases life span of pipes more than 25 years
- Economy in the long term due to less repairing/ re-working

Applications & Specifications:

- * 3 LPE Coating (DIN 30670) for service temperature upto +80°C
- * 3 LPP Coating (DIN 30678) for service temperature upto +110°C
- * Single layer FBE Coating (Canadian CAN/CSA Z245-06/ NACE RP 0394) for service temperature upto +80°C
- * Dual layer FBE Coating (Canadian CAN/CSA Z245-06/ NACE RP 0394) for service temperature upto +80°C
- * Internal Flow coating (API RP 5L2/ISO 15741) for service temperature upto + 80°C
- * Internal Solvent free epoxy (AWWA C 210/NF - French Specification & BS British Specification) for service temperature upto + 80°C



SPECIFICATIONS **Coating**

1) **Pipe Size Range for 3 LPE / 3LPP Coating**

| | | |
|---|----------------|----------------------|
| A | Outer Dia | 32.0 - 1250.00mm |
| B | Wall Thickness | Upto 25mm for all OD |
| C | Length | 6 - 14 meters |

2) **3 LPE / PP Coating Thickness (Layerwise)**

| Sr No. | Layer | Coating Thickness |
|--------|------------------------------|-------------------|
| 1 | Epoxy Coating | 150 - 300 microns |
| 2 | Adhesive Coating | 200 - 400 microns |
| 3 | Polyethylene / Polypropylene | 1.55 - 3.35mm |
| 4 | Total Thickness | 1.80 - 3.70mm |

3) **Pipe Size Range for Single Layer FBE Coating**

| | | |
|---|----------------|----------------------|
| A | Outer Dia | 32.0 - 1250.00mm |
| B | Wall Thickness | Upto 25mm for all OD |
| C | Length | 6 - 14 meters |

4) **Single Layer FBE Thickness**

| Sr No. | Layer | Coating Thickness |
|--------|---------------|-------------------|
| 1 | FBE Thickness | 400 - 500 microns |

5) **Pipe Size Range for Dual FBE Coating**

| | | |
|---|----------------|--------------------|
| A | Outer Dia | 114.30 - 1250.00mm |
| B | Wall Thickness | Upto 25mm |
| C | Length | 6 - 14 meters |

6) **Dual FBE Thickness**

| Sr No. | Layer | Coating Thickness |
|--------|--------------------------------------|--------------------|
| 1 | FBE Thickness (Anti-corrosive Layer) | 400 - 500 microns |
| 2 | ARO Thickness (Hard Coat Layer) | 400 - 500 microns |
| 3 | Total Thickness | 800 - 1000 microns |

7) **Pipe Size Range for Internal Coating**

| | | |
|---|----------------|-------------------|
| A | Outer Dia | 168.30 - 559.00mm |
| B | Wall Thickness | Upto 25mm |
| C | Length | 6 - 14 meters |

8) **Internal Coating Thickness**

| A) Sr No. | Layer | Coating Thickness |
|-----------|--|-------------------|
| 1 | Internal Flow Coating for flow improvement | 60 - 100 microns |
| B) Sr No. | Layer | Coating Thickness |
| 1 | Internal Solvent free epoxy for corrosion protection | 400 - 500 microns |

Pipe Fittings

MSL offers pipe fittings to cater to the Engineering and Petrochemical Industry requirements of high quality IBR Pipe Fittings.



Product Range

The product range includes Seamless Carbon Steel and Alloy Steel, as per following details:

| Products | Size |
|-------------|-------------------|
| Elbows | 1/2" NB to 14" NB |
| Reducers | 1" NB to 14" NB |
| Tees | 1" NB to 14" NB |
| Cups | 1/2" NB to 14" NB |
| Stub Ends | 1/2" NB to 14" NB |
| Flanges | 1/2" NB to 14" NB |
| Socket Weld | Upto 2" NB |
| Nipples | Upto 4" NB |
| Couplings | Upto 4" NB |

Material Specifications

ASTM A 234 WPB WPC WP-1 WP12 WP11 WP22 WP5 WP9 WP91 and WPR
 ASTM A 403 WP321 321H 304 304L 316 316L 347 and 347H
 ASTM A 420 WPL-6 WPL-9 WPL-3 and WPL-8

CHEMICAL COMPOSITION & MECHANICAL PROPERTIES

API LINE PIPES

| Specification | Grade | Chemical Composition (%) Max. | | | | | | | | | | Mechanical Properties | | | | | | | | Impact Energy J(Ft.lb) (min.) | Hydrostatic Test Pressure | | | | | |
|-----------------------------------|-------------------------------|--|-------------------------------|-------|-------|-------|-------|-------|-------|--------|--------|-----------------------|---------|------------------|---------|----------------|-----|---------|-----|-------------------------------|---------------------------|--|---|---|--|-------|
| | | C | Mn | P | S | Si | V | Nb | Ti | C.E. | | Yield Strength | | Tensile Strength | | % Elongation e | | | | | | | | | | |
| | | | | | | | | | | PCM | IIV | PSI | MPa | PSI | MPa | | PSI | MPa | PSI | | | MPa | | | | |
| API 5L / ISO 3183 & IS / ISO 3183 | E & S PSL - 1 & IS / ISO 3183 | 0.22 | 0.90 | 0.030 | 0.030 | - | - | - | - | - | - | - | - | 30,500 | 210 | 48,600 | 335 | - | - | - | - | <p>U.S. Customary Unit. P = 2 S t / D</p> <p>SI Unit P = 2000 S t / D</p> <p>where, P = Hydrostatic test Pr. in PSI (KPa) t = Specified WT. inch (mm) D = Specified Outside diameter, inch (mm) S = Hoop Stress in PSI (MPa)</p> <p>= 60% of Min. YS for all sizes for Grade A & B = 60% of Min. YS for all sizes ≤ 141.3 (mm) (5.916") for Grade X-42 and above = 75% of Min. YS. for size > 141.3 (mm) (5.916") to < 219.1 mm (8.5/8") for Grade X-42 and above = 85% of Min. YS for size > 219.1 (8.5/8") to < 508.0 mm (20") for Gr X-42 and above = 90% of Min. YS for size ≥ 508.0 mm (20") for Grade X-42 and above</p> <p>For Grade upto L-245 or B OD ≤ 88.9 mm (3.5"), it is not necessary that the test pressure exceeds 17.0 Mpa, For OD > 88.9 mm (3.5"), it is not necessary that the test pressure exceed 19.0 Mpa</p> <p>For all other Grades & sizes, it is not necessary that the test pressure exceed 20.5 Mpa.</p> | | | | |
| | | 0.26 | 1.20 | 0.030 | 0.030 | - | - | - | - | - | - | - | - | 35,500 | 245 | 60,200 | 415 | - | - | - | - | | | | | |
| | | 0.26 | 1.30 | 0.030 | 0.030 | - | - | - | - | - | - | - | - | 42,100 | 290 | 60,200 | 415 | - | - | - | - | | | | | |
| | | 0.26 | 1.40 | 0.030 | 0.030 | - | - | - | - | - | - | - | - | 46,400 | 320 | 63,100 | 435 | - | - | - | - | | | | | |
| | | 0.26 | 1.40 | 0.030 | 0.030 | - | - | - | - | - | - | - | - | 52,200 | 360 | 66,700 | 460 | - | - | - | - | | | | | |
| | | 0.26 | 1.40 | 0.030 | 0.030 | - | - | - | - | - | - | - | - | 56,600 | 390 | 71,100 | 490 | - | - | - | - | | | | | |
| | | 0.26 | 1.40 | 0.030 | 0.030 | - | - | - | - | - | - | - | - | 60,200 | 415 | 75,400 | 520 | - | - | - | - | | | | | |
| | | 0.26 | 1.45 | 0.030 | 0.030 | - | - | - | - | - | - | - | - | 65,300 | 450 | 77,600 | 535 | - | - | - | - | | | | | |
| | | 0.26 | 1.65 | 0.030 | 0.030 | - | - | - | - | - | - | - | - | 70,300 | 485 | 82,700 | 570 | - | - | - | - | | | | | |
| | | Note : For Seamless, 'C' will be 0.28% for Gr. B to X-70 and 'Mn' for Gr. X-65 to X-70 will be 1.40% | | | | | | | | | | | | | | | | | | | | | | | | |
| | | API 5L / ISO 3183 & IS / ISO 3183 | E & S PSL - 2 & IS / ISO 3183 | 0.24 | 1.20 | 0.025 | 0.015 | 0.40 | - | - | 0.040 | 0.25 | 0.43 | - | - | - | - | - | - | - | - | | - | - | <p>U.S. Customary Unit e = 62.5 000 A^{0.2} / U^{0.9}</p> <p>SI Unit e = 1940 A^{0.2} / U^{0.9}</p> <p>Legend : e = Specified min. elongation A = Tensile test piece cross sectional area. U = Specified min. tensile strength.</p> | |
| | | | | 0.24 | 1.20 | 0.025 | 0.015 | 0.40 | - | - | 0.040 | 0.25 | 0.43 | - | - | - | - | - | - | - | - | | - | - | | 27/20 |
| | | | | 0.18 | 1.40 | 0.025 | 0.015 | 0.45 | 0.050 | 0.050 | 0.040 | 0.25 | 0.43 | 35,500 | 245 | 60,200 | 415 | 110,200 | 760 | - | - | | - | - | | |
| 0.22 | 1.20 | | | 0.025 | 0.015 | 0.45 | 0.050 | 0.050 | 0.040 | 0.25 | 0.43 | - | - | - | - | - | - | - | - | - | - | 27 (20) | | | | |
| 0.24 | 1.20 | | | 0.025 | 0.015 | 0.40 | 0.060 | 0.050 | 0.040 | 0.25 | 0.43 | - | - | - | - | - | - | - | - | - | - | | | | | |
| 0.24 | 1.20 | | | 0.025 | 0.015 | 0.40 | 0.060 | 0.050 | 0.040 | 0.25 | 0.43 | - | - | - | - | - | - | - | - | - | - | 27 (20) | | | | |
| 0.18 | 1.40 | | | 0.025 | 0.015 | 0.45 | 0.050 | 0.050 | 0.040 | 0.25 | 0.43 | 42,100 | 290 | 71,800 | 495 | 110,200 | 760 | - | - | - | - | | | | | |
| 0.22 | 1.30 | | | 0.025 | 0.015 | 0.45 | 0.050 | 0.050 | 0.040 | 0.25 | 0.43 | - | - | - | - | - | - | - | - | - | - | 27 (20) | | | | |
| 0.24 | 1.40 | | | 0.025 | 0.015 | 0.40 | 0.070 | 0.050 | 0.040 | 0.25 | 0.43 | - | - | - | - | - | - | - | - | - | - | | | | | |
| 0.18 | 1.40 | | | 0.025 | 0.015 | 0.45 | 0.050 | 0.050 | 0.040 | 0.25 | 0.43 | 46,400 | 320 | 76,100 | 525 | 110,200 | 760 | - | - | - | - | 27 (20) | | | | |
| 0.22 | 1.30 | | | 0.025 | 0.015 | 0.45 | 0.050 | 0.050 | 0.040 | 0.25 | 0.43 | - | - | - | - | - | - | - | - | - | - | | | | | |
| 0.24 | 1.40 | | | 0.025 | 0.015 | 0.45 | 0.100 | 0.050 | 0.040 | 0.25 | 0.43 | - | - | - | - | - | - | - | - | - | - | 27 (20) | | | | |
| 0.18 | 1.50 | | | 0.025 | 0.015 | 0.45 | 0.050 | 0.050 | 0.040 | 0.25 | 0.43 | 52,200 | 360 | 76,900 | 530 | 110,200 | 760 | - | - | - | - | | | | | |
| 0.22 | 1.40 | 0.025 | 0.015 | 0.45 | - | - | - | - | 0.25 | 0.43 | - | - | - | - | - | - | - | - | - | - | 27 (20) | | | | | |
| 0.24 | 1.40 | 0.025 | 0.015 | 0.45 | 0.100 | 0.050 | 0.040 | 0.25 | 0.43 | - | - | - | - | - | - | - | - | - | - | | | | | | | |
| 0.18 | 1.50 | 0.025 | 0.015 | 0.45 | 0.070 | 0.050 | 0.040 | 0.25 | 0.43 | 56,600 | 390 | 79,000 | 545 | 110,200 | 760 | - | - | - | - | 27 (20) | | | | | | |
| 0.22 | 1.40 | 0.025 | 0.015 | 0.45 | - | - | - | - | 0.25 | 0.43 | - | - | - | - | - | - | - | - | - | | - | | | | | |
| 0.24 | 1.40 | 0.025 | 0.015 | 0.45 | 0.100 | 0.050 | 0.040 | 0.25 | 0.43 | - | - | - | - | - | - | - | - | - | - | 27 (20) | | | | | | |
| 0.18 | 1.70 | 0.025 | 0.015 | 0.45 | - | - | - | - | 0.25 | 0.43 | 60,200 | 415 | 81,900 | 565 | 110,200 | 760 | - | - | - | | - | | | | | |
| 0.12 | 1.60 | 0.025 | 0.015 | 0.45 | - | - | - | - | 0.25 | 0.43 | - | - | - | - | - | - | - | - | - | - | 27 (20) | | | | | |
| 0.18 | 1.70 | 0.025 | 0.015 | 0.45 | - | - | - | - | 0.25 | 0.43 | 65,300 | 450 | 87,000 | 600 | 110,200 | 760 | - | - | - | - | | | | | | |
| 0.12 | 1.60 | 0.025 | 0.015 | 0.45 | - | - | - | - | 0.25 | 0.43 | - | - | - | - | - | - | - | - | - | - | 27 (20) | | | | | |
| 0.18 | 1.80 | 0.025 | 0.015 | 0.45 | - | - | - | - | 0.25 | 0.43 | - | - | - | - | - | - | - | - | - | - | | | | | | |
| 0.12 | 1.70 | 0.025 | 0.015 | 0.45 | - | - | - | - | 0.25 | 0.43 | 70,300 | 485 | 92,100 | 635 | 110,200 | 760 | - | - | - | - | 40 (30) | | | | | |
| 0.18 | 1.90 | 0.025 | 0.015 | 0.45 | - | - | - | - | 0.25 | 0.43 | 80,500 | 555 | 102,300 | 705 | 119,700 | 825 | - | - | - | - | | | | | | |
| 0.12 | 1.85 | 0.025 | 0.015 | 0.45 | - | - | - | - | 0.25 | 0.43 | - | - | - | - | - | - | - | - | - | - | | | | | | |

E = ERW (Electric Resistance Welded) S = Seamless ; YS - Yield Strength

API CASING & TUBING

CHEMICAL COMPOSITION & MECHANICAL PROPERTIES

| Specifi- cation | Group Grade Type | Chemical Composition (%) | | | | | | | | | | | | Mechanical Properties | | | | | | Hardness (max.) | Hydrostatic Test Pressure | | | | | | | |
|--------------------|------------------|--------------------------|------|------|------|------|------|-------|-------|------|------|------|-------|-----------------------|------|---------|---------|---------|------|-----------------|---------------------------|----------------|------|------------------|-----|--------------------------|-----|--|
| | | C | | Mn | | Mo | | Cr | | Ni | | Cu | | P | | S | | Si | | | | Yield Strength | | Tensile Strength | | % Elongation e (min.) | | |
| | | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | | | Min | Max | HRC | HBW | | | |
| API 5CT | 1 E&S H-40 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 40,000 | 276 | 80,000 | 552 | 60,000 | 414 | - | - | $P = 2(f \times YS \times t) / D$ P = Hydrostatic Test Pressure in Mpa (PSI) f = Factor - 0.6 for Gr. H-40, J-55 and K-55 larger than 9 5/8", 0.8 for all other Grades and sizes. YS = Specified Min. Yield Strength in MPa (PSI) D = Specified Outside diameter in mm (inch) t = Specified W.T. in mm (inch) |
| | E&S J-55 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 55,000 | 379 | 80,000 | 552 | 75,000 | 517 | - | - | |
| | E&S K-55 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 55,000 | 379 | 80,000 | 552 | 95,000 | 655 | - | - | |
| | E&S N-80 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 80,000 | 552 | 110,000 | 758 | 100,000 | 689 | - | - | |
| | E&S N-80 Q | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 80,000 | 552 | 110,000 | 758 | 100,000 | 689 | - | - | |
| 2 | S R-95 | - | 0.45 | - | 1.90 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 95,000 | 655 | 110,000 | 758 | 105,000 | 724 | 22 | 235 | |
| | S M-65 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 65,000 | 448 | 85,000 | 586 | 85,000 | 586 | 23 | 241 | |
| | S L-80 | - | 0.43 | - | 1.90 | - | - | - | - | - | 0.25 | - | - | - | - | - | - | - | - | 80,000 | 552 | 95,000 | 655 | 95,000 | 655 | 23 | 241 | |
| | S L-80 9Cr | - | 0.15 | 0.30 | 0.60 | 1.10 | 1.10 | 8.00 | 10.00 | 0.50 | 0.25 | 0.25 | 0.020 | 0.010 | 1.00 | 80,000 | 552 | 95,000 | 655 | 80,000 | 552 | 95,000 | 655 | 95,000 | 655 | 23 | 241 | |
| | S L-80 13 Cr | 0.15 | 0.22 | 0.25 | 1.00 | - | - | 12.00 | 14.00 | 0.50 | 0.25 | 0.25 | 0.020 | 0.010 | 1.00 | 80,000 | 552 | 95,000 | 655 | 80,000 | 552 | 95,000 | 655 | 95,000 | 655 | 23 | 241 | |
| | S C-90 | - | 0.35 | - | 1.20 | 0.25 | 0.85 | - | 1.50 | 0.99 | - | - | - | - | - | 90,000 | 621 | 105,000 | 724 | 90,000 | 621 | 105,000 | 724 | 100,000 | 689 | 25.4 | 255 | |
| | S T-95 | - | 0.35 | - | 1.20 | 0.25 | 0.85 | 0.40 | 1.50 | 0.99 | - | - | - | - | - | 95,000 | 655 | 110,000 | 758 | 95,000 | 655 | 110,000 | 758 | 105,000 | 724 | 25.4 | 255 | |
| | S C-110 | - | 0.35 | - | 1.20 | 0.25 | 1.00 | 0.40 | 1.50 | 0.99 | - | - | - | - | - | 110,000 | 758 | 120,000 | 828 | 110,000 | 758 | 120,000 | 828 | 115,000 | 793 | 30 | 286 | |
| | 3 S P-110 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.030 a | 0.030 a | - | - | 110,000 | 758 | 140,000 | 965 | 125,000 | 862 | - | - | |
| | 4 S Q-125 | - | 0.35 | - | 1.35 | - | 0.85 | - | 1.50 | 0.99 | - | - | - | - | - | 125,000 | 862 | 150,000 | 1034 | 125,000 | 862 | 150,000 | 1034 | 135,000 | 931 | b | - | |

a - for ERW Gr. P-110, the Phosphorus content shall be 0.020% max. and Sulphur content 0.010% max.

b - No hardness limits are specified but the maximum variation is restricted as a manufacturing control.

N.L - No Limit

E - ERW (Electric Resistance Welded);

S - Seamless

Note: Charpy - V - Notch - Absorbed energy requirements for various grades are as per formulas given in **API Specification 5CT**.

CHEMICAL COMPOSITION & MECHANICAL PROPERTIES

ASTM

| Specification | Type | Grade | Chemical Composition (%) | | | | | | | | | | Mechanical Properties | | | | % Elongation (G.L. 50mm) e (min) | Hydrostatic Test Pressure | Hardness (Max) | | | | | |
|---------------|------|-------|--------------------------|------|------|------|-------|-------|------|------|------|------|-----------------------|------|------|------|-------------------------------------|---------------------------|----------------|----------------|-----|--|---|--|
| | | | C | | Mn | | P | S | Si | Cr | | Mo | Cu | | NI | V | | | | Yield Strength | | Tensile Strength | | |
| | | | Min | Max | Min | Max | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | | | |
| ASTM A-53 | E&S | A | - | 0.25 | - | 0.95 | 0.050 | 0.045 | - | - | 0.40 | - | 0.15 | 0.40 | 0.40 | 0.08 | 0.08 | 30,000 | 205 | 48,000 | 330 | P= 2.5 t/D or 2800 PSI (19.3 MPa) for size > 3.5" OD P= 2.5 t/D or 2500 PSI (17.2 MPa) for size ≤ 3.5" OD S= 0.60 times minimum specified YS PSI (MPa) | | |
| | | B | - | 0.30 | - | 1.20 | 0.050 | 0.045 | - | - | 0.40 | - | 0.15 | 0.40 | 0.40 | 0.08 | 0.08 | 35,000 | 240 | 60,000 | 415 | | | |
| ASTM A-106 | S | A | - | 0.25 | 0.27 | 0.93 | 0.035 | 0.035 | 0.10 | - | 0.40 | - | 0.15 | 0.40 | 0.40 | 0.08 | 0.08 | 30,000 | 205 | 48,000 | 330 | P = 2.5 t/D or 2800 PSI (19.0 MPa) for pipe size > 3.5" O.D P=2S t/D or 2500 PSI (17.0 MPa) for pipe size ≤ 3.5" O.D S = 0.60 times SMYS PSI (MPa) | | |
| | | B | - | 0.30 | 0.29 | 1.06 | 0.035 | 0.035 | 0.10 | - | 0.40 | - | 0.15 | 0.40 | 0.40 | 0.08 | 0.08 | 35,000 | 240 | 60,000 | 415 | | | |
| | | C | - | 0.35 | 0.29 | 1.06 | 0.035 | 0.035 | 0.10 | - | 0.40 | - | 0.15 | 0.40 | 0.40 | 0.08 | 0.08 | 40,000 | 275 | 70,000 | 485 | | | |
| ASTM A 178 | E | A | 0.06 | 0.18 | 0.27 | 0.63 | 0.035 | 0.035 | - | - | - | - | - | - | - | - | - | 26,000 | 180 | 47,000 | 325 | P = 32000 t/D (Inch-Pound Unit) P = 2200.6 t/D (S.I Unit) | | |
| | | C | - | 0.35 | - | 0.80 | 0.035 | 0.035 | - | - | - | - | - | - | - | - | - | 37,000 | 255 | 60,000 | 415 | | | |
| | | D | - | 0.27 | 1.00 | 1.50 | 0.030 | 0.015 | 0.10 | - | - | - | - | - | - | - | - | 40,000 | 275 | 70,000 | 485 | | | |
| ASTM A179 | S | - | 0.06 | 0.18 | 0.27 | 0.63 | 0.035 | 0.035 | - | - | - | - | - | - | - | - | - | 26,000 | 180 | 47,000 | 325 | | 72 HRB | |
| | | | 0.06 | 0.18 | 0.27 | 0.63 | 0.035 | 0.035 | - | 0.25 | - | - | - | - | - | - | - | 26,000 | 180 | 47,000 | 325 | | 77 HRB < 5.10 mm WT 137 HB > 5.10 mm WT | |
| ASTM A209 | S | T 1 | 0.10 | 0.20 | 0.30 | 0.80 | 0.025 | 0.025 | 0.10 | 0.50 | - | 0.44 | 0.65 | - | - | - | - | 30,000 | 205 | 55,000 | 380 | | 80 HRB WT < 5.10 mm 146 BHN WT ≥ 5.10 mm | |
| | | T 1a | 0.15 | 0.25 | 0.30 | 0.80 | 0.025 | 0.025 | 0.10 | 0.50 | - | 0.44 | 0.65 | - | - | - | - | 32,000 | 220 | 60,000 | 415 | | 81 HRB WT < 5.10 mm 153 BHN WT ≥ 5.10 mm | |
| | | T 1b | - | 0.14 | 0.30 | 0.80 | 0.025 | 0.025 | 0.10 | 0.50 | - | 0.44 | 0.65 | - | - | - | - | 28,000 | 195 | 53,000 | 365 | | 77 HRB WT < 5.10 mm 137 BHN WT ≥ 5.10 mm | |

CHEMICAL COMPOSITION & MECHANICAL PROPERTIES

ASTM

| Specification | Type | Grade | Chemical Composition (%) | | | | | | | | | | | | | | Mechanical Properties | | | | Hydrostatic Test Pressure | Hardness (Max)** | | | | | | | | | |
|--------------------------|-------|-------------|--------------------------|-------|------|------|-------|-------|------|------|------|------|------|------|------|-----|-----------------------|-----|------|--------------|---------------------------|------------------|------|--------|--------|--------|-----------------------|-------------------------|--|---|--------------------------------------|
| | | | C | | Mn | | P | S | | Si | | Cr | | Mo | | Cu | | Ni | | V | | | N | | Nb/Cb | | Yield Strength Min | Tensile Strength Min | % Elongation (G.L. 50mm) e (min) | | |
| | | | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | | | | | |
| ASTM A 210 | S | A-1 | - | 0.27 | - | 0.93 | 0.035 | 0.035 | 0.10 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 37,000 | 255 | 60,000 | 415 | 30 | P = 32000 t/D (Inch-Pound Unit) P = 220.6 t/D (S.I Unit) | 79 HRB / 143 BHN 89 HRB / 179 BHN |
| | | C | - | 0.35 | 0.29 | 1.06 | 0.035 | 0.035 | 0.10 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 40,000 | 275 | 70,000 | 485 | 30 | | |
| ASTM A 213 / A 335 | S | P-1 | 0.10 | 0.20 | 0.30 | 0.80 | 0.025 | 0.025 | 0.10 | 0.50 | - | - | 0.44 | 0.65 | - | - | - | - | - | - | - | - | - | - | 30,000 | 205 | 55,000 | 380 | 30 | For A 213 P = 32000 t/D (Inch-Pound Unit) P = 220.6 t/D (S.I Unit) | 85 HRB / 163 HB / 170 HV |
| | | # P-2 / T-2 | 0.10 | 0.20 | 0.30 | 0.61 | 0.025 | 0.025 | 0.10 | 0.30 | 0.50 | 0.81 | 0.44 | 0.65 | - | - | - | - | - | - | - | - | - | - | 30,000 | 205 | 60,000 | 415 | 30 | | -do- |
| | | P-5 / T-5 | - | 0.15 | 0.30 | 0.60 | 0.025 | 0.025 | - | 0.50 | 4.00 | 6.00 | 0.45 | 0.65 | - | - | - | - | - | - | - | - | - | - | 30,000 | 205 | 60,000 | 415 | 30 | | -do- |
| | | P-11 / T-11 | 0.05 | 0.15 | 0.30 | 0.60 | 0.025 | 0.025 | 0.50 | 1.00 | 1.50 | 1.50 | 0.44 | 0.65 | - | - | - | - | - | - | - | - | - | - | 30,000 | 205 | 60,000 | 415 | 30 | For A 335 P = 2 S t/D where S = 60% of SMYS | -do- |
| | | P-12 / T-12 | 0.05 | 0.15 | 0.30 | 0.61 | 0.025 | 0.025 | - | 0.50 | 0.80 | 1.25 | 0.44 | 0.65 | - | - | - | - | - | - | - | - | - | - | 32,000 | 220 | 60,000 | 415 | 30 | | -do- |
| | | P-22 / T-22 | 0.05 | 0.15 | 0.30 | 0.60 | 0.025 | 0.025 | - | 0.50 | 1.90 | 2.60 | 0.87 | 1.13 | - | - | - | - | - | - | - | - | - | - | 30,000 | 205 | 60,000 | 415 | 30 | | -do- |
| ASTM A-214 | E | P-91 / T-91 | 0.08* | 0.12* | 0.30 | 0.60 | 0.020 | 0.010 | 0.20 | 0.50 | 8.00 | 9.50 | 0.85 | 1.05 | - | - | - | - | 0.40 | 0.18 to 0.25 | 0.03 | 0.07 | 0.06 | 0.10 | 60,000 | 415 | 85,000 | 585 | 20 | 91 HRB min./ 90 HRB min. 25 HRC (max.) | |
| | | E | - | 0.18 | 0.27 | 0.63 | 0.035 | 0.035 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 72 HRB | |
| ASTM A 333 | E & S | 1 | - | 0.30 | 0.40 | 1.06 | 0.025 | 0.025 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 30,000 | 205 | 55,000 | 380 | 35 | P = 2 S t/D where S = 60% of SMYS | Impact 18 J (Min.) | |
| | | 6 | - | 0.30 | 0.29 | 1.06 | 0.025 | 0.025 | 0.10 | - | 0.30 | - | 0.12 | 0.40 | 0.08 | - | - | - | - | - | - | - | - | 35,000 | 240 | 60,000 | 415 | 30 | | 18 J (Min.) | |
| ASTM A 334 | E & S | 1 | - | 0.30 | 0.40 | 1.06 | 0.025 | 0.025 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 30,000 | 205 | 55,000 | 380 | 35 | P = 32000 t/D (Inch-Pound Unit) P = 220.6 t/D (S.I Unit) | Impact 18 J (Min.) | |
| | | 6 | - | 0.30 | 0.29 | 1.06 | 0.025 | 0.025 | 0.10 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 35,000 | 240 | 60,000 | 415 | 30 | | 18 J (Min.) | |

* C% for Grade T-91 = 0.07 to 0.14%

** Hardness values are not applicable for Grades P-1 to P-22

Tensile Strength of Grade P-2 = 380MPa / 55000PSI

CHEMICAL COMPOSITION & MECHANICAL PROPERTIES

ASTM

| Specification | Type | Grade | Chemical Composition (%) | | | | | | | | | | | | | | Mechanical Properties | | | | | | Hydrostatic Test Pressure | Hardness (Max) | | | | | | |
|---------------|------|----------|--------------------------|-------------------|------------------|------|--|-------|-------------------------------|-------|----------------|------|------|------|------|-----|-----------------------|-----|-----|----------------|------------------|-------------------------------------|---------------------------|----------------|-----|-----|---|---|---|---|
| | | | C | | Mn | | P | S | | Si | | Cr | | Mo | | Cu | | Ni | | Yield Strength | Tensile Strength | % Elongation (G.L. 50mm) e (min) | | | | | | | | |
| | | | Min | Max | Min | Max | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | | | | | | Min | Max | | | | |
| ASTM A-519 | S | SAE 1010 | 0.08 | 0.13 | 0.30 | 0.60 | 0.040 | 0.050 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | |
| | | | SAE 1018 | 0.15 | 0.20 | 0.60 | 0.90 | 0.040 | 0.050 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| | | | SAE 1026 | 0.22 | 0.28 | 0.60 | 0.90 | 0.040 | 0.050 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| | | | SAE 1035 | 0.32 | 0.38 | 0.60 | 0.90 | 0.040 | 0.050 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| | | | SAE 1040 | 0.37 | 0.44 | 0.60 | 0.90 | 0.040 | 0.050 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| | | | SAE 1518 | 0.15 | 0.21 | 1.10 | 1.40 | 0.040 | 0.050 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | SAE 1541 | 0.36 | 0.44 | 1.35 | 1.65 | 0.040 | 0.050 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | SAE 4130 | 0.28 | 0.33 | 0.40 | 0.60 | 0.040 | 0.040 | 0.15 | 0.35 | 0.80 | 1.10 | 0.15 | 0.25 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | SAE 52100 | 0.93 | 1.05 | 0.25 | 0.45 | 0.025 | 0.015 | 0.15 | 0.35 | 1.35 | 1.60 | - | 0.10 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | ASTM A-589 | E & S Butt Welded | - | - | - | - | 0.050 | 0.060 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | | Gr. A | - | - | - | - | 0.050 | 0.060 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| | | Gr. B | - | - | - | - | 0.050 | 0.060 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| | | | Yield Strength | | Tensile Strength | | % Elongation (G.L. 50mm) e (min) | | Hydrostatic Test Pressure | | Hardness (Max) | | | | | | | | | | | | | | | | | | | |
| | | | 30,000 | 205 | 48,000 | 330 | e = 625000 A ^{0.2} U ^{0.9} | | As per table of specification | | | | | | | | | | | | | | | | | | | | | |
| | | | 30,000 | 205 | 48,000 | 330 | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 35,000 | 240 | 60,000 | 415 | | | | | | | | | | | | | | | | | | | | | | | | |

Not Specified

P - Hydrostatic Test Pressure (Bar) D - Specified Outside Diameter (mm) t - Specified Wall Thickness (mm)
 A - Cross Sectional Area (inch² / mm²) U - Specified Tensile Strength (PSI / MPa)
 E - ERW (Electric Resistance Welded) S - Seamless SMYS - Specified Min. yield Strength.

CHEMICAL COMPOSITION & MECHANICAL PROPERTIES

IS

| Specifi- cation | Grade | Chemical Composition (%) | | | | | | | | | | | | Mechanical Properties | | | | | | Hydrostatic Test Pressure | Remarks | | |
|--------------------|-------|--------------------------|------|------|------|-------|-------|-----|------|-----|-----|-----|-----|-----------------------|------|----------------|--------|------------------|-----|---------------------------|---|---|--|
| | | C | | Mn | | P | S | Si | Cr | | Mo | Cu | Ni | V | C.E. | Yield Strength | | Tensile Strength | | | | % Elongation (min) | |
| | | Min | Max | Min | Max | Max | Max | Min | Max | Min | Max | Max | Max | Max | Min | Max | Min | Max | | | | | |
| IS:1161 | E & S | - | 0.12 | - | 0.60 | 0.040 | - | - | - | - | - | - | - | - | - | 30,500 | 210 | 48,000 | 330 | - | 20 | N.A | 1) % El upto 25mm NB for all grades = 12 min. 2) Flattening distance between plates for Weld = 75%, 85%, 85% and for Parent 60%, 75%, 75% for Grades YST-210, 240 and 310 respectively. |
| IS:1239 | E & S | - | 0.20 | - | 1.30 | 0.040 | 0.040 | - | - | - | - | - | - | - | - | - | 46,500 | 320 | - | - | 12 upto 25 mm NB 20, above 25 mm NB G.L. = 5.65 √Area | 5 Mpa | |
| IS:1914 | S | 0.08 | 0.25 | 0.35 | 1.40 | 0.050 | 0.050 | - | 0.35 | - | - | - | - | - | - | 35,200 | 242 | 64,000 | 440 | 84,000 | 580 | P = 2 S t/D (Max), 7 MPa (min.) S = Stress 40% of S.M.T.S | |
| IS:320 | E | 0.08 | 0.25 | 0.35 | 1.40 | 0.050 | 0.050 | - | 0.35 | - | - | - | - | - | - | 25,500 | 176 | 46,500 | 320 | 70,000 | 480 | | |
| IS:360 | E | 0.08 | 0.25 | 0.35 | 1.40 | 0.050 | 0.050 | - | 0.35 | - | - | - | - | - | - | 28,500 | 198 | 52,000 | 360 | 72,500 | 500 | | |
| IS:2416 | S | 0.08 | 0.25 | 0.35 | 1.40 | 0.050 | 0.050 | - | 0.35 | - | - | - | - | - | - | 29,000 | 201 | 58,000 | 402 | 72,500 | 500 | P = 2 S t/D (Max), 7 MPa (min.) S = Stress 40% S.M.T.S | |
| IS:310 | E | 0.08 | 0.25 | 0.35 | 1.40 | 0.050 | 0.050 | - | 0.35 | - | - | - | - | - | - | 22,000 | 152 | 44,000 | 304 | 58,000 | 402 | | |
| IS:360 | E | 0.08 | 0.25 | 0.35 | 1.40 | 0.050 | 0.050 | - | 0.35 | - | - | - | - | - | - | 26,000 | 177 | 51,000 | 353 | 65,500 | 451 | | |
| IS:3589 | E & S | - | 0.16 | - | 1.20 | 0.040 | 0.040 | - | - | - | - | - | - | - | - | 28,000 | 195 | 22,000 | 330 | - | - | Flattening Test - no opening shall occur in weld until the distance between two plates less than 5 Mpa | |
| IS:410 | E | - | 0.20 | - | 1.30 | 0.040 | 0.040 | - | - | - | - | - | - | - | - | 34,000 | 235 | 59,500 | 410 | - | - | S = Stress (60% of min. SMYS) | |
| IS:450 | E | - | 0.25 | - | 1.20 | 0.040 | 0.040 | - | - | - | - | - | - | - | - | 40,000 | 275 | 65,000 | 450 | - | - | | |
| IS:3601 | S | - | - | - | - | 0.060 | 0.060 | - | - | - | - | - | - | - | - | 45,000 | 310 | 78,000 | 540 | - | - | | |
| IS:4270 | E & S | - | - | - | - | 0.040 | 0.040 | - | - | - | - | - | - | - | - | 34,000 | 235 | 59,500 | 410 | - | - | P = 280 t/D for Fe 410 P = 350 t/D for Fe 450 Max Pressure applied shall be 7 MPa | |
| IS:11714 | S | 0.06 | 0.18 | 0.27 | 0.63 | 0.048 | 0.058 | - | - | - | - | - | - | - | - | 26,000 | 179 | 47,000 | 324 | - | - | | |
| IS:9295 | E | - | - | - | - | 0.06 | 0.06 | - | - | - | - | - | - | - | - | 30,500 | 210 | 48,000 | 330 | - | - | 1. Drift test = minimum increase in OD after expansion shall be 2.5% 2. Flattening distance between plates for weld = 75% and for parent = 60% | |

P: Hydrostatic Test Pressure (MPa) D: Specified Outside Diameter (mm) S.M.T.S: Specified Min. Tensile Strength
E: ERW (Electric Resistance Welded) S: Seamless S.M.Y.S: Specified Min. yield Strength t: Specified Wall Thickness (mm)

CHEMICAL COMPOSITION & MECHANICAL PROPERTIES

DIN

| Specification | Type | Grade | Chemical Composition (%) | | | | | | | | | | | | | | Mechanical Properties | | | | | | Hydrostatic Test Pressure | Impact | | |
|---------------|------|----------|--------------------------|------|------|-------|-------|-------|-------|------|------|------|------|-----|-----|-----|-----------------------|--|--|----------------------|----------|--------------------|---------------------------|--|--------------------|--------------------|
| | | | C | | Mn | | P | S | | Si | Cr | | Mo | | Cu | Ni | V | Yield Strength | | Tensile Strength | | % Elongation (min) | | | | |
| | | | Min | Max | Min | Max | Max | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Long | | | Trans | |
| DIN 1629 | S | St-37.0 | - | 0.17 | - | - | - | 0.040 | 0.040 | - | - | - | - | - | - | - | - | 235 for WT upto 16 mm 225 for WT 16 - 40 mm | 350 | 480 | 25 | 23 | 50 Bar | | | |
| | | | - | 0.21 | - | - | 0.040 | 0.040 | - | - | - | - | - | - | - | - | - | - | 275 for WT upto 16 mm 265 for WT 16 - 40 mm | 420 | 550 | 21 | | | 19 | |
| | | | - | 0.22 | - | - | 0.040 | 0.035 | - | - | - | - | - | - | - | - | - | - | 355 for WT upto 16 mm 345 for WT 16 - 40 mm | 500 | 650 | 21 | | | 19 | |
| DIN 1630 | S | St-37.4 | - | 0.17 | 0.35 | - | 0.040 | 0.040 | - | 0.35 | - | - | - | - | - | - | - | 235 for WT upto 16 mm 225 for WT 16 - 40 mm | 350 | 480 | 25 | 23 | 80 bar | Longitudinal: 43 Joules Transverse: 27 Joules | | |
| | | | 0.20 | 0.44 | 0.40 | - | 0.040 | 0.040 | - | 0.35 | - | - | - | - | - | - | - | - | 275 for WT upto 16 mm 265 for WT 16 - 40 mm | 420 | 550 | 21 | | | 19 | |
| | | | 0.22 | 0.52 | 1.60 | - | 0.040 | 0.035 | - | 0.55 | - | - | - | - | - | - | - | - | 355 for WT upto 16 mm 345 for WT 16 - 40 mm | 500 | 650 | 21 | | | 19 | |
| DIN 2391 | S | St-30.5I | - | 0.10 | - | 0.55 | 0.025 | 0.025 | - | 0.30 | - | - | - | - | - | - | - | NBK: 215 GBK: - | NBK: 290 GBK: 280 | NBK: 420 | NBK: 30 | NBK: 30 | Not Specified | | | |
| | | | - | 0.10 | - | 0.55 | 0.025 | 0.025 | - | 0.05 | - | - | - | - | - | - | - | - | NBK: 215 GBK: - | NBK: 290 GBK: 280 | NBK: 420 | NBK: 30 | | | NBK: 30 | |
| | | | - | 0.17 | 0.40 | - | 0.025 | 0.025 | - | 0.35 | - | - | - | - | - | - | - | - | NBK: 340 GBK: 315 | NBK: 470 | NBK: 25 | GBK: 25 | | | NBK: 25 GBK: 25 | |
| | | | - | 0.21 | 0.40 | - | 0.025 | 0.025 | - | 0.35 | - | - | - | - | - | - | - | - | - | NBK: 440 GBK: 390 | NBK: 570 | NBK: 21 | | | GBK: 21 | NBK: 21 GBK: 21 |
| | | | - | 0.22 | - | 1.60 | 0.025 | 0.025 | - | 0.55 | - | - | - | - | - | - | - | - | - | NBK: 355 GBK: - | NBK: 630 | NBK: 22 | | | GBK: 22 | NBK: 22 GBK: 22 |
| DIN 17175 | S | St-35.8 | - | 0.17 | 0.40 | 0.80 | 0.040 | 0.040 | 0.10 | 0.35 | - | - | - | - | - | - | - | 235 for WT ≤ 16 mm 225 for WT > 16 to 40 mm | 360 | 480 | 25 | 23 | 80 bar | Transverse: 34 Joules Transverse: 27 Joules Transverse: 34 Joules Transverse: 34 Joules | | |
| | | | - | 0.21 | 0.40 | 1.20 | 0.040 | 0.040 | 0.10 | 0.35 | - | - | - | - | - | - | - | - | 255 for WT ≤ 16 mm 245 for WT > 16 to 40 mm | 410 | 530 | 21 | | | 19 | |
| | | 0.10 | 0.18 | 0.40 | 0.70 | 0.035 | 0.035 | 0.10 | 0.35 | 0.70 | 1.10 | 0.45 | 0.65 | - | - | - | - | 290 for WT > 10 mm 305 for WT ≤ 10 mm | 440 | 590 | 22 | 20 | | | | |
| | | 0.12 | 0.20 | 0.40 | 0.80 | 0.035 | 0.035 | 0.10 | 0.35 | - | - | 0.25 | 0.35 | - | - | - | - | 270 for WT > 10 mm 285 for WT ≤ 10 mm | 450 | 600 | 22 | 20 | | | | |

GBK - Annealed NBK - Normalised S - Seamless E - ERW (Electric Resistance Welded)

TOLERANCE ON OUTSIDE DIAMETER, WALL THICKNESS, WEIGHT AND LENGTH OF PIPE

| SPECIFICATION | OUTSIDE DIAMETER | | WALL THICKNESS | WEIGHT | LENGTH | | | | | |
|------------------------------|--|--|---|--|---|-------------------------------------|--------------------------------------|--|--------------------------------------|-----|
| | PIPE BODY | PIPE ENDS (PLAIN END) | | | NOMINAL | AVG (MIN) | MINIMUM | MAXIMUM | ft. | Mtr |
| API 5L / ISO 3183 & ISO 3183 | $< 2\ 3/8"$ (60.3 mm) : +0.40mm, -0.80mm $\geq 2\ 3/8"$ (60.3mm) $\leq 24"$ (610mm) : ± 0.0075 D but max. of ± 3.20 mm for welded pipe Tolerance for Out of Roundness $< 2\ 3/8"$ (60.3 mm) : 1.20 mm $\geq 2\ 3/8"$ (60.3mm) $\leq 24"$ (610mm) : 0.020 D | Seamless : ≤ 4.0 mm WT : ± 0.6 mm, -0.5 mm > 4.0 mm WT to < 25.0 mm WT : ± 0.15 , -0.125t ≥ 25.0 mm WT : ± 3.7 mm or +0.1t (whichever is greater) -3.0 mm or 0.1t (whichever is greater) ERW ≤ 5.0 mm WT : ± 0.5 mm > 5.0 mm WT to < 15.0 mm WT : ± 0.1 t ≥ 15.0 mm WT : ± 1.5 mm | Single Length of Pipe : $\pm 10\%$, -3.5% Carloads ≥ 20 Ton : -1.75% Special Plain End Pipe : $\pm 10\%$, -5% | 20 40 | 17.5 35.0 | 5.33 10.67 | 9 14 | 22.5 45.0 | 6.86 13.72 | |
| API 5CT | $< 4.1/2"$ (114.3 mm) OD : ± 0.031 (0.79mm) $\geq 4.1/2"$ (114.3 mm) OD : $\pm 1\%$ D, -0.5% D | N.A | + Not Limited -12.5% | Single Length Carloads $> 40,000$ lbs (18,144 kg) Carloads $< 40,000$ lbs (18,144 kg) | CASING TUBING | Range-1 16 - 25 (4.88 - 7.62) | Range-2 25 - 34 (7.62 - 10.36) | Range-3 34 - 48 (feet) (10.36 - 14.63) (mtr) | 20 - 24 28 - 32 38 - 42 (feet) | |
| IS:1239 Pt-I BS:1387 | As per Table of relevant specification | N.A | Light : $\pm 10\%$ Medium & Heavy : $\pm 10\%$ Note : For IS:1239 Seamless Pipes, Tol. Shall be -12.5%, + not limited | Carload 10 MT Light : $\pm 7.5\%$, -5% 10 MT, Med. & Heavy : $\pm 7.5\%$ Single Tube Light : $\pm 10\%$, -8% Med & Heavy : $\pm 10\%$ | - - - | - - - | - - - | - - - | - - - | |
| IS:3589 | Upto 508 mm O.D. : Welded : $\pm 0.75\%$ Seamless : $\pm 1.0\%$ | N.A | Welded : $\pm 10\%$ Seamless : $\pm 20\%$, -12.5%, | Carload 10 MT & above : $\pm 7.5\%$ | Single Random Length - 4 to 7 mtr. Double Random Length - 7 to 14 mtr. | - - - | - - - | - - - | - - - | |
| IS:4270 | 114.30 mm - 508.0 mm OD : $\pm 1.0\%$ | N.A | Welded - Upto 406.4 mm O.D. : $\pm 15\%$, -12.5% Above 406.4 mm O.D. : $\pm 15\%$, -10% Seamless : $\pm 20\%$, -12.5% | +10%, -8% | - - - | - - - | - - - | - - - | - - - | |
| IS:1161 | Upto 483mm O.D. : ± 0.40 mm, -0.80 mm Over 483mm : $\pm 1.0\%$ | N.A | Welded : \pm not limited, -10% Seamless : \pm Not Limited, -12.5% | Carload 10MT Light : $\pm 5\%$ 10 MT, Med. & Heavy : $\pm 7.5\%$ Single Tube Light : $\pm 10\%$, -8% Med & Heavy : $\pm 10\%$ | - - - | - - - | - - - | - - - | - - - | |
| IS:9295 | $\pm 0.8\%$ | N.A | $\pm 10\%$ | Single Length : $\pm 10\%$ Carload per 10 tonnes : $\pm 7.5\%$ | - - - | - - - | - - - | - - - | - - - | |
| IS:1914 Pt-2,3&4 | Welded & CFS : ± 0 , -1% HFS : ≤ 63 mm O.D. : ± 0.40 mm, -0.80 mm HFS : > 63 mm O.D. : $\pm 1.0\%$ | N.A | Welded & CFS : $\pm 10\%$, -5% HFS ≤ 63 mm O.D. : $\pm 17.5\%$, -7.5% HFS > 63 mm O.D. : $\pm 15\%$, -5% | N.A | - - - | - - - | - - - | - - - | - - - | |

TOLERANCE ON OUTSIDE DIAMETER, WALL THICKNESS, WEIGHT AND LENGTH OF PIPE

| SPECIFICAT- ION | OUTSIDE DIAMETER | | WALL THICKNESS | WEIGHT | LENGTH | | | | | | |
|------------------------------|---|-----------------------|--|------------------------|--|-----|------------------|-----|----------------|-----|----------------|
| | PIPE BODY | PIPE ENDS (PLAIN END) | | | NOMINAL ft. | Mtr | AVG (MIN) ft. | Mtr | MINIMUM ft. | Mtr | MAXIMUM ft. |
| IS:2416 Pt-II,III & IV | Welded : ± 0.75% (±0.30mm min) HFS : ≤ 63mm O.D.: +0.40 mm, -0.80 mm HFS : > 63mm O.D. : ±1.0% | N.A | Welded : +10%, -5% HFS : +17.5%, -7.5% , CFS : +10%, -5% | N.A | Tolerance Upto 9 Mtr, + 3 mm, - 0 Above 9 mtr, + 6 mm, - 0 | | | | | | |
| IS:11714 Pt-2&3 | As per Table of relevant specification | N.A | Welded : ±18%, -0 Seamless : As per table of relevant specification | +10%, -0 | Tolerance -Below 50 mm O.D. : + 3.2 mm, - 0 50 mm O.D. & above : + 4.8 mm, - 0 | | | | | | |
| BS:3059 Pt I | Welded : ± 0.75% (±0.30 mm min) HFS : ± 1% (± 0.50 mm min) CFS : ± 0.5% (± 0.10 mm. Min) | N.A | Welded : Upto 3.25 mm WT, ± 10% Over 3.25 mm WT, ± 7.5% HFS : ± 12.5% CFS : ± 7.5% | N.A | Tolerance -Upto 6Mtr: + 6 mm, - 0 Above 6 mtr, 1.5 mm will increase for every 3 mtrs increase of length (12 mm max.) | | | | | | |
| BS:3059 Pt II | ± 0.75% (± 0.30 mm min) - Class 2 | N.A | ± 10% (excluding weld area) - Class 2 | N.A | | | | | | | |
| BS:6323 Pt V | As per Table of relevant specification | N.A | Less than 3 mm WT : ± 10% 3 mm WT & above : ± 8% | N.A | Tolerance Upto 0.5 mtr : + 2 mm, - 0 above 0.5 to 2.0 mtr. : + 3 mm, - 0 above 2.0 to 5.0 mtr. : + 5 mm, - 0 above 5.0 to 7.0 mtr. : + 10 mm, - 0 above 7.0 mtr. : as agreed | | | | | | |
| BS:EN 10216-1 | For D ≤ 219.1 mm: ± 1% or ± 0.5 mm whichever is greater For D < 219.1 mm: ± 1% or ± 0.5 mm whichever is greater | NA | For a T/D ratio ≤ 0.025 > 0.025 ≤ 0.050 > 0.050 ≤ 0.10 > 0.10 ± 12.5% or ± 0.4 mm, whichever is greater | According to ENV 10220 | Tolerance on Exact Length L ≤ 6000 mm : + 10mm, -0 6000 < L ≤ 12000 mm : + 15 mm, -0 L > 12000 mm : + by agreement, -0 | | | | | | |
| BS:EN 10216-2 | HFS For D ≤ 219.1 mm: ± 1% or ± 0.5 mm whichever is greater For D < 219.1 mm: ± 1% or ± 0.5 mm whichever is greater CFS ± 0.5% or ± 0.3 mm, whichever is greater | NA | HFS For a T/D ratio ≤ 0.025 > 0.025 ≤ 0.050 > 0.050 ≤ 0.10 > 0.10 ± 12.5% or ± 0.4 mm, whichever is greater ± 20% ± 15% ± 12.5% ± 10% CFS ± 10% or 0.2 mm, whichever is greater | According to ENV 10220 | Tolerance on Exact Length L ≤ 6000 mm : + 10mm, -0 6000 < L ≤ 12000 mm : + 15 mm, -0 L > 12000 mm : + by agreement, -0 | | | | | | |

E= ERW S= Seamless HFS= Hot Finished Seamless CFS = Cold Finished Seamless D = Outside Diameter T/WT = Wall Thickness L= Length

TOLERANCE ON OUTSIDE DIAMETER, WALL THICKNESS, WEIGHT AND LENGTH OF PIPE

| SPECIFICATION | TYPE | OUTSIDE DIAMETER | | PIPE ENDS (PLAIN END) | WALL THICKNESS | WEIGHT | LENGTH | | | | | | |
|---------------|-------|--|--|-----------------------|--|--|--|-----------|---------|---------|-----|------|--|
| | | PIPE BODY | | | | | NOMINAL | AVG (MIN) | MINIMUM | MAXIMUM | | | |
| ASTM A-53 | E & S | 1-1/2" NPS & under : ± 0.40 mm : ± 1.0% | | N.A | At any point: - 12.5% (max) | ± 10% | ft. | Mtr | ft. | Mtr | ft. | Mtr | |
| ASTM A106 | S | 1/8" to 1-1/2" : ± 0.40 mm, : ± 0.80 mm Over 1-1/2" to 4" : ± 1.60 mm, - 0.80 mm Over 4" to 8" : ± 2.40 mm, - 0.80 mm Over 8" to 18" : ± 3.20 mm, - 0.80 mm Over 18" to 26" | | N.A | At any point: - 12.5% (max) | Single Length of Pipe + 10%, - 3.5% | 20 | 6 | 16 | 4.88 | 22 | 6.71 | |
| ASTM A-179 | S | Hot Finished Seamless Tubes 4" (101.6mm & under) : ± 0.40 mm, - 0.80 mm Over 4" to 7 1/2" including : ± 0.40 mm, - 1.20 mm (101.6 to 190.5 mm) Over 7 1/2" to 9" (190.50 to 228.60 mm) : ± 0.40 mm, - 1.60 mm Welded and cold finished Seamless tubes < 1" (25.4 mm) : ± 0.10 mm 1" (25.4 mm) to 1-1/2" (38.1mm) incl. : ± 0.15 mm > 1-1/2" (38.1mm) to 2" (50.8mm) excl. : ± 0.20 mm 2" (50.8 mm) to 2-1/2" (63.5 mm) incl. : ± 0.25 mm 2-1/2" (63.5mm) to 3" (76.2mm) excl. : ± 0.30 mm 3" (76.2 mm) to 4" (101.6 mm) incl. : ± 0.38 mm > 4" (101.6 mm) to 7-1/2" (190.5 mm) incl. : ± 0.38 mm, - 0.64 mm > 7-1/2" (190.5mm) to 9" (228.6 mm) incl. : ± 0.38 mm, - 1.14 mm | | N.A | HFS Tubes O.D. ≤ 101.06 mm & WT < 2.40 mm : + 40%, - 0 WT 2.40 to 3.80 mm incl. : + 35%, - 0 WT 3.80 mm to 4.60 mm incl. : + 33%, - 0 WT > 4.60 mm : + 28%, - 0 OD > 101.60 mm & WT 2.40 to 3.80 mm incl. : + 35%, - 0 WT 3.80 to 4.60 mm incl. : + 33%, - 0 WT > 4.60 mm : + 28%, - 0 | HFS: + 16%, - 0 | Exact Length Tolerance: H.F.S. Tubes: + 5mm, - 0 | | | | | | |
| ASTM A-178 | E | | | N.A | Welded Tubes (for all sizes) : + 18%, - 0 CFS Tubes: ≤ 1-1/2" O.D. : + 20%, - 0 > 1-1/2" O.D. : + 22%, - 0 | Welded : + 10%, - 0 CFS Tubes: ≤ 1-1/2" O.D. : + 12%, - 0 > 1-1/2" O.D. : + 13%, - 0 | | | | | | | |
| ASTM A-334 | E & S | 1/8" to 1-1/2" : ± 0.40 mm, : ± 0.79 mm Over 1-1/2" to 4" : ± 1.59 mm, - 0.79 mm Over 4" to 8" incl. : ± 2.38 mm, - 0.79 mm Over 8" to 12" : ± 1.0% of O.D. Over 12" | | N.A | 1/8" to 2 1/2" incl. for all T/D ratio : + 20%, - 12.5% > 2 1/2" for T/D ≤ 5% : + 22.5%, - 12.5% > 2 1/2" for T/D > 5% : + 15%, - 12.5% | Single pipe NPS 12 & under : + 10%, - 3.5% Single pipe over NPS 12 : + 10%, - 5% | Specified Length : + 6 mm, - 0 | | | | | | |
| ASTM A-333 | E & S | 1/8" to 1-1/2" incl. : ± 0.40 mm, - 0.80 mm Over 1-1/2" to 4" incl. : ± 0.80 mm Over 4" to 8" incl. : ± 1.60 mm, - 0.80 mm Over 8" to 18" incl. : ± 2.40 mm, - 0.80 mm Over 18" to 26" incl. : ± 3.20 mm, - 0.80 mm | | N.A | At any point : - 12.5% (max.) | Single pipe NPS 12 & under : + 10%, - 3.5% Single pipe over NPS 12 : + 10%, - 5% | 20 | 6 | 16 | 4.88 | 22 | 6.71 | |
| ASTM A-519 | S | Upto 76.17 mm : ± 0.51 mm 76.20 - 114.27 mm : ± 0.64 mm 114.30 - 152.37 mm : ± 0.79 mm 152.40 - 190.47 mm : ± 0.94 mm 190.50 - 228.57 mm : ± 1.14 mm 228.6 - 273.05 mm : ± 1.27 mm | | Not Specified | Outside Diameter Wall Thickness < 15% of OD ≥ 15% of OD Upto 76.19 mm : ± 12.5% ± 10% 76.2 - 152.37 mm : ± 10% ± 7.5% 152.4 - 273.05 mm : ± 10% ± 10% | Not specified | Pipe Length < 1.20 mtr : + 1.6 mm, - 0 > 50.8 - 101.6 mm : + 2.4 mm, - 0 > 101.6 mm : + 3.2 mm, - 0 1.20 - 3.0 mtr : + 2.4 mm, - 0 > 50.8 mm : + 3.2 mm, - 0 3.0 - 7.3 mtr : All Sizes > 7.30 mtr : All Sizes Tolerance + 1.6 mm, - 0 + 2.4 mm, - 0 + 3.2 mm, - 0 + 2.4 mm, - 0 + 3.2 mm, - 0 + 4.8 mm, - 0 for each 3.0 mtr. above 7.3 mtr. but max 12.7 mm | | | | | | |

TOLERANCE ON OUTSIDE DIAMETER, WALL THICKNESS, WEIGHT AND LENGTH OF PIPE

| SPECIFICATION | TYPE | OUTSIDE DIAMETER | | WALL THICKNESS | WEIGHT | LENGTH | | | | | |
|-----------------------|-------|---|---|---|--|--|-----------|---------|---------|-----|-----|
| | | PIPE BODY | PIPE ENDS (PLAIN END) | | | NOMINAL | AVG (MIN) | MINIMUM | MAXIMUM | | |
| | | | | | | ft. | Mtr | ft. | Mtr | ft. | Mtr |
| ASTM A-589 | E & S | For NPS 1 1/2" & under: variation should not be more than 0.40 mm ± 1% of OD | Not Specified | At any point: - 12.5% (max) | ± 5% | Single Random Length: For Drive, Reamed & Drifted and Water Well Casing Pipe: 4.9 - 6.7 mtrs Random Length: For Driven Well Pipe : 0.9 to 1.8 mtrs or 1.8 - 3.0 mtrs, as specified Tolerance - As agreed | | | | | |
| RDSO ETI/OHE/11(5/89) | E & S | 33.7mm O.D. : + 0.30mm, - 0.1mm 38.0 mm O.D. : + 0.32mm, - 0.2mm 49.0 mm O.D. : + 0.32mm, - 0.2mm | 28.4 (Std. ID) & 27.70 (Min ID) 29.9 (Std. ID) & 29.58 (Min ID) 40.9 (Std. ID) & 40.58 (Min ID) | - 0.31 mm, + not limited - 0.35 mm, + not limited - 0.35 mm, + not limited | N.A | | | | | | |
| DIN 1629 and DIN 1630 | S | ≤ 100 mm OD : ± 1% of OD (0.5 mm max) > 100 mm OD : ± 1% of OD | ≤ 100 mm OD : ± 0.40 mm > 100 mm OD : ± 0.5 mm ≤ 200 mm : ± 0.5% > 200 mm OD : ± 0.6% | OD ≤ 130 mm : WT ≤ 2.0 mm : +15%, -10% WT > 2.0 mm ≤ 4.0 mm : + 12.5%, -10% WT > 4.0 mm : ± 9% OD > 130 mm ≤ 320 mm : WT ≤ 0.05 D : + 17.5%, - 12.5% WT > 0.05 D ≤ 0.11 D : ± 12.5% WT > 0.11 D : ± 10.0% OD > 320 mm < 660 mm : WT ≤ 0.05 D : + 20%, - 15% WT > 0.05 D ≤ 0.09 D : + 15%, - 12.5% WT > 0.09 D : + 12.5%, - 10% | Single Length of Pipe : +1.2%, -8% For Car load not less than 10 ton : +1.0%, -5% | Specified length : ± 500 mm Exact Length : Upto 6 Mtr : + 10 mm, - 0 6 - 12 mtrs : + 15 mm, - 0 Above 12 mtr : As agreed | | | | | |
| DIN 2391 | S | As per Table of relevant specification | Not specified | ± 10% | Not specified | Random length : 4 - 7 mtrs. Exact Length : Upto 500 mm : + 2mm, - 0 500 - 2000 mm : + 3mm, - 0 Above 2000 - 5000 mm : + 5mm, - 0 Above 5000 - 7000 mm : + 10mm, - 0 Above 7000 mm : As agreed | | | | | |
| DIN 17175 | S | OD ≤ 100 mm : ± 0.75% (± 0.5 mm min) OD > 100 mm ≤ 320 mm : ± 0.9% OD > 320 mm : ± 1.0% | OD ≥ 45mm < 100 : ± 0.40mm OD > 100mm ≤ 200 mm : ± 0.5% OD > 200mm : ± 0.6% | OD ≤ 130 mm : WT ≤ 2.0 mm : +15%, -10% WT > 2.0 mm ≤ 4.0 mm : + 12.5%, -10% WT > 4.0 mm : ± 9% OD > 130 mm ≤ 320 mm : WT ≤ 0.05 D : + 17.5%, - 12.5% WT > 0.05 D ≤ 0.11 D : ± 12.5% WT > 0.11 D : ± 10.0% OD ≤ 320 mm ≤ 660 mm : WT ≤ 0.05 D : + 22.5%, - 12.5% WT > 0.05 D ≤ 0.09 D : + 15%, - 12.5% WT > 0.09 D : + 12.5%, - 10% | Single Length of Tube : +10%, - 8% For Car load of min. 10 tons : + 10%, - 5% | Random Length : ± 500 mm Exact Length : Upto 6 Mtr : + 10 mm, - 0 6 - 12 mtrs : + 15 mm, - 0 Above 12 mtr : As agreed | | | | | |

E=ERW S= Seamless HFS= Hot Finished Seamless CFS= Cold Finished Seamless D/OD= Outside Diameter T/WT = Wall Thickness

Conversion Tables & Formulas

Conversion Tables

| Pressure | | Energy | |
|-------------------------|--|---|------------------------------------|
| 1 Atmosphere | = 14.7 PSI | 1 Foot - Pound (Ft-Lb) | = 1.3558 Joules for Impact Energy |
| 1 Atmosphere | = 1.033 kg/cm ² | 1 Joules | = 0.736 foot - pound |
| 1 Bar | = 100000 N/mtr ² or 100 KPa | 1 Foot - Pound | = 4.448222 Newton |
| 1 Bar | = 0.1 N/mm ² | 1 Foot - Pound | = 0.1383 kg - mtr |
| 1 Bar | = 1.02 kg/cm ² | 1 Foot - Pound | = 1.3558 Newton Meter (for Torque) |
| 1 Bar | = 14.504 PSI | 1 Horse Power | = 746 Watt |
| 1 kg/cm ² | = 0.9804 Bar | 1 Watt | = 0.00134 Horse Power |
| 1 kg/cm ² | = 14.22 PSI | Length | |
| 1 Kg/mm ² | = 9.81 MPa | 1 Kilometer | = 1000 meter |
| 1 PSI | = 0.0703 kg/cm ² | 1 Meter | = 100 centimeter |
| 1 PSI | = 0.0689 Bar | 1 Meter | = 1000 mm |
| 1 PSI | = 6.895 KPa | 1 Meter | = 3.28 foot |
| 1 PSI | = 0.006895 MPa | 1 Foot | = 0.3048 meter |
| 1 MPa | = 145.032 PSI | 1 Foot | = 304.8 mm |
| 1 MPa | = 10.1992 kg/cm ² | 1 Foot | = 12 inch |
| 1 MPa | = 9.9992 Bar | 1 Inch | = 25.4 mm |
| 1 MPa | = 1000 KPa | 1 mm | = 0.0394 inch |
| 1 MPa | = 1 N/mm ² | 1 Thou | = 0.001 inch |
| 1 MPa | = 0.102 kg/mm ² | 1 Micron | = 0.001 mm |
| 1 KPa | = 0.145032 PSI | 1 Yard | = 0.9144 meter |
| 1 KPa | = 0.001 MPA | 1 Meter | = 1.0936 yard |
| 1 KPa | = 0.01 Bar | 1 Yard | = 3 feet |
| 1 N/mm ² | = 10 Bar | 1 Mile | = 5280 feet |
| 1 N/mm ² | = 10.2 kg/cm ² | 1 Mile | = 1760 yard |
| 1 N/mm ² | = 145.032 PSI | Area | |
| 1 N/mm ² | = 1 MPa | 1 Square Yard | = 0.8361274 Square meter |
| 1 N/mm ² | = 0.102 kg/mm ² | 1 Square Yard | = 9 Square feet |
| 1 Ton/inch ² | = 1.575 kg/mm ² | 1 Square Inch | = 645.16 Square millimeter |
| Weight | | 1 Square Feet | = 0.0929 Square meter |
| 1 kg. | = 2.205 pounds (Lb) | 1 Acre | = 4840 Square yard |
| 1 Pound | = 0.45359 kg. | 1 Square Mile | = 640 Acres |
| 1 Pound | = 16 ounces | Temperature | |
| 1 Pound/foot | = 1.48822 kg/mtr | i) C | = 5 (F-32) / 9 |
| 1 kg/mtr | = 0.6714 pound/foot | ii) F | = 32 + 9 C / 5 |
| 1 kg | = 9.81 Newton | iii) C / 5 | = (F - 32) / 9 |
| 1 Newton | = 0.102 kg | C = Temperature in deg. Celsius F = Temperature in deg. Fahrenheit | |

Conversion Tables & Formulas

Formulas

1 Carbon Equivalent (Ref. API 5L)

a) When the Carbon Content is $\leq 0.12\%$

$$CE_{pcm} = C + \frac{Si}{30} + \frac{Mn}{20} + \frac{Cu}{20} + \frac{Ni}{60} + \frac{Cr}{20} + \frac{Mo}{15} + \frac{V}{10} + 5B$$

b) When the Carbon content is $> 0.12\%$

$$CE_{IW} = C + \frac{Mn}{6} + \frac{(Cr + Mo + V)}{5} + \frac{(Ni + Cu)}{15}$$

2 Test Pressure (Ref. API 5C3)

a) Hydrostatic Test Pressure

Hydrostatic test pressure for plain - end pipe, extreme - line casing and integral - joint tubing are calculated by using the following formula

$$P = \frac{2St}{D}$$

b) Internal Yield (Burst) Pressure

$$P_i = 0.875 (2 \times Y_p \times t / D)$$

Where;

P = Hydrostatic test pressure in PSI

P_i = Min. internal yield pressure in PSI

S = Fiber stress corresponding to the percent of specified yield strength

t = Specified wall thickness in inches

D = Specified outside diameter in inches

Y_p = Specified min. yield strength in PSI

3 Weight for Plain End Pipes (Ref. API 5L/ASTM)

The plain end linear mass in SI Units is calculated by using the following formula

$$W_{pe} = 0.02466 (D - t) t$$

Where;

W_{pe} is the plain end linear mass, expressed in kg/Mtr and rounded to nearest 0.01 kg/Mtr

D is the specified outside diameter, expressed in millimetres

t is the specified wall thickness, expressed in millimetres

4 Weight for Full Length Pipes

$$WL = (W_{pe} \times L) + ew$$

Where;

WL = Calculated weight of full length pipe (kg.)

W_{pe} is the plain end linear mass, expressed in Kg/Mtr and rounded to nearest 0.01 kg/Mtr

L = Length of Pipe (mtr)

ew = Weight gain or loss due to end finish (kg)

Note : For Plain End Pipe ew = 0

5 Weight of Billet

$$\text{Weight of Billet (Kg/Mtr)} : 0.0061654 \times (\text{Dia. mm})^2$$

6 Standard Drift Size (Ref. API 5CT)

| Product | Drift Mandrel Size(Min.) | |
|---------------------|--------------------------|---------------|
| | Length (mm) | Diameter (mm) |
| Casing | | |
| < 9 5/8 | 152 | d - 3.18 |
| ≥ 9 5/8 to ≤ 13 3/8 | 305 | d - 3.97 |
| > 13 3/8 | 305 | d - 4.76 |
| Tubing | | |
| ≤ 2 7/8 | 1067 | d - 2.38 |
| > 2 7/8 | 1067 | d - 3.18 |

Where; d - is inside diameter expressed in millimetres.

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