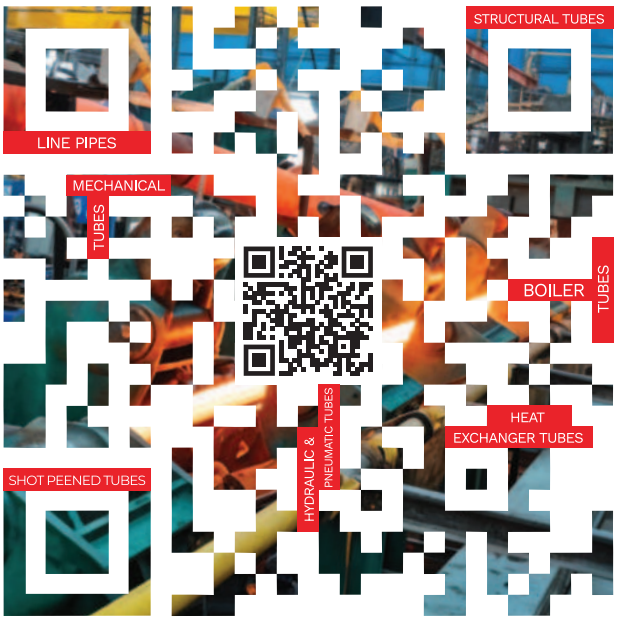
Perfect *blend* of
quality & integrity

HEAVY METAL & TUBES (INDIA) PVT. LTD.

A SELF-RELIANT COMPANY, EMBODYING THE **'MAKE IN INDIA' VISION** WITH **UNMATCHED QUALITY AND PERFORMANCE**



- LINE PIPES
- BOILER TUBES
- MECHANICAL TUBES
- STRUCTURAL TUBES
- SHOT PEENED TUBES
- HEAT EXCHANGER TUBES
- HYDRAULIC & PNEUMATIC TUBES
- "U" TUBES & ARBOR COILS

CARBON, ALLOY & STAINLESS STEEL

All under One Brand

UNIT 1

COLD DRAWN STAINLESS STEEL PLANT

(30,600 SQ. M)

UNIT 2

COLD DRAWN CARBON & ALLOY STEEL PLANT

(13,500 SQ. M)

UNIT 3

HOT & COLD FINISH CARBON & ALLOY STEEL PLANT

(30,100 SQ. M)

ABOUT US

Heavy Metal & Tubes (India) Pvt. Ltd., established in 1978, is one of India's leading manufacturers of Stainless Steel, Carbon Steel, and Alloy Steel tubes and pipes. With over four decades of expertise, we have built a strong foundation based on quality, innovation, and customer trust.

We operate three advanced manufacturing facilities in Gujarat, Western India. Each plant is equipped with cutting-edge machinery and comprehensive testing capabilities, ensuring products that meet the most stringent national and international standards, as well as customized client specifications.

Our success is driven by our highly experienced and skilled workforce, who bring deep technical knowledge and a commitment to excellence in every process from raw material selection to final inspection.

Our facilities and products are approved and trusted by major EPC contractors, PMCs, multinational corporations, consultants, TPIs, OEMs, and end-users worldwide.

With a legacy that spans over 45 years, Heavy Metal & Tubes continues to deliver high-quality, performance-driven solutions, backed by deep industry experience and a passion for precision.

CARBON / ALLOY / STAINLESS STEEL FROM ONE BRAND

69,000
METRIC TON PER ANNUM

75,000
SQ. METER COVERED AREA

30+
COUNTRIES SERVED

1000+
EXPERIENCED TEAM MEMBERS

03
DEDICATED PLANTS

5MW
RENEWABLE POWER

SUSTAINABLE ENERGY. STRONGER STEEL

Clean Power Behind Every Tube & Pipe We Manufacture

As a responsible manufacturer of premium steel tubes and pipes, we are deeply committed to integrating sustainability into our core operations. By harnessing renewable energy, we're not just producing steel - we're shaping a cleaner, smarter industrial future.

Our dedicated wind and solar energy infrastructure powers a significant share of our manufacturing processes, helping reduce emissions, lower operational costs, and enhance long-term energy security.

WIND POWER

2.75 MW

SOLAR POWER

2.15 MW

These investments in green power directly support cleaner production of steel tubes and pipes delivering value to customers who prioritize sustainability in their supply chains. By embracing renewable energy at scale, we're enhancing business continuity, boosting energy independence, and supporting INDIA's vision of a sustainable industrial future.

Green Energy. Greener Steel. Greater Impact.

CORPORATE SOCIAL RESPONSIBILITY (CSR)

At Heavy Metal, we believe in giving back to the community that supports us. Our CSR initiatives reflect our commitment to inclusive growth and social development:

Supporting Rural Education & Healthcare: We have actively contributed to the development of school and hospital in nearby villages, ensuring access to quality education and medical care for underprivileged communities.

Blood Donation & Medical Camps: Regularly organized health check-ups and blood donation drives promote wellness and community bonding.

During the pandemic, **our team stepped up to distribute essential food supplies and hygiene kits** to affected families, ensuring no one was left behind during the crisis.

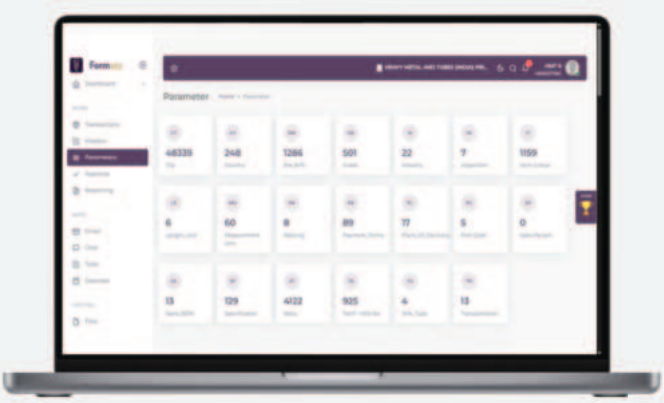
We continue to strive for meaningful change through every step we take beyond business.

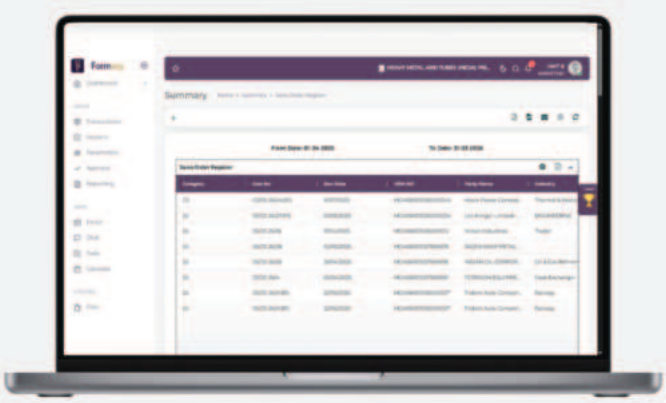
EMPOWERING OPERATIONS WITH TECHNOLOGY

At Heavy Metal, digital transformation is at the core of our operational excellence. In collaboration with Datanote, we have developed a customized Electronic Data Processing (EDP) system that seamlessly integrates all key functions of our business - from order processing and inventory management to production tracking and dispatch planning.

This robust EDP platform ensures:

- REAL-TIME DATA VISIBILITY
- STREAMLINED WORKFLOW ACROSS DEPARTMENTS
- IMPROVED ACCURACY AND TRACEABILITY
- FASTER DECISION-MAKING





With Datanote's powerful ERP backbone, our team can monitor, manage, and optimize operations more efficiently - supporting our goal of delivering quality tubes and pipes, on time, every time.

FROM PASSION TO OBSSESSION, *45+ Years* OF EVOLUTION

1978

- Heavy Metal's first unit was set up at Mumbai to manufacture cold drawn seamless carbon steel tubes & pipes.

1982

- The second plant was put up at Ankleshwar to manufacture cold drawn seamless carbon steel tubes & pipes.

1992

- Third plant was commissioned at Bileshwarpura, near Chhatral, to produce seamless carbon & alloy steel tubes and pipes.

1993

- Shree Reliable Tubes Pvt. Ltd. makes stainless steel tubes and pipes in Bileshwarpura.

2006

- Shifted Carbon and Alloy Steel cold drawn facility to Unit 2 with capacity expansion upto 24000 MTPA

2008

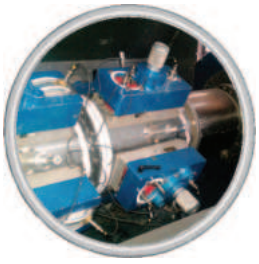
- New Bright Annealing furnace with 10 MTPD capacity commissioned in CS/AS div.

2009

- HMT initiated a major expansion to set up a state-of-the-art plant for Hot Finish Seamless Carbon and Alloy Steel Pipes & Tubes in Mandali, Gujarat.

2011

- HMT's Unit III began commercial production in June, with a 36,000 MTPA capacity, enabling it to meet rising demand in power, oil & gas, and engineering sectors.
- New 10 probe Rota Ultrasonic Testing machine is commissioned at SS Division.



1998

- HMT was incorporated as a limited company, merging Shree Reliable Tubes Pvt. Ltd. its Stainless-Steel Division.

2004

- India's 1st Hot Piercing Mill & Two pilger mills were added to the Stainless-Steel division.

2005

- Expansion of stainless-steel division was completed by tripling the capacity.

2012

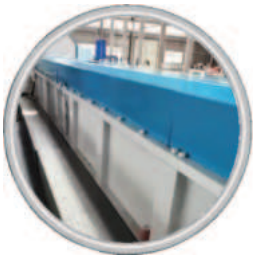
- Bright Annealing Furnace with 12 MTPD capacity is commissioned at SS Division.

2020

- Commissioned 4 pilger mills and 1 cold draw bench (12,000 MTPA capacity) at Unit-3 HFS Division.

2023

- Added 15 new pilger machines in SS Division taking the total to 31 pilgers.



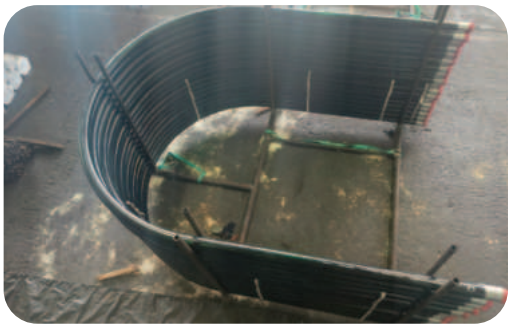
2024

- Started new piercing mill in our SS Div and 2 Shot Peening machines specifically targeting power sector demands.

2025

- Installed a 120-ton cold draw bench, pointing/swaging machine, 100 MTPD furnace, and Shot Blasting line at Unit-3 for heavy wall tube production.
- UT machines of all three units were upgraded to meet the ever-evolving stringent customer requirements.
- Installed a 160-ton cold draw bench with induction pointing machine at Unit-2 and commissioned an additional heavy pilger machine at Unit-1 (SS Division).

ACHIEVEMENTS



ARBOR COILS

MOC : ASTM A335 P9
101.4 mm OD x 5.74 mm WT
114.3 mm OD x 6.02 mm WT

Bend Dia:
3000mm (Radius 1500mm)
with Bevel ends

Tests & Inspection:
100% UT, Hydro, DP, Plane Testing, Ball Pass Test, PWHT

WHAT *Differentiates* HMT FROM OTHERS

Carbon Steel, Alloy Steel & Stainless Steel sourced from same mfr.

Duplex & Super Duplex, TP310/TP321H/TP347H/TP405/ TP410, Super S30432, Shot Peened Tubes

U-Tubes with max. hydro test pressure @700 Kg/CM² for critical applications.

SA334 Gr. 3, SA213 T5/T9/T91/T92

Capability to mfr. st. length tubes upto 34 Mtrs.

Special grades with quick delivery

MILESTONES

We take pride in our proven track record of delivering high-quality seamless tubes for critical applications across power, refinery, and chemical sectors. Highlighted below are some of our key milestones:

T-91 GRADE TUBES

- Supplied 900 MT to BHEL, Trichy for NTPC, Talcher Project (2×660 MW)
- Currently executing an additional 863 MT order for the same Client

T-92 & T-91 GRADE TUBES

- Successfully supplied 11 MT to NTPC, Gadarwara Project

T-12 GRADE TUBES

- Ongoing execution of 821 MT order to BHEL, Trichy for various NTPC projects

T-22 GRADE TUBES

- Currently executing a major 3000 MT order to BHEL, Trichy for NTPC applications

GR. A1 / T-22 / T-2 / TP-304H GRADE TUBES

- Exported 183 MT to a USA-based client
- Order value: USD 1.19 million

SUPER S30432 (SHOT PEENED) GRADE TUBES

- Booked order of 1150 MT order from BHEL, Trichy for NTPC Plants at Lara, Singrauli, SIPAT, and DVC Koderma (2×800 MW)

TP-347H (SHOT PEENED) GRADE TUBES

- Successfully executed 642 MT order for NTPC projects via BHEL, Trichy

TP-304N GRADE "U" TUBES

- Supplied 44 MT to BHEL, Bhopal for HP Heater Application
- Supplied more than 70,000 U tubes for Ultra Super Critical Power plants
- Tubes hydro-tested upto 625 Kg/cm^2 pressure

HEAVY WALL RIFLE TUBES

- Supplied SA210 Gr. C Tubes to NTPC, Singrauli Size: 63.5mm OD × 12.50 mm WT

P-91 GRADE TUBES

- Supplied to BHEL, Trichy in multiple sizes
  - 127 × 20 mm , 114.3 × 17.12 mm, 88.9 × 17 mm, 88.9 × 15.24 mm

TP-310 GRADE TUBES

- Executed 10 MT order for Tata Chemicals

TP-321 GRADE SPECIAL SHAPE BEND TUBES

- Pig Tails Supplied to BPCL upto 5 Radius

LONG LENGTH TUBES

- 27.5 Mtr. straight tubes in SA179 supplied to Brembana & Rolle, Italy

THE ONLY NTPC APPROVED MANUFACTURER FOR THE ENTIRE RANGE OF MATERIALS:

- Carbon Steel / Alloy Steel (up to T91 grade) / Stainless Steel (including Super 304)

UNIT 1

COLD DRAWN STAINLESS STEEL PLANT

At HMT, we operate a dedicated **Cold Drawn Stainless Steel Seamless Tube & Pipe Plant** spanning over **30,600 sq. m** of covered area, equipped with state-of-the-art technology to meet global quality standards.

Our manufacturing process begins with in-house production of high-quality seamless hollows. These are cold finished either through **32 Pilger Mills** or **4 Draw Benches**, utilizing precision dies and plugs to ensure tight dimensional tolerances and superior surface finish.

Key facilities include:

- **Hot Piercer**
- **32 Pilger Mills**
- **2 Bright Annealing Furnaces**
- **4 Draw Benches**

The tubes and pipes undergo stringent processes including **heat treatment, straightening, surface treatment,** and thorough **quality testing** to meet international specifications and customer-specific requirements. Final products are **marked, documented and packed** for global dispatch.

PRODUCTS

- Stainless Steel Seamless Tubes and Pipes
- "U" Tubes and Special Shapes
- Bright Annealed Tubes

MANUFACTURING RANGE

Outer Diameter (OD): 4 mm to 220 mm
Wall Thickness (THK): 0.5 mm to 25 mm
Length : Upto 34 Meters depending upon size

CAPACITY

9,000 MTPA

GRADE & SPECIFICATIONS

We offer tubes and pipes in a wide range of
stainless steel and special alloy grades including:
ASTM/ASME 213, 249, 268, 270, 312, 688, 376, 789, 790, ASTM A-269
Super 304, 304/L/H/LN, 310, 316/L/H/Ti/LN, 317/L, 321/H, 347/H, 405, 410, 904L
Duplex & Super Duplex (UNS 31803, 32205, 32750, 32760),
DIN & EN Grades: 1.4006, 1.4301, 1.4401, 1.4541, 1.4462, EN 10216-5, and more.
Other Specification / Grades can be supplied as per customer's requirements

FLOW CHART

Scan QR to Explore
All Flowchart Videos

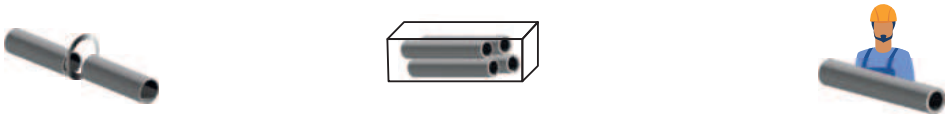
Round Bar > Round Bar Inspection > Piercing > Hollows/Mother Tubes > Drawing/Pilgering > Surface Treatment

Chemical & Mockup Test < Surface Treatment < Cutting < Straightening < Heat Treatment

Non-Destructive Test > Destructive Test > U Bending (if required) > Degreasing (U Tubes)

Hydro Testing < Heat Treatment of U Bend Portion (if required)

Final Cutting > Surface Treatment > Visual & Dimension Inspection



Marking < Visual & Dimension Inspection < Almen Testing < Shot Peening

Packing > Dispatch

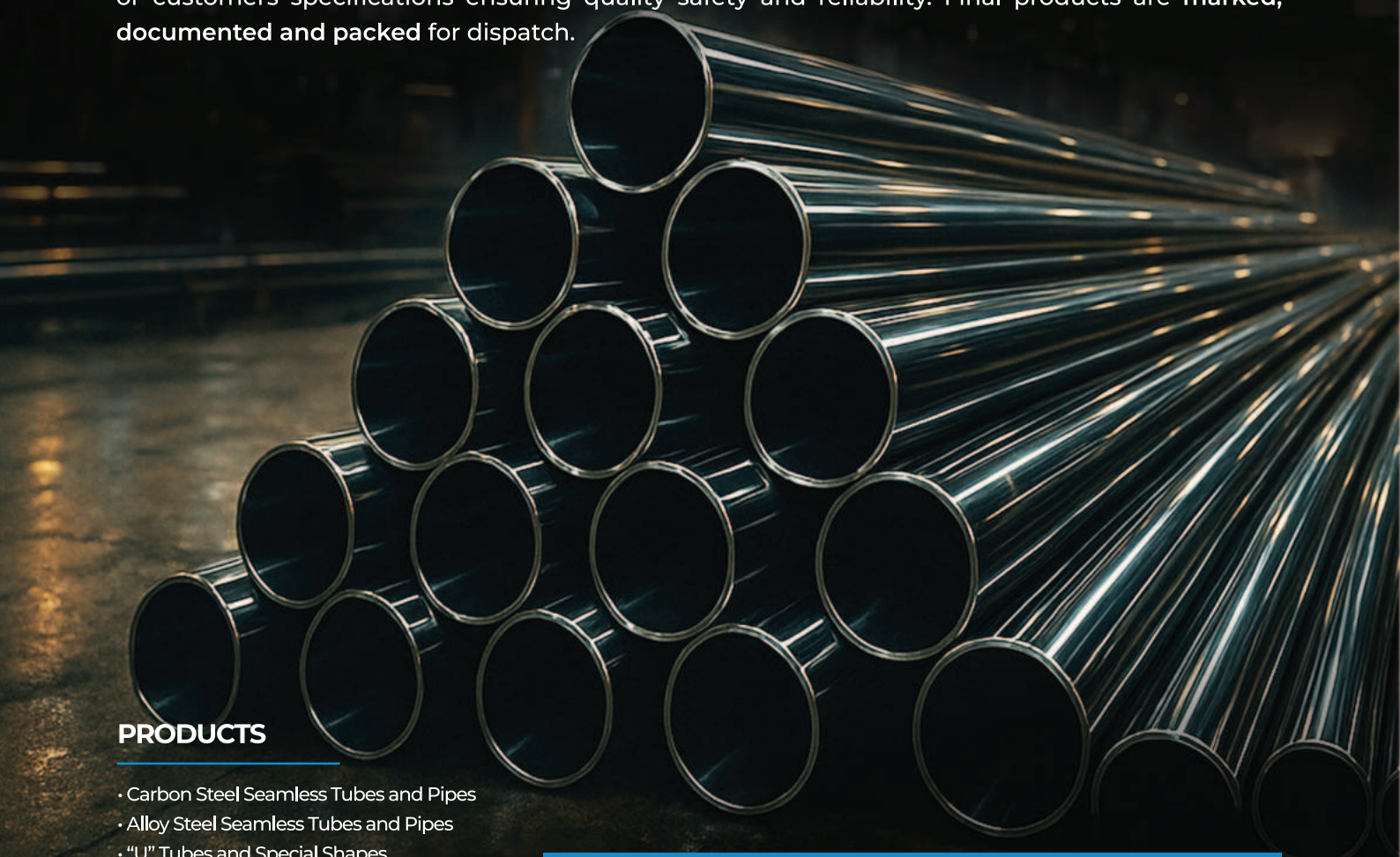
UNIT 2

COLD DRAWN CARBON & ALLOY STEEL PLANT

HMT's **Unit 2** is a state-of-the-art facility dedicated to the production of **Cold Drawn Carbon and Alloy Steel Tubes & Pipes.** Spread across **13,500 sq. m** of covered area, the plant is equipped to deliver precision-engineered products for demanding industrial applications.

Starting with seamless hollows manufactured in-house, our tubes are processed through **high-precision draw benches,** utilizing superior dies and plugs to achieve exact dimensional accuracy and smooth internal and external surfaces. We also manufacture **rifle tubes** for specialized and high-performance applications.

All drawn tubes are further processed through **heat treatment, straightening and surface finishing** stages. Each product undergoes **rigorous testing** as per relevant international standards or customers specifications ensuring quality safety and reliability. Final products are **marked, documented and packed** for dispatch.



PRODUCTS

- Carbon Steel Seamless Tubes and Pipes
- Alloy Steel Seamless Tubes and Pipes
- "U" Tubes and Special Shapes
- Rifle Tubes

MANUFACTURING RANGE

Outer Diameter (OD) : 4 mm to 220 mm
Wall Thickness (THK) : 0.5 mm to 25 mm
Length : Upto 34 Meters depending upon size

CAPACITY

24,000 MTPA

GRADE & SPECIFICATIONS

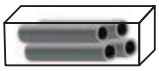
We manufacture as per a broad range of global standards including:
ASTM/ASME A/SA 179, 192, 199, 106 (Gr. A, B, C), 210 (Gr. A1, C), 519, 213 (T1, T2, T5, T9, T11, T12, T22, T91, T92), 335 (P1, P2, P5, P9, P11, P12, P22, P91, P92), 334/333, 209, 556, DIN 17175, 2391 (St35.8, St45.8, St52, 16Mo3, 13CrMo44, 10CrMo910), 2448, 1630, BS 3059, 980, 6323, 3602/1, EN 10716-2, 4130, EN 18, P235, P275, P355, 1026, 1030
Other Specification / Grades can be supplied as per customer's requirements

FLOW CHART

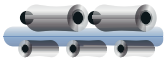
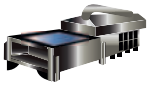
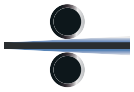
Scan QR to Explore
All Flowchart Videos

Hollows/Mother Tubes → Mother Tubes Inspection → Surface Treatment

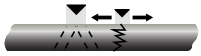




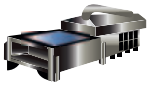
Drawing/Pilgering → Heat Treatment → Straightening → Cutting

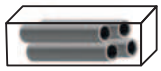
Chemical & Mockup Test → Non-Destructive Test → Destructive Test


U Bending (if required) → Heat Treatment of U Bend Portion (if required) → Hydro Testing


Visual & Dimension Inspection → Surface Treatment → Final Cutting


Marking → Packing → Dispatch



UNIT 3

HOT & COLD FINISH CARBON & ALLOY STEEL PLANT

Advanced Seamless Tube Manufacturing for Demanding Applications

HMT's Unit 3 is a fully integrated manufacturing facility designed to produce **high-quality seamless tubes and pipes** in **Carbon and Alloy steel grades.** Commissioned in **December 2011,** this facility leverages cutting-edge technology including C**ross-Roll Piercing, Accu Rolling,** and **Stretch Reducing Mill (SRM)** to deliver products with exceptional dimensional accuracy, uniform wall thickness, and superior surface finish.

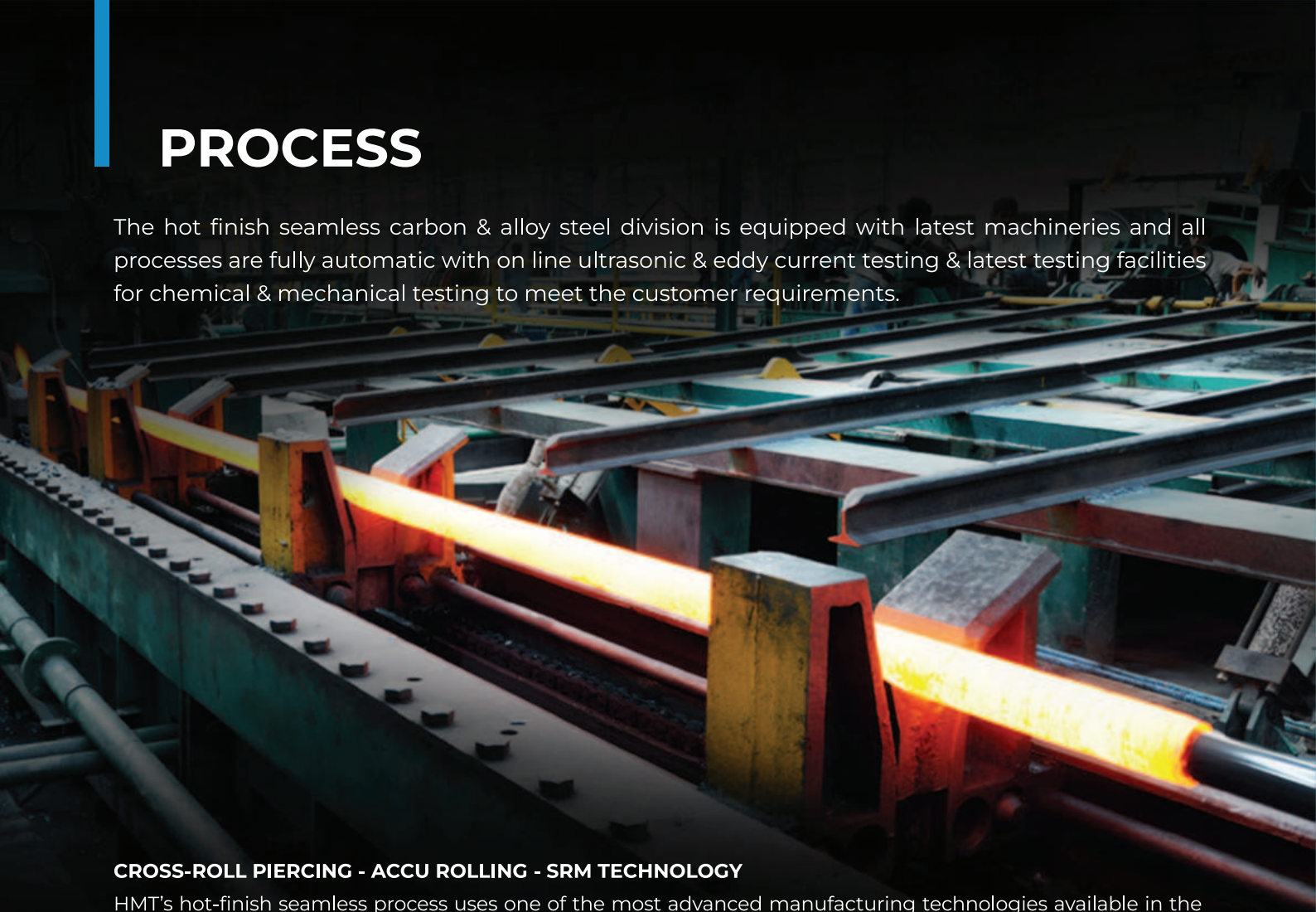
The manufacturing process starts with heating high-quality steel round bars, followed by **cross-roll piercing** to convert solid bars into hollow shells. These shells are precision-rolled using **Accu Roll Mills** and further processed through **24-stand SRM**, ensuring tight tolerances, smooth internal surfaces, and consistent product quality.

This hot-finishing route is ideal for producing tubes used in critical applications such as:
- **Boilers & Boiler Components**
- **Economizers**
- **Heat Exchangers**
- **Hydraulic and Mechanical Systems**
- **Cryogenic Services**

With the introduction of **4 Pilger Mills** and **2 Heavy Duty Draw Benches,** Unit 3 also supports **cold finishing operations** - allowing HMT to meet complex demands across various industries through multi-step reduction, heat treatment, and surface refinement.

PROCESS

The hot finish seamless carbon & alloy steel division is equipped with latest machineries and all processes are fully automatic with on line ultrasonic & eddy current testing & latest testing facilities for chemical & mechanical testing to meet the customer requirements.



CROSS-ROLL PIERCING - ACCU ROLLING - SRM TECHNOLOGY

HMT's hot-finish seamless process uses one of the most advanced manufacturing technologies available in the steel tube industry:

1. **Heating:**
   Clean Steel round bars are heated between 1150–1250°C in a rotary hearth furnace.

2. **Cross-Roll Piercing:**
   Heated bars are pierced using a cross-roll piercer to form elongated hollow shells.

3. **Accu Rolling:**
   The hollow shell passes through an Accu Roll Mill where two precision-controlled rollers and an internal mandrel ensure accurate dimensional control and smooth internal surfaces.

4. **Re-Heating & SRM:**
   Hollow shells are reheated to 900–950°C and passed through a 24-stand Stretch Reducing Mill, which refines the final outer diameter, wall thickness, and surface finish.

MANUFACTURING RANGE

Outer Diameter (OD) : 4 mm to 168.3 mm
Wall Thickness (THK) : 0.5 mm to 25 mm
Length : Up to 31 meters (depending on size)

CAPACITY

36,000 MTPA

Other Specification / Grades can be supplied as per customer's requirements

GRADE & SPECIFICATIONS

We supply to a wide range of international standards, including but not limited to:

- ASTM / ASME: A/SA 179, 192, 199, 106 (Gr. A, B, C), 210 (A1, C), 519 213 (T1, T2, T5, T9, T11, T12, T22, T91, T92), 335 (P1, P2, P5, P9, P11, P12, P22, P91,P92), 334/333 (Gr. 1, 3, 6, 8), 209 (T1, T1A, T1B), 556 (A, B, C)
- DIN / EN / BS: DIN 17175, 2391 (St35.8, St45.8, St52, 16Mo3, 13CrMo44, 10CrMo910) DIN 2448, 1630, BS 3059, 980, 6323, 3602/1 EN 10716-2, 1026, 1030, 4130, EN 18, P235, P275, P355

Other Specification / Grades can be supplied as per customer's requirements

Each product undergoes **stringent testing and inspection** to comply with customer specifications and third-party inspection agency requirements. Final tubes are **marked, documented and packed** for safe and traceable delivery.

FLOW CHART

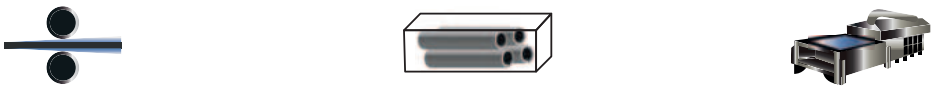
Scan QR to Explore
All Flowchart Videos

Round Bar > Round Bar Inspection > Round Bar Cutting > Rotary Hearth Furnace

Reheating Furnace < Accu-Rolling < Piercing < Hot Centering

24 Stand SRM > Hot End Cutting > Cooling Bed > Straightening

Cold Pilgering-Drawing (If Required) < Surface Treatment (If Required) < Heat treatment (If Required)



Heat treatment (If Required) > Straightening > Cutting > Physical & Chemical Testing > Hydro Testing

Threading/Bevelling (If Required) < VDI < Final Cutting < NDT (ET UT)

Varnishing > Length & Weight Measurement > Marking > Packing > Dispatch

SHOT PEENING OF STAINLESS STEEL TUBES

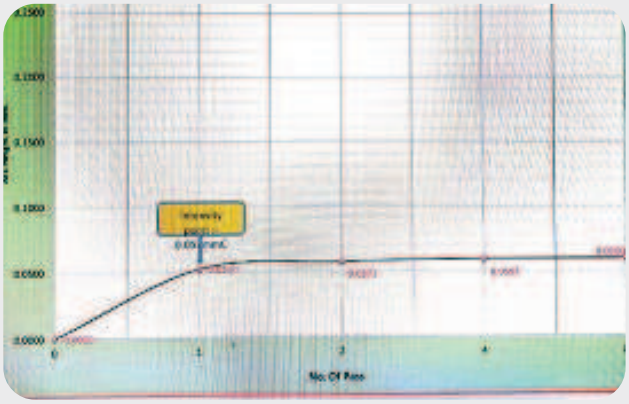
Enhancing Surface Integrity & Fatigue Life

ABOUT THE PROCESS

Shot Peening is a cold working process in which the surface of stainless steel tubes is bombarded with spherical media (shots) to induce compressive residual stress. This improves mechanical properties, surface integrity, and resistance to fatigue, corrosion, and stress cracking-making it essential for demanding applications in aerospace, power, oil & gas, chemical processing, and nuclear industries.

WHY SHOT PEENING?

- Improved Fatigue Strength
- Enhanced Surface Durability
- Resistance to Stress Corrosion Cracking (SCC)
- Reduction of Micro Cracks and Surface Imperfections



OUR SHOT PEENING INFRASTRUCTURE

Two Advanced Shot Peening lines

- Each line capable of processing **4 tubes at a time**
- Automated and precision-controlled peening for consistent quality across the surface area of tube ID

IN-HOUSE QUALITY ASSURANCE

- Full-fledged testing lab to verify **ALMEN testing, surface roughness, residual stress, micro hardness and coverage**
- Adherence to **domestic and international technical standards**

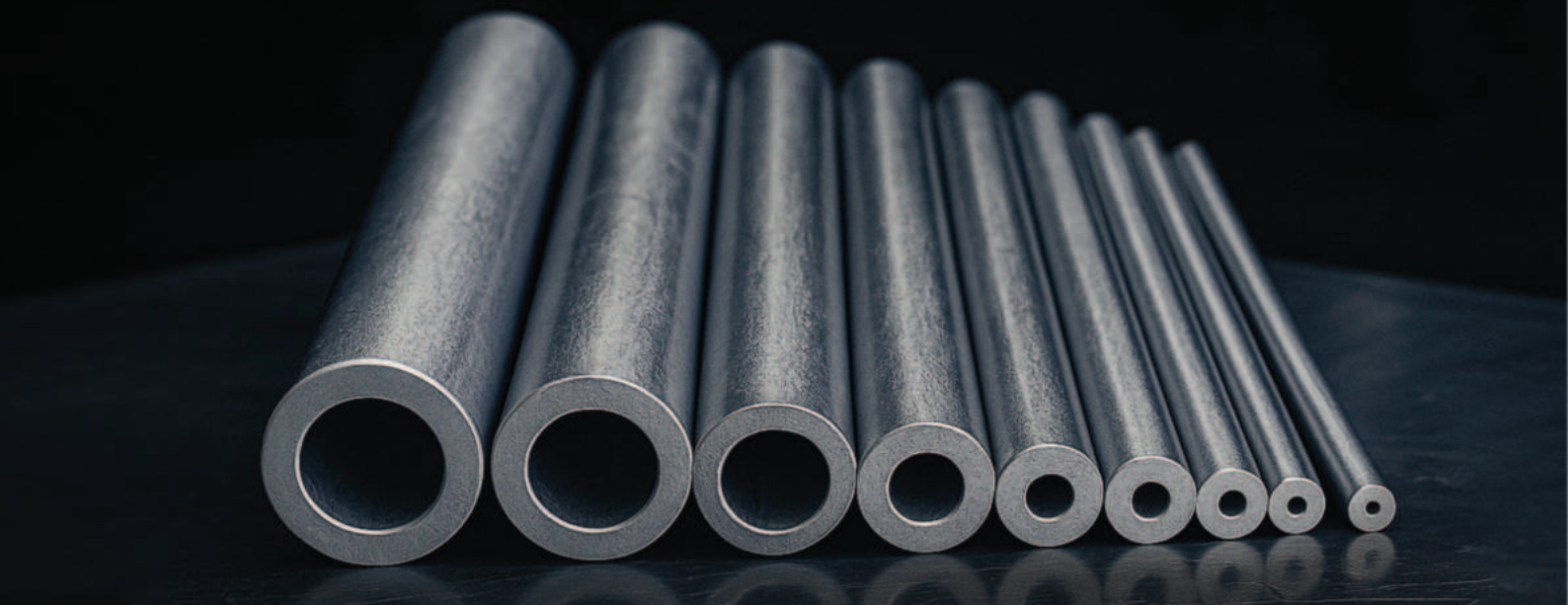
Daily Capacity:

Up to **2000 meters of stainless steel tubes** per day

HEAVY WALL THICKNESS TUBES

OUR CAPABILITY

Heavy Metal & Tubes specializes in manufacturing heavy wall thickness seamless tubes, especially high t/d ratio, with close dimensional accuracy and mechanical integrity. With focus on controlled tolerances and process stability, we are equipped to meet the most demanding engineering applications across various industries.



PRODUCTION INFRASTRUCTURE

(1) **Two Heavy Draw Benches and other smaller draw benches**
- Capable of drawing tubes with wall thickness up to 22 mm
- Precise speed and load control for dimensional consistency

(2) **Four Heavy-Duty Cold Pilger machines**

(3) **One Heavy-Duty Push Pointer**

(4) **One Hammer type Hot Pointing Machine**
- Enables smooth pointing and production of thick wall tubes

TECHNICAL SPECIFICATIONS

Outer Diameter (OD):	21.3 mm to 168.3 mm
Wall Thickness (WT):	Up to 22 mm
Length:	Up to 20 meters depending upon size
Tolerances:	As per ASTM, EN, and customer specific standards

QUALITY CONTROL

- Dimensional Inspection
- Ultrasonic & Eddy Current Testing
- Hydro Testing & PMI
- Microstructure & Grain Flow Evaluation

All processes are controlled and monitored in-house to ensure repeatability and compliance with international quality norms.


HEAVY METAL & TUBES


HEAVY METAL & TUBES


HEAVY METAL & TUBES
UNIT III

"U" TUBES

"U" Tubes for Heat Exchangers

Precision Bending for Critical Thermal Applications

U-tubes are an integral component in heat transfer equipment such as heat exchangers, where thermal efficiency and mechanical reliability are paramount. At HMT, we understand that U-bending is a precision-critical process, where even minor deviations can lead to flow disruption, vibration issues, or thermal inefficiencies.

The Criticality of U-Bending :

U-tube performance depends heavily on:

- **Dimensional accuracy to ensure proper tube alignment and fit-up in tube sheets.**
- **Controlled deformation to prevent thinning, wrinkling, or ovality at the bend.**
- **Stress management to avoid cracking, hardening, or long-term fatigue failure.**
- **Consistent radii for optimal flow and heat transfer performance.**

To meet these challenges, HMT uses advanced cold U-bending technology, paired with strict quality control at every step.

Precision U-Bending Process at HMT :

1. Cold U-Bending:

Our U-bending machines enable accurate and repeatable bends, even in small radii up to 1D (same as tube diameter). Bends are executed under controlled speed and pressure, ensuring no structural compromise to the tube material.

2. Custom Jigs & Fixtures:

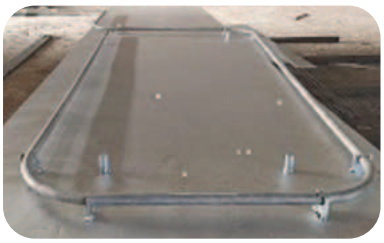
Application-specific three-dimensional jigs and fixtures are used for each batch to guarantee consistent leg lengths, centreline radii and symmetry.

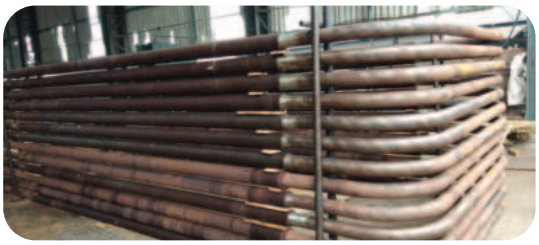
3. Post-Bend Heat Treatment:

Bending induces residual stresses in the bent region. HMT carries out localized stress relieving to restore ductility, eliminate hardening effects, and ensure long-term reliability under cyclic thermal conditions.

4. Dimensional & Visual Inspection:

U-tube is inspected for wall thinning, ovality, bend radius accuracy, and surface integrity using precise measurement tools, templates, and endoscope-based inspection methods.





PERFORMANCE STARTS WITH PRECISION

HMT U-Tubes are engineered to meet the most demanding thermal and mechanical conditions - ensuring safety, efficiency, and long service life.

CUSTOM BENDS ALSO AVAILABLE

In addition to standard U-shapes, HMT can provide multi-plane bends, offset bends, and custom geometries to meet special configuration or compact installation requirements.

PACKING

Packing plays a **crucial role** in preserving the quality and integrity of steel tubes and pipes during transportation and storage. At Heavy Metal, we place **special emphasis on the careful packing of long, thin-walled tubes and complex shapes like U-bend tubes,** which require extra protection against deformation and damage.

Depending on the **type of product** and **customer requirements,** we employ a variety of proven packing methods to ensure that each shipment reaches its destination in **pristine condition.** These include customized bundling, protective end caps, corrosion prevention treatments, and secure fastening techniques.

Our flexible packing solutions are designed to meet both **domestic and international standards,** guaranteeing safety and reliability. Some of the packing methods used are illustrated in the accompanying photographs.

STANDARD PACKING CHART

Sr.	Type of Packing	Applicability
1	Hessian / PVC Cloth Bundles with PVC Box Strap or Hexagonal Bundles Details not given in Customer's Order.	As Per Customer Requirement. Regular Packing When Packing
2	Wooden Crate For Domestic Supply.	As Per Customer Requirement.
3	Wooden Box made of treated wood or plywood sheet Recommended For Long, Thin Walled & `U' bend tubes.	As Per Customer Requirement.
4	Bare Tubes Bundles	For Big Diameter & Heavy Thickness Piping Material
5	Tubes With PVC Sleeve and packed in Wooden Boxes	For Polished Tubes & If Customer Require
6	Tubes bundles with PVC Film and Plywood Sheets on the bundles.	For Export Tubes Bundles.

Key Packing Guidelines

- **Customer-Centric Selection:**
  The type of packing is selected based on the customer's specifications in the purchase order. If no specific instructions are provided, our standard packing style is applied.
- **End Protection:**
  All tubes are supplied with standard end caps on both ends to protect against contamination and damage. Special end caps can be provided upon customer request.
- **Careful Handling:**
  Extra precautions are taken when handling and packing thin-walled tubes to prevent dents and scratches, ensuring product quality is maintained.
- **Shipping Marks:**
  Shipping marks are securely attached to every wooden crate, box, and bundle, facilitating easy identification and compliance with shipping standards.

Notes :

(1) Selection of type of packing depends on customers need as specified in customer's purchase order. If nothing is specified in the customer purchase order, our standard packing style is followed.

(2) All the tubes are supplied with standard end capes on both ends. Special types of end caps are supplied if required by customer.

(3) Care is taken during handling & packing of thin tubes to prevent dent & scratches.

(4) Shipping Marks are attached to each Wooden Crate, Wooden Box and Bundle packing.

QUALITY ASSURANCE

At HMT, quality is embedded in every stage of production - from the selection of raw materials to the final tubular product ready for dispatch. Our comprehensive Quality Assurance System ensures that every tube and pipe meets or exceeds the stringent requirements of national and international standards, as well as specific customer quality criteria.

The quality control department is independent of manufacturing shop. All tests are carried out by qualified & trained quality personnel in compliance with the guidelines of the quality assurance system. The documented 'Quality Assurance Manual' establishes the practice concerning these guidelines.

Depending on the intended application and technical delivery conditions or customer's specifications, a variety of specific tests can be carried out to ensure that highest quality standards are maintained. All 3 Plants are equipped with calibrated testing and measuring equipment for destructive and non-destructive testing.

Our products are approved by all leading TPI, EPC, Contractors and sub-contractors:

WORLD IS OUR PLAYGROUND

- ISO 9001 : 2015
- ISO 45001 : 2018
- ISO 14001 : 2015
- AD 2000 - Merkblatt W 0
- PED 2014/68/EU
- Well Known Tube / Pipe Maker under the Indian Boiler Regulations 1950
- NTPC Approved
- BIS Certified




Condensers | Heat Exchanger | Boiler & Pressure Vessel | Ornamental & Hardware Appliances Thermal & Nuclear Power Plants | Instrumentation | Hydraulic & Pneumatic Systems | Furniture | Dairies

INDUSTRY APPROVALS AND RECOGNITION

Our products have earned the trust and approval of leading Third Party Inspection (TPI) agencies, Engineering Procurement Contractors (EPC), and major contractors and subcontractors worldwide, reflecting our commitment to uncompromising quality and customer satisfaction.




Sugar Plants | Railways | Solvent Plant | Defence | Petroleum & Petrochemicals | Pharmaceutical & Chemical | Oil & Gas Refineries | Fertilizer Plants | Automobile & Locomotive | Steel Plants

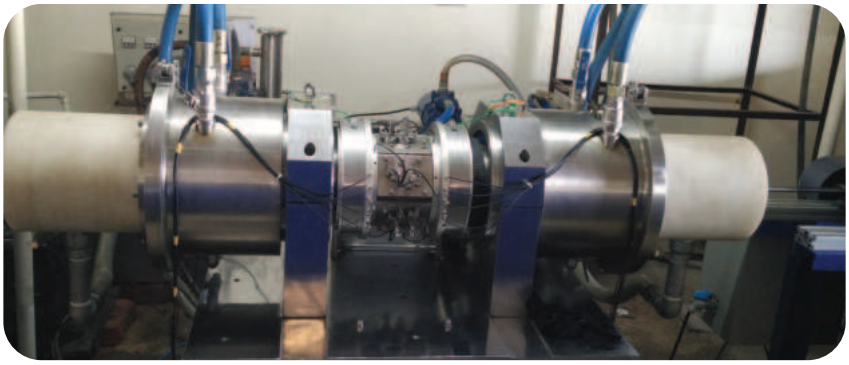
QUALITY CONTROL

Independent and Skilled Quality Control Team

The Quality Control Department operates independently from manufacturing to ensure unbiased inspection and testing. Staffed by highly qualified & trained professionals, this team implements and adheres strictly to the documented Quality Assurance Manual, which defines our procedures, inspection criteria, and compliance protocols.

All Three Plants are fully Equipped with Latest testing equipments.

Non-Destructive Test	Destructive Test
Eddy Current Test (3 nos)	Flaring Test
Hydrostatic Test (12 nos)	Flattening Test
Ultrasonic Testing (4 nos)	Hardness Test
Boroscopy	Reverse Bend Test
Visual Inspection	Metalography Test
DP / MP / RFET Testing	Corrosion Test
PMI	Impact Test
Almen Test for Shot Peened Tubes	Micro Vickers Hardness Test
Spectro Machine (3 nos)	Tensile Test



INDUSTRY APPROVALS AND RECOGNITION

TÜVNORD

Certificate

TN/PED-4-3/21388/24

Report No. / Manufacturer No. / Validity remark: 812 365 6857 / 21388 / 10.2024 - 10.2027

Quality Management System for Manufacturers of Material for Pressure Equipment

TÜV NORD Systems GmbH & Co. KG confirms that the manufacturer
Heavy Metal & Tubes (India) Pvt. Ltd. (Unit III)
HFS Division :193-211, Village -Mandali,
Ahmedabad-Mehsana Highway,
Dist:Mehsana-382 732,Gujarat,India

has implemented and applies a quality management system in relation to materials in accordance with the requirements of the certification scheme TNS-W0_PED-4-3. This quality management system has undergone a specific assessment with regard to materials in accordance with Directive 2014/68/EU, Annex I, point 4.3 to ensure the conformity of the materials and inspection certificates.

The scope of the approval is shown on the following page.

Test basis: **EN 764-4, section 4.2**

Manufacturing site(s): **As above**

Essen, 12.03.2025

TÜVNORD Digital unterschrieben von Huebinger Arnd

Certification Body

TÜV NORD Systems GmbH & Co. KG
Große Bahnstraße 31, 22525 Hamburg, Germany
tuev-nord.de | dniekamp@tuev-nord.de

TÜVNORDGROUP

TÜVINDIA

Certificate

Management system as per
ISO 9001:2015

The Certification Body TÜV INDIA PVT. LTD. hereby confirms as a result of the audit, assessment and certification decision according to ISO/IEC 17021-1:2015, that the organization

HEAVY METAL & TUBES (INDIA) PRIVATE LIMITED- UNIT-III
193-211, Village-Mandali, Ahmedabad-Mehsana Highway,
Taluka: Mehsana, Dist: Mehsana - 382 732,
Gujarat,
India

operates a management system in accordance with the requirements of ISO 9001 : 2015 and will be assessed for conformity within the 3 year term of validity of the certificate.

Scope

Manufacture and Supply of Hot Finish & Cold Finish Seamless Carbon Steel and Alloy Steel Pipes and Tubes Ranging from (Hot Finish Seamless) Tubes/Pipes: 26.67 MM to 168.3 MM (Cold Finish Seamless) Tubes/Pipes: 19.05 MM to 127 MM & (Hot Finish Seamless) Stainless Steel Hollow Pipe: 63.0 MM to 168.3 MM.

Certificate Registration No. **QM 02 01319**
Audit Report No. **BAR/AUD/24-25/6085**

Valid from **24.02.2025**
Valid until **02.02.2028**
Initial certification **03.02.2019**

Mumbai, **24.02.2025**

Certification Body at TÜV INDIA PVT. LTD.

To verify the validity of this certificate, please visit https://www.iafcertsearch.org

TÜV INDIA PVT. LTD.
801, Raheja Plaza 1, L.B.S Marg,
Ghatkopar (W) Mumbai - 400 086,
India
www.tuv-nord.com/in

NABCB IAF

TÜVNORDGROUP

TÜVNORD

Certificate

TN/AD2000-W0/21388/24

Report No. / Manufacturer No. / Validity remark: 812 365 0844 / 21388 / 10.2024 - 10.2027

Material Manufacturer acc. to AD 2000-Merkblatt W 0

TÜV NORD Systems GmbH & Co. KG confirms that the manufacturer
Heavy Metal & Tubes (India) Pvt. Ltd.
Unit I-Plot No.101 (SS Divison), Unit II-Plot No.138(CS Division)
Bileshwarpura, Taluka-Kaloi, A'bad-Mehsana Highway,
Dist:Gandhinagar-382 729,
Gujarat ,INDIA
has been inspected and recognised as a material manufacturer in accordance with the requirements of the certification scheme TNS-W0_PED-4-3 acc. to AD 2000-Merkblatt W 0.

For details, see the report and the scope of the assessment.

The manufacturer has the following requirements:

- facilities for proper manufacturing and testing,
- appropriate processes for the manufacture of the products,
- skilled personnel for the manufacture and testing of the products and
- a quality management system with corresponding records that ensures proper manufacture of the products and compliance with the requirements specified in the material specification.

Essen, 10.03.2025

TÜVNORD Digital unterschrieben von Niekamp Dirk

Certification Body

TÜV NORD Systems GmbH & Co. KG
Große Bahnstraße 31, 22525 Hamburg, Germany
tuev-nord.de | dniekamp@tuev-nord.de

TÜVNORDGROUP

TÜVNORD

Certificate

TN/PED-4-3/21388/24

Report No. / Manufacturer No. / Validity remark: 812 365 0844 / 21388 / 10.2024 - 10.2027

Quality Management System for Manufacturers of Material for Pressure Equipment

TÜV NORD Systems GmbH & Co. KG confirms that the manufacturer
Heavy Metal & Tubes (India) Pvt. Ltd.
Unit I-Plot No.101 (SS Divison), Unit II-Plot No.138(CS Division)
Bileshwarpura, Taluka-Kaloi, A'bad-Mehsana Highway,
Dist:Gandhinagar-382 729,
Gujarat ,INDIA
has implemented and applies a quality management system in relation to materials in accordance with the requirements of the certification scheme TNS-W0_PED-4-3. This quality management system has undergone a specific assessment with regard to materials in accordance with Directive 2014/68/EU, Annex I, point 4.3 to ensure the conformity of the materials and inspection certificates.

The scope of the approval is shown on the following page.

Test basis: **EN 764-4, section 4.2**

Manufacturing site(s): **As above**

Essen, 10.03.2025

TÜVNORD Digital unterschrieben von Niekamp Dirk

Certification Body

TÜV NORD Systems GmbH & Co. KG
Große Bahnstraße 31, 22525 Hamburg, Germany
tuev-nord.de | dniekamp@tuev-nord.de

TÜVNORDGROUP

TÜVNORD

Certificate

Management system as per
ISO 9001 : 2015

The Certification Body TÜV NORD CERT GmbH, hereby confirms as a result of the audit, assessment and certification decision according to ISO/IEC 17021-1:2015, that the organization

HEAVY METAL & TUBES (INDIA) PVT. LTD.
Unit 1 - 101, Billeshwarpura, Ahmedabad - Mehsana Road,
Taluka- Kalol, Dist: Gandhinagar,
Billeshwarpura - 382 729,
Gujarat,
India

operates a management system in accordance with the requirements of ISO 9001 : 2015 at the location

HEAVY METAL & TUBES (INDIA) PVT. LTD.
Unit 2 (CS CDS Div) - 138, Billeshwarpura,
Taluka- Kalol, Ahmedabad - Mehsana Road,
Dist: Gandhinagar, Billeshwarpura - 382 729,
Gujarat,
India

will be assessed for conformity within the 3 year term of validity of the certificate.

Scope

Unit 2 - Manufacture and Supply of Carbon and Alloy Steel Seamless Tubes and Pipes Sizes Ranging from 4 MM to 220 MM O.D.

Certificate Registration No. **44 100 18390575-01**
Audit Report No. **3.5-5372/2011**

Valid from **23.04.2024**
Valid until **22.04.2027**
Initial certification **09.10.2018**

Mumbai, **20.04.2024**

Certification Body at TÜV NORD CERT GmbH

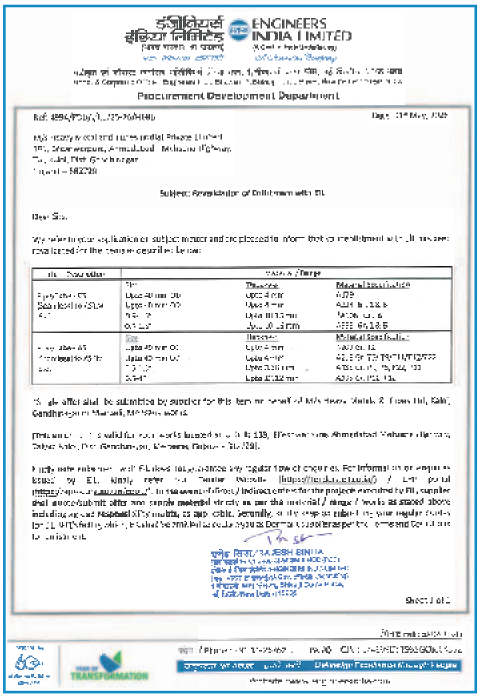
This certificate is valid in conjunction with the main certificate

TÜV NORD CERT GmbH
Am TÜV 1, 45307,
Essen
www.tuev-nord-cert.com

IAF DAkkS

TÜV INDIA PVT. LTD.
801, Raheja Plaza 1, L.B.S Marg,
Ghatkopar (W) Mumbai - 400 086,
India
www.tuv-nord.com/in

TÜVNORDGROUP



इंजीनियर्स इंडिया लिमिटेड ENGINEERS INDIA LIMITED

Procurement Development Department

Subject: Renewal of Enlistment with EIL

Dear Sir,

Sheet 1 of 1

INDUSTRY APPROVALS AND RECOGNITION

FORM XVI-F
[see regulation 4C]

Serial No. Tube /24/007 File No. P-30016/392/2022-Boiler

Central Boilers Board
Certificate of Approval for Well Known Tube Maker

This is to certify that the Inspection and Quality Management System of:

M/s Heavy Metal & Tubes (India) Pvt. Limited,
Unit-3: 193/211, Mandali,
Ahmedabad -Mehsana Highway,
Distt. Mehsana-382 732
Gujarat

has been evaluated by the Central Boilers Board and has been granted recognition under regulation 4C of the Indian Boiler Regulations, 1950, as a Well Known Tube Maker for the manufacture of tubes of sizes from "Boiler Quality Hot Finish Seamless Tubes of sizes of Outside Diameter (OD) 26.7 mm to 168.3 mm x Wall Thickness(WT) 3.2 mm to 25.00 mm & Cold Finish Seamless Tubes of sizes of Outside Diameter (OD) 19.05 mm to 127.0 mm x Wall Thickness(WT) 3.0 mm to 20.00 mm" in Carbon Steel and Alloy Steel grades

for their factory at Unit-3: 193/211, Mandali,
Ahmedabad -Mehsana Highway,
District Mehsana, Gujarat

This Certificate is valid for five years, i.e. upto 20th February, 2029
Validity is subject to the adherence to the quality control prescribed under the provisions of the Indian Boiler Regulations, 1950.

Certificate No. 193
12th August, 2024
Date of Issue

CBB

Secretary

FORM XVI-F
[see regulation 4C]

Serial No. Tube /24/006 File No. P-30016/2/2024-Boiler

Central Boilers Board
Certificate of Approval for Well Known Tube Maker

This is to certify that the Inspection and Quality Management System of:

M/s Heavy Metal & Tubes (India) Pvt. Limited,
Unit-2: 138, Bileshwarpura,
Chhatral, Tal.: Kalol,
Distt. Gandhinagar-382 729
Gujarat

has been evaluated by the Central Boilers Board and has been granted recognition under regulation 4C of the Indian Boiler Regulations, 1950, as a Well Known Tube Maker for the manufacture of tubes of sizes from Boiler Quality Cold Drawn Seamless Tubes of sizes of Outside Diameter (OD) 4.0 mm to 220.0 mm x Wall Thickness(WT) 0.50 mm to 25.00 mm in Carbon Steel and Alloy Steel grades

for their factory at Unit-2: 138, Bileshwarpura,
Chhatral, Tal.: Kalol,
District Gandhinagar, Gujarat

This Certificate is valid for five years, i.e. upto 20th February, 2029
Validity is subject to the adherence to the quality control prescribed under the provisions of the Indian Boiler Regulations, 1950.

Certificate No. 192
12th August, 2024
Date of Issue

CBB

Secretary

FORM XVI-F
[see regulation 4C]

Serial No. Tube /24/005 File No. P-30016/1/2024-Boiler

Central Boilers Board
Certificate of Approval for Well Known Tube Maker

This is to certify that the Inspection and Quality Management System of:

M/s Heavy Metal & Tubes (India) Pvt. Limited,
Unit-I: 101, Bileshwarpura,
Chhatral, Tal.: Kalol,
Distt. Gandhinagar-382 729
Gujarat

has been evaluated by the Central Boilers Board and has been granted recognition under regulation 4C of the Indian Boiler Regulations, 1950, as a Well Known Tube Maker for the manufacture of tubes of sizes from Boiler Quality Cold Drawn Stainless Steel Seamless & Welded Tubes of sizes of Outside Diameter (OD) 4.0 mm to 220.0 mm x Wall Thickness(WT) 0.50 mm to 25.00 mm.

for their factory at Unit-I: 101, Bileshwarpura,
Chhatral, Tal.: Kalol,
District Gandhinagar, Gujarat

This Certificate is valid for five years, i.e. upto 20th February, 2029
Validity is subject to the adherence to the quality control prescribed under the provisions of the Indian Boiler Regulations, 1950.

Certificate No. 191
12th August, 2024
Date of Issue

CBB

Secretary

ENGINEERS INDIA LIMITED
(A Govt. of India Undertaking)
Regd. & Corporate Office : Engineers India Bhawan, 1, Bhikaji Cama Place, New Delhi-110 066 INDIA
Procurement Development Department

Ref: 4994/PDD/I/RH/25-26/3685 Date: 09th July 2025

M/s Heavy Metal & Tubes (India) Private Ltd.
101, Billeshwarpura, Ahmedabad Mehsana Road
Chhatral – 382729
Gujarat

Subject: Enhancement & Revalidation of Enlistment with EIL

Dear Sirs,

We refer to your application on subject matter and are pleased to inform that your enlistment with EIL has been enhanced for the items as described below:

Item Description	Material/Range
Instrument Tubing	All Range
Pipe-SS (Seamless & Welded) to ASTM Std.	Size / Thickness / Material Specification 0.5-6" / Upto 10.97 mm / A312(Seamless) TP304/L/H, 316/L/H,321/H, 347/H 0.5-3" / Upto 5.49 mm / A312(EFSW-L) TP304/L/H, 316/L/H
Tube-Seamless & Welded Stainless Steel	Size / Thickness / Material Specification Upto 63.5mm OD / Upto 12mm / A213/A269(Seamless) Gr. 304/L/H, 316/L/H,321/H, 347/H Upto 40mm OD / Upto 3.5mm / A268 (Seamless) Gr. 405,410.

(This enlistment is valid for your works located at Unit-1, 101, Billeshwarpura, Taluka Kalol, Ahmedabad Mehsana Highway, Chhatral– 382729, Gujarat).

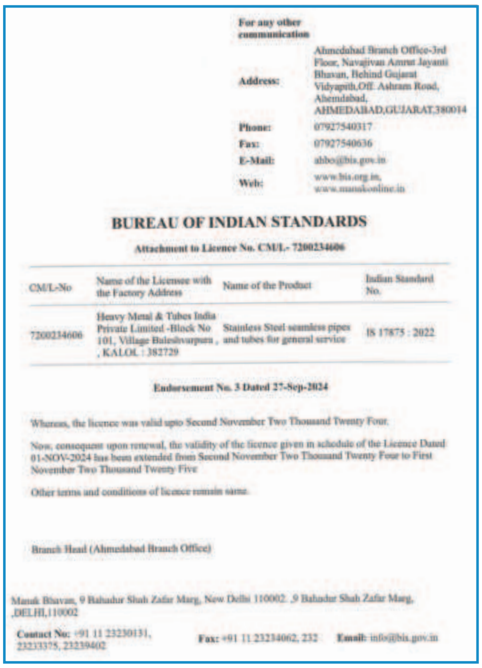
Kindly note enlistment with EIL does not guarantee any regular flow of enquiries. For information on enquiries issued by EIL, kindly refer our Tender Website (https://tenders.eil.co.in/) / CPP portal (https://eprocure.gov.in/cppp/). **In the event of direct / indirect orders for the projects executed by EIL, supplier shall quote/submit offer and supply material strictly as per the material / range / works as stated above including agreed responsibility matrix, as applicable.** Secondly, kindly keep on submitting your regular quotes for EIL RFQ's failing which, EIL shall be entitled to declare you as Dormant supplier as per the Terms and Conditions for enlistment.

Any change in the product range, location of Works/Sales Office, Management/ Organization structure etc., shall be intimated to us immediately along with relevant document for our necessary action. Further, kindly update your contact details on regular basis so that you may keep on receiving EIL communications. Also, kindly ensure submission of your Audited Annual Report on yearly basis to enable us update your latest financial data.

RAJESH SINHA
Chief GM & HOD (PDD)
ENGINEERS INDIA LIMITED
(A Govt. of India Undertaking)
1, Bhikaji Cama Place,
New Delhi-110066

Sheet 1 of 2

Phone : +91-11-26762121 (EPABX) CIN : L74899DL1965GOI004352
Delivering Excellence through People
Website : www.engineersindia.com



For any other communication

Address:	Ahmedabad Branch Office-3rd Floor, Navajivan Amrut Jayanti Bhavan, Behind Gujarat Vidyapith,Off. Ashram Road, Ahemdabad, AHMEDABAD,GUJARAT,380014
Phone:	07927540317
Fax:	07927540636
E-Mail:	ahbo@bis.gov.in
Web:	www.bis.org.in, www.manakonline.in

BUREAU OF INDIAN STANDARDS

Attachment to Licence No. CM/L- 7200234606

CM/L-No	Name of the Licensee with the Factory Address	Name of the Product	Indian Standard No.
7200234606	Heavy Metal & Tubes India Private Limited -Block No 101, Village Baleshvarpura , , KALOL : 382729	Stainless Steel seamless pipes and tubes for general service	IS 17875 : 2022

Endorsement No. 3 Dated 27-Sep-2024

Whereas, the licence was valid upto Second November Two Thousand Twenty Four.

Now, consequent upon renewal, the validity of the licence given in schedule of the Licence Dated 01-NOV-2024 has been extended from Second November Two Thousand Twenty Four to First November Two Thousand Twenty Five

Other terms and conditions of licence remain same.

Branch Head (Ahmedabad Branch Office)

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002. ,9 Bahadur Shah Zafar Marg, ,DELHI,110002

Contact No: +91 11 23230131, 23233375, 23239402 Fax: +91 11 23234062, 232 Email: info@bis.gov.in

ENGINEERS INDIA LIMITED
(A Govt. of India Undertaking)
Regd. & Corporate Office : Engineers India Bhawan, 1, Bhikaji Cama Place, New Delhi-110 066 INDIA
Procurement Development Department

Ref: 4994/PDD/I/EH/25-26/3756 Date: 15th July, 2025

M/s Heavy Metal and Tubes (India) Private Limited
101, Billeshwarpura,
Ahmedabad Mehsana Road
Chhatral, Mehsana - 382729
Gujarat

Subject: Enhancement of Enlistment with EIL

Dear Sirs,

We refer to your application on subject matter and are pleased to inform that your enlistment with EIL has been enhanced for the items as described below: -

Item Description	Size	Thickness	Specification & Grade
Pipe-CS (Seamless) to ASTM Stds.	0.5 - 4"	Upto 17.12mm	A106 Gr. B A333 Gr. 6
Pipe-AS (Seamless) to ASTM Stds.	0.5 - 4"	Upto 17.12	A335 Gr. P91, P9, P5, P22, P11, P12.
Tube-Seamless Carbon Steel	12.7 - 88.9 mm OD	Upto 11 mm	A192, A210 Gr. A1 & C, A334 Gr.6.
Tube-Seamless Alloy Steel	12.7 - 88.9 mm OD	Upto 11.0mm	A209 Gr. T1 A213 Gr. T11, T12, T22, T5, T9, T91

Single Offer shall be submitted by M/s Heavy Metals & Tubes from multiple enlisted works for overlapping ranges.

(This enlistment is valid for your works located at Unit-III, 193-211, Village Mandali, Ahmedabad Mehesana Highway, Mehsana - 382732, Gujarat).

Kindly note enlistment with EIL does not guarantee any regular flow of enquiries. For information on enquiries issued by EIL, kindly refer our Tender Website (https://tenders.eil.co.in/) / CPP portal (https://eprocure.gov.in/cppp/). **In the event of direct / indirect orders for the projects executed by EIL, supplier shall quote/submit offer and supply material strictly as per the material / range / works as stated above including agreed responsibility matrix, as applicable.** Secondly, kindly keep on submitting your regular quotes for EIL RFQ's failing which, EIL shall be entitled to declare you as Dormant supplier as per the Terms and Conditions for enlistment.

Any change in the product range, location of Works/Sales Office, Management/ Organization structure etc., shall be intimated to us immediately along with relevant document for our necessary action. Further, kindly update your contact details on regular basis so that you may keep on receiving EIL communications. Also, kindly ensure submission of your Audited Annual Report on yearly basis to enable us update your latest financial data.

RAJESH SINHA
Chief GM & HOD (PDD)
ENGINEERS INDIA LIMITED

Sheet 1 of 2

Phone : +91-11-26762121 (EPABX) CIN : L74899DL1965GOI004352
Delivering Excellence through People
Website : www.engineersindia.com

STAINLESS STEEL TUBES/PIPES PRODUCT SPECIFICATIONS

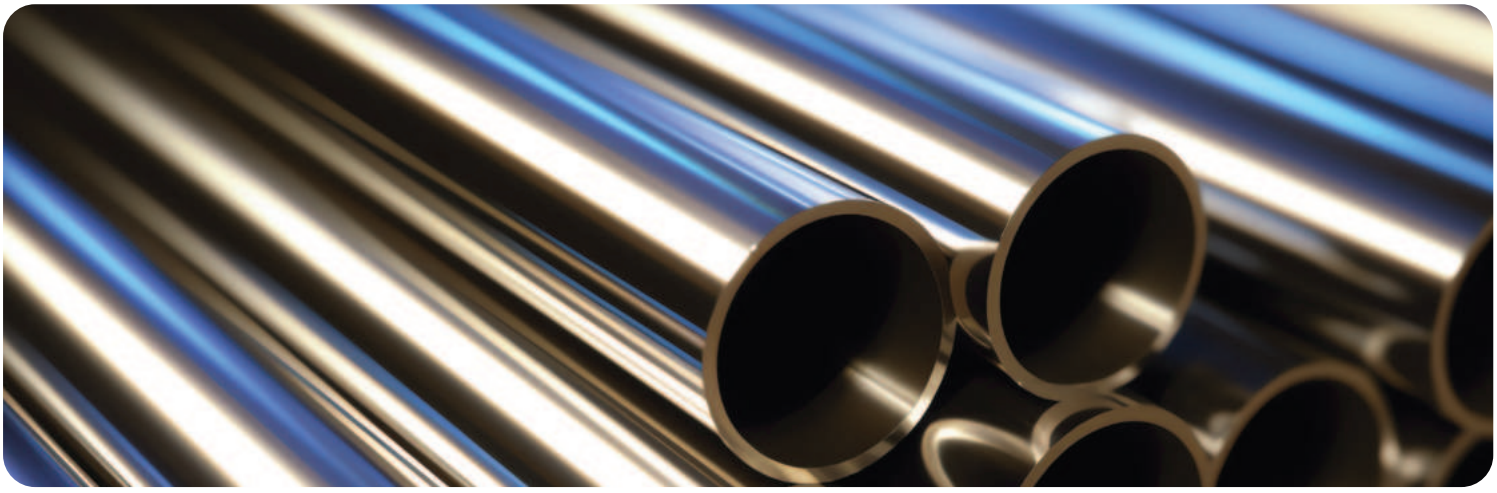
GRADE	TP-304	TP-304 CU	TP-304 L	TP-304 H	TP-304 N
Chemical Composition [Max values %] According to ASTM A-213/269/688/312	C 0.08 Cr 18.00-20.00 Ni 8.00-11.00 Mn (max) 2.00 Si (max) 1.00 P (max) 0.045 S (max) 0.030	C 0.08 Cr 17.0-19.0 Ni 8.0-10.0 Mn 2.0 Si 1.0 P 0.045 S 0.015 N 0.015 Cu 3.0-4.0	C 0.035 Cr 18.0-20.0 Ni 8.0-12.0 Mn 2.0 Si 1.0 P 0.045 S 0.030	C 0.04-0.10 Cr 18.0-20.0 Ni 8.0-11.0 Mn 2.0 Si 1.0 P 0.045 S 0.030	C 0.08 Cr 18.0-20.0 Ni 8.00-11.00 Mn 2.00 Si 1.00 P 0.045 S 0.030 N 0.10-0.16
Tensile Strength, min, ksi [MPa]	75[515]	75[515]	70[485]	75[515]	80[550]
Yield Strength, min, ksi [MPa]	30[205]	30[205]	25[170]	30[205]	35[240]
Equivalent Designation and Specifications	X5CrNi 18-10 EN 1.4301 UNS S30400 AISI304 JIS SUS304 GB S30408	X3CrNiCu 18-9-4 EN 1.4567 UNS 30430 AISI304Cu JIS SUS304J3 GB S30480	X2CrNi 18-9 EN 1.4307 UNS S30403 AISI304L JIS SUS304L G B S30403	X6CrNi 18-10 EN 1.4948 UNS S30409 AISI304H G B S30409	X5CrNiN19-9 EN 1.4315 UNS S30451 AISI304N JIS SUS 304N1 G B S304

GRADE	SUPER304H/ S30432	TP-304LN	TP-309S	TP-310H
Chemical Composition [Max values %]	C 0.07-0.13 Cr 17.0-19.0 Ni 7.5-10.5 Mn (max) 1.00 Si (max) 0.30 P (max) 0.040 S (max) 0.01 N 0.05-0.12 Cu 2.5-3.5 Nb 0.30-0.60 Al 0.003-0.030 B 0.001 -0.010	C 0.035 Cr 18.0-20.0 Ni 8.0-11.0 Mn 2.0 Si 1.0 P 0.045 S 0.030 N 0.10-0.16	C 0.08 Cr 22.0-24.0 Ni 12.0-15.0 Mn 2.00 Si 1.00 P 0.045 S 0.030	C 0.04-0.10 Cr 24.0-26.0 Ni 19.0-22.0 Mn 2.0 Si 1.0 P 0.045 S 0.030
Tensile Strength, min, ksi [MPa]	86[590]	75[515]	75[515]	75[515]
Yield Strength, min, ksi [MPa]	34[235]	30[205]	30[205]	30[205]
Equivalent Designation and Specifications	X6CrNi 18-10 UNS S30432 EN NO. 1.4948	X2 CrNiN 18-10 EN 1.4311 UNS S30453 AISI304LN JIS SUS304LN G B S30453	X12CrNi23-13 EN 1.4833 UNS S30908 AISI3095 JIS SUH309 G B S30908	X6CrNi25-20 UNS S31009 EN 1.4951 AISI310H JIS SUS310H

Above data are only for reference and HMT don't take any liability for the same.

GRADE	TP-310S	TP-316	TP-316L	TP-316H	TP-316N
Chemical Composition [Max values %]	C 0.08 Cr 24.0-26.0 Ni 19.0-22.0 Mn (max) 2.0 Si (max) 1.0 P (max) 0.045 S (max) 0.030	C 0.08 Cr 16.0-18.0 Ni 10.0-14.0 Mn 2.0 Si 1.0 P 0.045 S 0.030 Mo 2.0-3.0	C 0.035 Cr 16.0-18.0 Ni 10.0-14.0 Mn 2.0 Si 1.0 P 0.045 S 0.030 Mo 2.0-3.0	C 0.04-0.10 Cr 16.0-18.0 Ni 11.0-14.0 Mn 2.0 Si 1.0 P 0.045 S 0.030 Mo 2.0-3.0	C 0.08 Cr 16.0-18.0 Ni 10.0-13.0 Mn 2.0 Si 1.0 P 0.045 S 0.030 N 0.10-0.16 Mo 2.0-3.0
Tensile Strength, min, ksi [MPa]	75[515]	75[515]	70[485]	75[515]	80[550]
Yield Strength, min, ksi [MPa]	30[205]	30[205]	25[170]	30[205]	35[240]
Equivalent Designation and Specifications	X8CrNi 25-21 UNS S31008 EN 1.4845 AISI310S JIS SUS310S G B S31008	X5CrNiMo 17-12-2 EN 1.4401 UNS S31600 AISI316 JIS SUS316 G B S31608	X2 CrNiMo 17-12-2 EN 1.4404 UNS S31603 AISI316L JIS SUS316L G B S31603	X5 CrNiMo 17-2-2 UNS S31609 EN 1.4401 AISI316H	X2 CrNiMoN 17-13-3 En 1.4429 AISI 316N UNS S31651

GRADE	TP-316Ti	TP-316LN	TP-317	TP-317 L	TP-321
Chemical Composition [Max values %]	C 0.08 Cr 16.0-18.0 Ni 10.0-14.0 Mn (max) 2.0 Si (max) 1.0 P (max) 0.045 S (max) 0.030 N 0.10 Mo 2.0-3.0 Ti 5x (C+ N)-0.70	C 0.035 Cr 16.0-18.0 Ni 10.0-13.0 Mn 2.0 Si 1.0 P 0.045 S 0.030 N 0.10-0.16 Mo 2.0-3.0	C 0.08 Cr 18.0-20.0 Ni 11.0-15.0 Mn 2.0 Si 1.0 P 0.045 S 0.030 Mo 3.0-4.0	C 0.035 Cr 18.0-20.0 Ni 11.0-15.0 Mn 2.0 Si 1.0 P 0.045 S 0.030 Mo 3.0-4.0	C 0.08 Cr 17.0-19.0 Ni 9.0-12.0 Mn 2.0 Si 1.0 P 0.045 S 0.030 Ti 5x (C+ N)-0.70
Tensile Strength, min, ksi [MPa]	75[515]	75[515]	75[515]	75[515]	75[515]
Yield Strength, min, ksi [MPa]	30[205]	30[205]	30[205]	30[205]	30[205]
Equivalent Designation and Specifications	X6CrNiMoTi 17-12-2 EN 1.4571 UNS S31635 JIS SUS 316 Ti G B S31668	X2 CrNiMoN 17-13-3 EN 1.4406 UNS S31653	X3CrNiMo 18-12-3 EN 1.4449 UNS S31700 AISI317 JIS SUS317 G B S31708	X2 CrNiMo 18-15-4 EN 1.4438 UNS S31703 JIS SUS317 L G B S31703	X6CrNiTi 18-10 EN 1.4541 UNS S32100 AISI321 JIS SUS321 G B S32168



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GRADE	TP-321 H	TP-347	TP-347 H	TP-904L
Chemical Composition [Max values %]	C 0.04-0.10 Cr 17.0-19.0 Ni 9.0-12.0 Mn (max) 2.0 Si (max) 1.0 P (max) 0.045 S (max) 0.030 Ti 4(C+ N)-0.70	C 0.08 Cr 17.0-20.0 Ni 9.0-13.0 Mn 2.0 Si 1.0 P 0.045 S 0.030 Nb 10XC-1.10	C 0.04-0.10 Cr 17.0-19.0 Ni 9.0-13.0 Mn 2.0 Si 1.0 P 0.045 S 0.030 Nb 8xC-1 .10	C 0.02 Cr 19.0-23.0 Ni 23.0-28.0 Mn 2.0 Si 1.0 P 0.040 S 0.030 N 0.10 Mo 4.0-5.0 Cu 1.0-2.0
Tensile Strength, min, ksi [MPa]	75[515]	75[515]	75[515]	71[490]
Yield Strength, min, ksi [MPa]	30[205]	30[205]	30[205]	31[215]
Equivalent Designation and Specifications	X7 CrNiTi 18-10 EN 1.4940 UNS S32109 AISI321H G B S32169	X6CrNiNb 18-10 EN 1.4550 UNS S347 00 AISI347 JIS SUS347 G B S34778	X8 CrNiNb 16-13 EN 1.4961 UNS S34709 JIS SUS347 H	X1 NiCrMoCu 25-20-5 EN 1.4539 UNS N08904 AISI904L JIS SUS890L G B S39042

GRADE	TP-430	TP-405	TP-410
Chemical Composition [Max values %]	C 0.12 Cr 16.0-18.0 Mn (max) 1.0 Si (max) 1.0 P (max) 0.040 S (max) 0.030	C 0.08 Cr 11.5-14.5 Ni 0.50 Mn 1.0 Si 1.0 P 0.040 S 0.030 Al 0.10-0.30	C 0.15 Cr 11.5-13.5 Mn 1.0 Si 1.0 P 0.040 S 0.030
Tensile Strength, min, ksi [MPa]	60[415]	60[415]	60[415]
Yield Strength, min, ksi [MPa]	35[240]	30[205]	30[205]
Equivalent Designation and Specifications	X6Cr17 EN 1.4016 UNS S43000 AISI430 JIS SUS430 G B S11710	UNS S40500 EN/DIN 1.4002 AFNOR NF Z6CA1 13 JIS SUS405	UNS S41000 EN/DIN1.4006 AFNOR NF Z12 C1 3 UNI X12 Cr1 3 JIS SUS 410

GRADE	S32205	S31803	S32304	S32750
Chemical Composition [Max values %]	C 0.03 Cr 22.0-23.0 Ni 4.5-6.5 Mn (max) 2.0 Si (max) 1.0 P (max) 0.030 S (max) 0.020 N 0.14-0.20 Mo 3.0-3.5	C 0.03 Cr 21.0-23.0 Ni 4.50-6.50 Mn 2.00 Si 1.00 P 0.030 S 0.020 N 0.08- 0.20 Mo 2.5-3.5	C 0.03 Cr 21.5-24.5 Ni 3.0-5.5 Mn 2.50 Si 1.00 P 0.040 S 0.040 N 0.05-0.20 Mo 0.05-0.60 Cu 0.05-0.60	C 0.030 Cr 24.0-26.0 Ni 6.0-8.0 Mn 1.20 Si 0.8 P 0.035 S 0.020 N 0.24-0.32 Mo 3.0-5.0 Cu 0.5
Tensile Strength, min, ksi [MPa]	95[655]	90[620]	100[690]	116[800]
Yield Strength, min, ksi [MPa]	70[485]	65[450]	65[450]	80[550]
Equivalent Designation and Specifications	X2 CrNiMoN 22-5-3 EN 1.4462 UNS S32205 JIS SUS329J3L G B S22053	X2 CrNiMoN 22-5-3 EN 1.4462 UNS S32304 G B S23043	X2 CrNiN 2-3-4 EN 1.4362 UNS S32304 G B S23043	X2 CrNiMoN-25-7-4 EN 1.4410 UNS S32750 G B S25073

GRADE	625	825	Monel 400
Chemical Composition [Max values %]	C 0.10 Cr 20.0-23.0 Ni 58 (Min) Mn (max) 0.50 Si (max) 0.50 P (max) 0.015 S (max) 0.015 Mo 8.0-10.0 Nb+Ta 3.15-4.15 Co 1.0 Fe 5.0 Al 0.40 Ti 0.40	C 0.05 Cr 19.5-23.5 Ni 38.0-46.0 Mn 1.0 Si 0.50 S 0.03 Mo 2.5-3.5 Fe 22.0(Min) Al 0.20 Ti 0.60-1.2 Cu 1.5-3.0	C 0.30 Ni 63(Min) Mn 2.0 Si 0.50 S 0.024 Fe 2.50 Cu 28.0-34.0
Tensile Strength, min, ksi [MPa]	120[827]	75[517]	70[485]
Yield Strength, min, ksi [MPa]	60[414]	25[172]	28[195]
Equivalent Designation and Specifications	UNS N06625	UNS N08825	UNS N04400

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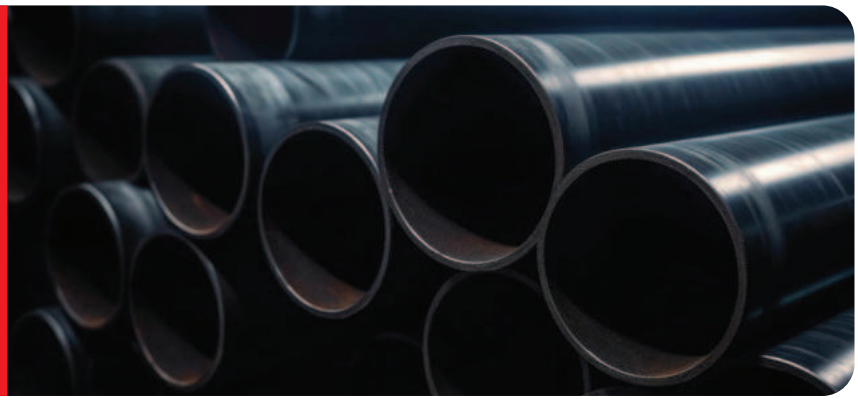
CARBON & ALLOY STEEL SEAMLESS TUBES/ PIPES PRODUCT SPECIFICATIONS



GRADE	ASTM A106 GRADE A	ASTM A106 GRADE B	ASTM A106 GRADE C	ASTM A179	ASTM A192	ASTM A210 GRADE A1
Chemical Composition [Max values %]	C 0.25 Cr 0.40 Ni 0.40 Mn (max) 0.27- 0.93 Si (max) 0.10(min) P (max) 0.035 S (max) 0.035 Mo 0.15 V 0.08 Cu 0.40	C 0.30 Cr 0.40 Ni 0.40 Mn 0.29-1.06 Si 0.10(min) P 0.035 S 0.035 Mo 0.15 V 0.08 Cu 0.40	C 0.35 Cr 0.40 Ni 0.40 Mn 0.29- 1.06 Si 0.10(min) P 0.035 S 0.035 Mo 0.15 V 0.08 Cu 0.40	C 0.06-0.18 Mn 0.27-0.63 P 0.035 S 0.035	C 0.06-0.18 Mn 0.27-0.63 P 0.035 S 0.035 Si 0.25	C 0.27 Mn 0.93 P 0.035 S 0.035 Si 0.10(min)
Tensile Strength, min, ksi [MPa]	48[330]	60[415]	70[485]	47[325]	47[325]	60[415]
Yield Strength, min, ksi [MPa]	30[205]	35[240]	40[275]	26[180]	26[180]	37[255]
Elongation in 2 in. or 50 mm, min, %	NS	NS	NS	35%	35%	30%

GRADE	ASTM A210 GRADE C	SA209 T1	SA209 T1 A	SA209 T1 B
Chemical Composition [Max values %]	C 0.35 Mn 0.29-1.06 P 0.035 S 0.035 Si 0.10(min)	C 0.10-0.20 Mn 0.30-0.80 Si 0.10-0.50 P 0.025 S 0.025 Mo 0.44-0.65	C 0.15-0.25 Mn 0.30-0.80 Si 0.10-0.50 P 0.025 S 0.025 Mo 0.44-0.65	C 0.14 Max Mn 0.30-0.80 Si 0.10-0.50 P 0.025 S 0.025 Mo 0.44–0.65
Tensile Strength, min, ksi [MPa]	70[485]	55[380]	60[415]	53[365]
Yield Strength, min, ksi [MPa]	40[275]	30[205]	32[220]	28[195]
Elongation in 2 in. or 50 mm, min, %	30%	30%	30%	30%

GRADE	T2 (UNS K11547)	T5 (UNS K41545)	T5B (UNS K51545)	T5C (UNS K41245)	T9 (UNS K90941)
Chemical Composition [Max values %]	C 0.10-0.20 Cr 0.50-0.81 Mn 0.30-0.61 Si 0.10-0.30 P (max) 0.025 S (max) 0.025 Mo 0.44-0.65	C 0.15 Cr 4.00-6.00 Mn 0.30-0.60 Si 0.50 P 0.025 S 0.025 Mo 0.45-0.65	C 0.15 Cr 4.00-6.00 Mn 0.30-0.60 Si 1.00-2.00 P 0.025 S 0.025 Mo 0.45-0.65	C 0.12 Cr 4.00-6.00 Mn 0.30-0.60 Si 0.50 P 0.025 S 0.025 Mo 0.45-0.65 Others Ti 4 x C-0.70	C 0.15 Cr 8.00-10.00 Mn 0.30-0.60 Si 0.25-1.00 P 0.025 S 0.025 Mo 0.90-1.10
Tensile Strength, min, ksi [MPa]	60[415]	60[415]	60[415]	60[415]	60[415]
Yield Strength, min, ksi [MPa]	30[205]	30[205]	30[205]	30[205]	30[205]
Elongation in 2 in. or 50 mm, min, %	30%	30%	30%	30%	30%

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GRADE	T11 (UNS K11597)	T12 (UNS K11562)	T22 (UNS K21590)	T23 (UNS K40712)
Chemical Composition [Max values %]	C 0.05-0.15 Cr 1.00-1.50 Mn 0.30-0.60 Si 0.50-1.00 P (max) 0.025 S (max) 0.025 Mo 0.44-0.65	C 0.05-0.15 Cr 0.80-1.25 Mn 0.30-0.61 Si 0.50 P 0.025 S 0.025 Mo 0.44-0.65	C 0.05-0.15 Cr 1.90-2.60 Mn 0.30-0.60 Si 0.50 P 0.025 S 0.025 Mo 0.87-1.13	C 0.04-0.10 Cr 1.90-2.60 Ni 0.40 Mn 0.10-0.60 Si 0.50 P 0.030 S 0.010 Mo 0.05-0.30 V 0.20-0.30 B 0.0010-0.006 Nb 0.02-0.08 N 0.015 Al 0.030 W 1.45-1.75 Others Ti 0.005-0.060 Ti/N 3.5 (Min)
Tensile Strength, min, ksi [MPa]	60[415]	60[415]	60[415]	74[510]
Yield Strength, min, ksi [MPa]	30[205]	30[220]	30[205]	58[400]
Elongation in 2 in. or 50 mm, min, %	30%	30%	30%	20%

GRADE	T91 TYPE 1 (UNSK90901)	T91 TYPE 2 (UNS K90901)	T92 (UNS K92460)
Chemical Composition [Max values %]	C 0.07-0.14 Cr 8.0-9.5 Ni 0.40 Mn 0.30-0.60 Si 0.20-0.50 P (max) 0.020 S (max) 0.010 N 0.30-0.070 Mo 0.85-1.05 V 0.18-0.25 Nb 0.06-0.10 Al 0.02 Others Ti 0.01 Zr 0.01	C 0.08-0.12 Cr 8.0-9.5 Ni 0.20 Mn 0.30-0.50 Si 0.20-0.40 P 0.020 S 0.005 N 0.035-0.070 Mo 0.85-1.05 Cu 0.10 Nb 0.06-0.10 V 0.18-0.25 B 0.001 Tl 0.01 Zr 0.01 Sb 0.003 Sn 0.010 Al 0.020 W 0.05 N/Al 4.0 min	C 0.07-0.13 Cr 8.5-9.5 Ni 0.40 Mn 0.30-0.60 Si 0.50 P 0.020 S 0.010 N 0.030-0.070 Mo 0.30-0.60 Nb 0.04-0.09 V 0.15-0.25 B 0.001-0.006 Al 0.02 W 1.5-2.00 Others Ti 0.01 Zr 0.01
Tensile Strength, min, ksi [MPa]	85[585]	85[585]	90[620]
Yield Strength, min, ksi [MPa]	60[415]	60[415]	64[440]
Elongation in 2 in. or 50 mm, min, %	20%	20%	20%

GRADE	P1 (UNS K11522)	P2 (UNS K11547)	P5 (UNS K41545)	P5b (UNS K51545)	P5c (UNS K41245)
Chemical Composition [Max values %]	C 0.10–0.20 Cr - Mn 0.30–0.80 Si 0.10–0.50 P (max) 0.025 S (max) 0.025 Mo 0.44–0.65	C 0.10–0.20 Cr 0.50–0.81 Mn 0.30–0.61 Si 0.10–0.30 P 0.025 S 0.025 Mo 0.44–0.65	C 0.15 max Cr 4.00-6.00 Mn 0.30–0.60 Si 0.50 max P 0.025 S 0.025 Mo 0.45-0.65	C 0.15 max Cr 4.00–6.00 Mn 0.30-0.60 Si 1.00-2.00 P 0.025 S 0.025 Mo 0.45-0.65	C 0.12 max Cr 4.00–6.00 Mn 0.30–0.60 Si 0.50 max P 0.025 S 0.025 Mo 0.45–0.65
Tensile Strength, min, ksi [MPa]	55[380]	55[380]	60[415]	60[415]	60[415]
Yield Strength, min, ksi [MPa]	30[205]	30[205]	30[205]	30[205]	30[205]
Elongation in 2 in. or 50 mm, min, %	30%	30%	30%	30%	30%

GRADE	P9 (UNS K90941)	P11 (UNS K11597)	P12 (UNS K11562)	P22 (UNS K21590)
Chemical Composition [Max values %]	C 0.15 max Cr 8.00–10.00 Mn 0.30–0.60 Si 0.25–1.00 P (max) 0.025 S (max) 0.025 Mo 0.90–1.10	C 0.05–0.15 Cr 1.00–1.50 Mn 0.30–0.60 Si 0.50–1.00 P 0.025 S 0.025 Mo 0.44–0.65	C 0.05–0.15 Cr 0.80–1.25 Mn 0.30–0.61 Si 0.50 max P 0.025 S 0.025 Mo 0.44–0.65	C 0.05-0.15 Cr 1.90-2.60 Mn 0.30-0.60 Si 0.50 max P 0.025 S 0.025 Mo 0.87-1.13
Tensile Strength, min, ksi [MPa]	60[415]	60[415]	60[415]	60[415]
Yield Strength, min, ksi [MPa]	30[205]	30[205]	32[220]	30[205]
Elongation in 2 in. or 50 mm, min, %	30%	30%	30%	22%

Above data are only for reference and HMT don't take any liability for the same.

GRADE	P23 (UNS K41650)	P91 TYPE 1 (UNS K91560)	P91 TYPE 2 (UNS K91560)	P92 (UNS K92460)
Chemical Composition [Max values %]	C 0.04-0.10 Cr 1.90-2.60 Ni 0.40 max Mn 0.10-0.60 Si 0.50 max P 0.030 max S 0.010 max N 0.015 max Mo 0.05-0.30 V 0.20-0.30 Cb 0.02-0.08 B 0.0010-0.006 Al 0.030 max W 1.45-1.75 Ti 0.005-0.060 Ti/N 3.5 max	C 0.08-0.12 Cr 8.00-9.50 Ni 0.40 max Mn 0.30-0.60 Si 0.20-0.50 P 0.020 S 0.010 N 0.030-0.070 Mo 0.85-1.05 V 0.18-0.25 Al 0.02 max Cb 0.06-0.10 Ti 0.01 max Zr 0.01 max	C 0.08-0.12 Cr 8.0-9.5 Ni 0.20 Mn 0.30-0.50 Si 0.20-0.40 P 0.020 S 0.005 N 0.035-0.070 Mo 0.85-1.05 V 0.18-0.25 Al 0.020 N/Al Ratio 4.0 Cb 0.06-0.10 Ti 0.01 Zr 0.01 Sn 0.010 Sb 0.003 As 0.010 B 0.001 W 0.05 Cu 0.10	C 0.07-0.13 Cr 8.50-9.50 Ni 0.40 Mn 0.30-0.60 Si 0.50 P 0.020 S 0.010 N 0.03-0.07 Mo 0.30-0.60 V 0.15-0.25 Al 0.02 Cb 0.04-0.09 W 1.5-2.0 B 0.001-0.006 Ti 0.01 Zr 0.01
Tensile Strength, min, ksi [MPa]	74[510]	85[585]	85[585]	90[620]
Yield Strength, min, ksi [MPa]	58[400]	60[415]	60[415]	64[440]
Elongation in 2 in. or 50 mm, min, %	20%	20%	20%	20%

GRADE	ASTM A334 GRADE 1	ASTM A334 GRADE 3	ASTM A334 GRADE 6	ASTM A334 GRADE 7	ASTM A334 GRADE 8	ASTM A334 GRADE 9	ASTM A334 GRADE 11
Chemical Composition [Max values %]	C 0.30 Mn 0.4-1.06 P 0.025 S 0.025	C 0.19 Mn 0.31-0.64 P 0.025 S 0.025 Si 0.18-0.37 Ni 3.18-3.82	C 0.30 Mn 0.29-1.06 P 0.025 S 0.025 Si 0.10(min)	C 0.19 Mn 0.90 P 0.025 S 0.025 Si 0.13-0.32 Ni 2.03-2.57	C 0.13 Mn 0.90 P 0.025 S 0.025 Si 0.13-0.32 Ni 8.40-9.60	C 0.20 Mn 0.40-1.06 P 0.025 S 0.025 Ni 1.60-2.24 Cu 0.75-1.25	C 0.10 Mn 0.60 P 0.025 S 0.025 Si 0.35 Ni 35.0-37.0 Cr 0.50 Co 0.50 Mo 0.50
Tensile Strength, min, ksi [MPa]	55[380]	65[450]	60[415]	65[450]	100[690]	63[435]	65[450]
Yield Strength, min, ksi [MPa]	30[205]	35[240]	35[240]	35[240]	75[520]	46[315]	35[240]
Elongation in 2 in. or 50 mm, min, %	35%	30%	30%	30%	22%	28%	18%

GRADE	ASTM A333 GRADE 1	ASTM A333 GRADE 3	ASTM A 333 GRADE 4	ASTM A333 GRADE 6	ASTM A 333 GRADE 7
Chemical Composition [Max values %]	C 0.30 Mn 0.40-1.06 P 0.025 S 0.025	C 0.19 Mn 0.31-0.64 P 0.025 S 0.025 Si 0.18-0.37 Ni 3.18-3.82	C 0.12 Mn 0.50-1.05 P 0.025 S 0.025 Si 0.08-0.37 Ni 0.47-0.98 Cr 0.44-1.01 Cu 0.40-0.75 Al 0.04-0.30	C 0.30 Mn 0.29-1.06 P 0.025 S 0.025 Si 0.10(min)	C 0.19 Mn 0.90 P 0.025 S 0.025 Si 0.13-0.32 Ni 2.03-2.57
Tensile Strength, min, ksi [MPa]	55[380]	65[450]	60[415]	60[415]	65[450]
Yield Strength, min, ksi [MPa]	30[205]	35[240]	35[240]	35[240]	35[240]
Elongation in 2 in. or 50 mm, min, %	35%	30%	30%	30%	30%

GRADE	ASTM A333 GRADE 8	ASTM A333 GRADE 9	ASTM A333 GRADE 10	ASTM A333 GRADE 11
Chemical Composition [Max values %]	C 0.13 Mn 0.90 P 0.025 S 0.025 Si 0.13-0.32 Ni 8.40-9.60	C 0.20 Mn 0.40-1.06 P 0.025 S 0.025 Ni 1.6-2.24 Cu 0.75-1.25	C 0.20 Mn 1.15-1.50 P 0.035 S 0.015 Si 0.10-0.35 Ni 0.25 Cr 0.15 Cu 0.15 Al 0.06 V 0.12 Nb 0.05 Mo 0.05	C 0.10 Mn 0.60 P 0.025 S 0.025 Si 0.35 Ni 35.0-37.0 Cr 0.50 Mo 0.50 Co 0.50
Tensile Strength, min, ksi [MPa]	100[690]	63[435]	80[550]	65[450]
Yield Strength, min, ksi [MPa]	75[515]	46[315]	65[450]	35[240]
Elongation in 2 in. or 50 mm, min, %	22%	28%	22%	18%

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GRADE	ASTM/ASME SA556 A2	ASTM/ASME SA556 B2	ASTM/ASME SA556 C2	DIN 1629 ST 37.0	DIN 1629 ST 44.0	DIN 1629 ST 52.0
Material No.	-	-	-	1.0254	1.0256	1.0421
Chemical Composition [Max values %]	C 0.18 Mn 0.27-0.63 P 0.035 S 0.035	C 0.27 Mn 0.29-0.93 Si 0.10 Min P 0.035 S 0.035	C 0.30 Mn 0.29-1.06 Si 0.10 Min P 0.035 S 0.035	C 0.17 P 0.040 S 0.040 N 0.009	C 0.21 P 0.040 S 0.040 N 0.009	C 0.22 P 0.040 S 0.035 Al total 0.020
Tensile Strength, min, ksi [MPa]	320	410	480	350-480	420-550	500-650
Yield Strength, min, ksi [MPa]	180	260	280	235	275	355
Elongation in 2 in. or 50 mm, min, %	35%	30%	30%	25%	21%	21%

PART-1

GRADE	320
Chemical Composition [Max values %]	C 0.16 Mn 0.30-0.70 Si 0.10-0.35 P 0.040 S 0.040
Tensile Strength, min [N/mm2]	320-480
Yield Strength, min[N/mm2]	195
Elongation	25%

BS:3059

PART-2

GRADE	360	440	243	460	622-490
Chemical Composition [Max values %]	C 0.17 Mn 0.40-0.80 Si 0.10-0.35 P 0.035 S 0.035	C 0.12-0.18 Mn 0.90-1.20 Si 0.10-0.35 P 0.035 S 0.035	C 0.12-0.20 Mn 0.40-0.80 Si 0.10-0.35 P 0.035 S 0.035 Mo 0.25-0.35 Al 0.012	C 0.10-0.15 Mn 0.40-0.70 Si 0.10-0.35 P 0.030 S 0.030 Cr 0.70-1.10 Mo 0.45-0.65 Al 0.020	C 0.08-0.15 Mn 0.40-0.70 Si 0.50 P 0.030 S 0.030 Cr 2.0-2.5 Mo 0.90-1.20 Al 0.020
Tensile Strength, min [N/mm2]	360-500	440-580	480-630	460-610	490-640
Yield Strength, min[N/mm2]	235	245	275	180	275
Elongation	24%	21%	22%	22%	20%

GRADE	10CrMo 9 10	13 CrMo4 4	X 20 CrMoV 12 1	15 MO 3
Material No.	1.7380	1.7335	1.4922	1.5415
Chemical Composition [Max values %]	C 0.08-0.15 Mn 0.40-0.70 Si 0.50 P 0.035 S 0.035 Cr 2.00-2.50 Mo 0.90-1.20	C 0.10-0.18 Mn 0.40-0.70 Si 0.10-0.35 P 0.035 S 0.035 Cr 0.70-1.10 Mo 0.45-0.65	C 0.17-0.23 Mn < 1.00 Si < 0.50 P 0.030 S 0.030 Cr 10.0-12.5 Mo 0.80-1.20 Ni 0.30-0.80 V 0.25-0.35	C 0.12-0.20 Mn 0.40-0.80 Si 0.10-0.35 P 0.035 S 0.035 Mo 0.25-0.35
Tensile Strength, min [N/mm2]	450-600	440-590	690-840	450-600
Yield Strength, min[N/mm2]	280	290	490	270
Elongation	20%	22%	17%	22%

GRADE	ST 35.8	ST 45.8	ST 30 SI	ST 30 AI	ST. 35	ST. 45
Material No.	1.0305	1.0405	1.0211	1.0212	1.0308	1.0408
Chemical Composition [Max values %]	C 0.17 Mn 0.40-0.80 Si 0.10-0.35 P 0.040 S 0.040	C 0.21 Mn 0.40-1.20 Si 0.10-0.35 P 0.040 S 0.040	C 0.10 Mn 0.55 Si 0.30 P 0.025 S 0.025	C 0.10 Mn 0.55 Si 0.05 P 0.025 S 0.025	C 0.17 Mn 0.40 Min Si 0.35 P 0.025 S 0.025	C 0.21 Mn 0.40 Min Si 0.35 P 0.025 S 0.025
Tensile Strength, min, ksi [MPa]	360-480	410-530	290-420	290-420	340-470	440-570
Yield Strength, min, ksi [MPa]	235	255	215	215	235	255
Elongation in 2 in. or 50 mm, min, %	25%	21%	30%	30%	25%	21%

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GRADE	1008	1010	1012	1015	1016	1017
Chemical Composition [Max values %]	C 0.10 Mn 0.30-0.50 P 0.040 S 0.050	C 0.08-0.13 Mn 0.30-0.60 P 0.040 S 0.050	C 0.10-0.15 Mn 0.30-0.60 P 0.040 S 0.050	C 0.13-0.18 Mn 0.30-0.60 P 0.040 S 0.050	C 0.13-0.18 Mn 0.60-0.90 P 0.040 S 0.050	C 0.15-0.20 Mn 0.30-0.60 P 0.040 S 0.050

GRADE	1018	1019	1020	1021	1022	1025	1026
Chemical Composition [Max values %]	C 0.15-0.20 Mn 0.60-0.90 P 0.040 S 0.050	C 0.15-0.20 Mn 0.70-1.00 P 0.040 S 0.050	C 0.18-0.23 Mn 0.30-0.60 P 0.040 S 0.050	C 0.18-0.23 Mn 0.60-0.90 P 0.040 S 0.050	C 0.18-0.23 Mn 0.70-1.00 P 0.040 S 0.050	C 0.22-0.28 Mn 0.30-0.60 P 0.040 S 0.050	C 0.22-0.28 Mn 0.60-0.90 P 0.040 S 0.050
Tensile Strength, min, ksi [MPa]	-	-	379	-	-	379	-
Yield Strength, min, ksi [MPa]	-	-	234	-	-	248	-
Elongation	-	-	22%	-	-	22%	-

GRADE	1030	1040	1045	1050	1541
Chemical Composition [Max values %]	C 0.28-0.34 Mn 0.60-0.90 P 0.040 S 0.050	C 0.37-0.44 Mn 0.60-0.90 P 0.040 S 0.050	C 0.43-0.50 Mn 0.60-0.90 P 0.040 S 0.050	C 0.48-0.55 Mn 0.60-0.90 P 0.040 S 0.050	C 0.36-0.44 Mn 1.35-1.65 P 0.040 S 0.050
Tensile Strength, min, ksi [MPa]	-	-	517	538	-
Yield Strength, min, ksi [MPa]	-	-	331	345	-
Elongation	-	-	15%	12%	-

GRADE	ASTM A519 4130	ASTM A519 4140	ASTM A519 8620	EN 18	AISI 602
Chemical Composition [Max values %]	C 0.28-0.33 Cr 0.80-1.10 Mn 0.40-0.60 Si 0.15-0.35 P 0.040 S 0.040 Mo 0.15-0.25	C 0.38-0.43 Cr 0.80-1.10 Mn 0.75-1.00 Si 0.15-0.35 P 0.040 S 0.040 Mo 0.15-0.25	C 0.18-0.23 Cr 0.40-0.60 Mn 0.70-0.90 P 0.040 S 0.040 Ni 0.40-0.70 Mo 0.15-0.25	C 0.35-0.45 Cr 0.90-1.40 Mn 0.50-0.80 Si 0.10-0.35 P 0.040 S 0.040 Mo 0.20-0.40	C 0.24-0.33 Cr 1.0-1.5 Mn 0.45-0.65 Si 0.55-0.75 P 0.025(Max) S 0.025(Max) Mo 0.40-0.60 V 0.20-0.30
Tensile Strength, min, ksi [MPa]	621 HR 724 SR 517 A 621 N	-	-	-	-
Yield Strength, min, ksi [MPa]	483 HR 586 SR 379 A 414 N	-	-	-	-

GRADE	IS 1239 (PART-1)	IS 1239 (PART-2)
Chemical Composition [Max values %]	C 0.20 | Mn 1.30 | S 0.040 | P 0.040	S 0.050 | P 0.050
Tensile Strength, min, ksi [MPa]	320	

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CARBON & ALLOY STEEL SEAMLESS TUBES/PIPES PRODUCT COMPARISON

ASTM STANDARD	ASTM STEEL	DIN STANDARD	DIN STEEL	BS STANDARD	BS STEEL	EN STANDARD	EN STEEL	UNI STANDARD	UNI STEEL	GOST STANDARD	GOST STEEL	JIS STANDARD	JIS STANDARD
A106	Gr.A	17175	St35.8	3059-2	360	10216-2	P235GH	-	C14	1050	10	G3456	STPT370
	Gr.B	17175	St45.8	3059-2	430	10216-2	P265GH	-	C18	1050	20	G3456	STPT410
	Gr.C	17175	17Mn4	3059-2	440	-	(P295 GH)	-	-	4543	14G2	G3456	STPT480
A179	A179	17175	St35.8	3602-1	360	10216-2	P235GH	-	C14	1050	10	G3456	STPT370
A192	A192	17175	St35.8	3602-1	360	10216-2	P235GH	-	C14	1050	10	G3456	STPT370
A209	T1 .T1a,T1b	-	16Mo5	-	-	-	-	-	16Mo5	-	-	G3462	STBAI2
A210	Gr.A-1	17175	St45.8	3602-1	430	10216-2	P265GH	-	-	-	-	G3456	STPT410
	Gr.C	17175	17Mn4	-	-	-	-	-	-	-	-	-	-
A213	T/P122	-	-	-	-	-	11CrWCuMoVNbNB	-	-	-	-	-	HCM 12A
	T/P911	-	-	-	-	-	X11 CrMoWVNb9-1-1	-	-	-	-	-	-
	T/P92	-	-	-	-	-	X11 CrMoWVNb9-2	-	-	-	-	-	STBA29
	T11	-	-	3604-1	621	10216-2	10CrMo5-5	-	-	-	-	G3462	STBA23
	T12	17175	13CrMo4 4	3059-2	620	10216-2	13CrMo4-5	-	14CrMo3	4543	15ChM	G3462	STBA22
	T2	-	-	-	-	-	(15CrMo2-5)	-	-	-	-	G3462	STBA20
	T21	17176	12CrMo12-10	-	-	-	-	-	-	-	-	G3462	STBA25
	T22	17175	10CrMo9 10	3059-2	622-490	10216-2	10CrMo9-10	-	12CrMo9 10	5520	10ChM	G3462	STBA24
	T23	-	-	-	-	-	7CrWVMoNb 9-6	-	-	-	-	-	HCM 2S
	T24	-	-	-	-	-	7CrMaTiB10-10	-	-	-	-	-	-
	T5,T5b.T5c	17176	12CrMo19 5	3604-1	625	10216-2	X11CrMo5	-	-	550	15ChM	-	-
	17	-	-	-	-	-	(X11CrMo7)	-	-	-	-	G3462	STBA26
	T9	17176	X12CrMo9 1	3059-2	629	10216-2	X11CrMo9-1	-	-	-	-	-	-
A333	T91	-	-	3059-2	629-590	10216-2	X10CrM0VNb9-1	-	-	-	-	63462	STBA28
	Gr.1	17173	TTSt35N	3603	430LT	10216-4	P215NL	-	C15	-	-	G3460	STPL380
	Gr.3	17173	10Ni14	3603	503LT	10216-4	12Ni14	-	18Ni14	-	-	G3460	STPL450
	GE.6	17174	TTSt35V	3603	430LT	10217-4	P265NL	-	C20	-	-	-	-
	Gr.7	-	-	-	-	-	(10Ni9)	-	18Ni9	-	-	-	-
A334	Gr.8	17173	X8Ni9	3603	509LT	10216-4	X10Ni9	-	X12N109	-	-	-	-
	Gr.1	17174	TTSt35N	-	-	10217-4	P215NL	-	-	-	-	G3464	STBL380
	Gr.3	17173	10Ni14	3603	503LT	10253-2	12Ni14	-	18Ni14	-	-	G3464	STBL450
	Gr.6	17173	TTSt35V	3603	430LT	10217-6	P265NL	-	C20	-	-	-	-
A335	Gr.7	-	-	-	-	-	-	-	18Ni9	-	-	-	-
	P1	-	-	-	-	-	-	-	16Mo5	-	-	G3458	STPAI2
	P11	-	-	3604-2	621	10253-2	10CrMo5-5	-	-	-	-	G3458	STPA23
	P12	2609	13CrMo4 4	3604-1	620-440	10253-2	13CrMo4-5	-	-	-	-	G3458	STPA22
	P2	-	-	-	-	-	-	-	-	-	-	G3458	STPA20
	P21	-	12CrMo12-10	-	-	-	-	-	-	-	-	G3458	STPA25
	P22	2609	10CrMo9 10	3604-1	6222	10253-2	10CrMo9-10	-	-	-	-	G3458	STPA24
A53	P24	-	-	-	-	-	7CrMoVTiB10-10	-	-	-	-	-	-
	P5,P5b,P5c	17176	12CrMo19 5	3606	625	10253-2	X11CrMo5	-	-	20072	15ChM	-	-
A556	P7	-	-	-	-	-	(X11CrMo7)	-	-	-	-	G3458	STPA26
	P9	-	-	3604-1	629	10253-2	X11CrMo9-1	-	-	-	-	-	-
	P91	-	-	-	-	10253-2	X10CrMoVNb9-1	-	-	-	-	G3458	STPA28
	Gr.A	17121	RSt37-2	6323-3	HFS 3	10025-2	S235JR	-	Fe35-1	1050	10	-	-
	GrB	17121	St44-3	6323-3	HFS4	10025-2	S275J2	-	Fe45-1	1050	20	-	-
	Gr.A-2	17175	5135.8	3602-1	360	10216-2	P235GH	-	C14	1050	10	G3456	STPT370
	Gr.B-2	17175	St45.8	3602-1	430	10216-2	P265GH	-	-	-	-	-	-
	Gr.C2	-	-	-	-	-	-	-	-	-	-	-	-

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COLD DRAWN SEAMLESS STAINLESS, CARBON & ALLOY STEEL MANUFACTURING RANGE

OUTSIDE DIAMETER		in mm	6.35	12.7	19.05	25.4	31.75	38.1	44.45	50.8	57.15	63.5	69.85	76.2	82.55	88.9	95.25	101.6
		in inch	1/4	1/2	3/4	1	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/2	2 3/4	3	3 1/4	3 1/2	3 3/4	4
WALL THICKNESS																		
Gauge	mm	inch																
22 SWG	0.711	0.028	0.099	0.210	0.322	0.433	0.544	0.656	0.767	0.878	0.990	1.101						
22 BWG	0.711	0.028	0.099	0.210	0.322	0.433	0.544	0.656	0.767	0.878	0.990	1.101						
21 SWG	0.813	0.032	0.111	0.238	0.366	0.493	0.620	0.748	0.875	1.002	1.130	1.257						
21 BWG	0.813	0.032	0.111	0.238	0.366	0.493	0.620	0.748	0.875	1.002	1.130	1.257						
20 SWG	0.914	0.036	0.123	0.266	0.409	0.552	0.695	0.838	0.981	1.124	1.268	1.411	1.554					
20 BWG	0.889	0.035	0.120	0.259	0.398	0.537	0.677	0.816	0.955	1.094	1.233	1.373	1.512					
19 SWG	1.016	0.040	0.134	0.293	0.452	0.611	0.770	0.929	1.088	1.247	1.406	1.566	1.725					
19 BWG	1.067	0.042	0.139	0.306	0.473	0.640	0.807	0.974	1.142	1.309	1.476	1.643	1.810					
18 SWG	1.219	0.048	0.154	0.345	0.536	0.727	0.918	1.109	1.300	1.491	1.681	1.872	2.063	2.254	2.445	2.636	2.827	
18 BWG	1.245	0.049	0.157	0.352	0.547	0.742	0.937	1.132	1.327	1.522	1.716	1.911	2.106	2.301	2.496	2.691	2.886	
17 SWG	1.473	0.058	0.177	0.408	0.639	0.869	1.100	1.331	1.561	1.792	2.023	2.253	2.484	2.715	2.945	3.176	3.407	
17 BWG	1.499	0.059	0.179	0.414	0.649	0.884	1.118	1.353	1.588	1.823	2.057	2.292	2.527	2.762	2.996	3.231	3.466	
16 SWG	1.626	0.064	0.189	0.444	0.699	0.953	1.208	1.463	1.717	1.972	2.226	2.481	2.736	2.990	3.245	3.500	3.754	4.009
16 BWG	1.651	0.065	0.191	0.450	0.708	0.967	1.226	1.484	1.743	2.001	2.260	2.518	2.777	3.035	3.294	3.552	3.811	4.070
15 SWG	1.829	0.072	0.204	0.490	0.777	1.063	1.350	1.636	1.922	2.209	2.495	2.782	3.068	3.355	3.641	3.927	4.214	4.500
15 BWG	1.829	0.072	0.204	0.490	0.777	1.063	1.350	1.636	1.922	2.209	2.495	2.782	3.068	3.355	3.641	3.927	4.214	4.500
14 SWG	2.032	0.080	0.216	0.535	0.853	1.171	1.489	1.807	2.126	2.444	2.762	3.080	3.399	3.717	4.035	4.353	4.671	4.990
14 BWG	2.108	0.083	0.221	0.551	0.881	1.211	1.541	1.871	2.201	2.531	2.861	3.192	3.522	3.852	4.182	4.512	4.842	5.172
13 SWG	2.337	0.092		0.597	0.963	1.329	1.695	2.061	2.427	2.793	3.159	3.525	3.891	4.257	4.623	4.989	5.355	5.721
13 BWG	2.413	0.095		0.612	0.990	1.368	1.746	2.124	2.502	2.879	3.257	3.635	4.013	4.391	4.769	5.147	5.525	5.902
12 SWG	2.642	0.104		0.655	1.069	1.483	1.897	2.310	2.724	3.138	3.552	3.965	4.379	4.793	5.206	5.620	6.034	6.448
12 BWG	2.769	0.109		0.678	1.112	1.545	1.979	2.413	2.846	3.280	3.714	4.147	4.581	5.014	5.448	5.882	6.315	6.749
11 SWG	2.946	0.116		0.709	1.170	1.631	2.093	2.554	3.015	3.477	3.938	4.399	4.861	5.322	5.783	6.245	6.706	7.167
11 BWG	3.048	0.120		0.726	1.203	1.680	2.157	2.635	3.112	3.589	4.067	4.544	5.021	5.499	5.976	6.453	6.931	7.408
10 SWG	3.251	0.128		0.758	1.267	1.776	2.285	2.794	3.303	3.812	4.321	4.830	5.340	5.849	6.358	6.867	7.376	7.885
10 BWG	3.404	0.134		0.780	1.313	1.847	2.380	2.913	3.446	3.979	4.512	5.045	5.578	6.111	6.644	7.177	7.710	8.243
9 SWG	3.658	0.144		0.816	1.389	1.961	2.534	3.107	3.680	4.253	4.826	5.398	5.971	6.544	7.117	7.690	8.263	8.836
9 BWG	3.759	0.148		0.829	1.418	2.006	2.595	3.183	3.772	4.361	4.949	5.538	6.127	6.715	7.304	7.893	8.481	9.070
8 SWG	4.064	0.160		0.866	1.502	2.138	2.775	3.411	4.048	4.684	5.321	5.957	6.593	7.230	7.866	8.503	9.139	9.775
8 BWG	4.191	0.165		0.879	1.536	2.192	2.848	3.505	4.161	4.817	5.474	6.130	6.786	7.443	8.099	8.755	9.412	10.068
7 SWG	4.470	0.176			1.607	2.307	3.007	3.707	4.407	5.107	5.807	6.507	7.207	7.907	8.607	9.307	10.007	10.707
7 BWG	4.572	0.180			1.632	2.348	3.064	3.780	4.496	5.212	5.928	6.644	7.360	8.076	8.792	9.508	10.224	10.940
6 SWG	4.877	0.192			1.705	2.468	3.232	3.996	4.760	5.523	6.287	7.051	7.815	8.578	9.342	10.106	10.870	11.633
6 BWG	5.156	0.203			1.767	2.574	3.382	4.189	4.996	5.804	6.611	7.419	8.226	9.034	9.841	10.648	11.456	12.263
5 SWG	5.385	0.212			1.815	2.658	3.501	4.345	5.188	6.031	6.875	7.718	8.561	9.404	10.248	11.091	11.934	12.778
5 BWG	5.588	0.220			1.855	2.730	3.605	4.480	5.356	6.231	7.106	7.981	8.856	9.731	10.606	11.481	12.356	13.231
4 SWG	5.893	0.232			1.912	2.835	3.758	4.681	5.603	6.526	7.449	8.372	9.295	10.218	11.141	12.063	12.986	13.909
4 BWG	6.045	0.238				2.885	3.832	4.779	5.725	6.672	7.619	8.565	9.512	10.459	11.405	12.352	13.299	14.245
3 SWG	6.401	0.252				2.999	4.002	5.004	6.006	7.009	8.011	9.014	10.016	11.018	12.021	13.023	14.026	15.028
3 BWG	6.579	0.259				3.054	4.084	5.114	6.144	7.175	8.205	9.235	10.266	11.296	12.326	13.356	14.387	15.417
2 SWG	7.010	0.276				3.179	4.277	5.375	6.473	7.570	8.668	9.766	10.864	11.961	13.059	14.157	15.255	16.352
2 BWG	7.214	0.284				3.235	4.365	5.495	6.625	7.754	8.884	10.014	11.143	12.273	13.403	14.533	15.662	16.792
1 SWG	7.620	0.300				3.341	4.535	5.728	6.921	8.114	9.308	10.501	11.694	12.888	14.081	15.274	16.467	17.661
1 BWG	7.620	0.300				3.341	4.535	5.728	6.921	8.114	9.308	10.501	11.694	12.888	14.081	15.274	16.467	17.661
0 SWG	8.829	0.324				3.608	4.991	6.373	7.756	9.139	10.521	11.904	13.286	14.669	16.052	17.434	18.817	20.200
0 BWG	8.636	0.340				3.570	4.923	6.275	7.628	8.980	10.332	11.685	13.037	14.390	15.742	17.094	18.447	19.799

For Carbon and Alloy Steel Tubes Cross Section Kg/mtr Weight is: (in mm): (OD -Thk) x Thk x 0.0246615. For Stainless Steel Tubes Cross Section Kg/mtr weight: (in mm); (OD -Thk) x Thk x 0.0252

SEAMLESS CARBON & ALLOY STEEL LINE PIPE MANUFACTURING RANGE

NOMINAL PIPE SIZE			SCHEDULE STANDARD		SCHEDULE 40		SCHEDULE XS		SCHEDULE 80		SCHEDULE 120		SCHEDULE 160		SCHEDULE XXS	
INCH	MM	IN MM	WALL	WT.	WALL	WT.	WALL	WT.	WALL	WT.	WALL	WT.	WALL	WT.	WALL	WT.
1/4	8	13.7	2.24	0.63	2.24	0.63	3.02	0.80	3.02	0.8	-	-	-	-	-	-
3/8	10	17.1	2.31	0.84	2.31	0.84	3.2	1.10	3.2	1.1	-	-	-	-	-	-
1/2	15	21.3	2.77	1.27	2.77	1.27	3.73	1.62	3.73	1.62	-	-	4.78	1.95	7.47	2.55
3/4	20	26.7	2.87	1.69	2.87	1.69	3.91	2.20	3.91	2.2	-	-	5.56	2.9	7.82	3.64
1	25	33.4	3.38	2.50	3.38	2.50	4.55	3.24	4.55	3.24	-	-	6.35	4.24	9.09	5.45
1 1/4	32	42.2	3.56	3.39	3.56	3.39	4.85	4.47	4.85	4.47	-	-	6.35	5.61	9.7	7.77
1 1/2	40	48.3	3.68	4.05	3.68	4.05	5.08	5.41	5.08	5.41	-	-	7.14	7.25	10.16	9.58
2	50	60.30	3.91	5.44	3.91	5.44	5.54	7.48	5.54	7.48	-	-	8.74	11.11	11.07	13.44
2 1/2	65	73.00	5.16	8.63	5.16	8.63	7.01	11.41	7.01	11.41	-	-	9.52	14.90	14.02	20.39
3	80	88.90	5.49	11.29	5.49	11.29	7.62	15.27	7.62	15.27	-	-	11.13	21.35	15.34	27.83
3 1/2	90	101.60	5.74	13.57	5.74	13.57	8.08	18.64	8.08	18.64	-	-				
4	100	114.30	6.02	16.08	6.02	16.08	8.58	22.32	8.56	22.32	11.13	28.32	13.49	33.54	17.12	41.03
5	125	141.30	6.55	21.77	6.55	21.77	9.52	30.94	9.52	30.94	12.70	40.28	15.88	49.12	19.05	57.43
6	150	168.30	7.11	8.26	7.11	28.26	10.97	42.56	10.97	42.56	14.27	54.21	18.28	67	21.95	79.22

SEAMLESS COLD DRAWN STAINLESS STEEL LINE PIPE MANUFACTURING RANGE

NOMINAL PIPE SIZE			SCHEDULE 5 S		SCHEDULE 10 S		SCHEDULE 20 S		SCHEDULE 40 S		SCHEDULE 80 S		SCHEDULE 160 S		SCHEDULE XXS	
INCH	MM	IN MM	WALL	WT.	WALL	WT.	WALL	WT.	WALL	WT.	WALL	WT.	WALL	WT.	WALL	WT.
1/8	6	10.30	1.20	0.28	1.24	0.28	1.50	0.33	1.73	0.37	2.41	0.48	-	-	-	-
1/4	8	13.70	1.20	0.38	1.65	0.50	2.00	0.59	2.24	0.65	3.02	0.81	-	-	-	-
3/8	10	17.10	1.20	0.48	1.65	0.64	2.00	0.79	2.31	0.86	3.20	1.12	-	-	-	-
1/2	15	21.30	1.65	0.82	2.11	1.02	2.30	1.10	2.77	1.29	3.73	1.65	4.75	1.98	7.47	2.60
3/4	20	26.70	1.65	1.04	2.11	1.31	2.55	1.55	2.87	1.72	3.91	2.25	5.56	2.96	7.82	3.72
1	25	33.40	1.65	1.32	2.77	2.14	2.55	1.98	3.38	2.56	4.55	3.31	6.35	4.33	9.09	5.57
11/4	32	42.20	1.65	1.69	2.77	2.75	3.00	2.96	3.56	3.47	4.85	4.56	6.35	5.74	9.70	7.94
11/2	40	48.30	1.65	1.94	2.77	3.18	3.00	3.42	3.68	4.14	5.08	5.53	7.14	7.41	11.10	10.41
2	50	60.30	1.65	2.44	2.77	4.02	3.00	4.33	3.91	5.56	5.54	7.64	8.74	11.36	11.07	13.73
21/2	65	73.00	2.11	3.77	3.05	5.38	4.00	6.96	5.16	8.82	7.01	11.66	9.53	15.24	14.02	20.84
3	80	88.90	2.11	4.61	3.05	6.60	4.00	8.56	5.49	11.54	7.62	15.61	11.10	21.76	15.24	28.29
4	100	114.30	2.11	5.97	3.05	8.55	4.50	12.45	6.02	16.43	8.56	22.81	13.49	34.27	17.12	41.93
5	125	141.30	2.77	9.67	3.40	11.82	5.00	17.17	6.55	22.24	9.53	31.65	15.88	50.19	19.05	58.69
6	150	168.30	2.77	11.55	3.40	14.13	6.35	25.92	7.11	28.88	10.97	43.49	18.25	69.01	21.95	80.95
8	200	219.08	2.77	15.10	3.76	20.40	6.35	34.04	8.18	43.47	12.70	66.05	23.01	113.69	22.23	110.27

For Carbon and Alloy Steel Tubes Cross Section Kg/mtr Weight is: (in mm): (OD -Thk) x Thk x 0.0246615. For Stainless Steel Tubes Cross Section Kg/mtr weight: (in mm); (OD -Thk) x Thk x 0.0252

CARBON DRAWN SEAMLESS STAINLESS, CARBON & ALLOY STEEL HYDRAULIC/MECHANICAL TUBES MANUFACTURING RANGE

WT IN MM																			
MIN		0.50	1.00	1.50	2.00	2.50	3.00	3.50	4.00	5.00	6.00	7.00	8.00	9.00	10.00	12.00	14.00	16.00	18.00	20.00	22.00
MAX		1.00	1.50	2.00	2.50	3.00	3.50	4.00	5.00	6.00	7.00	8.00	9.00	10.00	12.00	14.00	16.00	18.00	20.00	22.00	24.00
OD IN MM																					
MIN	MAX																				
6.00	8.00	√	√	√	√																
8.00	10.00	√	√	√	√	√															
10.00	16.00	√	√	√	√	√	√	√													
16.00	25.00	√	√	√	√	√	√	√	√	√											
25.00	30.00	√	√	√	√	√	√	√	√	√	√	√									
30.00	40.00	√	√	√	√	√	√	√	√	√	√	√	√	√	√						
40.00	50.00		√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√			
50.00	60.00			√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√		
60.00	75.00				√	√	√	√	√	√	√	√	√	√	√	√	√	√	√		
75.00	90.00				√	√	√	√	√	√	√	√	√	√	√	√	√	√	√		
90.00	110.00				√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
110.00	130.00				√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
130.00	150.00				√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
150.00	175.00				√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
175.00	200.00				√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
200.00	220.00				√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√

For Carbon and Alloy Steel Tubes Cross Section Kg/mtr Weight is: (in mm): (OD -Thk) x Thk x 0.0246615. For Stainless Steel Tubes Cross Section Kg/mtr weight: (in mm); (OD -Thk) x Thk x 0.0252

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Unit - 2 : Cold Drawn Carbon & Alloy Steel Plant

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