JSW Hot Rolled Steel

JSW Steel Plant, Vijayanagar Works, Karnataka
India's leading integrated steel company

Content

Meet JSW

The US$ 23 billion JSW Group is ranked among India's leading business houses. JSW's innovative and sustainable presence in various sectors including Steel, Energy, Infrastructure, Cement, Paints, Venture Capital and Sports is helping the Group play an important role in driving India's economic growth. The Group strives for excellence by leveraging its strengths & capabilities including a successful track-record of executing large capital-intensive & technically complex projects, differentiated product-mix, state-of-the-art manufacturing facilities and greater focus on pursuing sustainable growth.

It also has a strong social development focus aimed at empowering local communities residing around its Plant & Port locations. JSW Group is known to create value for all its stakeholders by combining its growth roadmap, superior execution capabilities and a relentless drive to be **#BetterEveryday.**

40000+

People

300+

Offices

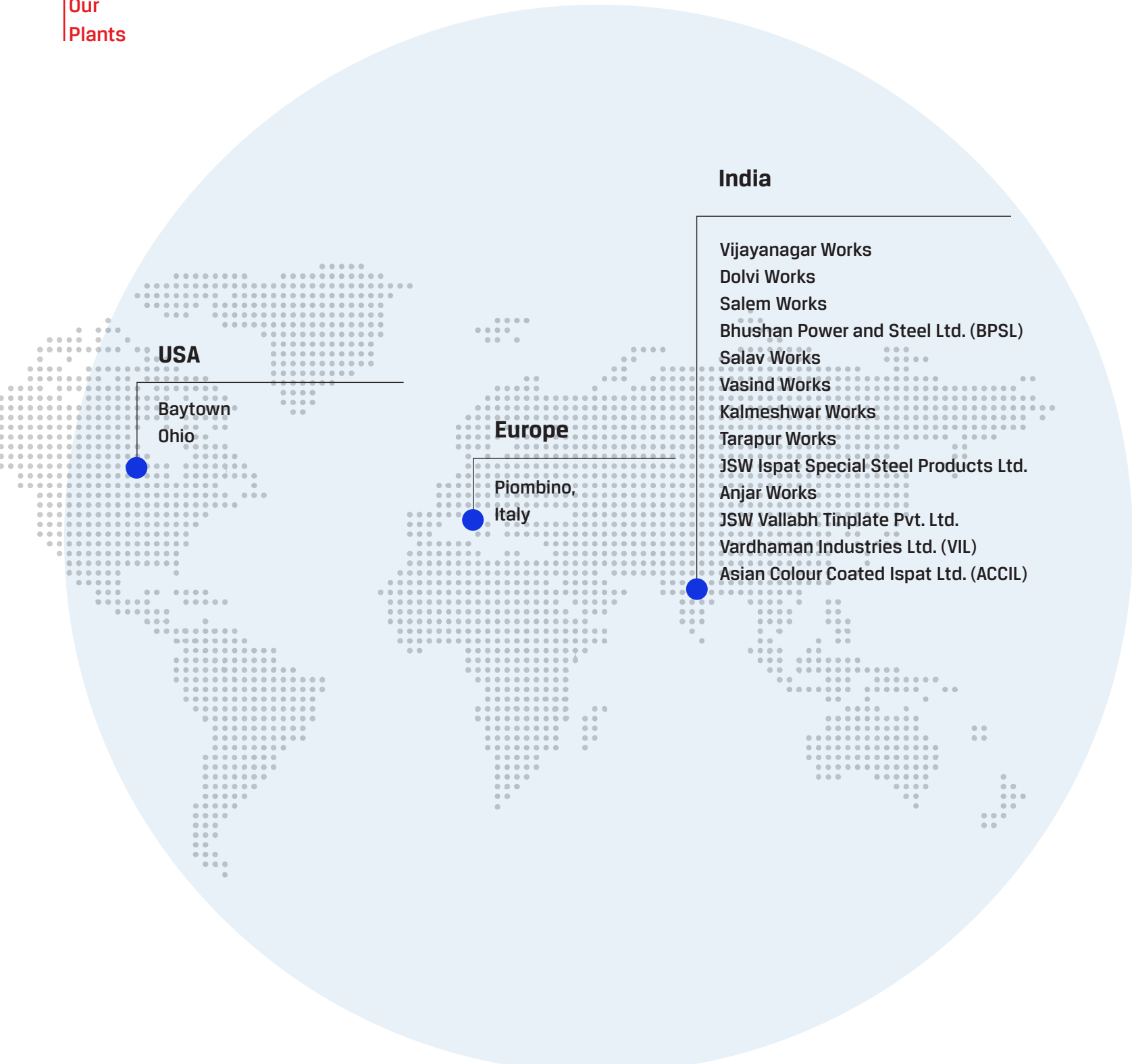
16

Plants

4

Continents

Our Plants


India
Vijayanagar Works
Dolvi Works
Salem Works
Bhushan Power and Steel Ltd. (BPSL)
Salav Works
Vasind Works
Kalmeshwar Works
Tarapur Works
JSW Ispat Special Steel Products Ltd.
Anjar Works
JSW Vallabh Tinplate Pvt. Ltd.
Vardhaman Industries Ltd. (VIL)
Asian Colour Coated Ispat Ltd. (ACCIL)
USA
Baytown
Ohio
Europe
Piombino,
Italy

Meet JSW Steel

JSW Steel is the flagship business of the diversified, US$ 23 billion JSW Group. As one of India's leading business houses, JSW Group also has interests in energy, infrastructure, cement, paints, sports, and venture capital. JSW Steel has emerged as an organization with a strong cultural foundation. It is certified by Great Places to Work (2021 and 2022) as well as ranked as one of the Best Employers among Nation Builders (2023). Over the last three decades, it has grown from a single manufacturing unit to become India's leading integrated steel company with a capacity of 29.7 MTPA in India and the USA (including capacities under joint control). Its next phase of growth in India will take its total capacity to 38.5 MTPA by FY25. The Company's manufacturing unit in Vijayanagar, Karnataka is the largest single-location steel-producing facility in India with a capacity of 12.5 MTPA.

JSW Steel has always been at the forefront of research and innovation. It has a strategic collaboration with global leader JFE Steel of Japan, enabling JSW to access new and state-of-the-art technologies to produce and offer high-value special steel products to its customers. These products are extensively used across industries and applications including construction, infrastructure, automobile, electrical applications, and appliances.

JSW Steel is widely recognized for its excellence in business and sustainability practices. Some of these recognitions include World Steel Association's Steel Sustainability Champion (consecutively from 2019 to 2022), Leadership Rating (A) in CDP climate change disclosure (2022), Deming Prize for TQM for its facilities at Vijayanagar (2018), and Salem (2019). It was part of the Dow Jones Sustainability Index (DJSI) for Emerging Markets during 2021 and included in the S&P Global's Sustainability Yearbook (consecutively for 2020 and 2021). In December 2022, JSW Steel was ranked 8th among the top 35 world-class steelmakers, according to the 'World-Class Steelmaker Rankings' by World Steel Dynamics (WSD), based on a variety of factors. As a responsible corporate citizen, JSW Steel's CO2 emission reduction goals are aligned with India's Climate Change commitments under the Paris Accord.

JSW Steel Plant, Vijayanagar Works, Karnataka


Total Quality Management (TQM)
is a set of systematic activities carried out by the entire
tively and efficiently achieve the organization's objectives
roducts and services with a level of quality that satisfies
ropriate time and price".
JSW
HART

- Vijayanagar, Karnataka is the largest single-location steel-producing facility in India
- JSW Steel Salem Works is the largest integrated Alloy and Special Steel plant in India
- India's largest Coated Steel producer
- India's only Hot Strip Mill with Slab Sizing Press servicing a wide range of widths from single slab width.
- India's largest Long Steel producer by installed capacity
- One of the Widest Cold Rolling Mill (up to 1870 mm width)
- ZERO EFFLUENT discharge for greener: cleaner environment
- First continuous annealing line in India
- First Licensee Galvalume® producer in India
  India's only Multi-Radii Bloom Caster operational at Salem works
- India's most modern and largest Vertical Caster-300/260/220 x 2200 mm
- 1.6 million trees planted at Vijayanagar Works, transforming the area into a green oasis

JSW Steel
Hot Rolled Capacities

JSW Steel manufactures superlative Hot Rolled (HR) coils at its Hot Strip Mills (HSM), situated at Vijayanagar, Karnataka, and at Dolvi, Maharashtra. The production of these coils involves the use of state-of-the-art equipment and manufacturing processes that ensure products of the highest quality. At Vijayanagar, HSM-I has a commissioned capacity of 3 MTPA and HSM-II has commissioned capacity of 5 MTPA, equipped with sizing presses and an automatic line inspection facility.

HSM 2 is one of the widest Hot Strip mills in India, capable of rolling up to 2150 mm.

JSW Steel's Dolvi unit in Maharastra has 10 MTPA capacity with 8.5 MTPA flat products and 1.5 MTPA long products. The Dolvi unit CSP uses a combination of the advanced Conarc Process and Thin Slab Casting technology, which facilitates the production of HR coils that are superior in quality due to their thinner gauges and finer surface quality.

The convenient coastal location of the Dolvi unit allows easy access to the plant and makes the import and export of raw materials and finished goods extremely efficient.


Mill Stand-1
VEMS

JSW Steel Plant, Vijayanagar Works, Karnataka

Manufacturing Facilities

Vijayanagar						
Parameters	Pellet	Sinter	Coke Oven	Corex	Blast Furnace	Convertor
Capacity	Pellet Plant1: 4.2 MTPA Pellet Plant2: 4.2 MTPA Pellet Plant3: 8.0 MTPA Total: 16.4MTPA	Sinter Plant1: 2.2MTPA Sinter Plant2: 2.2MTPA Sinter Plant3: 4.75MTPA Sinter Plant4: 2.2MTPA Total: 12.95MTPA	Coke Oven3: 1.5MTPA Coke Oven4: 1.9MTPA Cove Oven5:3.00MTPA Total: 6.4MTPA	Corex1: 0.8MTPA Corex2: 0.8MTPA Total - 1.6MTPA	Blast Furnace1: 1.9MTPA Blast Furnace2: 1.5MTPA Blast Furnace3: 3.5MTPA Blast Furnace4: 3.5MTPA Total: 10.4MTPA	SMS1 (3 Convertors) : 4.0 MTPA SMS2 (4 Convertors) : 6.8 MTPA SMS3 (EAF, ZPF): 2.9 MPTS Total: 13.7 MTPA
Technology / Supplier	M/s. Kvaerner Metals, USA	M/s Otto Kumpo, Germany	Coke Oven3,4&5: M/s MECC, China (Sino Steel)	M/s Voest Alpine, Austria	BF1 - M/s Mecon, India BF2 - M/s Danieli Corus, Netherlands BF3 & 4 - M/s Siemens VAI, UK	M/s SMS Demag, Germany
Features	Dryers, Ball Mills, Pelletisiers of 7.5m dia, Indurating furnace, Electrostatic Precipitator and Water Re-circulation System	SP1 &2: 204 Square meter Sinter Bed SP3: 496 Square meter Sinter Bed SP4: 231 Square meter Sinter Bed	Coke Oven3,4&5: Recovery type with 12 batteries of 760 ovens	Coal Blending Station, Coal Drying Plant, Stock House, Water Re-circulation System, Gas Cleaning System, and Slag Granulation Plant	BF1 - useful volume of 2307 m3 BF2 - useful volume of 1680 m3 BF3&4 - useful volume of 4019 m3 each	SMS1 Convertors: 130tons/heat SMS2 Convertors: 170tons/heat SMS3 Convertors:155tons/heat Pre tap plug & post tap slag arrester (DART system), Top Cone Cooling, Combined blowing of oxygen from top and Argon from bottom, Sublance system.

Vijayanagar						
Secondary Steel Making	Caster	HSM	CRM	ACL	WRM	BRM
SMS1: 3LHF & 1RH degasser SMS2: 4LHF & 2RH degassers SMS3:2LHF,1VD Degasser	SMS1 (4 Slab casters): 4.00MTPA SMS2(1 Billet caster): 1.40MTPA SMS2(4 Slab casters): 5.40MTPA SMS3(2 Billet Casters): 2.90MTPA Total - 13.7MTPA	HSM1: 3.2MTPA HSM2: 5.0MTPA Total - 8.2MTPA	CRM1: 1.8MTPA CRM2: 2.3MTPA (CAL1-0.95MTPA, CAL2-0.95MTPA - CRCA & CGL-1.30MTPA - Coated), CCL-0.3 MTPA	ACL1 - 0.2MTPA	WRM1: 0.6MTPA WRM2:1.2MTPA Total: 1.8MTPA	BRM1: 1.0MTPA BRM2:1.2MTPA Total: 2.2MTPA
M/s SMS Demag, Germany	M/s. SMS Demag, Germany M/s. VAI Siemens, UK	HSM1: M/s Danieli, USA HSM2: M/s Mitsubishi-Hitachi, Japan	CRM1: Continuous Pickling Line:M/s. Flat Products India Ltd Compact Cold Rolling Mill:M/s. SMS Demag, Germany Batch Annealing Furnace:M/s. Ebner, Austria CRM2: Pickling and Continuous Cold Rolling Mill:M/s. SMS Siemag, Germany Continuous Annealing Mill(2 Nos): M/s. SPCO, Japan Continous Galvanising Line (1 No.) : M/s SPCO, Japan	Terminal equipments- Tenova, Italy Furnaces- LOI Thermoprocess	WRM1: M/s Morgan,USA WRM2: M/s Primetals, USA	BRM1: M/s Morgan, USA BRM2: M/s Danelli, Italy
LHF: Auto Electrode regulation system, Multiple wire feeding, Water cooled roof RH Degasser: Multi function lance, Hydraulic Rocker Arm System, Recirculation rate : 100 TPM for SMS1 & 125TPM for SMS2	Billet Caster: 165 x 165mm Slab Casters: 220/260/300mm Thick with 800 to 2200 mm Width Caster1&2: Curved Moulds with electromechanical Oscillation, Air mist cooling, Auto mould width change, SEN change facility Caster 3,4,6,7&8: Dynamic spray cooling, Auto mould width change, Vertical mould with hydraulic Oscillator, Auto-strand taper control with dynamic soft reduction. Electro Magnetic Stirrer facility also available	Thickness 1.4 - 25.4 mm and width 900-2100mm HSM1: 2- Reheating Furnace, 1-Roughing mill (Reversible), 6 stand-4 Hi tandem mill (Finishing Mill), Run out Table & 2-Down coilers HSM2: 3- Reheating Furnace, 2-Roughing mill (Reversible), 7 stand-4 Hi tandem mill (Finishing Mill), Run out Table & 3-Down coilers capable to make Dual Phase steel Online Surface inspection system	Thickness: 0.35 - 3.2mm and Width:900 - 1870mm CRM1: Pickling and Continuous Cold Rolling Mill(1 No), Electrolytic Cleaning Line(1 No:), Batch Annealing Furnace(1 No:), Skin Pass Mill(1 No), Recoiling Line(2 Nos), Auto Packing Line(1 Nos) CRM2: Pickling and Continuous Cold Rolling Mill(1 No), Continuous Annealing Line(2 Nos), Continous Galvanising Line (1 No.) : M/s SPCO, Japan, Recoiling Line(3 Nos), Auto Packing Line(2 Nos)	Thickness: 0.30 - 0.7 mm and Width:900 - 1350mm Process speed- 30-120mpm Coating- C3,C5,C6 Welder Capability- To weld 0.3 to 3.2%Si in the above thickness	Heavy Duty Automatic Compactor Laser Diameter monitoring system ,Morgan Enhanced Temp Control System,Automatic Water Flow Control in Water Boxes	Block Mill, Walking Beam Reheating Furnace 2 slit , longest(106m) cooling bed HYQST Technology to achieve uniform microstruture

Manufacturing Facilities

Dolvi					
Parameters	Pellet	Sinter	Coke Oven	Blast Furnace (BF)	Direct Reduced Iron (DRI)
Capacity	Pellet Plant 1 (4 MTPA), Pellet Plant 2 (8 MTPA)	Sinter Plant 1 (2.8 MTPA) Sinter Plant 2 (2.32 MTPA)	Coke Plant 1 (1 MTPA), Coke Plant 2 (3 MTPA)	BF 1 (3 MTPA), BF 2 (4.5 MTPA)	DRI (1.6 MTPA)
Technology / Supplier	Pellet Plant 1: METSO Pellet Plant 2: OUTOTEC, GERMANY	MECC CHINA, OUTOTEC	Coke Plant 1: MECC SINO STEEL, CHINA Coke Plant 2: ACRE	BF 1: NIPPON, JAPAN BF 2: NSENGI	MIDREX, USA
Features	Pellet Plant 1: 464 m2 travel grate Pallet Plant 2: 816 m2 Area, 204x4 Machine Length	Sinter Plant 1: 198 m2, Sinter Plant 2: 224 m2 bed area, WHRS boiler	Coke Plant 1: 5.5m height, Stamp charged, 2x55 ovens & recovery type. Coke Plant 2: 6.25m height, 4x62 ovens, recovery type, CDQ	BF 1: 4 tap holes, Productivity 2.84 BF 2: Inner Vol. 5358 m3, Dry GCP, Gran Shots	Gas based single module, in-house modification for usages of COG

JSW - BPSL					
Parameters	Pellet	Sinter	Coke Oven	Blast Furnace (BF)	Direct Reduced Iron (DRI)
Plant Capacity	3.85	5.9	1.54	2.65	1.8
ABP 23-24	3.86	4.52	1.55	2.87	1.83

Did You Know? JSW is recognised as 'Worldsteel Sustainability Champion for 2023', for the fifth consecutive time in a row.

Dolvi				
Convertor	Conarc	Secondary Refining	Casting	Hot Strip Mill (HSM)
SMS 2 [BOF (5 MTPA)]	SMS 1 [Furnace (5 MTPA)]	SMS 1 [5 nos. of LF] SMS 2 [2 nos. of LF & RH]	SMS 1 [CSP Caster (3.5 MTPA), Billet Caster (1.5 MTPA)] [5 MTPA] SMS 2 [5 MTPA]	HSM 1/Continuous Strip Processing (CSP) (3.5 MTPA) HSM 2 (5 MTPA)
SMS Group	SMS Group	SMS 1: SMS Group SMS2: SMS Group	SMS: Thin slab caster, technology/supplier SMS Siemag	HSM 1: SMS SIEMAG HSM 2: PRIMETALS
Sub-lance in BOF, Pneumatic slag stopper with infrared camera	CONARC	Largest RH Vessel, Capability to process 100% heat through RH	SMS 1: Thin slab caster (two caster) (Slab thickness 59 & 65mm, LCR, EMBR, MMS, TGD, X Pact width transition) SMS 2: 2 x Twin Strand Caster, Mould EMS, Dynamic Soft Reduction	HSM 1: CSP, CVC roll, Online surface inspection HSM 2: Stein Digit@l Furnace® technology, Crown & shape control: Pair Cross & Work Roll shifting, Parsytec surface inspection system

JSW - BPSL				
Convertor	Conarc	Secondary Refining	Casting	Hot Strip Mill (HSM) CSP
-	-	-	2.7	2.7
-	-	-	2.69	2.69

Did You Know? JSW joined 'Responsible Steel', the steel industry's first global multistakeholder standard and certification.

Vijayanagar

- Electromagnetic Stirrer in the mould for clean steel
- Cut to length facility with inbuilt trimmer to supply material in thickness 8-25mm in trimmed cut to length form
- Vacuum Degasser to ensure minimum gaseous(H2,02,N2) in steel
- KR Process and Co-injection Technology for production of ultra low Sulphur Steel
- Low levels of dissolved Oxygen: Hydrogen:- RH-OB Process
- Clean Steel with low NMI (Non Metallic Inclusions):- Combined Blowing, Sublance System, DART System, Inclusion Morphology Modification, Full Shrouding System, Tundish Furniture, Vertical Bend Caster, Mold Fluid Flow
- Minimum Segregation: Dynamic Soft Reduction Technology
- Close Dimensional Tolerances: Automatic Profile Control Model
- High Strength and Dual Phase Steel (Plain Carbon: Low Alloy) depending on customer requirements
- Flatness/Shape in Cut To Length Form: Automatic Flatness Control Model at HSM and Robust Leveling System in Cut to Length Line

Dolvi

- Largest RH Vessel in INDIA, Capability to process 100% heat through RH in SMS2
- 2 x Twin Strand Caster, Mould EMS, Dynamic Soft Reduction in SMS 2
- Dart slag stopper to control BOF slag while tapping
- Stein Digit@l Furnace® technology in HSM2
- Expertise in Hot Metal Operation without mixer 6: Desulphurisation units
- Casting speed of 11 mtr/min in two casters - benchmark in the world
- Thin Slab Casters
- Direct Rolling without any preheating of the slab
- Hydraulic Auto Gauge Control: PCFC for Profile Control
- Raw Material to Hot Rolled Coil in 222 minutes

Product Capabilities

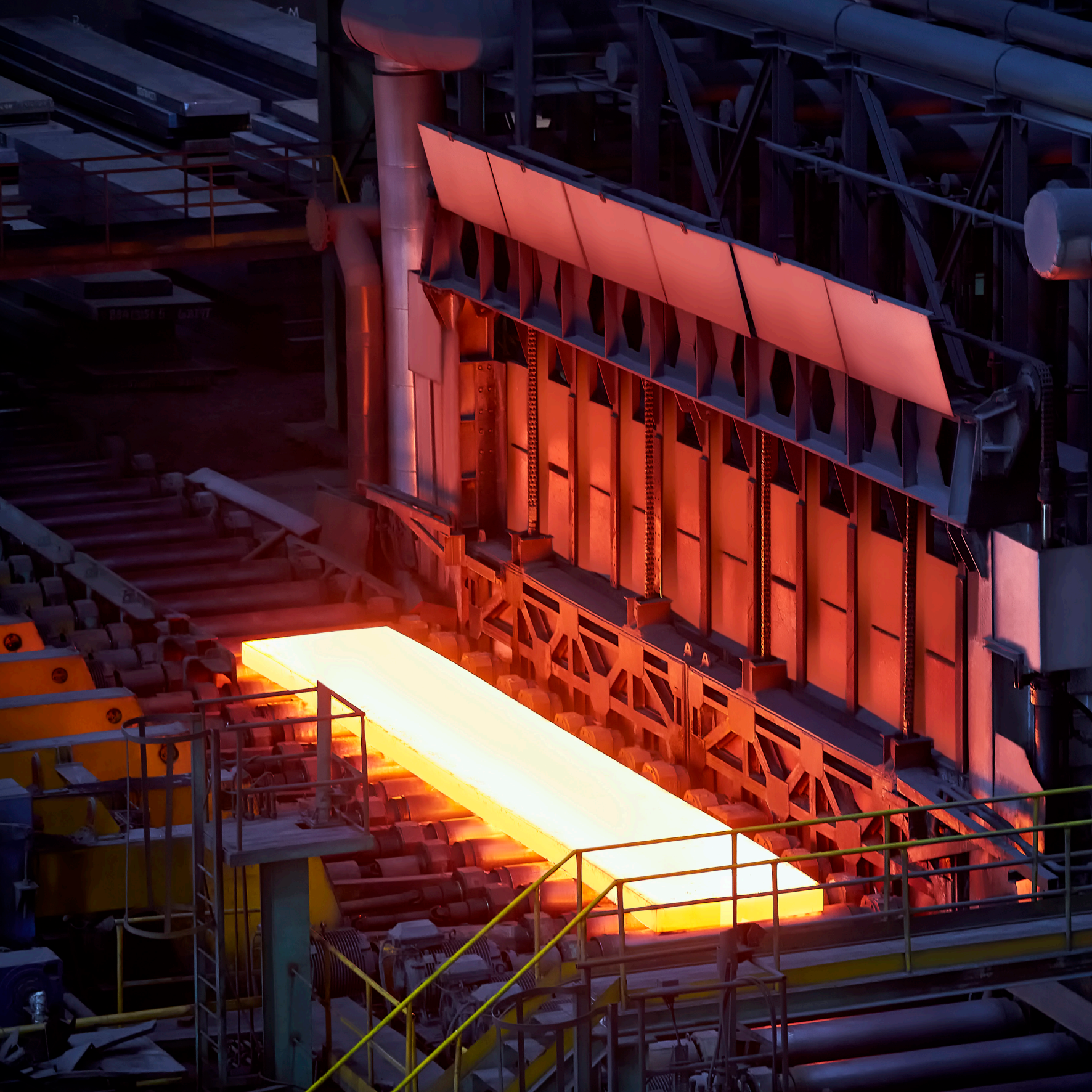
Parameters	Vijayanagar	Dolvi
Grades	Re-rolling Grades ,Drawing and Press Forming Grades includes HSLA grades ,Tube and Pipe Forming Grades,Structural General Engineering/ Forming Grades and Chequered Grade,Medium & High Tensile General Engineering/ Forming Grades ,LPG/ Boiler Quality / Low Pressure Vessel Grades,Medium and High Carbon Grades,Weather Resistance and Alloy Steel Grades, Line Pipe Grades	Re-rolling Grades, Drawing and Press Forming Grades includes HSLA, Tube and Pipe Grades, Structural General Engineering Grades and Chequered Grade, High Tensile General Engineering Grades, LPG/Low Pressure Vessel Grades, Medium Carbon Grades, Weather Resistance Grades and Line Pipe Grades (API)
Thickness (mm)	1.4 - 25.4	1.5 - 25 mm
Width (mm)	900 - 2100	900 - 1620 mm
UTS (Mpa)	As per standard (UTS 270MPa to 980Mpa)	As per Standards / Customised
Coil ID	762 (+/- 40) mm	762 (+/- 40) mm
Coil OD	2100mm max	2000mm max
Edge	Mill Edge	Mill Edge
Width Tolerance	Width up to 1500mm: - 0/+ 20 mm for 95% of coil length (for balance 5% in head end & tail end +25 mm max). Width 〉1500mm: - 0/+ 25 mm for 95% of coil length (for balance 5% in Head end & tail end +30 mm max).	- 0/+ 20 mm for 95% of coil length
Thickness Tolerance	3/4th EN for 95% coil length (balance coil length is full EN 10051).The measurement on thickness shall be made at any point not less than 40mm from both side edges for mill edge material.	Up to 6 mm thickness 3/4th EN for 95% coil length (balance coil length is full EN 10051) and for〉 6 mm thickness 6% of thickness for 95% of coil length (balance coil length is full EN 10051).
Telescopicity	50 mm maximum except 2 - 3 ID/OD wraps*.	50 mm maximum except 2 - 3 ID/OD wraps*.
Tongue / Fish Tail	500 mm max at each end*	1000 mm max each or as agreed
Camber	20 mm max in any 5000 mm length, except head end and tail end 5% length.	20 mm max in any 5000 mm length, except head end and tail end 5% length. For specific orders 〈=1250mm, values shall be agreed upon discussion
Packing	Mill Standard: 1-3 Circumferential and 2 to 4 bands through the eye based on width of the coils or as agreed	1-2 circumferential and 2-4 bands through the eye or as agreed
Marking	Mill standard: Adhesive label containing Customer Name, Grade, Coil size, Coil No., Heat No and weight or as agreed.	Mill standard: Adhesive label containing Customer Name, Grade, Coil size, Coil No., Heat No and weight or as agreed.
Documents / Markings	Metric system as standard. Imperial system for dimension and weight can be accepted for specific cases.	Metric system as standard. Imperial system for dimension and weight can be accepted for specific cases.

*For Lower thickness (〈=3mm), values shall differ from mentioned values. The weight of coils which can offer by JSW is determined by three factors: - Manufacturing limit: 13 – 21 kg/mm of width (13-40 tons) Maximum Safe outside diameter (2100 max) Maximum weight allowed by Rail/Road transport.

Parameters	Anjar Works		
Product	Hot Rolled Steel Plates	Hot Rolled Steel Coils	Hot Rolled Steel CTL plates
Product Specification & Grades	LINE PIPES APPLICATION • API 5L up to X80 PSL 1 & PSL 2 for Sour and Non-Sour BOILER AND PRESSURE VESSEL • ASTM / ASME A515 Gr. 55 to Gr. 70 • ASTM / ASME A515 Gr. 55 to Gr. 70 • ASTM A572 Gr. 50 • ASTM A517 Grade B/F/Q • ASME SA 537 CLASS1,2 • EN10149-2 S500MC - S700MC • EN10028-2 16Mo3 • IS2002 Grade 1 to 3. • IS2041 R220 to R355 STRUCTURAL & GENERAL ENGINEERING • ASTM A36 • EN10025-2 S 235 to S355 (JR, J0, J2, K2, J2W) • EN10025-2 S 275 to S355 (N, NL) • EN10025-3 S420N • EN10025-4 S420M • EN10225-1 S355ML0, NL0, S420ML0 • EN 10028-2 Grade P235 to P355 • ASTM A588 Grade A, B, C • ASTM A204 Grade A, B, C • IS2062 E250 to E450 • IS10748 Gr1 to Gr5 SHIP BUILDING • LR A, B, D, E & LR AH27S to AH36, DH27S to DH36 • ABS-A, B, D, AH 32 & DH 32 • IRS-GRADE A, B, D & DH32 • DNV-NV A, NV B, NV D, NV A275, NV A32, NV D275 & NV D32 AUTOMOTIVE • EN10083-2 C45 • EN10084 16MnCr5, 20MnCr5 SPEICAL STEEL • HARDOX 400 to 500 • WELDOX 700 (ASTM A514) • DMR249A and B	LINE PIPES APPLICATION • API 5L up to X80 PSL 1 & PSL 2 for Sour and Non-Sour • IS10748 Gr1 to Gr5 STRUCTURAL & GENERAL ENGINEERING • ASTM A36 • EN10025-2 S235 to S355 • IS2062 E250, E350	LINE PIPES APPLICATION • API 5L up to X80 PSL 1 & PSL 2 for Sour and Non-Sour • IS10748 Gr1 to Gr5 STRUCTURAL & GENERAL ENGINEERING • ASTM A36 • EN10025-2 S235 to S355 IS2062 E250, E350

Product Capabilities

Dimensions and Delivery Conditions			
Product	Hot Rolled Steel Plates	Hot Rolled Steel Coils	Hot Rolled Steel CTL plates
Rolling Process	Normalizing & TMCP Rolled	Normalizing & TMCP Rolled	Normalizing & TMCP Rolled
Thickness (mm)	8-120	8-25	8-25
Width(mm)	1500-4500	1500-2500	1500-2500
Length(mm)	6000-18000	-	6000-15000
Edge Condition	As rolled/Trimmed/Gas cut	As Rolled	As Rolled
Marking	Stencil Marking and/or Low stress hard punching	Stencil Marking and/or Sticker	Stencil Marking and/or Low stress hard punching
Test Certificate	EN10204:2004 Type 3.1 / 3.2	EN10204:2004 Type 3.1 / 3.2	EN10204:2004 Type 3.1 / 3.2



Cut to Length
Hot Rolled Coil

Product Specification								
Product Range	Product Range		Product Range		Product Range		Product Range	
	Min	Max	Min	Max	Min	Max	Min	Max
Thickness (mm)	8	25.4	1.2	6	2.5	10	8	25.4
Width (mm)	900	2100	900	1600	900	2050	900	2150
Length (mm)	1500	12000	1000	13000	1000	13000	1000	14000
Bundle Weight (mm)	-	6	-	15	-	15	-	20
Capacity (tons/annum)	350000		170000		250000		540000	
Yield Strength (Mpa) Max	550		900		550		850	
Tensile Strength (Mpa) Max	900		1100		900		1100	

*Max YS differs from max for higher sections ⟩ 20mm

Thickness Tolerance: As per EN 10051 or JIS G3193 or IS 1852 or ASTM A568/635 tolerance tables mentioned in Hot rolled section.

Width Tolerance: As per EN 10051 or JIS G3193 or IS 1852 or ASTM A568/635 tolerance tables mentioned in Hot rolled section.

Flatness Tolerance: As per EN 10051 or JIS G3193 tolerance tables mentioned in Hot rolled section.

Out of Squareness (Diagonal Difference):

The out-of-Squareness shall not exceed 1.0% of the actual width of the sheet/plate.

Input Material Specification		
Product Range	Minimum	Maximum
Inner Dia of the Coil (mm)	610	840
Outer Dia of the Coil (mm)	1000	2150
Weight of the Coil (MT)	-	35

Length Tolerance	
Length (mm)	Tolerance (mm)
≤2000	+5/-0
⟩2000 ≤4000	+8/-0
⟩4000 ≤7000	+10/-0
⟩7000 ≤13000	+12/-0

24 km long conveyer belt to aid
seamless transmission of iron ore.
Vijayanagar Works, Karnataka

Hot Rolled Strips for Re-Rolling (CRCA & Galvanising Applications)

Equivalent Specification	Grade	C max	Mn max	S max	P max	Si max	Al	N max	Micro alloys max	CE max
IS 11513	Grade CR2	0.12	0.50	0.035	0.040	-	0.02 min	0.012	0.25	-
SAE J403	1010	0.08 - 0.13	0.30 - 0.60	0.035	0.030	-	-	-	-	-
EN 10111	DD11	0.12	0.60	0.045	0.045	-	-	-	-	-
IS 11513	Grade CR3	0.10	0.45	0.030	0.030	-	0.02 min	0.012	0.25	-
IS 11513	Grade CR3 + B	0.10	0.45	0.030	0.030	-	0.02 min	0.012	B:8-50 ppm	-
SAE J403	1008	0.10	0.30 - 0.50	0.035	0.030	-	-	-	-	-
EN 10111	DD12	0.10	0.45	0.035	0.035	-	-	-	-	-
IS 11513	Grade CR4	0.08	0.45	0.030	0.030	-	0.02 min	0.012	0.25	-
IS 11513	Grade CR4 + B	0.08	0.45	0.030	0.030	-	0.02 min	0.012	B:8-50 ppm	-
SAE J403	1005	0.06	0.35	0.035	0.030	-	-	-	-	-
SAE J403	10B05	0.06	0.35	0.035	0.030	-	-	-	B:8-50 ppm	-
SAE J403	1006	0.08	0.45	0.035	0.030	-	-	-	-	-
SAE J403	10B06	0.08	0.45	0.035	0.030	-	-	-	B:8-50 ppm	-
EN 10111	DD13	0.08	0.40	0.030	0.030	-	-	-	-	-
EN 10111	DD14	0.08	0.35	0.025	0.025	-	-	-	-	-
IS 11513	Grade CR1	0.15	1.00	0.040	0.080	-	0.02 min	0.012	-	-
SAE J403	1012	0.10 - 0.15	0.30 - 0.60	0.035	0.030	-	-	-	-	-
SAE J403	1015	0.13 - 0.18	0.30 - 0.60	0.035	0.030	-	-	-	-	-
SAE J403	1018	0.15 - 0.20	0.60 - 0.90	0.035	0.030	-	-	-	-	-
IS 11513	CR5	0.06	0.25	0.020	0.020	-	0.02 min	0.012	0.15	-
IS 11513	CR6	0.18	3.00	0.025	0.070	-	0.02 min	0.012	0.20	-
SAE J403	1016	0.13 - 0.18	0.60 - 0.90	0.035	0.030	-	-	-	-	-
SAE J403	1017	0.15 - 0.20	0.30 - 0.60	0.035	0.030	-	-	-	-	-
SAE J403	1020	0.18 - 0.23	0.30 - 0.60	0.035	0.030	-	-	-	-	-
SAE J403	1021	0.18 - 0.23	0.60 - 0.90	0.035	0.030	-	-	-	-	-
SAE J403	1030 Mod	0.27 - 0.34	1.0 - 1.50	0.030	0.030	0.45	-	-	-	-
SAE J403	1040	0.37 - 0.44	0.60 - 0.90	0.035	0.030	0.45	-	-	-	-
SAE J403	1055	0.50 - 0.60	0.60 - 0.90	0.035	0.030	-	-	-	-	-

Hot Rolled Strips for Electrical stampings and forming

Standard Specification		Chemical Composition (%)								
Equivalent Specification	Grade	C max	Mn max	S max	P max	Si max	Al	N max	Micro alloys max	CE max
IS 11513	CR1	0.15	1.00	0.04	0.080	-	-	0.012	0.25	-
IS 11513	CR2	0.12	0.50	0.035	0.035	-	-	0.012	0.25	-
IS 11513	CR3	0.10	0.45	0.045	0.030	-	-	0.012	0.25	-

* New BIS Standard which is under final stage of release from BIS will replace IS 11513 for Hot Rolled Strips for Electrical stampings and forming

Hot Rolled Strips for Drawing and Press Forming (Includes Automobile and Other Engineering applications)

Standard		Chemical Composition (%)								
Equivalent Specification	Grade	C max	Mn max	S max	P max	Si max	Al	N max	Micro alloys max	CE max
IS 1079	HR1	0.15	0.60	0.035	0.050	-	0.02 min	0.012	Nb+V+Ti: 0.10 B: 0.006	-
IS 1079	HR2	0.10	0.45	0.035	0.040	-	0.02 min	0.012	Nb+V+Ti: 0.10 B: 0.004	-
IS 1079	ISH270C	0.08	0.45	0.035	0.035	-	0.02 min	0.012	Nb+V+Ti: 0.2 B: 0.006	-
IS 5986	ISH290S	0.12	0.60	0.040	0.040	0.50	0.01 min	0.012	0.15	-
JIS G3131	SPHC	0.12	0.60	0.035	0.045	-	-	-	-	-
JFS A1001	JSH270C	0.10	0.60	0.030	0.050	0.050	0.1 max	-	Nb: 0.1 Ti: 0.1 B: 0.1	-
EN 10111	DD11	0.12	0.60	0.045	0.045	-	-	-	Ti: 0.025 B: 0.003	-
IS 1079	HR3	0.08	0.40	0.030	0.035	-	0.02 min	0.012	Nb+V+Ti: 0.10 B: 0.004	-
IS 1079	ISH270D	0.06	0.40	0.030	0.030	-	0.02 min	0.012	Nb+V+Ti: 0.2 B: 0.006	-
JIS G3131	SPHD	0.10	0.45	0.035	0.035	-	-	-	-	-
JFS A1001	JSH270D	0.10	0.60	0.035	0.030	0.050	0.1 max	-	Nb : 0.1 Ti : 0.1 B : 0.1	-
EN 10111	DD12	0.10	0.45	0.035	0.035	-	-	-	Ti: 0.025 B: 0.003	-
ASTM A1011	DS Type A	0.08	0.50	0.030	0.020	-	0.01 min	-	Ti: 0.025	-
ASTM A1011	DS Type B	0.02 - 0.08	0.50	0.030	0.020	-	0.01 min	-	Ti: 0.025	-
IS 1079	HR4	0.08	0.35	0.030	0.030	-	0.02 min	0.012	Nb+V+Ti: 0.10 B: 0.004	-
IS 1079	ISH270E	0.06	0.35	0.025	0.025	-	0.02 min	0.012	Nb+V+Ti: 0.2 B: 0.006	-
JIS G3131	SPHE	0.08	0.40	0.030	0.030	-	-	-	-	-
JFS A1001	JSH270E	0.10	0.60	0.035	0.030	0.05	0.1 max	-	Nb: 0.1 Ti: 0.1 B: 0.1	-
EN 10111	DD13	0.08	0.40	0.030	0.030	-	-	-	Ti: 0.025 B:0.003	-
EN 10111	DD14	0.08	0.35	0.025	0.025	-	-	-	Ti: 0.025 B:0.003	-
IS 1079	HR0	0.25	2.00	0.050	0.080	-	-	0.012	Nb+V+Ti: 0.2 B: 0.006	-

Hot Rolled Strips for Drawing and Press Forming (Includes Automobile and Other Engineering applications)

Mechanical Properties ('t' = thickness in mm & 'GL' = Gauge Lenght

Tensile Test Direction	YS (Mpa) min	UTS (Mpa) min	%El (min) GL: 50mm	%El (min) GL: 80mm	%El (min) GL: 5.65 √ (A)	Bend (180 deg)	Impact Temp °C	Impact (J) min
T	-	270 - 440	t≤3: 24 t⟩3: 29	t≤3: 23	t≤3: 28	2t	-	-
T	-	270 - 420	t≤3: 26 t⟩3: 31	t≤3: 25	t⟩3: 30	1t	-	-
T	170	270 - 420	t ⟨ 2: 26 2 t⟨3. 2: 26 t≥3.2: 31	t≤3: 25	t⟩3: 30	1t	-	-
T	165	290 - 400	-	t≤3: 22	t⟩3: 30	t≤12: close t⟩12: 1t	-	-
L	-	270	1.2≤t⟨1.6: 27 1.6≤t⟨2.0: 29 2.0≤t⟨2.5: 29 2.5≤t⟨3.2: 29 t⟩3.2 :31	-	-	t⟨3.2: Close t≥3.2: 0.5t	-	-
L	1.6≤t⟨2: 195-315 2≤t⟨2.5: 185-305 2.5≤t⟨3.2:185-305 3.2⟨t⟨4:175-295 4≤t⟨6.3:175-295	270	1.6≤t⟨2: 36-50 2≤t⟨2.5: 37-51 2.5≤t⟨3.2: 37-51 3.2≤t⟨4: 38-52 4≤t⟨6.3: 38-52	-	-	2.6⟨t⟨3.2: Close 3.2⟨t⟨14: 0.5t	-	-
T	1.5≤t⟨2: 170-360 2≤t≤8: 170-340	440 max	-	1.5≤t⟨2: 23 2≤t⟨3: 24	3≤t≤8: 28	1t	-	-
T	-	270 - 400	t≤3: 29 t⟩3: 34	t≤3: 28	t⟩3: 33	Close	-	-
T	⟨ t 3.2 -170 min ⟩ t 3.2 -165 min	270 - 400	t ⟨ 2: 29 2 t⟨3.2: 29 t≥3.2: 34	t≤3 : 28	t⟩3: 33	Close	-	-
L	-	270	1.2≤t⟨1.6: 30 1.6≤t⟨2: 32 2≤t⟨2.5: 33 2.5≤t⟨3.2: 35 3.2≤t⟨4.0: 37 t⟩4.0: 39	-	-	t⟨3.2: Close t≥3.2: 0.5t	-	-
L	1.6≤t⟨2: 185-295 2≤t⟨2.5: 175-285 2.5≤t⟨3.2:175-285 3.2≤t⟨4:165-275 4≤t⟨6.3:165-275	270	1.6≤t⟨2: 38-52 2≤t⟨2.5: 39-53 2.5≤t⟨3.2: 39-53 3.2≤t⟨4: 40-54 4≤t⟨6.3: 41-55	-	-	2.6⟨t⟨3.2: Close 3.2⟨t⟨14:Close	-	-
T	1.5≤t⟨2: 170-340 2≤t≤8: 170-320	420 max	-	1.5≤t⟨2: 25 2≤t⟨3: 26	3≤t≤8: 30	Close	-	-
L	205 - 310	-	28	-	-	-	-	-
L	205 - 310	-	28	-	-	-	-	-
T	-	270 - 380	t≤3: 32 t⟩3: 37	t≤3: 31	t⟩3: 36	Close	-	-
T	t ⟨ 2 - 165min 2 t⟨3.2 - 155min t 3.2 - 145min	270 - 380	t ⟨ 2: 32min 2 t⟨3.2: 32min t ≥ 3.2: 37min	t≤3: 31	t⟩3: 36	Close	-	-
L	-	270	1.2≤t⟨1.6: 32 1.6≤t⟨2: 34 2≤t⟨2.5: 35 2.5≤t⟨3.2: 37 3.2≤t⟨4.0: 39 t⟩4.0: 41	-	-	-	-	-
L	1.6≤t⟨2: 165-265 2≤t⟨2.5: 155-255 2.5≤t⟨3.2: 155-255 3.2≤t⟨4: 145-245 4≤t⟨6.3: 145-245	270	1.6≤t⟨2: 41-54 2≤t⟨2.5: 42-55 2.5≤t⟨3.2: 42-55 3.2≤t⟨4: 43-56 4≤t⟨6.3: 43-56	-	-	2.6⟨t⟨3.2:Close 3.2⟨t⟨14: Close	-	-
T	1.5≤t⟨2: 170-330 2≤t≤8: 170-310	400 max	-	1.5≤t⟨2: 28 2≤t⟨3: 29	3≤t≤8: 33	Close	-	-
T	1.5≤t⟨2: 170-310 2≤t≤8: 170-290	380 max	-	1.5≤t⟨2: 31 2≤t⟨3: 32	3≤t≤8: 36	Close	-	-
T	-	-	-	-	-	-	-	-

Hot Rolled Strips for Drawing and Press Forming (Includes Automobile and Other Engineering applications)

Standard		Chemical Composition (%)								
Equivalent Specification	Grade	C max	Mn max	S max	P max	Si max	Al	N max	Micro alloys max	CE max
IS 5986	ISH310S	0.15	0.80	0.030	0.040	0.50	-	-	-	-
JFS A1001	JSH310W	0.25	2.0	0.030	0.050	0.60	0.1 max	-	Nb: 0.1 Ti: 0.1 B: 0.1	-
IS 5986	ISH330S (Gr 205)	0.15	0.80	0.040	0.040	0.50	0.01 min	0.012	0.15	-
JIS G3101	SS330	-	-	0.050	0.050	-	-	-	-	-
SAE J403	1012	0.10 - 0.15	0.30 - 0.60	0.035	0.030	-	-	-	-	-
IS 5986	ISH360S (Gr 235)	0.17	1.20	0.040	0.040	0.50	0.01 min	0.012	0.15	-
IS 5986	ISH370S	0.17	1.20	0.030	0.040	0.50	-	-	0.15	-
JFS A1001	JSH370W	0.25	2.0	0.030	0.050	0.60	0.1 max	-	Nb: 0.1 Ti: 0.1 B: 0.1	-
JIS G3113	SAPH370	-	-	0.040	0.040	-	-	-	-	-
EN 10025	S235JR	0.17	1.40	0.035	0.035	-	-	0.012	-	0.35
EN 10025	S235J0	0.17	1.40	0.030	0.030	-	-	0.012	-	0.35
EN 10025	S235J2	0.17	1.40	0.025	0.025	-	-	-	-	0.35
SAE J403	1015	0.13 - 0.18	0.30 - 0.60	0.035	0.030	-	-	-	-	-
IS 2062	E250A	0.23	1.50	0.045	0.045	0.40	-	0.012	0.25	0.42
IS 5986	ISH410S (Gr 255)	0.20	1.30	0.040	0.040	0.50	-	0.012	0.15	0.42
IS 5986	ISH400S	0.20	1.30	0.030	0.040	0.50	-	-	0.15	0.42
JFS A1001	JSH400W	0.25	-	0.030	0.050	0.60	0.1 max	-	Nb: 0.1 Ti: 0.1 B: 0.1	-
JIS G3101	SS400	-	-	0.050	0.050	-	-	-	-	-
JIS G3113	SAPH400	-	-	0.040	0.040	-	-	-	-	-

Hot Rolled Strips for Drawing and Press Forming (Includes Automobile and Other Engineering applications)

Mechanical Properties ('t' = thickness in mm & 'GL' = Gauge Lenght

Tensile Test Direction	YS (Mpa) min	UTS (Mpa) min	%El (min) GL: 50mm	%El (min) GL: 80mm	%El (min) GL: 5.65 √ (A)	Bend (180 deg)	Impact Temp ˚C	Impact (J) min
T	⟨2: 195 2⟨t⟨3.2: 185 3.2⟨t⟨6.3 : 175 t⟩6.3: 165	310	t⟨2: 33 2⟨t⟨3.2: 34 3.2⟨t⟨6.3: 38 t⟩6.3: 40	-	-	t≤12: 1t t⟩12: 2t	-	-
L	1.6⟨t⟨2: 195-315 2⟨t⟨2.5: 185-305 2.5⟨t⟨3.2: 185-305 3.2⟨t⟨4: 175-295 4⟨t⟨6.3: 175-295	310	1.6≤t⟨2: 37-51 2≤t⟨2.5: 38-52 2.5≤t⟨3.2: 38-52 3.2≤t⟨4: 39-53 4≤t⟨6.3: 40-54	-	-	2.6⟨t⟨3.2: 1t 3.2⟨t⟨14: 1t	-	-
T	205	330 - 440	-	t≤3: 20	t⟩3: 28	t≤12: 1t t⟩12: 2t	-	-
L	t≤16: 205 t⟩16: 195	330 - 440	t≤5: 26 t⟩5⟨16: 21 t⟩16: 26	-	-	0.5t	-	-
-	-	-	-	-	-	-	-	-
T	235	360 - 470	-	t≤3: 19	t⟩3: 26	t≤12: 1t t⟩12: 2t	-	-
T	2t⟨: 225 min 2⟨t⟨3.2: 215 min 3.2⟨t⟨6.3: 205 min t⟩6.3: 195 min	370	t⟨2: 32 2⟨t⟨3.2: 33 3.2⟨t⟨6.3: 36 t⟩6.3: 38	-	-	t≤12: 1t t⟩12: 2t	-	-
L	1.6⟨t⟩2: 225-345 2⟨t⟩2.5: 215-335 2.5⟨t⟩3.2: 215-335 3.2⟨t⟩4: 205-335 4⟨t⟩6.3: 205-335	370	1.6≤t⟨2: 34-47 2≤t⟨2.5: 35-48 2.5≤t⟨3.2: 35-48 3.2≤t⟨4: 36-49 4≤t⟨6.3: 37-50	-	-	2.6⟨t⟨3.2: 1t 3.2⟨t⟨14: 1t	-	-
L	t⟨6: 225 6≤t⟨8: 225 8≤t≤14: 215	370	1.6≤t⟨2: 32 2≤t⟨2.5: 33 2.5≤t⟨3.15: 35 3.15≤t⟨4: 36 4≤t⟨6.3: 37 6.3≤t⟨14: 38	t≥6.3: 25 on GL: 200mm	-	t⟨2: 0.5t t≥2: 1t	-	-
T	t≤16: 235 t⟩16: 225	t⟨3: 360-510 t≥3: 360-510	-	t⟩1.5 ≤2: 17 t⟩2 ≤2.5: 18 t⟩2.5 ⟨3: 19	t≥3: 24	1t	20	27
T	t≤16: 235 t⟩16: 225	t⟨3: 360-510 t≥3: 360-510	-	t⟩1.5 ≤2: 17 t⟩2 ≤2.5: 18 t⟩2.5 ⟨3: 19	t≥3: 24	1t	0	27
T	t≤16: 235 t⟩16: 225	t⟨3: 360-510 t≥3: 360-510	-	t⟩1.5 ≤2: 17 t⟩2 ≤2.5: 18 t⟩2.5 ⟨3: 19	t≥3: 24	1t	-20	27
-	-	-	-	-	-	-	-	-
T	t⟨20: 250 t⟩20: 240	410	-	-	23	2t	-	-
T	255	410 - 520	-	t≤3: 17	t⟩3: 23	t≤12: 1t t⟩12: 2t	-	-
T	t⟨: 245-375 2⟨t⟨3.2: 235-355 3.2⟨t⟨6.3:225-345 t⟩6.3: 215 min	400	t⟨2: 31 2⟨t⟨3.2: 33 3.2⟨t⟨6.3: 35 t⟩6.3: 37	-	-	t≤12: 1t t⟩12: 2t	-	-
L	1.6≤t⟨2: 245-365 2≤t⟨2.5: 235-355 2.5≤t⟨3.2: 235-355 3.2≤t⟨4: 225-345 4≤t⟨6.3: 225-345	400	1.6≤t⟨2: 32-45 2≤t⟨2.5: 33-46 2.5≤t⟨3.2: 34-47 3.2≤t⟨4: 35-48 4≤t⟨6.3: 36-49	-	-	2.6⟨t⟨3.2: 1t 3.2⟨t⟨14: 1t	-	-
L	t≤16: 245 t⟩16: 235	400 - 510	t≤5: 21 t⟩5⟨16: 17 t⟩16: 21	-	-	1.5t	-	-
L	t⟨6: 255 6≤t⟨8: 235 8≤t≤14: 235	400	1.6≤t⟨2: 31 2≤t⟨2.5: 32 2.5≤t⟨3.15: 34 3.15≤t⟨4: 35 4≤t⟨6.3: 36 6.3≤t⟨14: 37	t≥6.3: 24 on GL: 200mm	-	t⟨2: 1t t≥2: 1t	-	-

Hot Rolled Strips for Drawing and Press Forming (Includes Automobile and Other Engineering applications)

Standard		Chemical Composition (%)								
Equivalent Specification	Grade	C max	Mn max	S max	P max	Si max	Al	N max	Micro alloys max	CE max
EN 10025	S275JR	0.21	1.50	0.035	0.035	-	-	0.012	-	0.40
EN 10025	S275J0	0.18	1.50	0.030	0.030	-	-	0.012	-	0.40
EN 10025	S275J2	0.18	1.50	0.025	0.025	-	-	-	-	0.40
SAE J403	1018	0.15 - 0.20	0.60 - 0.90	0.035	0.030	-	-	-	-	-
ASTM A36	A36	0.25	t>20: 0.8-1.20	0.030	0.030	0.40	-	-	-	-
IS 2062	E275A	0.23	1.50	0.045	0.045	0.40	-	0.012	0.25	0.43
IS 2062	E300A	0.20	1.50	0.045	0.045	0.45	-	0.012	0.25	0.44
IS 5986	ISH440S	0.24	1.65	0.030	0.040	0.50	-	-	0.15	0.45
IS 5986	ISH440R	0.20	1.65	0.020	0.030	0.50	-	-	0.20	-
JFS A1001	JSH440R	0.20	2.0	0.030	0.050	0.60	0.1 max	-	Nb : 0.1 Ti : 0.2 B : 0.1	-
JFS A1001	JSH440W	0.25	2.0	0.030	0.050	0.60	0.1 max	-	Nb : 0.1 Ti : 0.1 B : 0.1	-
JIS G3113	SAPH440	-	-	0.040	0.040	-	-	-	-	-
IS 5986	ISH440F	0.16	1.6	0.020	-	-	-	-	0.20	-
JFS A1001	JSH440B	0.25	2.0	0.020	0.050	1.0	0.1 max	-	Nb : 0.1 Ti : 0.1 B : 0.1	-
SAE J403	1020	0.18 - 0.23	0.30 - 0.60	0.035	0.030	-	-	-	-	-
SAE J403	1021	0.18 - 0.23	0.60 - 0.90	0.035	0.030	-	-	-	-	-
ASTM A1011	HSLAS Grade 50 Class1	0.23 or 0.20	1.35 or 1.50	0.040	0.040	-	-	-	Nb/V/Ti: 0.005 min	-
ASTM A1018	HSLAS Grade 50 Class1	0.23	1.50	0.040	0.040	-	-	-	Nb/V/Ti: 0.005 min	-
IS 2062	E350A	0.20	1.55	0.045	0.045	0.45	-	0.012	0.25	0.47
SAE J403	ISH490S	0.20	1.65	0.020	0.030	0.50	-	-	0.20	-

Hot Rolled Strips for Drawing and Press Forming (Includes Automobile and Other Engineering applications)

Mechanical Properties ('t' = thickness in mm & 'GL' = Gauge Lenght

Tensile Test Direction	YS (Mpa) min	UTS (Mpa) min	%El (min) GL: 50mm	%El (min) GL: 80mm	%El (min) GL: 5.65 √ (A)	Bend (180 deg)	Impact Temp °C	Impact (J) min
T	t≤16: 275 t〉16: 265	t〈3: 430-580 t≥3: 410-560	-	t〉1.5 ≤2: 15 t〉2 ≤2.5: 16 t〉2.5 〈3: 17	t≥3: 21	2t	20	27
T	t≤16: 275 t〉16: 265	t〈3: 430-580 t≥3: 410-560	-	t〉1.5 ≤2: 15 t〉2 ≤2.5: 16 t〉2.5 〈3: 17	t≥3: 21	2t	0	27
T	t≤16: 275 t〉16: 265	t〈3: 430-580 t≥3: 410-560	-	t〉1.5 ≤2: 15 t〉2 ≤2.5: 16 t〉2.5 〈3: 17	t≥3: 21	2t	-20	27
-	-	-	-	-	-	-	-	-
T	250	400 - 550	21	-	-	-	-	-
T	t〈20: 275 t〉20: 265	430	-	-	22	2t	-	-
T	t〈20: 300 t〉20: 290	440	-	-	22	2t	-	-
T	t〈: 285-400 2〈t〈3.2: 275-390 3.2〈t〈6.3:265-380 t〉6.3: 255 min	440	t〈2: 29 2〈t〈3.2: 30 3.2〈t〈6.3: 33 t〉6.3: 34	-	-	t≤12: 1t t〉12: 2t	-	-
T	t〈: 305-450 2〈t〈3.2: 305-440 3.2〈t〈6.3:305-430 t〉6.3: 295 min	440	t〈2: 26 2〈t〈3.2: 27 3.2〈t〈6.3: 28 t〉6.3: 29	-	-	t≤12: 1t t〉12: 2t	-	-
L	1.6≤t〈2: 285-400 2≤t〈2.5: 275-390 2.5≤t〈3.2: 275-390 3.2≤t〈4: 265-380 4≤t〈6.3: 265-380	440	1.6≤t〈2: 29-42 2≤t〈2.5: 30-43 2.5≤t〈3.2: 32-45 3.2≤t〈4: 33-46 4≤t〈6.3: 34-47	-	-	2.6〈t〈3.2: 1t 3.2〈t〈14: 1t	-	-
L	1.6≤t〈2: 285-400 2≤t〈2.5: 275-390 2.5≤t〈3.2: 275-390 3.2≤t〈4: 265-380 4≤t〈6.3: 265-380	440	1.6≤t〈2: 29-42 2≤t〈2.5: 30-43 2.5≤t〈3.2: 32-45 3.2≤t〈4: 33-46 4≤t〈6.3: 34-47	-	-	2.6〈t〈3.2: 1t 3.2〈t〈14: 1t	-	-
L	t〈6: 305 6≤t〈8: 295 8≤t≤14: 275	440	1.6≤t〈2: 29 2≤t〈2.5: 30 2.5≤t〈3.15: 32 3.15≤t〈4: 33 4≤t〈6.3: 34 6.3≤t〈14: 35	t≥6.3: 22 on GL: 200mm	-	t〈2: 1t t≥2: 1.5t	-	-
T	t〈: 285-420 2〈t〈3.2: 275-420 3.2〈t〈6.3: 625-420 t〉6.3: 295 min	440	t〈2: 26 2〈t〈3.2: 27 3.2〈t〈6.3: 28 t〉6.3: 29	-	-	t≤12: 1t t〉12: 2t	-	-
L	1.6≤t〈2: 285-400 2≤t〈2.5: 275-390 2.5≤t〈3.2: 275-390 3.2≤t〈4: 265-380 4≤t〈6.3: 265-380	440	1.6≤t〈2: 29-42 2≤t〈2.5: 30-43 2.5≤t〈3.2: 32-45 3.2≤t〈4: 33-46 4≤t〈6.3: 34-47	-	-	2.6〈t〈3.2: 1t 3.2〈t〈14: 1t	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
L	340	450	t≤2.5: 20 t〉2.5: 22	-	-	2t	-	-
L	340	450	t≥6: 20	-	-	2t	-	-
T	t〈20: 350 t〉20: 330	490	-	-	22	2t	-	-
T	355	490 - 630	-	16	20	t≤12: 2t t〉12: 3t	-	-

Hot Rolled Strips for Drawing and Press Forming (Includes Automobile and Other Engineering applications)

Standard		Chemical Composition (%)								
Equivalent Specification	Grade	C max	Mn max	S max	P max	Si max	Al	N max	Micro alloys max	CE max
IS 5986	ISH490R	0.20	1.65	0.020	0.030	0.50	-	-	0.2	-
JFS A1001	JSH490W	0.25	2.0	0.030	0.050	1.0	0.1 max	-	Nb : 0.1 Ti : 0.1 B : 0.1	-
JFS A1001	JSH490R	0.20	2.0	0.030	0.050	1.0	0.1 max	-	Nb : 0.1 Ti : 0.2 B : 0.1	-
JIS G3134	SPFH490	-	-	-	-	-	-	-	-	-
ASTM A1011	HSLAS Grade 55 Class1	0.25 or 0.22	1.35 or 1.50	0.040	0.040	-	-	-	Nb/V/Ti: 0.005 min	-
ASTM A1018	HSLAS Grade 55 Class1	0.25	1.50	0.040	0.040	-	-	-	Nb/V/Ti: 0.005 min	-
IS 5986	ISH540R	0.20	1.70	0.50	0.030	0.50	-	-	0.20	-
JFS A1001	JSH540R	0.20	2.0	0.030	0.050	1.0	0.1 max	-	Nb : 0.1 Ti : 0.2 B : 0.1	-
JIS G3134	SPFH540	-	-	-	-	-	-	-	-	-
ASTM A1011	HSLAS Grade 60 Class1	0.26	1.50	0.040	0.040	-	-	-	Nb/V/Ti: 0.005 min	-
ASTM A1018	HSLAS Grade 60 Class1	0.26	1.50	0.040	0.040	-	-	-	Nb/V/Ti: 0.005 min	-
IS 5986	ISH540F	0.16	1.80	0.020	-	-	-	-	0.2	-
JFS A1001	JSH540B	0.25	2.0	0.020	0.050	1.0	0.1 max	-	Nb : 0.1 Ti : 0.1 B : 0.1	-
IS 5986	ISH590R	0.20	1.80	0.020	0.030	-	-	-	0.2	-
JFS A1001	JSH590R	0.20	2.0	0.030	0.050	1.0	0.1 max	-	Nb : 0.1 Ti : 0.2 B : 0.1	-
JIS G3134	SPFH590	-	-	-	-	-	-	-	-	-
ASTM A1011	HSLAS Grade 65 Class1	0.26	1.50	0.040	0.040	-	-	-	Nb/V/Ti: 0.005 min	-
ASTM A1018	HSLAS Grade 65 Class1	0.26	1.50	0.040	0.040	-	-	-	Nb/V/Ti: 0.005 min	-
IS 5986	ISH590F	0.16	2.0	0.020	-	-	-	-	0.2	-

Hot Rolled Strips for Drawing and Press Forming (Includes Automobile and Other Engineering applications)

Mechanical Properties ('t' = thickness in mm & 'GL' = Gauge Lenght

Tensile Test Direction	YS (Mpa) min	UTS (Mpa) min	%El (min) GL: 50mm	%El (min) GL: 80mm	%El (min) GL: 5.65 √ (A)	Bend (180 deg)	Impact Temp ˚C	Impact (J) min
T	t<: 375-500 2<t<3.2: 365-490 3.2<t<6.3:355-480 t>6.3: 345 min	490	t<2: 22 2<t<3.2: 23 3.2<t<6.3: 24 t>6.3: 25	-	22	t≤12: 1.5t t>12: 2.5t	-	-
T	1.6≤t<2: 335-460 2≤t<2.5: 325-450 2.5≤t<3.2: 325-450 3.2≤t<4: 315-440 4≤t<6.3: 315-440	490	1.6≤t<2: 25-39 2≤t<2.5: 26-40 2.5≤t<3.2: 26-40 3.2≤t<4: 27-41 4≤t<6.3: 27-41	-	-	2.6<t<3.2: 1t 3.2<t<14: 1t	-	-
T	1.6≤t<2: 375-500 2≤t<2.5: 365-490 2.5≤t<3.2: 365-490 3.2≤t<4: 355-480 4≤t<6.3: 355-480	490	1.6≤t<2: 22-36 2≤t<2.5: 23.-37 2.5≤t<3.2: 23-37 3.2≤t<4: 24-38 4≤t<6.3: 24-38	-	-	2.6<t<3.2: 1t 3.2<t<14: 1t	-	-
T	325	490	1.6≤t<2: 22 2≤t<2.5: 23 2.5≤t<3.25: 24 3.25≤t≤6: 25	-	-	1.6≤t<3.25: 0.5t 3.25≤t≤6: 1t	-	-
L	380	480	t≤2.5: 18 t>2.5: 20	-	-	2t	-	-
L	380	480	t≥6: 18	-	-	2t	-	-
T	2t<: 430-570 2<t<3.2: 420-560 3.2<t<6.3:410-550 t>6.3: 400 min	540	t<2: 19 2<t<3.2: 20 3.2<t<6.3: 21 t>6.3: 22	-	19	2t	-	-
T	1.6≤t<2: 430-570 2≤t<2.5: 420-560 2.5≤t<3.2: 420-560 3.2≤t<4: 410-550 4≤t<6.3: 410-550	540	1.6≤t<2: 19-33 2≤t<2.5: 20-34 2.5≤t<3.2: 20-34 3.2≤t<4: 21-35 4≤t<6.3: 21-35	-	-	2.6<t<3.2: 1t 3.2<t<14: 1.5t	-	-
T	355	540	1.6≤t<2: 21 2≤t<2.5: 22 2.5≤t<3.25: 23 3.25≤t≤6: 24	-	-	1.6≤t<3.25: 1t 3.25≤t≤6: 1.5t	-	-
L	410	520	t≤2.5: 16 t>2.5: 18	-	-	2.5t	-	-
L	410	520	t≥6: 16	-	-	2.5t	-	-
T	2t<: 375-540 2<t<3.2: 365-530 3.2<t<6.3:355-520 t>6.3: 355 min	540	2t<2: 22 2<t<3.2: 23 3.2<t<6.3: 24 t>6.3:	17	20	t≤12: 1.5t t>12:	-	-
T	1.6≤t<2: 375-510 2≤t<2.5: 365-500 2.5≤t<3.2: 365-500 3.2≤t<4: 355-490 4≤t<6.3: 355-490	540	1.6≤t<2: 22-36 2≤t<2.5: 23-37 2.5≤t<3.2: 23-37 3.2≤t<4: 24-38 4≤t<6.3: 24-38	-	-	2.6<t<3.2: 1t 3.2<t<14: 1t	-	-
T	t<2: 480-630 2<t<3.2: 470-620 3.2<t<6.3:450-610 t>6.3: 450 mi	590	t<2: 19 2<t<3.2: 20 3.2<t<6.3: 21 t>6.3: 22	-	17	t≤12: 1.5t t>12: 2.5t	-	-
T	1.6≤t<2: 480-630 2≤t<2.5: 470-620 2.5≤t<3.2: 460-610 3.2≤t<4: 450-610 4≤t<6.3: 450-610	590	1.6≤t<2: 17-31 2≤t<2.5: 18-32 2.5≤t<3.2: 18-32 3.2≤t<4: 19-33 4≤t<6.3: 19-33	-	-	2.6<t<3.2: 1.5t 3.2<t<14: 1.5t	-	-
T	420	590	1.6≤t<2: 19 2≤t<2.5: 20 2.5≤t<3.25: 21 3.25≤t≤6: 22	-	-	1.5t	-	-
L	450	550	t≤2.5: 14 t>2.5: 16	-	-	3t	-	-
L	450	550	t≥6: 14	-	-	3t	-	-
T	2t<: 460-620 2<t<3.2: 450-620 3.2<t<6.3:440-620 t>6.3: 440 min	590	2t<2: 18 2<t<3.2: 19 3.2<t<6.3: 20 t>6.3:	15	17	t≤12: 1.5t t>12:	-	-

Hot Rolled Strips for Drawing and Press Forming (Includes Automobile and Other Engineering applications)

Standard		Chemical Composition (%)								
Equivalent Specification	Grade	C max	Mn max	S max	P max	Si max	Al	N max	Micro alloys max	CE max
JFS A1001	JSH590B	0.20	2.3	0.020	0.050	1.2	0.1 max	-	Nb : 0.1 Ti : 0.2 B : 0.1	-
IS 5986	ISH780R	0.20	2.0	0.020	0.030	-	-	-	0.25	-
JFS A1001	JSH780R	0.20	2.0	0.030	0.050	1	0.1 max	-	Nb : 0.1 Ti : 0.2 B : 0.1	-
IS 5986	ISH 360LA	0.12	1.20	0.020	0.025	0.5	-	-	0.22	-
IS 5986	ISH 390LA	0.12	1.30	0.020	0.025	0.5	-	-	0.22	-
EN 10149	S315MC (E34)	0.12	1.30	0.020	0.025	0.5	0.015 min	-	0.22	-
ASTM A1011	HSLAS Grade 45 Class2	0.15	1.35	0.040	0.040	-	-	-	Nb/V/Ti: 0.005 min	-
ASTM A1018	HSLAS Grade 45 Class2	0.15	1.50	0.040	0.040	-	-	-	Nb/V/Ti: 0.005 min	-
IS 5986	ISH410LA	0.12	1.40	0.020	0.025	0.5	-	0.012	0.22	-
ASTM A1011	HSLAS Grade 45 Class1	0.22 or 0.20	1.35 or 1.45	0.040	0.040	-	-	-	Nb/V/Ti: 0.005 min	-
ASTM A1018	HSLAS Grade 45 Class1	0.22	1.50	0.040	0.040	-	-	-	Nb/V/Ti: 0.005 min	-
ASTM A1011	HSLAS Grade 50 Class2	0.15	1.35	0.040	0.040	-	-	-	Nb/V/Ti: 0.005 min	-
ASTM A1018	HSLAS Grade 50 Class2	0.15	1.50	0.040	0.040	-	-	-	Nb/V/Ti: 0.005 min	-
IS 5986	ISH430LA	0.12	1.50	0.020	0.025	0.5	-	0.012	0.22	-
EN 10149	S355MC (E38)	0.12	1.50	0.020	0.025	0.5	0.015 min	-	0.22	-
IS 5986	ISH450LA	0.12	1.65	0.020	0.025	0.5	-	-	0.22	-
ASTM A1011	HSLAS Grade 55 Class2	0.15	1.35	0.040	0.040	-	-	-	Nb/V/Ti: 0.005 min	-
ASTM A1018	HSLAS Grade 55 Class2	0.15	1.50	0.040	0.040	-	-	-	Nb/V/Ti: 0.005 min	-
IS 5986	ISH480LA	0.12	1.50	0.015	0.025	0.5	-	0.012	0.22	-
EN 10149	S420MC (E42)	0.12	1.60	0.015	0.025	0.5	0.015 min	-	0.22	-
ASTM A1011	HSLAS Grade 60 Class2	0.15	1.50	0.040	0.040	-	-	-	Nb/V/Ti: 0.005 min	-

Hot Rolled Strips for Drawing and Press Forming (Includes Automobile and Other Engineering applications)

Mechanical Properties ('t' = thickness in mm & 'GL' = Gauge Lenght

Tensile Test Direction	YS (Mpa) min	UTS (Mpa) min	%El (min) GL: 50mm	%El (min) GL: 80mm	%El (min) GL: 5.65 √ (A)	Bend (180 deg)	Impact Temp ˚C	Impact (J) min
T	1.6≤t〈2: 460-610 2≤t〈2.5: 450-600 2.5≤t〈3.2: 450-600 3.2≤t〈4: 440-590 4≤t〈6.3: 440-590	590	1.6≤t〈2: 18-32 2≤t〈2.5: 19-33 2.5≤t〈3.2: 19-33 3.2≤t〈4: 20-34 4≤t〈6.3: 20-34	-	-	2.6〈t〈3.2: 1t 3.2〈t〈14: 1.5t	-	-
T	2〈t〈3.2: 685-835 3.2〈t〈6.3:675-825 t〉6.3: 675 min	780	2〈t〈3.2: 14 3.2〈t〈6.3: 15 t〉6.3: 15	-	12	t≤12: 2t t〉12:	-	-
T	2≤t〈2.5: 685-835 2.5≤t〈3.2: 685-835 3.2≤t〈4: 675-825 4≤t〈6.3: 675-825	780	2≤t〈2.5: 14-29 2.5≤t〈3.2: 14-29 3.2≤t〈4: 15-30 4≤t〈6.3: 15-30	-	-	2.6〈t〈3.2: 2t 3.2〈t〈14: 2t	-	-
T	300 min	360 - 460	-	23	25	t≤12: Close t〉12: 1t	-	-
T	315 min	390 - 510	-	20	24	t≤12: Close t〉12: 1t	-	-
L	315(340)	390-510	-	t〈3: 20	t≥3: 24	Close	-	-
L	310	380	t≤2.5: 23 t〉2.5: 25	-	-	1.5t	-	-
L	310	380	t≥6: 22	-	-	1.5t	-	-
T	340	410 - 520	-	t〈3: 20	t〉3: 23	t≤12:0.5t t〉12: 2t	-	-
L	310	410	t≤2.5: 23 t〉2.5: 25	-	-	1.5t	-	-
L	310	410	t≥6: 22	-	-	1.5t	-	-
L	340	410	t≤2.5: 20 t〉2.5: 22	-	-	1.5t	-	-
L	340	410	t≥6: 20	-	-	1.5t	-	-
T	355	430 - 550	-	't〈3:19	t〉3: 23	t≤12: 1t t〉12: 2t	-	-
L	355 (380)	430 - 550	-	't〈3:19	t〉3: 23	0.5t	-	-
T	380	450 - 570	-	18	21	t≤12: 1t t〉12: 2t	-	-
L	380	450	t≤2.5: 18 t〉2.5: 20	-	-	2t	-	-
L	380	450	t≥6: 18	-	-	2t	-	-
T	420	480 - 620	-	't〈3:16	t〉3: 19	t≤12: 1t t〉12: 2t	-	-
L	420 (420)	480 - 620	-	't〈3:16	t〉3: 19	0.5t	-	-
L	410	480	t≤2.5: 16 t〉2.5: 18	-	-	2t	-	-

Hot Rolled Strips for Drawing and Press Forming (Includes Automobile and Other Engineering applications)

Standard		Chemical Composition (%)								
Equivalent Specification	Grade	C max	Mn max	S max	P max	Si max	Al	N max	Micro alloys max	CE max
ASTM A1018	HSLAS Grade 60 Class2	0.15	1.50	0.040	0.040	-	-	-	Nb/V/Ti: 0.005 min	-
IS 5986	ISH500LA	0.12	1.65	0.015	0.025	0.5	-	-	0.22	-
EN 10149	S460MC (BSK46/E46)	0.12	1.60	0.015	0.025	0.5	0.015 min	-	0.22	-
ASTM A1011	HSLAS Grade 65 Class2	0.15	1.50	0.040	0.040	-	-	-	Nb/V/Ti: 0.005 min	-
ASTM A1018	HSLAS Grade 65 Class2	0.15	1.50	0.040	0.040	-	-	-	Nb/V/Ti: 0.005 min	-
IS 5986	ISH550LA	0.12	1.70	0.015	0.025	0.5	-	0.012	0.22	-
EN 10149	S500MC	0.12	1.70	0.015	0.025	0.5	0.015 min	-	0.22	-
IS 5986	ISH600LA	0.12	1.80	0.015	0.025	0.5	-	0.012	0.22	-
EN 10149	S550MC	0.12	1.80	0.015	0.025	0.5	0.015 min	-	0.22	-
IS 5986	ISH650LA	0.12	1.90	0.015	0.025	0.5	-	0.012	0.22	-
EN 10149	S600MC	0.12	1.90	0.015	0.025	0.5	0.015 min	-	NB+V+Ti: 0.22 Mo: 0.50 B : 0.005	-
IS 5986	ISH700LA	0.12	2.0	0.015	0.025	0.6	-	-	0.22	-
EN 10149	S650MC	0.12	2.0	0.015	0.025	0.6	0.015 min	-	NB+V+Ti: 0.25 Mo: 0.50 B : 0.005	-
IS 5986	ISH750LA	0.12	2.10	0.015	0.025	0.6	-	-	0.22	-
EN 10149	S700MC	0.12	2.10	0.015	0.025	0.6	0.015 min	-	NB+V+Ti: 0.26 Mo: 0.50 B : 0.005	-

Did You Know? Salem Works became the first integrated Steel Plant (ISP) globally to win the prestigious 'Sword of Honour' award from the British Safety Council

Hot Rolled Strips for Drawing and Press Forming (Includes Automobile and Other Engineering applications)

Mechanical Properties ('t' = thickness in mm & 'GL' = Gauge Lenght

Tensile Test Direction	YS (Mpa) min	UTS (Mpa) min	%El (min) GL: 50mm	%El (min) GL: 80mm	%El (min) GL: 5.65 √ (A)	Bend (180 deg)	Impact Temp °C	Impact (J) min
L	410	480	t≥6: 16	-	-	2t	-	-
T	450 min	500 - 670	-	t〈3: 14	t〉3:18	t≤12: 1t t〉12: 2t	-	-
L	460 (460)	520 - 670	-	t〈3: 14	t≥3: 17	1t	-	-
L	450	520	t≤2.5: 14 t〉2.5: 16	-	-	2.5t	-	-
L	450	520	t≥6: 14	-	-	2.5t	-	-
T	500	550 - 700	-	't〈3:12	t〉3: 14	t≤12: 1.5t t〉12: 2t	-	-
L	500	550 - 700	-	't〈3:12	t〉3: 14	1t	-	-
T	550	600 - 760	-	t〈3: 12	t〉3: 14	t≤12: 1.5t t〉12: 2t	-	-
L	550	600 - 760	-	t〈3: 12	t〉3: 14	1.5t	-	-
T	600	650 - 820	-	t〈3: 11	t〉3: 13	t≤12: 2t t〉12: 3t	-	-
L	600	650 - 820	-	t〈3: 11	t〉3: 13	1.5t	-	-
T	650	700 - 880	-	t〈3: 10	t〉3: 12	t≤12: 2t t〉12: 3t	-	-
L	t≤8: 650 t〉8: 630	700 - 880	-	t〈3: 10	t〉3: 12	2t	-	-
T	700	750 - 950	-	t〈3: 10	t〉3: 12	t≤12: 2t t〉12: 3t	-	-
L	t≤8: 700 t〉8: 680	750 - 950	-	t〈3: 10	t〉3: 12	2t	-	-

Did You Know? Dolvi Works was recognised with a 5-star safety rating from the British Safety Council

Hot Rolled Strips for Welded Tubes and Pipes

Standard		Chemical Composition (%)								
Equivalent Specification	Grade	C max	Mn max	S max	P max	Si max	Al	N max	Micro alloys max	CE max
IS 10748	Grade 1	0.10	0.50	0.040	0.040	-	-	0.012	0.20	-
JIS G3132	SPHT1	0.10	0.50	0.040	0.040	0.35	-	-	-	-
SAE J403	1008	0.10	0.30-0.50	0.035	0.030	-	-	-	-	-
ASTM A500	Grade A	0.26	1.35	0.035	0.035	-	-	-	-	-
IS 10748	Grade2	0.12	0.60	0.040	0.040	-	-	0.012	0.20	-
JIS G3132	SPHT2	0.18	0.60	0.040	0.040	0.35	-	-	-	-
SAE J403	1010	0.08-0.13	0.30-0.60	0.035	0.030	-	-	-	-	-
IS 10748	Grade3	0.16	1.20	0.040	0.040	-	-	0.012	0.20	-
IS 2062	E250A	0.23	1.50	0.045	0.045	0.40	-	0.012	0.25	0.42
JIS G3101	SS400	-	-	0.050	0.050	-	-	-	-	-
JIS G3132	SPHT3	0.25	0.30-0.90	0.040	0.040	0.35	-	-	-	-
EN 10025	S275JR	0.21	1.50	0.035	0.035	-	-	0.012	-	0.40
ASTM A36	A36	0.25	t>20: 0.8-1.20	0.030	0.030	0.40	-	-	-	-
ASTM A500	Grade B	0.26	1.35	0.035	0.035	-	-	-	-	-
ASTM A500	Grade D	0.26	1.35	0.035	0.035	-	-	-	-	-
IS 10748	Grade4	0.20	1.30	0.040	0.040	-	-	0.012	0.20	0.45
ASTM A500	Grade C	0.23	1.35	0.035	0.035	-	-	-	-	-
IS 10748	Grade5	0.25	1.30	0.040	0.040	-	-	0.012	0.20	0.45
IS 10748	Grade6	0.25	1.50	0.040	0.040	-	-	0.012	0.20	0.45
JIS G3132	SPHT4	0.30	0.30-1.0	0.040	0.040	0.35	-	-	-	-
SAE J403	1020	0.18-0.23	0.30-0.60	0.035	0.030	-	-	-	-	-
SAE J403	1026	0.22-0.26	0.60-0.90	0.035	0.030	-	-	-	-	-

Hot Rolled Strips for Welded Tubes and Pipes

Mechanical Properties ('t' = thickness in mm & 'GL' = Gauge Lenght

Tensile Test Direction	YS (Mpa) min	UTS (Mpa) min	%El (min) GL: 50mm	%El (min) GL: 80mm	%El (min) GL: 5.65 (A)	Bend (180 deg)	Impact Temp C	Impact (J) min
T	170	290	-	-	30	t	-	-
L	-	270	1.2≤t〈1.6: 30 1.6≤t〈3: 32 3≤t〈6: 35 6≤t≤13: 37	-	-	t≤3: Close 3〈t≤13: 0.5t	-	-
-	-	-	-	-	-	-	-	-
T	270	310	-	-	-	-	-	-
T	210	330	-	-	28	2t	-	-
L	-	340	1.2≤t〈1.6: 25 1.6≤t〈3: 27 3≤t〈6: 30 6≤t≤13: 32	-	-	t≤3: 1t 3〈t≤13: 1.5t	-	-
-	-	-	-	-	-	-	-	-
T	240	410	-	-	25	2t	-	-
T	t〈20: 250 t〉20: 240	410	-	-	23	2t	-	-
L	t≤16: 245 t〉16: 235	400-510	t≤5: 21	-	-	1.5t	-	-
L	-	410	1.6≤t〈3: 22 3≤t〈6: 25 6≤t≤13: 27	-	-	t≤3: 1.5t 3〈t≤13: 2t	-	-
T	t≤16: 275 t〉16: 265	t〈3: 430-580 t≥3: 410-560	-	1.5〈t≤2: 15 2〈t≤2.5: 16 2.5〈t〈3: 17	t≥3: 21	2t	20	27
T	250	400-550	400-550	21	-	-	-	-
T	315	400	-	-	-	-	-	-
T	250	400	-	-	-	-	-	-
T	275	430	-	-	20	3t	-	-
T	345	425	-	-	-	-	-	-
T	310	490	-	-	15	3t	-	-
T	355	490	-	-	15	3t	-	-
L	-	490	1.6≤t〈3: 18 3≤t〈6: 20 6≤t≤13: 22	-	-	t≤3: 1.5t 3〈t≤13: 2t	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-

Hot Rolled Strips for Welded Tubes and Pipes

Standard		Chemical Composition (%)								
Equivalent Specification	Grade	C max	Mn max	S max	P max	Si max	Al	N max	Micro alloys max	CE max
SAE J403	1536	0.30-0.37	1.20-1.50	0.035	0.030	-	-	-	-	-
SAE J403	1541	0.36-0.44	1.35-1.65	0.035	0.030	-	-	-	-	-
EN 10083	22MnB5	0.17-0.24	1.10-1.50	0.040	0.035	0.40	-	-	Cr -0.3 Ti-0.05 B- 0.0008-0.005	-
EN 10083	26MnB5	0.23-0.29	1.10-1.50	0.040	0.035	0.40	-	-	Cr -0.3 Ti-0.05 B- 0.0008-0.005	-
EN 10083	34MnB5	0.33-0.37	1.20-1.50	0.040	0.035	0.20-0.25	-	-	Cr -0.3 Ti-0.05 B- 0.0008-0.005	-

Hot Rolled Strips for Welded Tubes and Pipes

Mechanical Properties ('t' = thickness in mm & 'GL' = Gauge Lenght

Tensile Test Direction	YS (Mpa) min	UTS (Mpa) min	%El (min) GL: 50mm	%El (min) GL: 80mm	%El (min) GL: 5.65 (A)	Bend (180 deg)	Im-pact Temp C	Im-pact (J) min
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-

Hot Rolled Strips for Structural, General Engineering and Forming

Standard		Chemical Composition (%)								
Equivalent Specification	Grade	C max	Mn max	S max	P max	Si max	Al	N max	Micro alloys max	CE max
IS 5986	ISH290S	0.12	0.60	0.040	0.040	0.50	-	-	0.15	-
IS 5986	ISH330S	0.15	0.80	0.040	0.040	0.50	-	-	0.15	-
JIS G3101	SS330	-	-	0.050	0.050	-	-	-	-	-
IS 5986	ISH360S (Gr 235)	0.17	1.20	0.040	0.040	0.50	0.01 min	0.012	0.15	-
EN 10025	S235JR	0.17	1.40	0.035	0.035	-	-	0.012	-	0.35
EN 10025	S235J0	0.17	1.40	0.030	0.030	-	-	0.012	-	0.35
EN 10025	S235J2	0.17	1.40	0.025	0.025	-	-	0.012	-	0.35
ASTM A1011	SS Grade 36 Type 1	0.25	0.90	0.040	0.035	-	-	-	Ti: 0.025	-
ASTM A1018	SS Grade 36 Type 1	0.25	1.50	0.040	0.035	-	-	0.014	Ti: 0.025	-
ASTM A1011	SS Grade 40	0.25	0.90	0.040	0.035	-	-	-	Ti: 0.025	-
ASTM A1018	SS Grade 40	0.25	1.50	0.040	0.035	-	-	0.014	Ti: 0.025	-
IS 2062	E250A	0.23	1.50	0.045	0.045	0.40	-	0.012	0.25	0.42
IS 2062	E250BR	0.22	1.50	0.045	0.045	0.40	-	0.012	0.25	0.41
IS 2062	E250B0	0.22	1.50	0.045	0.045	0.40	-	0.012	0.25	0.41
IS 2062	E250C	0.20	1.50	0.040	0.040	0.40	-	0.012	0.25	0.39
IS 5986	ISH410S (Gr 255)	0.20	1.30	0.040	0.040	0.50	0.01 min	0.012	0.15	0.42
JIS G3101	SS400	-	-	0.050	0.050	-	-	-	-	-
JIS G3106	SM400A	0.23	2.5 x C min	0.035	0.035	-	-	-	-	-
JIS G3106	SM400B	0.20	0.60 - 1.50	0.035	0.035	0.35	-	-	-	-
JIS G3106	SM400C	0.18	0.60 - 1.50	0.035	0.035	0.35	-	-	-	-

Hot Rolled Strips for Structural, General Engineering and Forming

Mechanical Properties ('t' = thickness in mm & 'GL' = Gauge Lenght

Tensile Test Direction	YS (Mpa) min	UTS (Mpa) min	%El (min) GL: 50mm	%El (min) GL: 80mm	%El (min) GL: 5.65 √ (A)	Bend (180 deg)	Impact Temp ˚C	Impact (J) min
T	165	290 - 400	-	t≤3: 22	t〉3: 30	t≤12: close t〉12: 1t	-	-
L	205	330 - 440	-	t〈3: 20	t〉3: 28	t〈12: 1t t〉12: 2t	-	-
L	t≤16: 205 t〉16 : 195	330 - 430	t≤5: 26 5〉t〈16: 21 t〉16: 26	-	-	0.5t	-	-
T	235	360 - 470	-	t≤3: 19	t〉3: 26	t≤12: 1t t〉12: 2t	-	-
T	t≤16: 235 t〉16: 225	t〈3: 360-510 t≥3: 360-510	-	1.5〈t≤2: 17 2〈t≤2.5: 18 2.5〈t〈3: 19	t≥3: 24	1t	20	27
T	t≤16: 235 t〉16: 225	t〈3: 360-510 t≥3: 360-510	-	1.5〈t≤2: 17 2〈t≤2.5: 18 2.5〈t〈3: 19	t≥3: 24	1t	0	27
T	t≤16: 235 t〉16: 225	t〈3: 360-510 t≥3: 360-510	-	1.5〈t≤2: 17 2〈t≤2.5: 18 2.5〈t〈3: 19	t≥3: 24	1t	-20	27
L	250	365	1.6≤t〈2.5: 21 2.5≤t〈6: 22	-	1.5t	-	-	-
L	250	365	t≥6: 21	-	1.5t	-	-	-
L	275	380	1.6≤t〈2.5: 20 2.5≤t〈6: 21	-	2t	-	-	-
L	275	380	t≥6: 19	-	2t	-	-	-
T	t〈20: 250 t≥20: 240	410	-	-	23	2t	-	-
T	t〈20: 250 t≥20: 240	410	-	-	23	2t	Room Temp	27
T	t〈20: 250 t≥20: 240	410	-	-	23	2t	0	27
T	t〈20: 250 t≥20: 240	410	-	-	23	2t	-20	27
T	255	410 - 520	-	t≤3: 17	t〉3: 23	t≤12: 1t t〉12: 2t	-	-
L	t≤16: 245 t〉16: 235	400 - 510	t≤5: 21 5〉t〈16 : 17 t〉16 : 21	-	-	1.5t	-	-
L	t≤16: 245 t〉16: 235	400 - 510	t≤5: 23	-	-	-	-	-
L	t≤16: 245 t〉16: 235	400 - 510	t≤5: 23	-	-	-	0	27
L	t≤16: 245 t〉16: 235	400 - 510	t≤5: 23	-	-	-	0	47

Hot Rolled Strips for Structural, General Engineering and Forming

Standard		Chemical Composition (%)								
Equivalent Specification	Grade	C max	Mn max	S max	P max	Si max	Al	N max	Micro alloys max	CE max
EN 10025	S275JR	0.21	1.50	0.035	0.035	-	-	0.012	-	0.40
EN 10025	S275J0	0.18	1.50	0.030	0.030	-	-	0.012	-	0.40
EN 10025	S275J2	0.18	1.50	0.025	0.025	-	-	-	-	0.40
ASTM A36	A36	0.25	t>20: 0.8-1.20	0.030	0.030	0.40	-	-	-	-
ASTM A572	Grade 42	0.21	1.60	0.030	0.030	0.40	-	-	Type 1 / 2 / 3 or 5	-
ASTM A1011	SS Grade 36 Type2	0.25	1.35	0.040	0.035	-	-	-	Ti: 0.025	-
ASTM A1011	SS Garde 45	0.25	1.35	0.040	0.035	-	-	-	Ti: 0.025	-
ASTM A1018	SS Garde 36 Type2	0.25	1.35	0.040	0.035	-	-	0.014	Ti: 0.025	-
IS 2062	E275A	0.23	1.50	0.045	0.045	0.40	-	0.012	0.25	0.43
IS 2062	E275BR	0.22	1.50	0.045	0.045	0.40	-	0.012	0.25	0.42
IS 2062	E275B0	0.22	1.50	0.045	0.045	0.40	-	0.012	0.25	0.41
IS 2062	E275C	0.20	1.50	0.040	0.040	0.40	-	0.012	0.25	0.39

Hot Rolled Strips for Chequered Sheets and Plates for Structural use

Standard		Chemical Composition (%)								
Equivalent Specification	Grade	C max	Mn max	S max	P max	Si max	Al	N max	Micro alloys max	CE max
IS 3502	E250A	0.23	1.50	0.045	0.045	0.40	-	0.012	0.25	0.42
EN 10025	S275JR	0.21	1.50	0.035	0.035	-	-	0.012	-	0.40
ASTM A36	A36	0.25	-	0.030	0.030	0.40	-	-	-	-

Hot Rolled Strips for Structural, General Engineering and Forming

Mechanical Properties ('t' = thickness in mm & 'GL' = Gauge Lenght

Tensile Test Direction	YS (Mpa) min	UTS (Mpa) min	%El (min) GL: 50mm	%El (min) GL: 80mm	%El (min) GL: 5.65 √ (A)	Bend (180 deg)	Impact Temp ˚C	Impact (J) min
T	t≤16: 275 t〉16: 265	t〈3: 430-580 t≥3: 410-560	-	1.5〈t≤2: 15 2〈t≤2.5: 16 2.5〈t〈3: 17	t≥3: 21	2t	20	27
T	t≤16: 275 t〉16: 265	t〈3: 430-580 t≥3: 410-560	-	1.5〈t≤2: 15 2〈t≤2.5: 16 2.5〈t〈3: 17	t≥3: 21	2t	0	27
T	t≤16: 275 t〉16: 265	t〈3: 430-580 t≥3: 410-560	-	1.5〈t≤2: 15 2〈t≤2.5: 16 2.5〈t〈3: 17	t≥3: 21	2t	-20	27
T	250	400 - 550	21	-	-	-	-	-
T	290	415	24	20	-	-	-	-
L	250	400 - 550	1.6≤t〈2.5: 20 2.5≤t〈6: 21	-	2t	-	-	-
L	310	410	1.6≤t〈2.5: 18 2.5≤t〈6: 19	-	2t	-	-	-
L	250	400 - 550	t≥6: 21	-	2t	-	-	-
T	t〈20: 275 t〉20: 265	430	-	-	22	2t	-	-
T	t〈20: 275 t〉20: 265	430	-	-	22	2t	Room Temp	27
T	t〈20: 275 t〉20: 265	430	-	-	22	2t	0	27
T	t〈20: 275 t〉20: 265	430	-	-	22	2t	-20	27

Hot Rolled Strips for Chequered Sheets and Plates for Structural use

Mechanical Properties ('t' = thickness in mm & 'GL' = Gauge Lenght

Tensile Test Direction	YS (Mpa) min	UTS (Mpa) min	%El (min) GL: 5.65 √ (A)	Bend (180 deg)	Temp ˚C	Impact (J) min
T	250	410	23	2t	-	-
T	275	410 - 560	21	-	20	27
T	250	400 - 550	-	-	-	-

Hot Rolled Strips for High Tensile structural and Forming applications (includes atmoshpheric corrosion resistance grades)

Standard		Chemical Composition (%)								
Equivalent Specification	Grade	C max	Mn max	S max	P max	Si max	Al	N max	Micro alloys max	CE max
IS 2062	E300A	0.20	1.50	0.045	0.045	0.45	-	0.012	0.25	0.44
IS 2062	E300BR	0.20	1.50	0.045	0.045	0.45	-	0.012	0.25	0.44
IS 2062	E300B0	0.20	1.50	0.045	0.045	0.45	-	0.012	0.25	0.44
IS 2062	E300C	0.20	1.50	0.040	0.040	0.45	-	0.012	0.25	0.44
ASTM A572	Grade 50	0.25	1.60	0.030	0.030	0.40	-	-	Type 1 / 2 / 3 or 5	-
ASTM A1011	SS Grade 50	0.25 Or 0.22	1.35 or 1.50	0.040	0.035	-	-	-	Ti: 0.025	-
IS 2062	E350A	0.20	1.55	0.045	0.045	0.45	-	0.012	0.25	0.47
IS 2062	E350BR	0.20	1.55	0.045	0.045	0.45	-	0.012	0.25	0.47
IS 2062	E350B0	0.20	1.55	0.045	0.045	0.45	-	0.012	0.25	0.47
IS 2062	E350C	0.20	1.55	0.040	0.040	0.45	-	0.012	0.25	0.45
IS 5986	ISH490S	0.24	1.65	0.040	0.040	0.50	-	-	0.15	0.50
JIS G3101	SS490	-	-	0.050	0.050	-	-	-	0.20	-
JIS G3106	SM490A	0.20	1.65	0.035	0.035	0.55	-	-	0.20	-
JIS G3106	SM490B	0.18	1.65	0.035	0.035	0.55	-	-	0.20	-
JIS G3106	SM490C	0.18	1.65	0.035	0.035	0.55	-	-	0.20	-
EN 10025	S355JR	0.24	1.60	0.035	0.035	0.55	-	0.012	1) Without MA or 2) MA : 0.20	0.45
EN 10025	S355J0	0.20	1.60	0.030	0.030	0.55	-	0.012	0.20	0.45
EN 10025	S355J2	0.20	1.60	0.025	0.025	0.55	-	-	0.20	0.45
EN 10025	S355K2	0.20	1.60	0.025	0.025	0.55	-	-	0.20	0.45
ASTM A572	Grade 55	0.25	1.60	0.030	0.030	0.40	-	-	Type 1 / 2 / 3 or 5	-
ASTM A1011	SS Grade 55	0.25 or 0.22	1.35 or 1.50	0.040	0.035	-	-	-	Ti: 0.025	-
IS 2062	E410A	0.20	1.60	0.045	0.045	0.45	-	0.012	0.25	0.50
IS 2062	E410BR	0.20	1.60	0.045	0.045	0.45	-	0.012	0.25	0.50

Hot Rolled Strips for High Tensile structural and Forming applications (includes atmoshpheric corrosion resistance grades)

Mechanical Properties ('t' = thickness in mm & 'GL' = Gauge Lenght

Tensile Test Direction	YS (Mpa) min	UTS (Mpa) min	%El (min) GL: 50mm	%El (min) GL: 80mm	%El (min) GL: 5.65 √ (A)	Bend (180 deg)	Impact Temp ˚C	Impact (J) min
T	t<20: 300 t>20: 290	440	-	-	22	2t	-	-
T	t<20: 300 t>20: 290	440	-	-	22	2t	Room Temp	27
T	t<20: 300 t>20: 290	440	-	-	22	2t	0	27
T	t<20: 300 t>20: 290	440	-	-	22	2t	-20	27
T	345	450	21	-	-	-	-	-
L	340	450	1.6≤t<2.5: 16 2.5≤t<6: 17	-	-	2.5t	-	-
T	t<20: 350 t>20: 330	490	-	-	22	2t	-	-
T	t<20: 350 t>20: 330	490	-	-	22	2t	Room Temp	27
T	t<20: 350 t>20: 330	490	-	-	22	2t	0	27
T	t<20: 350 t>20: 330	490	-	-	22	2t	-20	27
T	355	490 - 630	-	t≤3: 16	t>3: 20	t ≤12: 2t t >12: 3t	-	-
T	t≤16: 285 t>16: 275	490 - 610	t≤5: 19	-	-	2t	-	-
T	t≤16: 325 t>16: 315	490 - 610	t≤5: 22	-	-	-	-	-
T	t≤16: 325 t>16: 315	490 - 610	t≤5: 22	-	-	-	0	27
T	t≤16: 325 t>16: 315	490 - 610	t≤5: 22	-	-	-	0	47
T	t≤16: 355 t>16: 345	t<3: 510-680 t≥3: 470-630	-	1.5<t≤2: 14 2<t≤2.5: 15 2.5<t<3: 16	t≥3: 20	2t	20	27
T	t≤16: 355 t>16: 345	t<3: 510-680 t≥3: 470-630	-	1.5<t≤2: 14 2<t≤2.5: 15 2.5<t<3: 16	t≥3: 20	2t	0	27
T	t≤16: 355 t>16: 345	t<3: 510-680 t≥3: 470-630	-	1.5<t≤2: 14 2<t≤2.5: 15 2.5<t<3: 16	t≥3: 20	2t	-20	27
T	t≤16: 355 t>16: 345	t<3: 510-680 t≥3: 470-630	-	1.5<t≤2: 14 2<t≤2.5: 15 2.5<t<3: 16	t≥3: 20	2t	-20	27
T	380	485	20	-	-	-	-	-
L	380	480	1.6≤t<2.5: 14 2.5≤t<6: 15	-	-	3t	-	-
T	t<20: 410 t>20: 390	540	-	-	20	2t	-	-
T	t<20: 410 t>20: 390	540	-	-	20	2t	Room Temp	25

Hot Rolled Strips for High Tensile structural and Forming applications (includes atmoshpheric corrosion resistance grades)

Standard		Chemical Composition (%)								
Equivalent Specification	Grade	C max	Mn max	S max	P max	Si max	Al	N max	Micro alloys max	CE max
IS 2062	E410B0	0.20	1.60	0.045	0.045	0.45	-	0.012	0.25	0.50
IS 2062	E410C	0.20	1.60	0.040	0.040	0.45	-	0.012	0.25	0.50
IS 5986	ISH550LA	0.12	1.70	0.015	0.025	0.50	-	0.012	0.22	0.45
JIS G3101	SS540	0.30	1.60	0.040	0.040	-	-	-	0.20	-
ASTM A572	Grade 60	0.26	1.60	0.030	0.030	0.40	-	-	Type 1 / 2 / 3 or 5	-
IS 2062	E450A	0.22	1.65	0.045	0.045	0.45	-	0.012	0.25	0.52
IS 2062	E450BR	0.22	1.65	0.045	0.045	0.45	-	0.012	0.25	0.52
ASTM A572	Grade 65	0.23	1.65	0.030	0.030	0.40	-	-	Type 1 / 2 / 3 or 5	-

Hot Rolled Strips for atmoshpheric corrosion resistance applications

Standard		Chemical Composition (%)								
Equivalent Specification	Grade	C max	Mn max	S max	P max	Si max	Al	N max	Micro alloys max	CE max
IRS - M41/97	NA	0.10	0.25 - 0.45	0.030	0.075 - 0.14	0.28 - 0.72	0.08	-	Cr: 0.35-0.60 Cu: 0.30-0.60 Ni: 0.20 - 0.47 V: 0.05, Nb: 0.04	-
IS 11587	WR-Fe 480A	0.12	0.60	0.050	0.070-0.15	0.25-0.75	-	-	Cr: 0.30-1.25 Cu: 0.25-0.55 Ni: 0.65	-
IS 11587	WR-Fe 490H	0.12	0.60	0.035	0.070-0.15	0.25-0.75	-	-	Cr: 0.30-1.25 Cu: 0.25-0.55 Ni: 0.65	-
JIS G3125	SPA - H	0.12	0.60	0.035	0.070-0.15	0.25-0.75	-	-	Cr: 0.30-1.25 Cu: 0.25-0.55 Ni: 0.65	-
EN 10025	S355J0WP	0.12	1.00	0.035	0.060-0.15	0.75	-	0.012	Cr: 0.30-1.25 Cu: 0.25-0.55 Ni: 0.65	0.52

Hot Rolled Strips for High Tensile structural and Forming applications (includes atmoshpheric corrosion resistance grades)

Mechanical Properties ('t' = thickness in mm & 'GL' = Gauge Lenght

Tensile Test Direction	YS (Mpa) min	UTS (Mpa) min	%El (min) GL: 50mm	%El (min) GL: 80mm	%El (min) GL: 5.65 √ (A)	Bend (180 deg)	Im-pact Temp ˚C	Im-pact (J) min
T	t<20: 410 t>20: 390	540	-	-	20	2t	0	25
T	t<20: 410 t>20: 390	540	-	-	20	2t	-20	25
T	490	540 - 650	-	-	t>3: 12	t ≤12: 2t t >12: 3t	-	-
T	t≤16: 400 t>16: 390	540	t≤5: 16	-	-	2t	-	-
T	415	520	18	-	-	-	-	-
T	t<20: 450 t>20: 430	570	-	-	20	2.5t	-	-
T	t<20: 450 t>20: 430	570	-	-	20	2.5t	Room Temp	20
T	450	550	17	-	-	-	-	-

Hot Rolled Strips for atmoshpheric corrosion resistance applications

Mechanical Properties ('t' = thickness in mm & 'GL' = Gauge Lenght

Tensile Test Direction	YS (Mpa) min	UTS (Mpa) min	%El (min) GL: 50mm	%El (min) GL: 80mm	%El (min) GL: 5.65 √ (A)	Bend (180 deg)	Im-pact Temp ˚C	Im-pact (J) min
T	340	480	-	-	22	1t	-	-
T	t≤12: 345 t>12: 325	480	-	-	21	3t	-	-
T	355	490	t<6 : 22	t>6<16 :15 (200)	-	-	-	-
T	355	t≤6: 480 t>6: 490	t≤6: 22	-	t>6: 15	t≤6: 0.5t t>6: 1.5t	-	-
T	t≤16: 355 t>16-25:345	t<3: 510-680 t≥3: 470-630	-	1.5<t≤2: 14 2<t≤2.5: 15 2.5<t<3: 16	t≥3: 20	2t	0	27

Hot Rolled Strips for atmoshpheric corrosion resistance applications

Standard		Chemical Composition (%)								
Equivalent Specification	Grade	C max	Mn max	S max	P max	Si max	Al	N max	Micro alloys max	CE max
EN 10025	S355J2WP	0.12	1.00	0.030	0.060-0.15	0.75	0.02 min	0.012	Cr: 0.30-1.25 Cu: 0.25-0.55 Ni: 0.65	0.52
ASTM	Corten A	0.12	0.20 - 0.50	0.030	0.010-0.20	0.25 - 0.75	0.02 min	-	Cr: 0.50-1.25 Cu: 0.25-0.55 Ni: 0.65, V: 0.05	-
ASTM	Corten B	0.16	0.80 - 1.25	0.030	0.030	0.30 - 0.50	-	-	Cr: 0.40-0.65 Cu: 0.25-0.40 Ni: 0.40, V: 0.02-0.10	-
ASTM A588	Grade A	0.19	0.80 - 1.25	0.050	0.040	0.30 - 0.65	-	-	Cr: 0.40-0.65 Cu: 0.25-0.40 Ni: 0.40, V: 0.02-0.10	-
ASTM A588	Grade B	0.20	0.75 - 1.35	0.050	0.040	0.15 - 0.50	-	-	Cr: 0.40-0.70 Cu: 0.20-0.40 Ni: 0.50, V: 0.01-0.10	-
ASTM A588	Grade K	0.17	0.50 - 1.20	0.050	0.040	0.25 - 0.50	-	-	Cr: 0.40-0.70 Cu: 0.30-0.50 Ni: 0.40, Nb: 0.005-0.05	-

Did You Know? JSW achieved leadership level (A) in CDP Climate Programme.

Hot Rolled Strips for atmoshpheric corrosion resistance applications

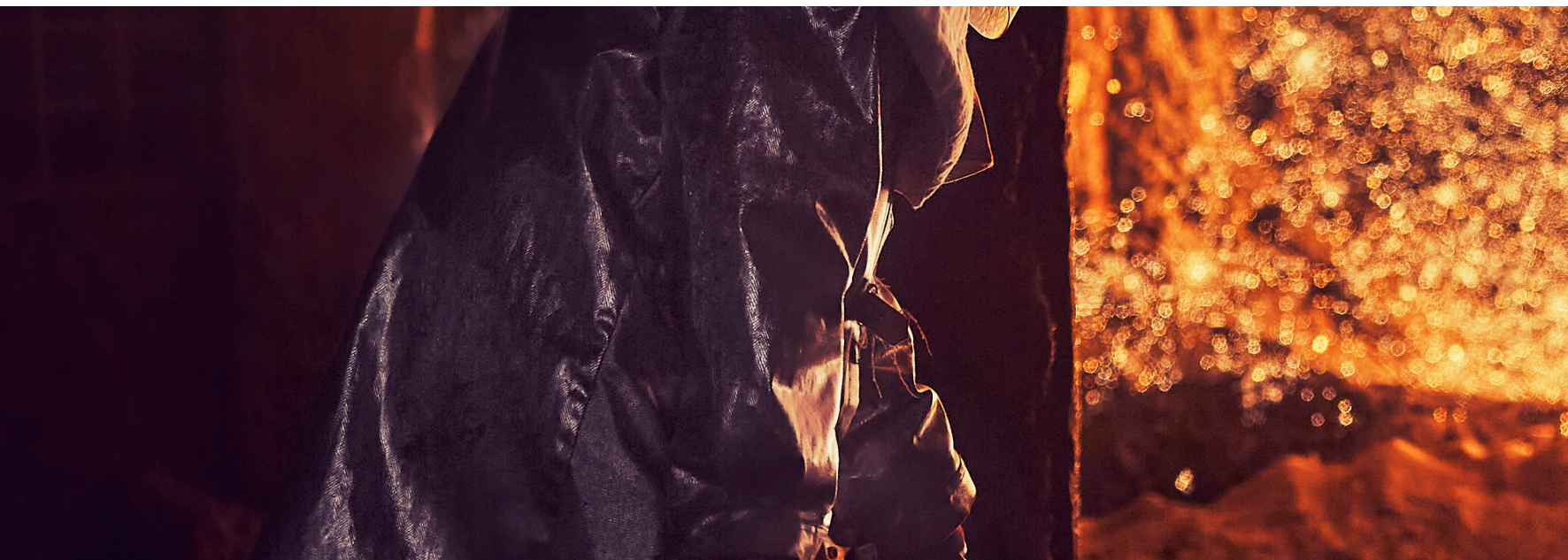
Mechanical Properties ('t' = thickness in mm & 'GL' = Gauge Lenght

Tensile Test Direction	YS (Mpa) min	UTS (Mpa) min	%El (min) GL: 50mm	%El (min) GL: 80mm	%El (min) GL: 5.65 √ (A)	Bend (180 deg)	Im-pact Temp ˚C	Im-pact (J) min
T	t≤16: 355 t>16-25:345	t<3: 510-680 t≥3: 470-630	-	1.5<t≤2: 14 2<t≤2.5: 15 2.5<t<3: 16	t≥3: 20	2t	-20	27
T	345	480	21	-	-	-	-	-
T	t16: 355 t>16: 345	470-630	20	-	-	-	-	-
T	345	485	21	-	-	-	-	-
T	345	485	21	-	-	-	-	-
T	345	485	21	-	-	-	-	-

Did You Know? JSW produces 27.7 MTPA Domestic crude steel capacity (including BPSL and JSW Ispat Special Products Ltd.)

Hot Rolled Strips for Simple Pressure Vessels

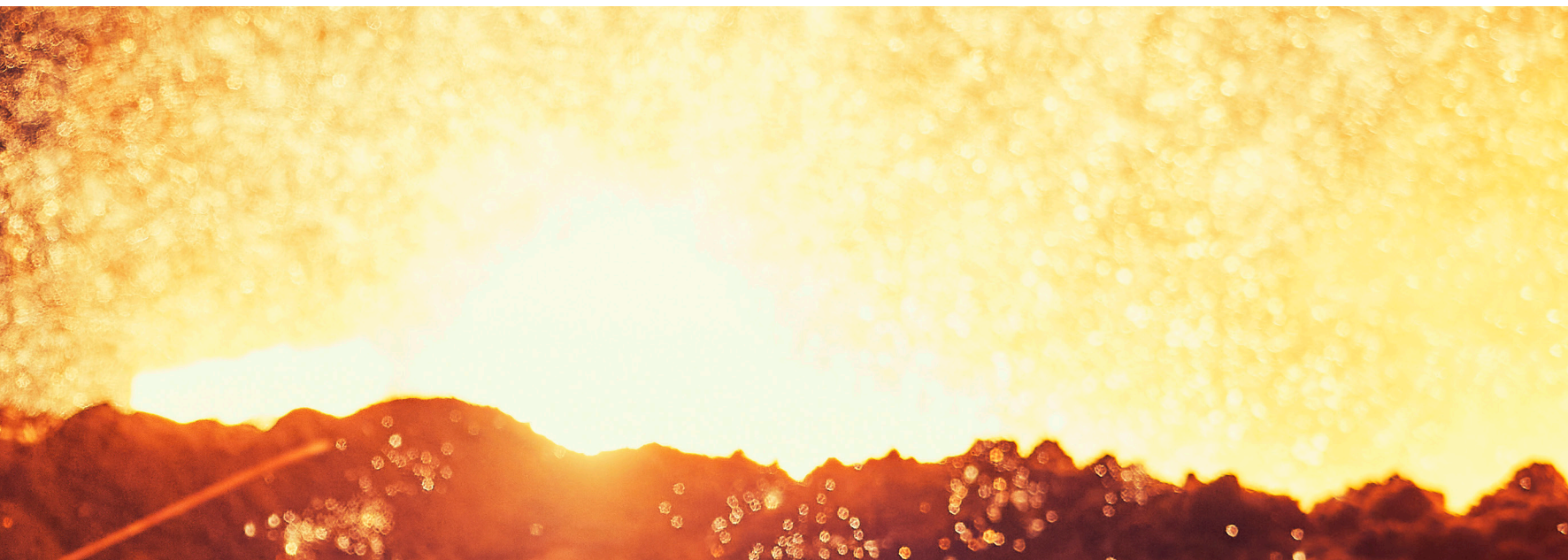
Standard		Chemical Composition (%)								
Equivalent Specification	Grade	C max	Mn max	S max	P max	Si max	Al	N max	Micro alloys max	CE max
ASTM A285	Grade A	0.17	0.90	0.025	0.025	-	-	-	-	-
ASTM A285	Grade B	0.22	0.90	0.025	0.025	-	-	-	-	-
IS 6240	Grade 1	0.16	0.30 min	0.025	0.025	0.25	0.020 min	0.009	0.10	-
IS 15914	HS 235	0.16	0.30 min	0.025	0.025	0.25	0.015 min	0.009	0.10	-
EN 10120	P245NB	0.16	0.30 min	0.015	0.025	0.25	0.020 min	0.009	0.08	-
ASTM A285	Grade C	0.28	0.90	0.025	0.025	-	-	-	-	-
IS 15914	HS 265	0.18	0.40 min	0.025	0.025	0.30	0.015 min	0.009	0.10	-
JIS G3116	SG255	0.20	0.30 min	0.020	0.020	-	-	-	-	-
EN 10120	P265NB	0.19	0.40 min	0.015	0.025	0.25	0.020 min	0.009	0.08	-
IS 15914	HS 295	0.19	0.50 min	0.025	0.025	0.35	0.015 min	0.009	0.10	-
JIS G3116	SG295	0.20	1.00	0.020	0.020	0.35	-	-	-	-
IS 15914	HS 345	0.20	0.70 min	0.025	0.025	0.45	0.015 min	0.009	0.10	-
JIS G3116	SG325	0.20	1.50	0.020	0.020	0.55	-	-	-	-



Hot Rolled Strips for Simple Pressure Vessels

Mechanical Properties ('t' = thickness in mm & 'GL' = Gauge Lenght

Tensile Test Direction	YS (Mpa) min	UTS (Mpa) min	%El (min) GL: 50mm	%El (min) GL: 80mm	%El (min) GL: 5.65 (A)	Bend (180 deg)	ECV(mm) min
T	165	310-450	30	-	-	-	-
T	185	345-485	28	-	-	-	-
T	240	350-450	-	-	25	1t	13.5
T	235	360-460	-	-	25	-	-
T	245	360-450	-	t<3: 26	3≤t≤5: 34	-	-
T	205	380-515	27	-	-	-	-
T	265	410-510	-	-	22	-	-
L	255	400	28	-	-	1t	-
T	265	410-500	-	t<3: 24	3≤t≤5: 32	-	-
T	295	450-560	-	-	20	-	-
L	295	440	26	-	-	1.5t	-
T	345	490-610	-	-	18	-	-
L	325	490	22	-	-	1.5t	-



Hot Rolled Strips for Boiler Tubes and Pressure Vessels

Standard		Chemical Composition (%)								
Equivalent Specification	Grade	C max	Mn max	S max	P max	Si max	Al	N max	Micro alloys max	CE max
IS 10748	Grade 2	0.12	0.6	0.040	0.040	-	-	0.012	0.20	-
IS 2002	Gr1	0.18	0.50-1.20	0.040	0.035	0.15-0.35	0.02 max	0.012	Cu - 0.1	0.44
EN 10028-2	P235GH	0.16	0.40-1.20	0.010	0.025	0.35	0.02 min	0.012	0.07	-
EN 10207	P235S	0.16	0.40-1.20	0.025	0.025	0.35	0.02 min	0.010	-	-
ASTM A178	Grade A	0.06-0.18	0.27-0.63	0.035	0.035	-	-	-	-	-
IS 2002	Gr2	0.20	0.50-1.20	0.040	0.035	0.15-0.35	0.02 max	0.012	Cu - 0.1	0.44
EN 10028-2	P265GH	0.20	0.60-1.40	0.010	0.025	0.40	0.02 min	0.012	0.07	-
EN 10207	P265S	0.20	0.50-1.50	0.025	0.025	0.40	0.02 min	0.010	-	-
ASTM A515	Grade 60	0.24	0.90	0.025	0.025	0.15-0.40	0.02 max	-	-	-
ASTM A516	Grade 60	0.21	0.60-0.90/ 0.85-1.20	0.025	0.025	0.15-0.40	0.02 min	-	-	-
-	16Mo3	0.12-0.20	0.40-0.80	0.040	0.040	0.10-0.35	0.02 max	-	Mo: 0.25-0.35, Cr, Cu & Ni: 0.30	-
EN 10028-2	16Mo3	0.12-0.20	0.40-0.90	0.010	0.025	0.35	-	0.012	Mo: 0.25-0.35, Cr, Cu & Ni: 0.30	-
ASTM A515	Grade 65	0.28	0.90	0.025	0.025	0.15-0.40	0.02 max	-	-	-
ASTM A516	Grade 65	0.24	0.85-1.20	0.025	0.025	0.15-0.40	0.02 min	-	-	-
ASTM A515	Grade 70	0.31	1.20	0.025	0.025	0.15-0.40	0.02 max	-	-	-
ASTM A516	Grade 70	0.27	0.85-1.20	0.025	0.025	0.15-0.40	0.02 min	-	-	-

Did You Know? The Company's manufacturing unit in Vijayanagar, Karnataka is the largest single-location steel-producing facility in India with a capacity of 12.5 MTPA

Hot Rolled Strips for Boiler Tubes and Pressure Vessels

Mechanical Properties ('t' = thickness in mm & 'GL' = Gauge Lenght

Tensile Test Direction	YS (Mpa) min	UTS (Mpa) min	%El (min) GL: 50mm	%El (min) GL: 80mm	%El (min) GL: 5.65 (A)	Bend (180 deg)	Im-pact Temp C	Im-pact (J) min
T	210	330	-	-	28	2t	-	-
T	T<16 - 235 T>16 - 225	360-480	-	-	24	2t	-	-
T	t≤16: 235	360-480	-	-	24	-	20	40
T	t≤16: 235 t>16: 225	360-480	-	2<t≤2.5: 20 2.5<t<3: 21	t≥3: 26	-	-20	28
-	-	-	-	-	-	-	-	-
T	T<16 - 265 T>16 - 255	410-530	-	-	22	2t	-	-
T	t≤16: 265	410-530	-	-	22	-	20	40
T	t≤16: 265 t>16: 255	410-530	-	2<t≤2.5: 17 2.5<t<3: 18	t≥3: 22	-	-20	28
T	220	415-550	25	-	-	-	-	-
T	220	415-550	25	-	-	-	-	-
-	-	-	-	-	-	-	-	-
T	t≤275	440-590	-	-	22	-	20	31
T	240	450-585	23	-	-	-	-	-
T	240	450-585	23	-	-	-	-	-
T	260	485-620	21	-	-	-	-	-
T	260	485-620	21	-	-	-	-	-

Did You Know? JSW Steel is widely recognized for its excellence in business and sustainability practices.

Hot Rolled Strips of Medium Carbon grades

Standard		Chemical Composition (%)									
Equivalent Specification	Grade	C max	Mn max	S max	P max	Si max	Al	N max	Cr max	Micro alloys max	CE max
SAE J403	1026	0.22 - 0.28	0.60 - 0.90	0.035	0.030	-	-	-	-	-	-
JIS G4051	S28C	0.25 - 0.31	0.60 - 0.90	0.035	0.030	0.15 - 0.35	-	-	-	-	-
SAE J403	1030	0.28 - 0.34	0.60 - 0.90	0.035	0.030	-	-	-	-	-	-
SAE J403	1030 Mod	0.26 - 0.34	1.10 - 1.50	0.050	0.030	-	-	-	-	-	-
JIS G4051	S30C	0.27 - 0.33	0.60 - 0.90	0.035	0.030	0.15 - 0.35	-	-	-	-	-
SAE J403	1035	0.32 - 0.38	0.60 - 0.90	0.035	0.030	-	-	-	-	-	-
SAE J403	1536	0.30 - 0.37	1.20 - 1.50	0.035	0.030	-	-	-	-	-	-
JIS G4051	S35C	0.32 - 0.39	0.60 - 0.90	0.035	0.030	0.15 - 0.35	-	-	-	-	-
EN 10083	C35	0.32 - 0.39	0.50 - 0.80	0.045	0.045	0.40	-	-	0.40	0.63	-
SAE J403	1040 (MC11)	0.37 - 0.44	0.60 - 0.90	0.035	0.030	-	-	-	-	-	-
EN 10083	C40	0.37 - 0.44	0.50 - 0.80	0.045	0.045	0.40	-	-	0.40	0.63	-
JIS G4051	S40C	0.37 - 0.43	0.60 - 0.90	0.035	0.030	0.15 - 0.35	-	-	-	-	-
SAE J403	1541	0.36 - 0.44	1.35 - 1.65	0.035	0.030	-	-	-	-	-	-
SAE J403	1042	0.40 - 0.47	0.60 - 0.90	0.035	0.030	-	-	-	-	-	-
SAE J403	1045	0.43 - 0.50	0.60 - 0.90	0.035	0.030	-	-	-	-	-	-
JIS G4051	S45C	0.42 - 0.48	0.60 - 0.90	0.035	0.030	0.15 - 0.35	-	-	-	-	-
EN 10083	C45	0.42 - 0.50	0.50 - 0.80	0.045	0.045	0.40	-	-	0.40	0.63	-
SAE J403	1050	0.48 - 0.55	0.60 - 0.90	0.035	0.030	-	-	-	-	-	-
JIS G4051	S50C	0.47 - 0.53	0.60 - 0.90	0.035	0.030	0.15 - 0.35	-	-	-	-	-
SAE J403	1055 (MC12)	0.50 - 0.60	0.60 - 0.90	0.035	0.030	-	-	-	-	-	-
JIS G4051	S55C	0.52 - 0.58	0.60 - 0.90	0.035	0.030	0.15 - 0.35	-	-	-	-	-
EN 10083	C55	0.52 - 0.60	0.60 - 0.90	0.045	0.045	0.40	-	-	0.40	0.63	-
SAE J403	1060	0.55 - 0.65	0.60 - 0.90	0.035	0.030	-	-	-	-	-	-
EN 10083	C60	0.57 - 0.65	0.60 - 0.90	0.045	0.045	0.40	-	-	0.40	0.63	-
SAE J403	1065	0.60 - 0.70	0.60 - 0.90	0.035	0.030	-	-	-	-	-	-
SAE J403	1070	0.65 - 0.75	0.60 - 0.90	0.035	0.030	-	-	-	-	-	-
SAE J403	1080	0.75 - 0.88	0.60 - 0.90	0.035	0.030	-	-	-	-	-	-

Hot Rolled Strips of Alloyed Steels

Standard		Chemical Composition (%)											
Equivalent Specification	Grade	C max	Mn max	S max	P max	Si max	Al	N max	Cr max	Ni max	Cu max	Mo max	Micro alloys max
EN 10132	16MnCr5	0.14-0.19	1.00-1.30	0.035	0.035	0.40	-	-	0.80-1.10	-	-	-	-
-	15Cr3	0.12-0.18	0.40-0.60	-	-	0.15-0.35	-	-	0.50-0.80	-	-	-	-
-	50CrV4	0.45-0.55	0.70-1.10	0.035	0.035	0.15-0.40	-	-	0.90-1.20	-	-	-	V: 0.10-0.20
EN 10083	51CrV4	0.47-0.55	0.70-1.10	0.035	0.025	0.40	-	-	0.90-1.20	-	-	-	V: 0.10-0.25
SAE J404	6150	0.48-0.53	0.70-0.90	0.040	0.035	0.15-0.35	-	-	0.80-1.10	-	-	-	V: 0.15min
-	58CrV4	0.55-0.62	0.70-1.10	0.035	0.035	0.15-0.40	-	-	0.90-1.20	-	-	-	V: 0.10-0.25
JIS G4105	SCM415	0.13-0.18	0.60-0.85	0.030	0.030	0.15-0.35	-	-	0.90-1.20	-	-	0.15-0.30	-
JIS G4105	SCM420	0.18-0.23	0.60-0.85	0.030	0.030	0.15-0.35	-	-	0.90-1.20	-	-	0.15-0.30	-
JIS G4105	SCM435	0.33-0.38	0.60-0.85	0.030	0.030	0.15-0.35	-	-	0.90-1.20	-	-	0.15-0.30	-
EN 10083	34CrMo4	0.30-0.37	0.60-0.90	0.035	0.025	0.40	-	-	0.90-1.20	-	-	0.15-0.30	-
SAE J404	4135	0.33-0.38	0.70-0.90	0.040	0.030	0.15-0.35	-	-	0.80-1.10	-	-	0.15-0.25	-
EN 10083	20MnB5	0.17-0.23	1.10-1.40	0.040	0.025	0.40	-	-	-	-	-	-	B: 0.0008-0.005
SAE J403	15B21	0.18-0.23	1.10-1.40	0.035	0.030	-	-	-	-	-	-	-	B: 0.0005-0.003
-	22MnB5	0.19-0.25	1.10-1.50	0.040	0.035	0.40	-	-	0.35	-	-	-	B: 0.0008-0.005 Ti: 0.05 max
SAE J403	15B22	0.19-0.24	1.10-1.40	0.035	0.030	-	-	-	0.30	-	-	-	B: 0.0005-0.003
-	26MnB5	0.23-0.29	1.10-1.50	0.040	0.035	0.40	-	-	0.35	-	-	-	B: 0.0008-0.005 Ti: 0.05 max
SAE J403	15B26	0.22-0.29	1.10-1.40	0.035	0.030	-	-	-	0.30	-	-	-	B: 0.0005-0.003
EN 10083	30MnB5	0.27-0.33	1.15-1.45	0.040	0.025	0.40	-	-	-	-	-	-	B: 0.0008-0.005
-	34MnB5	0.33-0.37	1.20-1.50	0.040	0.035	0.40	-	-	0.35	-	-	-	B: 0.0008-0.005 Ti: 0.05 max
SAE J404	8620	0.18-0.23	0.70-0.90	0.040	0.030	0.15-0.35	-	-	0.40-0.60	0.40-0.70	-	0.15-0.25	-

Hot Rolled Strips for Line Pipes and Casing & Tubing

Standard		Chemical Composition (%)												
Equivalent Specification	Grade	C max	Mn max	S max	P max	Si max	Al	N max	V max	Nb max	Ti max	Others max	CE (IIW) max	CE (pcm) max
API 5L	Gr BM	0.22	1.2	0.015	0.025	0.45	-	-	0.05	0.05	0.040	-	0.43	0.25
API 5L	X 42M	0.22	1.3	0.015	0.025	0.45	-	-	0.05	0.05	0.040	-	0.43	0.25
API 5L	X 46M	0.22	1.3	0.015	0.025	0.45	-	-	0.05	0.05	0.040	-	0.43	0.25
API 5L	X 52M	0.22	1.4	0.015	0.025	0.45	-	-	0.15			-	0.43	0.25
API 5L	X 56M	0.22	1.4	0.015	0.025	0.45	-	-	0.15			-	0.43	0.25
API 5L	X 60M	0.12	1.6	0.015	0.025	0.45	-	-	0.15			Cr: 0.3	0.43	0.25
API 5L	X 65M	0.12	1.6	0.015	0.025	0.45	-	-	0.15			Cr: 0.3	0.43	0.25
API 5L	X 70M	0.12	1.7	0.015	0.025	0.45	-	-	0.15			Cr: 0.4, Mo: 0.25	0.43	0.25
API 5L	X 80M	0.12	1.85	0.015	0.025	0.45	-	-	0.15			Cr: 0.4, Mo: 0.25	0.43	0.25
API 5CT	J55	-	-	0.040	0.040	-	-	-	0.15			-	-	-

Notes

1 When the steel is aluminium killed, the total aluminium content shall not be less than 0.02 percent. When the steel is silicon killed, the silicon content shall not be less than 0.10 percent. When the steel is aluminium silicon killed, the silicon content shall not be less than 0.03 percent and total aluminium content shall not be less than 0.01 percent.

2 When copper bearing steel is required the copper content shall be between 0.20 and 0.35 percent.

3 Classes for the suitability of hot dip galvanizing (for guidance)
Class1 -〉 Si: 0.03 max and Si+2.5P: 0.09 max
Class2 -〉 Si: 0.35 max
Class3 -〉 Si: 0.14 - 0.25 and P: 0.035 max

4 Carbon Equivalent (CE) = C + Mn/6 + (Cr+Mo+V)/5 + (Ni+Cu)/15
CE (PCM) = C+Si/30+Mn/20+Cu/20+Ni/60+Cr/20+Mo/15+V/10+5B

5 Customized composition and properties may be mutually agreed between the purchaser and the supplier.

6 Project Orders technical parameters shall be mutually agreed based on the clients requirements

7 The values given here are indicative and however the final will be as per standard requirements or mutual agreement.

Hot Rolled Strips for Line Pipes and Casing & Tubing

Mechanical Properties ('t' = thickness in mm & 'GL' = Gauge Lenght

YS (Mpa) min	UTS (Mpa) min	%El (min) GL: 50.8mm	YS/UTS max	Bend (180 deg)	Impact Temp ˚C	Impact (J) min	Hardness max
245 - 450	415 - 655	-	0.93	2t	0	40	HV 248
290 - 495	415 - 655	-	0.93	2t	0	40	HV 248
320 - 525	435 - 655	-	0.93	2t	0	40	HV 248
360 - 530	460 - 760	-	0.93	2t	0	50	HV 248
390 - 545	490 - 760	-	0.93	2t	0	50	HV 248
415 - 565	520 - 760	-	0.93	2t	0	50	HV 248
450 - 600	535 - 760	-	0.93	2t	0	55	HV 248
485 - 635	570 - 760	-	0.93	3t	0	70	HV 248
555 - 705	625 - 825	-	0.93	3t	0	70	HV 248
379 - 552	517	-	0.93	2t	0	40	HV 248


JSW

JSW Steel Plant, Vijayanagar Works, Karnataka

Re-rolling (CRCA & Galvanising applications)

Standard		Chemical Composition (%)								
Equivalent Specification	Grade	C max	Mn max	S max	P max	Si max	Al	N max	Micro alloys max	CE max
11513_2017	CR0 (Hard Quality)	0.35	4.00	0.045	0.050	-	0.02 min	0.012	-	-
11513_2017	CR1 (CQ)	0.15	1.00	0.040	0.080	-	0.02 min	0.012	-	-
11513_2017	CR2(DQ)	0.12	0.50	0.035	0.040	-	0.02 min	0.012	-	-
11513_2017	CR3(DDQ)	0.10	0.45	0.030	0.030	-	0.02 min	0.012	-	-
11513_2017	CR4(EDD)	0.08	0.45	0.030	0.030	-	0.02 min	0.009	-	-
11513_2017	CR5 (IF)	0.06	0.25	0.020	0.020	-	0.02 min	0.007	0.15 max	-
11513_2017	CR6(HSLA)	0.18	3.00	0.025	0.070	-	0.02 min	0.012	0.20 max	-
11513_2017	CR7 (High Strength C-Mn)	0.25	2.50	0.030	0.050	-	0.02 min	0.012	0.15 max	-
11513_2017	CR8 (IFHS)	0.01	1.60	0.025	0.120	-	0.02 min	0.007	-	-
11513_2017	CR3+ B (DD)	0.10	0.45	0.030	0.030	-	0.02 min	0.012	B: 8-60ppm	-
11513_2017	CR4+B (EDD)	0.08	0.40	0.025	0.025	-	0.02 min	0.009	B: 8-60 ppm	-
SAE J403_2014	1006	0.08	0.25-0.40	0.035	0.030	-	-	-	-	-
SAE J403_2014	1008	0.10	0.30-0.50	0.035	0.030	-	-	-	-	-
SAE J403_2014	1010	0.08–0.13	0.30-0.60	0.035	0.030	-	-	-	-	-
SAE J403_2014	1012	0.10–0.15	0.30-0.60	0.035	0.030	-	-	-	-	-
SAE J403_2014	1015	0.13–0.18	0.30-0.60	0.035	0.030	-	-	-	-	-
SAE J403_2014	1018	0.15–0.20	0.60-0.90	0.035	0.030	-	-	-	-	-
SAE J403_2014	1020	0.18–0.23	0.30-0.60	0.035	0.030	-	-	-	-	-

Medium carbon grades

Standard		Chemical Composition (%)									
Equivalent Specification	Grade	C max	Mn max	S max	P max	Si max	Al	N max	Cr max	Micro alloys max	CE max
SAEJ403	1026	0.22-0.28	0.60-0.90	0.05	0.03	-	-	-	-	-	-
SAEJ403	1030	0.28-0.34	**0.60-0.90**	0.05	0.03	-	-	-	-	-	-
SAEJ403	1030 Mod	0.26-0.34	1.20-1.50	0.05	0.03	-	-	-	-	-	-
SAEJ403	1035	0.32-0.38	0.60-0.90	0.05	0.03	-	-	-	0.2	-	-
SAEJ403	1536	0.30-0.37	1.20-1.50	0.05	0.03	-	-	-	0.2	-	-
SAEJ403	1040	0.37-0.44	0.60-0.90	0.05	0.03	-	-	-	0.2	-	-
SAEJ403	1541	0.36-0.44	1.35-1.65	0.05	0.03	-	-	-	0.2	-	-
SAEJ403	1042	0.40-0.47	0.60-0.90	0.05	0.03	-	-	-	0.2	-	-
SAEJ403	1045	0.43-0.50	0.60-0.90	0.05	0.03	-	-	-	0.2	-	-
SAEJ403	1050	0.48-0.55	0.60-0.90	0.05	0.03	-	-	-	0.2	-	-
SAEJ403	1060	0.55-0.65	0.60-0.90	0.05	0.03	-	-	-	0.2	-	-
SAEJ403	1070	0.65-0.75	0.60-0.90	0.05	0.03	-	-	-	0.2	-	-
SAEJ403	1080	0.75-0.85	0.60-0.90	0.05	0.03	-	-	-	0.2	-	-

Did You Know? Dolvi Works was recognised with a 5-star safety rating from the British Safety Council

Chequered sheets and plates for structural use

Standard		Chemical Composition (%)								
Equivalent Specification	Grade	C max	Mn max	S max	P max	Si max	Al	N max	Micro alloys max	CE max
IS 3502	E250A	0.23	1.5	0.045	0.045	0.4	-	0.012	0.25	0.42

Atmospheric corrosion resistance application

Standard		Chemical Composition (%)								
Equivalent Specification	Grade	C max	Mn max	S max	P max	Si max	Al	N max	Micro alloys max	CE max
IRS-M41/97	NA	0.10	0.25- 0.45	0.03	0.075-0.14	0.28-0.72	0.08 max	-	Cr: 0.35-0.60, Cu: 0.30-0.60, Ni: 0.20 - 0.47, V: 0.05, Nb: 0.04	-
JIS G3125	SPA-H	0.12	0.20-0.50	0.04	0.07-0.15	0.25-0.75	-	-	Cr: 0.30-1.25, Cu: 0.25-0.60, Ni: 0.65	-

Chequered sheets and plates for structural use

Mechanical Properties ('t' = thickness in mm & 'GL' = Gauge Lenght

Tensile Test Direction	YS (Mpa)	UTS (Mpa)	%El min GL: 5.65 SQRT	Bend @180 deg	Impact Temp (Deg)C	Impact (J) min
T	250	410	23	2t	-	-

Atmospheric corrosion resistance application

Mechanical Properties ('t' = thickness in mm & 'GL' = Gauge Lenght

Tensile Test Direction	YS (Mpa)	UTS (Mpa)	%El (min) GL: 50mm	%El (min) GL: 80mm	%El (min) GL: 5.65 SQRT	Bend @180 Deg	Impact Temp (Deg C)	Impact (J) min
-	340	480	-	-	22	1t	-	-
-	t≤6: 345, t>6: 355	t≤6: 480, t>6: 490	t≥6: 22	-	t≥6: 15	t≤6: 0.5t, t≥6: 1.5t	-	-

Structural, general engineering and forming

Standard		Chemical Composition (%)								
Equivalent Specification	Grade	C max	Mn max	S max	P max	Si max	Al	N max	Micro alloys max	CE max
EN 10025-2019	S235JR	0.17	1.4	0.035	0.035	-	-	0.012	-	0.35
EN 10025-2019	S235J0	0.17	1.4	0.030	0.030	-	-	0.012	-	0.35
EN 10025-2019	S235J2	0.17	1.4	0.025	0.025	-	-	-	-	0.35
ASTM A1011	Grade 36 Type 1	0.25	0.9	0.040	0.040	-	-	-	Ti: 0.025	-
ASTM A1018	Grade 36 Type 1	0.25	1.5	0.040	0.040	-	-	0.014	Ti: 0.025	-
ASTM A1011	SS Grade 40	0.25	0.9	0.040	0.040	-	-	-	Ti: 0.025	-
ASTM A1018	SS Grade 40	0.25	1.5	0.040	0.040	-	-	0.014	Ti: 0.025	-
IS 2062-2011	E250A	0.23	1.5	0.045	0.045	0.04	-	0.012	0.25	0.42
IS 2062-2011	E250BR	0.22	1.5	0.045	0.045	0.04	-	0.012	0.25	0.41
IS 2062-2011	E250B0	0.22	1.5	0.045	0.045	0.04	-	0.012	0.25	0.41
IS 2062-2011	E250C	0.20	1.5	0.040	0.040	0.04	-	0.012	0.25	0.39
IS 5986-2017	ISH 410S	0.20	1.3	0.040	0.040	-	-	0.012	0.20	0.42
JIS 63101	SS400	-	-	0.050	0.050	-	-	-	-	-
JIS 63106	SM400A	0.23	2.5xC mi	0.035	0.035	-	-	-	-	-
JIS 63106	SM400B	0.20	0.60-1.40	0.035	0.035	0.035	-	0.012	-	-
JIS 63106	SM400C	0.18	1.4	0.035	0.035	0.035	-	0.012	-	0.40
EN 10025-2019	S275JR	0.21	1.5	0.035	0.035	-	-	-	-	0.40
EN 10025-2019	S275J0	0.18	1.5	0.030	0.030	-	-	-	-	0.40
EN 10025-2019	S275J2	0.18	1.5	0.025	0.025	-	-	-	-	-
ASTM A36	A36	0.25	0.8-1.20	0.05	0.04	0.400	-	-	Type 1/2/3 or 5	-
ASTM A572	Grade 42	0.21	1.35	0.05	0.04	0.400	-	-	-	-

Structural, general engineering and forming

Mechanical Properties ('t' = thickness in mm & 'GL' = Gauge Lenght

Tensile Test Direction	YS (Mpa) min	UTS (Mpa) min	%El (min) GL: 50mm	%El (min) GL: 80mm	%El (min) GL: 5.65 (A)	Bend (180 deg)	Impact Temp C	Impact (J) min
T	t≤16: 235 t〉16:225	360-510	-	1.5≤t≤2: 17 2≤t≤2.5: 18 2.5≤t≤3: 19	t≥3: 26	1t	20	27
T	t≤16: 235 t〉16:225	360-510	-	1.5≤t≤2: 17 2≤t≤2.5: 18 2.5≤t≤3: 19	24	1t	0	-
T	t≤16: 235 t〉16:225	360-510	-	1.5≤t≤2: 17 2≤t≤2.5: 18 2.5≤t≤3: 19	24	1t	-20	27
L	250	365	1.6≤t≤2.5: 21 2.5≤t≤6: 22	-	-	-	-	-
L	250	365	1.6≤t≤6: 20 t〉6: 19	-	-	-	-	-
L	275	380	t〉6: 19	-	-	-	-	-
L	275	380	-	-	23	2t	Room Temp	27
T	250	410	-	-	23	2t	0	27
T	250	410	-	-	23	2t	-20	27
T	250	410	-	-	23	2t	-	-
T	250	410	-	17	24	t〈12: t , t〉12: 2t	-	-
T	255	410-520	t〉5: 21	-	-	1.5t	-	-
L	t≤16: 245 t〉16: 235	400-510	t〉5: 23	-	-	-	-	-
L	t≤16: 245 t〉16: 235	400-510	t〉5: 23	-	-	-	0	27
L	t≤16: 245 t〉16: 235	400-510	t〉5: 23	-	-	-	0	47
L	t≤16: 275 t〉16: 265	400-510	-	1.5≤t≤2: 15 2≤t≤2.5: 16 2.5≤t≤3: 17	21	-	20	27
T	t≤16: 275 t〉16: 265	t〈3: 430-580 t≥3: 410-560	-	1.5≤t≤2: 15 2≤t≤2.5: 16 2.5≤t≤3: 17	21	-	0	27
-	t≤16: 275 t〉16: 265	t〈3: 430-580 t≥3: 410-560	-	1.5≤t≤2: 15 2≤t≤2.5: 16 2.5≤t≤3: 17	21	-	-20	27
T	t≤16: 275 t〉16: 265	t〈3: 430-580 t≥3: 410-560	21	-	-	-	-	-
T	250	400-550	22	-	-	-	-	-
T	290	415	1.6≤t≤2.5: 20	-	2t	2t	-	-

Structural, general engineering and forming										
Standard		Chemical Composition (%)								
Equivalent Specification	Grade	C max	Mn max	S max	P max	Si max	Al	N max	Micro alloys max	CE max
ASTM A1011	SS Grade 36 Type2	0.25	1.35	0.040	0.035	-	-	-	Ti: 0.025	-
ASTM A1011	SS Grade 45	0.25	1.35	0.040	0.035	-	-	-	Ti: 0.025	-
ASTM AI018	SS Grade 36 Type2	0.25	1.35	0.040	0.035	-	-	0.014	Ti: 0.025	0.43
IS 2062-2011	E275A	0.23	1.50	0.045	0.045	0.4	-	0.012	0.25	-
IS 2062-2011	E275BR	0.22	1.50	0.045	0.045	0.4	-	0.012	0.25	0.42
IS 2062-2011	E275B0	0.22	1.50	0.045	0.045	0.4	-	0.012	0.25	0.41
IS 2062-2011	E275C	0.20	1.50	0.040	0.040	0.4	-	0.012	0.25	0.39
EN 10111	DD11	0.12	0.6	0.045	0.045	-	-	-	-	-
EN 10111	DD12	0.10	0.45	0.035	0.035	-	-	-	-	-
EN 10111	DD13	0.08	0.40	0.030	0.030	-	-	-	-	-

Structural, general engineering and forming

Mechanical Properties ('t' = thickness in mm & 'GL' = Gauge Lenght

Tensile Test Direction	YS (Mpa) min	UTS (Mpa) min	%El (min) GL: 50mm	%El (min) GL: 80mm	%El (min) GL: 5.65 (A)	Bend (180 deg)	Impact Temp C	Impact (J) min
L	250	400-550	2.5≤t≤6: 21 1.6≤t≤2.5: 18	-	2t	2t	-	-
L	310	410	2.5≤t≤6: 19 t≥6: 21	-	2t	2t	-	-
L	250	400-550	-	-	22	2t	-	-
T	t≤20: 275 t>20: 265	430	-	-	-	-	-	-
T	t≤20: 275 t>20: 265	430	-	-	22	2t	Room Temp	27
T	t≤20: 275 t>20: 265	430	-	-	22	2t	0	27
T	t≤20: 275 t>20: 265	430	-	-	22	2t	-20	27
-	T <=2 : 170-360, t>2 170-340	440 max	T<2- 23, 2 mm ≤ t < 3 mm-24	28	-	-	-	-
-	T <=2 : 170-340, t>2 170-320	420 max	T<2- 25, 2 mm ≤ t < 3 mm-26	30	-	-	-	-
-	T <=2 : 170-330, t>2 170-310	400 max	T<2- 28, 2 mm ≤ t < 3 mm-29	33	-	-	-	-

High tensile structural and forming applications										
Standard		Chemical Composition (%)								
Equivalent Specification	Grade	C max	Mn max	S max	P max	Si max	Al	N max	Micro alloys max	CE max
IS 2062-2011	E300A	0.2	1.50	0.045	0.045	0.45	-	0.012	0.25	0.44
IS 2062-2011	E300BR	0.2	1.50	0.045	0.045	0.45	-	0.012	0.25	0.44
IS 2062-2011	E30080	0.2	1.50	0.045	0.045	0.45	-	0.012	0.25	0.44
IS 2062-2011	E300C	0.2	1.50	0.040	0.040	0.45	-	0.012	0.25	0.44
ASTM A572	Grade 50	0.23 or0.20	1.35 or 1.50	0.050	0.040	0.40	-	-	Type I/2/3 or 5	-
ASTM A1011	SS Grade 50	0.25 or 0.22	1.35 or 1.50	0.040	0.035	-	-	-	Ti: 0.025	-
IS 2062-2011	E350A	0.2	1.55	0.045	0.045	0.45	-	0.012	0.25	0.47
IS 2062-2011	E350BR	0.2	1.55	0.045	0.045	0.45	-	0.012	0.25	0.47
IS 2062-2011	E35080	0.2	1.55	0.045	0.045	0.45	-	0.012	0.25	0.47
IS 2062-2011	E350C	0.2	1.55	0.040	0.040	0.45	-	0.012	0.25	0.45
JIS G3101	SS490	-	-	0.050	0.050	-	-	-	0.20	-
JIS G3106	SM490A	0.2	1.6	0.035	0.035	0.55	-	-	0.20	-
JIS G3106	SM4908	0.18	1.6	0.035	0.035	0.55	-	-	0.20	-
JIS G3106	SM490C	0.18	1.6	0.035	0.035	0.55	-	-	0.20	-
EN 10025-2019	S355JR	0.24	1.6	0.035	0.035	0.55	-	0.012	1) Without MA 2) MA: 0.201	0.45
EN 10025-2019	S355J0	0.20	1.6	0.030	0.030	0.55	-	0.012	0.20	0.45
EN 10025-2019	S355J2	0.20	1.6	0.025	0.025	0.55	-	-	0.20	0.45
EN 10025-2019	S355K2	0.20	1.6	0.025	0.025	0.55	-	-	0.20	0.45
ASTM A572	Grade 55	0.25 or0.20	I.35or 1.60	0.050	0.040	0.54	-	-	Type 1/2/3 or 5	-
ASTM A011	SS Grade 55	0.25 or0.22	I.35or 1.50	0.040	0.035	-	-	-	Ti: 0.025	-
IS 2062-2011	E410A	0.20	1.6	0.045	0.045	0.45	-	0.012	0.25	0.5

High tensile structural and forming applications

Mechanical Properties ('t' = thickness in mm & 'GL' = Gauge Lenght

Tensile Test Direction	YS (Mpa)	UTS (Mpa)	%El (min) GL: 50mm	%El (min) GL: 80mm	%El (min) GL: 5.65 SQRT	Bend (180 deg)	Impact Temp C	Impact (J) min
T	t≤20: 300, t〉20: 290	440	-	-	22	2t	-	-
T	t≤20: 300, t〉20: 290	440	-	-	22	2t	20	27
T	t≤20: 300, t〉20: 290	440	-	-	22	2t	0	27
T	t≤20: 300, t〉20: 290	440	-	-	22	2t	-20	27
T	250	450	19	-	-	-	-	-
-	275	450	1.5≤t≤2.5:16 , 2.5≤t≤6: 17	-	-	2.5t	-	-
T	t≤20: 350 t〉20: 330	490	-	-	22	2t	-	-
T	t≤20: 350 t〉20: 330	490	-	-	22	2t	Room Temp	27
T	t≤20: 350 t〉20: 330	490	-	-	22	2t	0	27
T	t≤20: 350 t〉20: 330	490	-	-	22	2t	-20	27
T	t≤16: 285 t〉16: 275	490-610	t≤5: 19	-	-	2t	-	-
T	t≤16: 325 t〉16: 315	490-610	t≤5: 22	-	-	-	0	27
T	t≤16: 325 t〉16: 315	490-610	t≤5: 22	-	-	-	0	47
T	t≤16: 325 t〉16: 315	490-610	t≤5: 22	-	t≥3:20	2t	20	27
T	t≤16: 355 t〉16: 345	t〈3: 510-680 t≥3: 470-630	-	1.5≤t≤2: 14 2≤t≤2.5:15 2.5≤t≤3: 16	t≥3:20	2t	0	27
T	t≤16: 355 t〉16: 345	t〈3: 510-680 t≥3: 470-630	-	1.5≤t≤2: 14 2≤t≤2.5:15 2.5≤t≤3: 16	t≥3:20	2t	-20	27
T	t≤16: 355 t〉16: 345	t〈3: 510-680 t≥3: 470-630	-	1.5≤t≤2: 14 2≤t≤2.5:15 2.5≤t≤3: 16	t≥3:20	2t	-20	40
T	t≤16: 355 t〉16: 345	t〈3: 510-680 t≥3: 470-630	-	1.5≤t≤2: 14 2≤t≤2.5:15 2.5≤t≤3: 16	-	-	-	-
T	380	485	18	-	-	-	-	-
-	380	480	1.6≤t≤2.5: 14 2.5≤t≤6: 15		-	3t		-
T	t≤20: 410 t〉20: 390	540	-	-	20	2t	-	-

High tensile structural and forming applications										
Standard		Chemical Composition (%)								
Equivalent Specification	Grade	C max	Mn max	S max	P max	Si max	Al	N max	Micro alloys max	CE max
IS 2062-2011	E410BR	0.20	1.6	0.045	0.045	0.45	-	0.012	0.25	0.5
IS 2062-2011	E41080	0.20	1.6	0.045	0.045	0.45	-	0.012	0.25	0.5
IS 2062-2011	E410C	0.20	1.6	0.040	0.040	0.45	-	0.012	0.25	0.5
JIS G3101	SS540	-	-	0.050	0.050	-	-	-	0.20	-
ASTM A572	Grade 60	0.26 or0.20	1.35or 1.60	0.050	0.040	0.40	-	-	Type 1/2/3 or 5	-
IS 2062-2011	E450A	0.22	1.65	0.045	0.045	0.45	-	0.012	0.25	0.52
IS 2062-2011	E450BR	0.22	1.65	0.045	0.045	0.45	-	0.012	0.25	0.52
ASTM A572	Grade 65	0.26 or 0.23	1.35or 1.65	0.050	0.040	0.40	-	-	Type 1/2/3 or 5	-

High tensile structural and forming applications

Mechanical Properties ('t' = thickness in mm & 'GL' = Gauge Lenght

Tensile Test Direction	YS (Mpa)	UTS (Mpa)	%El (min) GL: 50mm	%El (min) GL: 80mm	%El (min) GL: 5.65 SQRT	Bend (180 deg)	Im-pact Temp C	Im-pact (J) min
T	t≤20: 410 t>20: 390	540	-	-	20	2t	Room Temp	25
T	t≤20: 410 t>20: 390	540	-	-	20	2t	0	25
T	t≤20: 410 t>20: 390	540	-	-	20	2t	-20	25
T	t≤16: 400 t>16: 390	540	t≤5: 16	-	-	2t	-	-
T	415	520	-	-	-	-	-	-
T	t≤20: 450 t>20: 430	570	-	-	20	2.5t	-	-
T	t≤20: 450 t>20: 430	570	-	-	20	2.5t	Room Temp	20
T	450	550	15	-	-	-	-	-

Boiler and Pressure Vessel Application:

Standard		Chemical Composition (%)								
Equivalent Specification	Grade	C max	Mn max	S max	P max	Si max	Al	N max	Micro alloys max	CE max
ASTM A516	Grade 60	0.21	0.60-0.90/ 0.85-1.20	0.035	0.035	0.15-0.40	-	-	-	-
ASTM A515	Grade 65	0.28	0.9	0.035	0.035	0.15-0.40	-	-	-	-
ASTM A516	Grade 65	0.24	0.85-1.20	0.035	0.035	0.15-0.40	-	-	-	-
ASTM A515	Grade 70	0.31	1.2	0.035	0.035	0.15-0.40	-	-	-	-
ASTM A516	Grade 70	0.27	0.85-1.20	0.035	0.035	0.15-0.40	-	-	-	-

Line pipes and casing & tubing

Standard		Chemical Composition (%)												
Equivalent Specification	Grade	C max	Mn max	S max	P max	Si max	Al	N max	V max	Nb Max	Ti Max	Others Max	CE(IIW) max	CE (PCM) max
API 5L	Gr BM	0.22	1.2	0.015	0.025	0.45	-	-	0.05	0.05	0.04	-	0.43	0.25
API 5L	X 42M	0.22	1.3	0.015	0.025	0.45	-	-	0.05	0.05	0.04	-	0.43	0.25
API 5L	X46M	0.22	1.3	0.015	0.025	0.45	-	-	0.05	0.05	0.04	-	0.43	0.25
API 5L	X 52M	0.22	1.4	0.015	0.025	0.45	-	-	-	0.015	-	-	0.43	0.25
API 5L	X 56M	0.22	1.4	0.015	0.025	0.45	-	-	-	0.015	-	-	0.43	0.25
API 5L	X S0M	0.12	1.6	0.015	0.025	0.45	-	-	-	0.015	-	Cr: 0.3	0.43	0.25
API 5L	X 65M	0.12	1.6	0.015	0.025	0.45	-	-	-	0.015	-	Cr: 0.3	0.43	0.25
API 5L	X 70M	0.12	1.7	0.015	0.025	0.45	-	-	-	0.015	-	Cr: 0.4, Mo: 0.25	0.43	0.25
API 5CT	J55	-	-	0.04	0.04	-	-	-	-	0.015	-	-	-	-

Boiler and Pressure Vessel Application:

Mechanical Properties ('t' = thickness in mm & 'GL' = Gauge Lenght

Tensile Test Direction	YS (Mpa)	UTS (Mpa)	%El (min) GL: 50mm	%El (min) GL: 80mm	%El (min) GL: 5.65 SQRT	Bend (180 deg)	Impact Temp C	Impact (J) min
T	220	415-550	25	-	-	-	-	-
T	240	450-585	23	-	-	-	-	-
T	240	450-585	23	-	-	-	-	-
T	260	485-620	21	-	-	-	-	-
T	260	485-620	21	-	-	-	-	-

Line pipes and casing & tubing

Mechanical Properties ('t' = thickness in mm & 'GL' = Gauge Lenght

YS (Mpa)	UTS(Mpa)	%El min Gl: 50 mm	YS/UTS max	Bend @180 Deg	Impact Temp (Deg C)	Impact (J) Min	Hardness max
245-450	415-655	-	0.93	2t	0	40	HV 248
290-495	415-655	-	0.93	2t	0	40	HV 248
320-525	435-655	-	0.93	2t	0	40	HV 248
360-530	460-760	-	0.93	2t	0	50	HV 248
390-545	490-760	-	0.93	2t	0	50	HV 248
415-565	520-760	-	0.93	2t	0	50	HV 248
450-600	535-760	-	0.93	2t	0	55	HV 248
485-635	570-760	-	0.93	3t	0	70	HV 248
379-552	517	-	0.93	2t	0	40	HV 248

LPG Cylinder Grades					
Dimensional Scope		Equv. linternational / BIS Grades			
THK RANGE	WIDTH RANGE	BIS	JIS	EN	SAE /ASTM
(2.5-4.0)	(900-1620)	IS 6240-2008	-	EN 10028-2 P235	ASTM A 285 Gr.B
(2.6-6.0)	(900-1620)	IS 6240-2008	JIS-G 3116 SG255	EN:10207 SPH 265	ASTM A 285 Gr.B,
(2.5-4.0)	(900-1620)	-	JIS-G 3116 SG255	EN:10207 SPH 265	ASTM A 285 Gr.C
(2.6-4.0)	(900-1620)	-	JIS G 3116 SG 295	-	-

JSW Steel Plant, Dolvi Works, Maharashtra

Drawing & Press Forming

Standard		Chemical Composition (%)												
Equivalent Specification	Grade	C max	Mn max	S max	P max	Si max	Al min	N max	V max	Nb Max	Ti Max	Others Max	CE(IIW) max	CE (PCM) max
IS1079-2017	HR0	0.25	2.00	0.050	0.080	0.999	0.02	0.012	-	-	-	-	-	-
IS1079-2017	HR1	0.15	0.60	0.035	0.050	0.999	0.02	0.012	-	-	-	-	-	-
IS1079-2017	HR2	0.10	0.45	0.035	0.040	0.999	0.02	0.012	-	-	-	-	-	-
IS1079-2017	HR3	0.08	0.40	0.030	0.035	0.999	0.02	0.012	-	-	-	-	-	-
IS1079-2017	HR4	0.08	0.35	0.030	0.030	0.999	0.02	0.012	-	-	-	-	-	-
IS1079-2017	ISH270C	0.08	0.45	0.035	0.035	0.999	0.02	0.012	-	-	-	-	-	-
IS1079-2017	ISh270D	0.06	0.40	0.030	0.030	0.999	0.02	0.012	-	-	-	-	-	-
IS1079-2017	ISH270E	0.06	0.35	0.025	0.025	0.999	0.02	0.012	-	-	-	-	-	-
IS5986-2017	ISH290S	0.12	0.60	0.040	0.040	0.500	0.02	0.009	-	-	-	-	-	-
IS5986-2017	ISH310S	0.15	0.80	0.030	0.040	0.500	0.02	0.009	-	-	-	-	-	-
IS5986-2017	ISH330S	0.15	0.80	0.040	0.040	0.500	0.02	0.009	-	-	-	-	-	-
IS5986-2017	ISH360S	0.17	1.20	0.040	0.040	0.500	0.02	0.009	-	-	-	-	-	-
IS5986-2017	ISH370S	0.17	1.20	0.030	0.040	0.500	0.02	0.009	-	-	-	-	-	-
IS5986-2017	ISH400S	0.20	1.30	0.030	0.040	0.500	0.02	0.009	-	-	-	-	-	0.42
IS5986-2017	ISH410S	0.20	1.30	0.040	0.040	0.500	0.02	0.009	-	-	-	-	-	0.42
IS5986-2017	ISH440S	0.24	1.50	0.030	0.040	0.500	0.02	0.009	-	-	-	-	-	0.45
IS5986-2017	ISH490S	0.24	1.60	0.040	0.040	0.500	0.02	0.009	-	-	-	-	-	0.50
IS5986-2017	ISH320LA	0.12	1.20	0.020	0.025	0.500	0.02	0.009	-	-	-	-	-	-
IS5986-2017	ISH360LA	0.12	1.20	0.020	0.025	0.500	0.02	0.009	-	-	-	-	-	-
IS5986-2017	ISH390LA	0.12	1.30	0.020	0.025	0.500	0.02	0.009	-	-	-	-	-	-
IS5986-2017	ISH410LA	0.12	1.40	0.020	0.025	0.500	0.02	0.009	-	-	-	-	-	-

Drawing & Press Forming

Mechanical Properties ('t' = thickness in mm & 'GL' = Gauge Lenght

YS (Mpa)	UTS(Mpa)	%El min Gl: 50 mm	YS/UTS max	Bend @180 Deg	Impact Temp (Deg C)	Impact (J) Min	Hardness max
-	-	-	-	-	-	-	-
0	440	28	-	2T	-	-	-
0	420	30	-	1T	-	-	-
0	400	33	-	CL	-	-	-
0	380	36	-	CL	-	-	-
170 min	420 max	30	-	1T	-	-	-
170 min	400 max	33	-	CL	-	-	-
165 min	380 max	36	-	CL	-	-	-
165 min	290-400	30	-	1T	-	-	-
195 min	310 min	40	-	1T	-	-	-
205 min	330-440	28	-	1T	-	-	-
235 min	360-470	26	-	1T	-	-	-
225 min	370 min	38	-	1T	-	-	-
245 min	400 min	37	-	1T	-	-	-
255 min	410-520	23	-	1T	-	-	-
285 min	440 min	34	-	1T	-	-	-
355 min	490-630	20	-	2T	-	-	-
255 min	320-420	27	-	-	-	-	-
300 min	360-460	25	-	1T	-	-	-
315 min	390-510	24	-	1T	-	-	-
340 min	410-520	23	-	0.5T	-	-	-

Drawing & Press Forming

Standard		Chemical Composition (%)												
Equivalent Specification	Grade	C max	Mn max	S max	P max	Si max	Al min	N max	V max	Nb Max	Ti Max	Others Max	CE(IIW) max	CE (PCM) max
IS5986-2017	ISH430LA	0.12	1.50	0.020	0.025	0.500	0.02	0.009	-	-	-	-	-	-
IS5986-2017	ISH450LA	0.12	1.50	0.020	0.025	0.500	0.02	0.009	-	-	-	-	-	-
IS5986-2017	SH480LA	0.12	1.50	0.015	0.025	0.500	0.02	0.009	-	-	-	-	-	-
IS5986-2017	ISH500LA	0.12	1.60	0.015	0.025	0.500	0.02	0.009	-	-	-	-	-	-
IS5986-2017	ISH550LA	0.12	1.70	0.015	0.025	0.500	0.02	0.009	-	-	-	-	-	-
IS5986-2017	ISH600LA	0.12	1.80	0.015	0.025	0.500	0.02	0.009	-	-	-	-	-	-
IS5986-2017	ISH650LA	0.12	1.90	0.015	0.025	0.500	0.02	0.009	-	-	-	-	-	-
IS5986-2017	ISH700LA	0.12	2.00	0.015	0.025	0.500	0.02	0.009	-	-	-	-	-	-
IS5986-2017	ISH750LA	0.12	2.10	0.015	0.025	0.500	0.02	0.009	-	-	-	-	-	-
IS5986-2017	ISH440R	0.20	1.50	0.020	0.030	0.500	0.02	0.009	-	-	-	-	-	-
IS5986-2017	ISH490R	0.20	1.60	0.020	0.030	0.500	0.02	0.009	-	-	-	-	-	-
IS5986-2017	ISH540R	0.20	1.70	0.020	0.030	0.500	0.02	0.009	-	-	-	-	-	-
IS5986-2017	ISH590R	0.20	1.80	0.020	0.030	0.999	0.02	0.009	-	-	-	-	-	-
IS5986-2017	ISH780R	0.20	2.00	0.020	0.030	0.999	0.02	0.009	-	-	-	-	-	-
IS5986-2017	ISH440F	0.16	1.60	0.020	0.999	0.999	0.02	0.009	-	-	-	-	-	-
IS5986-2017	ISH540F	0.16	1.80	0.020	0.999	0.999	0.02	0.009	-	-	-	-	-	-
IS5986-2017	ÍSH590F	0.16	2.00	0.020	0.999	0.999	0.02	0.009	-	-	-	-	-	-
IS5986-2017	ISH540Y	0.16	1.80	0.020	0.999	0.999	0.02	0.009	-	-	-	-	-	-
IS5986-2017	ISH590Y	0.16	2.00	0.020	0.999	0.999	0.02	0.009	-	-	-	-	-	-
EN10149-2-2013	S315MC	0.12	1.30	0.020	0.025	0.500	0.015	0.012	0.2	0.09	0.15	-	-	-

Drawing & Press Forming

Mechanical Properties ('t' = thickness in mm & 'GL' = Gauge Lenght

YS (Mpa)	UTS(Mpa)	%El min Gl: 50 mm	YS/UTS max	Bend @180 Deg	Impact Temp (Deg C)	Impact (J) Min	Hardness max
355 min	430-550	23	-	2T	-	-	-
380 min	450-570	21	-	1T	-	-	-
420 min	480-620	19	-	1T	-	-	-
450 min	500-670	18	-	1T	-	-	-
500 min	550-700	14	-	1.5T	-	-	-
550 min	600-760	14	-	1.5T	-	-	-
600 min	650-820	13	-	1.5T	-	-	-
650 min	700-880	12	-	2T	-	-	-
650 min	750-950	12	-	2T	-	-	-
305 min	440 min	29	-	1T	-	-	-
375 min	490 min	25	-	1.5T	-	-	-
430 min	540 min	22	-	1.5T	-	-	-
480 min	590 min	20	-	1.5T	-	-	-
685 min	780 min	15	-	1.5T	-	-	-
285 min	440 min	33	-	1.5T	-	-	-
375 min	540 min	24	-	1.5T	-	-	-
460 min	590 min	20	-	1.5T	-	-	-
440 min	590 min	20	-	1.5T	-	-	-
325 min	590 min	24	-	1.5T	-	-	-
315	390 - 510	24	-	CL	-	-	-

Drawing & Press Forming

Standard		Chemical Composition (%)												
Equivalent Specification	Grade	C max	Mn max	S max	P max	Si max	Al min	N max	V max	Nb Max	Ti Max	Others Max	CE(IIW) max	CE (PCM) max
EN10149-2013	S355MC	0.12	1.50	0.020	0.025	0.500	0.015	0.012	0.2	0.09	0.15	-	-	-
EN10149-2-2013	S420MC	0.12	1.6	0.015	0.025	0.500	0.015	0.012	0.2	0.09	0.15	-	-	-
EN10149-2-2013	S460MC	0.12	1.6	0.015	0.025	0.500	0.015	0.012	0.2	0.09	0.15	-	-	-
EN10149-2-2013	S500MC	0.12	1.7	0.015	0.025	0.500	0.015	0.012	0.2	0.09	0.15	-	-	-
EN10149-2-2013	S550MC	0.12	1.8	0.015	0.025	0.500	0.015	0.012	0.2	0.09	0.15	-	-	-
EN10149-2-2013	S600MC	0.12	1.9	0.015	0.025	0.500	0.015	0.012	0.2	0.09	0.22	-	-	-
EN10149-2-2013	S650MC	0.12	2.00	0.015	0.025	0.600	0.015	0.012	0.2	0.09	0.22	-	-	-
EN10149-2-2013	S700MC	0.12	2.10	0.015	0.025	0.600	0.015	0.012	0.2	0.09	0.22	-	-	-

Did You Know? The JSW Group is a $23 billion and amongst India's largest conglomerates.

Drawing & Press Forming

Mechanical Properties ('t' = thickness in mm & 'GL' = Gauge Lenght

YS (Mpa)	UTS(Mpa)	%El min Gl: 50 mm	YS/UTS max	Bend @180 Deg	Impact Temp (Deg C)	Impact (J) Min	Hardness max
355	430-550	23	-	0.5T	-	-	-
420	480 - 620	19	-	0.5T	-	-	-
460	520 - 670	17	-	1T	-	-	-
500	550 - 700	14	-	1T	-	-	-
550	600 - 760	14	-	1.5T	-	-	-
600	650 - 820	13	-	1.5T	-	-	-
650	700 - 880	12	-	2T	-	-	-
700	750 - 950	12	-	2T	-	-	-

Did You Know? The World Steel Association elected JSW Steel's Mr. Sajjan Jindal as Chairman of World Steel for the 2021-22 period.


LADLE NO.4

Hot Rolled Steel Plates For Structural and General Engineering

Standard		Chemical Composition (%)									
Equivalent Specification	Grade	C max	Mn max	S max	P max	Si max	Al	N max	Micro alloys max	Others max	CE (IIW)
IS 2062	E250A	0.23	1.5	0.045	0.045	0.04	-	0.012	0.25	Cu : 0.17 - 0.38, If Steel Copper Bearing Quality	0.42
IS 2062	E250BR	0.22	1.5	0.045	0.045	0.04	-	0.012	0.25	Cu : 0.17 - 0.38, If Steel Copper Bearing Quality	0.41
IS 2062	E250B0	0.22	1.5	0.045	0.045	0.04	-	0.012	0.25	Cu : 0.17 - 0.38, If Steel Copper Bearing Quality	0.39
IS 2062	E250C	0.20	1.5	0.040	0.040	0.04	-	0.012	0.25	Cu : 0.17 - 0.38, If Steel Copper Bearing Quality	0.39
IS 2062	E275A	0.23	150	0.045	0.045	0.4	-	0.012	0.25	Cu : 0.17 - 0.38, If Steel Copper Bearing Quality	0.43
IS 2062	E275BR	0.22	1.5	0.045	0.045	0.4	-	0.012	0.25	Cu : 0.17 - 0.38, If Steel Copper Bearing Quality	0.42
IS 2062	E275B0	0.22	1.5	0.045	0.045	0.4	-	0.012	0.25	Cu : 0.17 - 0.38, If Steel Copper Bearing Quality	0.42
IS 2062	E275C	0.20	1.5	0.040	0.040	0.4	-	0.012	0.25	Cu : 0.17 - 0.38, If Steel Copper Bearing Quality	0.41
IS 2062	E300A	0.20	1.5	0.045	0.045	0.45	-	0.012	0.25	Cu : 0.17 - 0.38, If Steel Copper Bearing Quality	0.44
IS 2062	E300BR	0.20	150	0.045	0.045	0.45	-	0.012	0.25	Cu : 0.17 - 0.38, If Steel Copper Bearing Quality	0.44
IS 2062	E300B0	0.20	1.5	0.045	0.045	0.45	-	0.012	0.25	Cu : 0.17 - 0.38, If Steel Copper Bearing Quality	0.44
IS 2062	E300C	0.20	1.5	0.040	0.040	0.45	-	0.012	0.25	Cu : 0.17 - 0.38, If Steel Copper Bearing Quality	0.44
IS 2062	E350A	0.20	1.55	0.045	0.045	0.45	-	0.012	0.25	Cu : 0.17 - 0.38, If Steel Copper Bearing Quality	0.47
IS 2062	E350BR	0.20	1.55	0.045	0.045	0.45	-	0.012	0.25	Cu : 0.17 - 0.38, If Steel Copper Bearing Quality	0.47
IS 2062	E350B0	0.20	155	0.045	0.045	0.45	-	0.012	0.25	Cu : 0.17 - 0.38, If Steel Copper Bearing Quality	0.47
IS 2062	E350C	0.20	1.55	0.045	0.045	0.45	-	0.012	0.25	Cu : 0.17 - 0.38, If Steel Copper Bearing Quality	0.45
IS 2062	E410A	0.20	1.60	0.045	0.045	0.45	-	0.012	0.25	Cu : 0.17 - 0.38, If Steel Copper Bearing Quality	0.46
IS 2062	E410BR	0.20	1.60	0.045	0.045	0.45	-	0.012	0.25	Cu : 0.17 - 0.38, If Steel Copper Bearing Quality	0.50
IS 2062	E410B0	0.20	1.60	0.045	0.045	0.45	-	0.012	0.25	Cu : 0.17 - 0.38, If Steel Copper Bearing Quality	0.50
IS 2062	E410C	0.20	1.60	0.045	0.045	0.45	-	0.012	0.25	Cu : 0.17 - 0.38, If Steel Copper Bearing Quality	0.50
IS 2062	E450A	0.22	1.65	0.045	0.045	0.45	-	0.012	0.25	Cu : 0.17 - 0.38, If Steel Copper Bearing Quality	0.52
IS 2062	E450BR	0.22	1.65	0.045	0.045	0.45	-	0.012	0.25	Cu : 0.17 - 0.38, If Steel Copper Bearing Quality	0.52

Hot Rolled Steel Plates For Structural and General Engineering

Mechanical Properties ('t' = thickness in mm & 'GL' = Gauge Lenght

YS (Mpa) min	UTS (Mpa) min	%El (min) GL: 50mm	%EL(Min) GL-5.65√A	Bend (180 deg)	Im-pact Temp C	Im-pact (J) min
t ⟨ 20:250, t t: 20-40:-240, t ⟩ 40:230	410	-	23	t ⟨= 25:2T, t ⟩25:3T	-	-
t ⟨ 20:250, t t: 20-40:-240, t ⟩ 40:230	410	-	23	t ⟨= 25:2T, t ⟩25:3T	RT	27
t ⟨ 20:250, t t: 20-40:-240, t ⟩ 40:230	410	-	23	t ⟨= 25:2T, t ⟩25:3T	0	27
t ⟨ 20:250, t t: 20-40:-240, t ⟩ 40:230	410	-	23	t ⟨= 25:2T, t ⟩25:3T	-20	27
t ⟨ 20:275, t t: 20-40:-265 t ⟩ 40:255	430	-	22	t ⟨= 25:2T, t ⟩25:3T	-	-
t ⟨ 20:275, t t: 20-40:-265 t ⟩ 40:255	430	-	22	t ⟨= 25:2T, t ⟩25:3T	RT	27
t ⟨ 20:275, t t: 20-40:-265 t ⟩ 40:255	430	-	22	t ⟨= 25:2T, t ⟩25:3T	0	27
t ⟨ 20:275, t t: 20-40:-265 t ⟩ 40:255	430	-	22	t ⟨= 25:2T, t ⟩25:3T	-20	27
t ⟨ 20:300, t t: 20-40:-290 t ⟩ 40:280	440	-	22	t ⟨= 25:2T	-	-
t ⟨ 20:300, t t: 20-40:-290 t ⟩ 40:280	440	-	22	t ⟨= 25:2T	RT	27
t ⟨ 20:300, t t: 20-40:-290 t ⟩ 40:280	440	-	22	t ⟨= 25:2T	0	27
t ⟨ 20:300, t t: 20-40:-290 t ⟩ 40:280	440	-	22	t ⟨= 25:2T	-20	27
t ⟨ 20:350, t t: 20-40:-330 t ⟩ 40:320	490	-	22	t ⟨= 25:2T	-	-
t ⟨ 20:350, t t: 20-40:-330 t ⟩ 40:320	490	-	22	t ⟨= 25:2T	RT	27
t ⟨ 20:350, t t: 20-40:-330 t ⟩ 40:320	490	-	22	t ⟨= 25:2T	0	27
t ⟨ 20:350, t t: 20-40:-330 t ⟩ 40:320	490	-	22	t ⟨= 25:2T	-20	27
t ⟨ 20:410, t t: 20-40:-390 t ⟩ 40:380	540	-	20	t ⟨= 25:2T	-	-
t ⟨ 20:410, t t: 20-40:-390 t ⟩ 40:380	540	-	20	t ⟨= 25:2T	RT	25
t ⟨ 20:410, t t: 20-40:-390 t ⟩ 40:380	540	-	20	t ⟨= 25:2T	0	25
t ⟨ 20:410, t t: 20-40:-390 t ⟩ 40:380	540	-	20	t ⟨= 25:2T	-20	25
t ⟨ 20:450, t t: 20-40:-430 t ⟩ 40:420	570	-	20	t ⟨= 25:2T	-	-
t ⟨ 20:450, t t: 20-40:-430 t ⟩ 40:420	570	-	20	t ⟨= 25:2T	RT	20

Hot Rolled Steel Plates For Structural and General Engineering

Standard		Chemical Composition (%)									
Equivalent Specification	Grade	C max	Mn max	S max	P max	Si max	Al	N max	Micro alloys max	Others max	CE (IIW)
ASTM A36	A36	0.29	0.85 - 1.20	Q030	0.030	0.4	-	-	-	0.20 min when Copper steel is specified	-
ASTM A572	Grade 42	0.21	1.35	0.030	0.030	0.4	-	-	-	Type 1 / 2 / 3 or 5	-
ASTM A572	Grade 50	0.23	1.35	0.030	0.030	0.4	-	-	-	Type 1 / 2 / 3 or 5	-
ASTM A572	Grade 55	0.25	1.35	0.030	0.030	0.4	-	-	-	Type 1 / 2 / 3 or 5	-
ASTM A572	Grade 60	0.26	1.35	0.030	0.030	0.4	-	-	-	Type 1 / 2 / 3 or 5	-
ASTM A572	Grade 65 (13-32mm)	0.23	1.65	0.030	0.030	0.4	-	-	-	Type 1 / 2 / 3 or 5	-
ASTM A572	Grade 65 (13-32mm)	0.26	1.35	0.030	0.030	0.4	-	-	-	Type 1 / 2 / 3 or 5	-
EN10025 - 2	S235JR	0.20	1.40	0.035	0.035	-	>= 0.020	0.012	-	Cu : 0.55	t<=30-0.35, >30T<=40-0.35, >40 T<=150-0.38
EN10025 - 2	S235J0	0.17	1.40	0.030	0.030	-	>= 0.020	0.012	-	Cu : 0.55	t<=30-0.35, >30T<=40-0.35, >40 T<=150-0.38
EN10025 - 2	S235J2	0.17	1.40	0.025	0.025	-	>= 0.020	-	-	Cu : 0.55	t<=30-0.35, >30T<=40-0.35, >40 T<=150-0.38
EN10025 - 2	S275JR	0.22	1.50	0.030	0.030	-	>= 0.020	-	-	Cu : 0.55	t<=30-0.40, >30T<=40-0.40, >40 T<=150-0.42
EN10025 - 2	S275J0	0.18	1.50	0.030	0.030	-	>= 0.020	-	-	Cu : 0.55	t<=30-0.40, >30T<=40-0.40, >40 T<=150-0.42
EN10025 - 2	S275J2	0.18	1.50	0.030	0.030	-	>= 0.020	-	-	Cu : 0.55	t<=30-0.40, >30T<=40-0.40, >40 T<=150-0.42
EN10025 - 2	S355JR	0.24	1.60	0.035	0.035	0.55	>= 0.020	0.012	-	Cu : 0.55	t<=30-0.45, >30T<=40-0.45, >40 T<=150-0.47
EN10025 - 2	S355J0	0.22	1.60	0.030	0.030	0.55	>= 0.020	0.012	-	Cu : 0.55	t<=30-0.45, >30T<=40-0.45, >40 T<=150-0.47
EN10025 - 2	S355J2	0.22	1.60	0.025	0.025	0.55	>= 0.020	-	-	Cu : 0.55	t<=30-0.45, >30T<=40-0.45, >40 T<=150-0.47
EN10025 - 2	S355K2	0.22	1.60	0.025	0.025	0.55	>= 0.020	-	-	Cu : 0.55	t<=30-0.45, >30T<=40-0.45, >40 T<=150-0.47
EN10025 - 3	S275N	0.18	0.50 - 1.50	0.025	0.030	0.40	>= 0.020	0.015	-	Cu : 0.55	t<=30-0.45, >30T<=40-0.45, >40 T<=150-0.47

Hot Rolled Steel Plates For Structural and General Engineering

Mechanical Properties ('t' = thickness in mm & 'GL' = Gauge Lenght

YS (Mpa) min	UTS (Mpa) min	%El (min) GL: 50mm	%EL(Min) GL-5.65√A	Bend (180 deg)	Im-pact Temp C	Im-pact (J) min
250	400 - 550	23	-	-	-	-
415	290	24	-	-	-	-
450	345	21	-	-	-	-
485	380	20	-	-	-	-
520	415	18	-	-	-	-
550	450	17	-	-	-	-
550	450	17	-	-	-	-
t≤16-235, ›16 T ≤40-225, ›40 T ≤63-215, ›63T≤80-215, ›80T ≤100-215 ›100 T≤150-195	≥3 T≤100- 360 to 510, ›100 T≤150- 350 to 500	-	≥ 3 T≤ 40- 24, › 40 T≤ 63-23, › 63 T≤ 100-22, › 100 T ≤ 150-22	-	RT	27
t≤16-235, ›16 T ≤40-225, ›40 T ≤63-215, ›63T≤80-215, ›80T ≤100-215 ›100 T≤150-195	≥3 T≤100- 360 to 510, ›100 T≤150- 350 to 500	-	≥ 3 T≤ 40- 24, › 40 T≤ 63-23, › 63 T≤ 100-22, › 100 T ≤ 150-22	-	0	27
t≤16-235, ›16 T ≤40-225, ›40 T ≤63-215, ›63T≤80-215, ›80T ≤100-215 ›100 T≤150-195	≥3 T≤100- 360 to 510, ›100 T≤150- 350 to 500	-	≥ 3 T≤ 40- 24, › 40 T≤ 63-23, › 63 T≤ 100-22, › 100 T ≤ 150-22	-	-20	27
t≤16-275, ›16 T ≤40-265, ›40 T ≤63-255, ›63T≤80-245, ›80T ≤100-235 ›100 T≤150-225	≥3 T≤100- 410 to 560, ›100 T≤150- 400 to 540	-	≥ 3 T≤ 40- 21, › 40 T≤ 63-20, › 63 T≤ 100-19, › 100 T ≤ 150-19	-	RT	27
t≤16-275, ›16 T ≤40-265, ›40 T ≤63-255, ›63T≤80-245, ›80T ≤100-235 ›100 T≤150-225	≥3 T≤100- 410 to 560, ›100 T≤150- 400 to 540	-	≥ 3 T≤ 40- 21, › 40 T≤ 63-20, › 63 T≤ 100-19, › 100 T ≤ 150-19	-	0	27
t≤16-275, ›16 T ≤40-265, ›40 T ≤63-255, ›63T≤80-245, ›80T ≤100-235 ›100 T≤150-225	≥3 T≤100- 410 to 560, ›100 T≤150- 400 to 540	-	≥ 3 T≤ 40- 21, › 40 T≤ 63-20, › 63 T≤ 100-19, › 100 T ≤ 150-19	-	-20	27
t≤16-355, ›16 T ≤40-345, ›40 T ≤63-355, ›63T≤80-325, ›80T ≤100-315 ›100 T≤150-295	≥3 T≤100- 470 to 630, ›100 T≤150- 450 to 600	-	≥ 3 T≤ 40- 20, › 40 T≤ 63-19, › 63 T≤ 100-18, › 100 T ≤ 150-18	-	RT	27
t≤16-355, ›16 T ≤40-345, ›40 T ≤63-355, ›63T≤80-325, ›80T ≤100-315 ›100 T≤150-295	≥3 T≤100- 470 to 630, ›100 T≤150- 450 to 600	-	≥ 3 T≤ 40- 20, › 40 T≤ 63-19, › 63 T≤ 100-18, › 100 T ≤ 150-18	-	0	27
t≤16-355, ›16 T ≤40-345, ›40 T ≤63-355, ›63T≤80-325, ›80T ≤100-315 ›100 T≤150-295	≥3 T≤100- 470 to 630, ›100 T≤150- 450 to 600	-	≥ 3 T≤ 40- 20, › 40 T≤ 63-19, › 63 T≤ 100-18, › 100 T ≤ 150-18	-	-20	27
t≤16-355, ›16 T ≤40-345, ›40 T ≤63-355, ›63T≤80-325, ›80T ≤100-315 ›100 T≤150-295	≥3 T≤100- 470 to 630, ›100 T≤150- 450 to 600	-	≥ 3 T≤ 40- 20, › 40 T≤ 63-19, › 63 T≤ 100-18, › 100 T ≤ 150-18	-	-20	40
t≤16-355, ›16 T ≤40-345, ›40 T ≤63-355, ›63T≤80-325, ›80T ≤100-315 ›100 T≤150-295	≥3 T≤100- 470 to 630, ›100 T≤150- 450 to 600	-	≥ 3 T≤ 40- 20, › 40 T≤ 63-19, › 63 T≤ 100-18, › 100 T ≤ 150-18	-	-20	40

Hot Rolled Steel Plates For Structural and General Engineering

Standard		Chemical Composition (%)									
Equivalent Specification	Grade	C max	Mn max	S max	P max	Si max	Al	N max	Micro alloys max	Others max	CE (IIW)
EN10025 - 3	S275N	0.18	0.50 - 1.50	0.025	0.030	0.40	>= 0.020	0.015	-	Nb-0.05, V-0.05, Ti-0.05, Cu-0.55, Cr-0.30, Ni-0.30, Mo-0.10	t<=63-0.40, >63 0T<=100-0.40, >100T<=250-0.42
EN10025 - 3	S275L	0.16	0.50 - 1.50	0.020	0.025	0.40	>= 0.020	0.015	-	Nb-0.05, V-0.05, Ti-0.05, Cu-0.55, Cr-0.30, Ni-0.30, Mo-0.10	t<=63-0.40, >63 0T<=100-0.40, >100T<=250-0.42
EN10025 - 3	S355N	0.20	0.90 - 1.65	0.025	0.030	0.50	>= 0.020	0.015	-	Nb-0.05, V-0.05, Ti-0.05, Cu-0.55, Cr-0.30, Ni-0.30, Mo-0.10	t<=63-0.43, >63 0T<=100-0.45, >100T<=250-0.45
EN10025 - 3	S355NL	0.18	0.90 - 1.65	0.020	0.025	0.50	>= 0.020	0.015	-	Nb-0.05, V-0.05, Ti-0.05, Cu-0.55, Cr-0.30, Ni-0.30, Mo-0.10	t<=63-0.43, >63 0T<=100-0.45, >100T<=250-0.45
IS 10748	Gr I	0.10	0.50	0.040	0.040	-	-	-	-	-	-
IS 10748	Gr II	0.12	0.60	0.040	0.040	-	-	-	-	-	-
IS 10748	Gr III	0.16	1.20	0.040	0.040	-	-	-	-	-	-
IS 10748	Gr IV	0.20	1.30	0.040	0.040	-	-	-	-	-	0.45
IS 10748	Gr V	0.25	1.30	0.040	0.040	-	-	-	-	-	0.45
IS 2002	Gr I	0.18	0.50 - 1.20	0.035	0.040	0.50 - 1.35	0.020 max	0.012	0.25	Cu : 0.10 max	0.44
IS 2002	Gr 2	0.20	0.50 - 1.20	0.035	0.040	0.50 - 1.35	0.020 max	0.012	-	Cu : 0.10 max	0.44

Hot Rolled Steel Plates For Structural and General Engineering

Mechanical Properties ('t' = thickness in mm & 'GL' = Gauge Lenght

YS (Mpa) min	UTS (Mpa) min	%El (min) GL: 50mm	%EL(Min) GL-5.65√A	Bend (180 deg)	Im-pact Temp C	Im-pact (J) min
t≤16-275, ⟩16 T ≤40-265, ⟩40 T ≤63-255, ⟩63T≤80-245, ⟩80T ≤100-235, ⟩100 T≤150-215	T≤100- 370 to 510, ⟩100 T≤200- 350 to 480	-	T≤ 16- 24, ⟩ 16 T≤ 40-24, ⟩ 40 T≤ 63-24, ⟩ 63 T ≤ 80-23, ⟩ 80 T ≤ 200-23	-	-20	40
t≤16-275, ⟩16 T ≤40-265, ⟩40 T ≤63-255, ⟩63T≤80-245, ⟩80T ≤100-235, ⟩100 T≤150-215	T≤100- 370 to 510, ⟩100 T≤200- 350 to 480	-	T≤ 16- 24, ⟩ 16 T≤ 40-24, ⟩ 40 T≤ 63-24, ⟩ 63 T ≤ 80-23, ⟩ 80 T ≤ 200-23	-	-50	27
t≤16-355, ⟩16 T ≤40-345, ⟩40 T ≤63-335, ⟩63T≤80-325, ⟩80T ≤100-315, ⟩100 T≤150-295	T≤100- 470 to 630, ⟩100 T≤200- 450 to 600	-	T≤ 16- 22, ⟩ 16 T≤ 40-22, ⟩ 40 T≤ 63-22, ⟩ 63 T ≤ 80-21, ⟩ 80 T ≤ 200-21	-	-20	40
t≤16-355, ⟩16 T ≤40-345, ⟩40 T ≤63-335, ⟩63T≤80-325, ⟩80T ≤100-315, ⟩100 T≤150-295	T≤100- 470 to 630, ⟩100 T≤200- 450 to 600	-	T≤ 16- 22, ⟩ 16 T≤ 40-22, ⟩ 40 T≤ 63-22, ⟩ 63 T ≤ 80-21, ⟩ 80 T ≤ 200-21	-	-50	27
170	290	-	30	t	-	-
210	330	-	28	2t	-	-
240	410	-	25	2t	-	-
275	430	-	20	3t	-	-
310	490	-	15	3t	-	-
t≤16-235, ⟩16 T ≤40-225, ⟩40 T ≤60-215, ⟩60 T≤100-200, ⟩100 T ≤350-185	T≤60- 360 to 480, ⟩60 T≤100- 360 to 480, ⟩100 T≤350- 350 to 480	-	T≤ 60- 24, ⟩ 60 T≤ 350-23	t ⟨= 25:2T,	-	-
t≤16-265, ⟩16 T ≤40-255, ⟩40 T ≤60-245, ⟩60 T≤100-215, ⟩100 T ≤350-200	T≤60- 410 to 530, ⟩60 T≤100- 410 to 530, ⟩100 T≤350- 400 to 530	-	T≤ 60- 22, ⟩ 60 T≤ 350-21	t ⟨= 25:2T,	-	-

Hot Rolled Steel Plates For Boiler Tubes and Pressure Vessels

Standard		Chemical Composition (%)									
Equivalent Specification	Grade	C max	Mn max	S max	P max	Si max	Al	N max	Micro alloys max	Others max	CE (IIW)
IS 2002	Gr 3	0.22	0.50 - 1.20	0.035	0.040	0.50 - 1.35	0.020 max	0.012	-	Cu : 0.10 max	0.44
IS 2041	R220	0.21	0.60 - 1.50	0.035	0.040	0.15 - 0.35	>= 0.020	0.012	-	-	0.50
IS 2041	R260	0.25	0.85 - 1.50	0.035	0.035	0.15 - 0.35	>= 0.020	0.012	-	-	0.50
IS 2041	R270	0.16	0.80 - 1.50	0.015	0.025	0.40	>= 0.020	0.012	0.05	Cr-0.30, Cu-0.30, Mo-0.08, Ni-0.50	0.50
IS 2041	R355	0.18	0.10 - 1.70	0.015	0.025	0.50	>= 0.020	0.012	0.12	Cr-0.30, Cu-0.30, Mo-0.08, Ni-0.50	0.50
ASTM A516 / ASME SA516	Grade 55	0.24	0.60 - 1.20	0.035	0.035	0.50 - 1.40	-	-	-	-	-
ASTM A516 / ASME SA516	Grade 60	0.27	0.85 - 1.20	0.035	0.035	0.50 - 1.40	-	-	-	-	-
ASTM A516 / ASME SA516	Grade 60	0.29	0.85 - 1.20	0.035	0.035	0.50 - 1.40	-	-	-	-	-
ASTM A516 / ASME SA516	Grade 60	0.31	0.85 - 1.20	0.035	0.035	0.50 - 1.40	-	-	-	-	-
EN100282	16M03	0.12 - 0.20	0.40 - 0.90	0.010	0.025	≤0.40	>= 0.020	0.012	0.12	Cr-0.30, Cu-0.30, Mo-0.25 to 35, Ni-0.30	-

Hot Rolled Steel Plates For Boiler Tubes and Pressure Vessels

Mechanical Properties ('t' = thickness in mm & 'GL' = Gauge Lenght

YS (Mpa) min	UTS (Mpa) min	%El (min) GL: 50mm	%EL(Min) GL-5.65√A	Bend (180 deg)	Im-pact Temp C	Im-pact (J) min
t≤16-290, 〉16 T ≤40-285, 〉40 T ≤60-280, 〉60 T≤100-255, 〉100 T ≤350-230	T≤60- 460 to 580, 〉60 T≤100- 450 to 570, 〉100 T≤350- 440 to 570	-	T≤ 60- 21, 〉 60 T≤ 350-20	t 〈= 25:2T, t 〉25:3T	-	-
t≤16-220, 〉16 T ≤40-220, 〉40 T ≤60-220, 〉60 T≤100-220	415 - 540	-	21	t 〈= 25:2T	20 0 -20 -40	50 40 27 20
t≤16-260, 〉16 T ≤40-260, 〉40 T ≤60-260, 〉60 T≤100-260	490 - 620	-	21	t 〈= 25:2T	20 0 -20 -40	50 40 27 20
t≤16-275, 〉16 T ≤40-265, 〉40 T ≤60-255, 〉60 T≤100-235	390 - 510	-	23	t 〈= 25:2T	20 0 -20 -40	80 70 50 40
t≤16-355, 〉16 T ≤40-345, 〉40 T ≤60-335, 〉60 T≤100-315	490 - 640	-	21	t 〈= 25:2T	20 0 -20 -40	80 70 50 40
205	380 - 515	27	-	-	-	-
220	415 - 550	25	-	-	-	-
240	450 - 585	23	-	-	-	-
260	485 - 620	21	-	-	-	-
t≤16-275, 〉16 T ≤40-270, 〉40 T ≤60-260, 〉60 T≤100-240, 〉100 T≤150-220	t≤60-440-590, 〉60 T≤100-430-580, 〉100 T≤150-420-570	-	22	-	-	-

Hot Rolled Steel Plates For Line Pipes Application

Standard		Chemical Composition (%)									
Equivalent Specification	Grade	C max	Mn max	S max	P max	Si max	Al	N max	Micro alloys max	Others max	CE (IIW)
API 5L Grade PSL 1	Gr. BM	0.26	1.20	0.030	0.030	-	-	-	-	Nb+V+Ti ≤0.15	-
API 5L Grade PSL 2	Gr. BM	0.20	1.20	0.015	0.025	0.45	-	-	Nb+V+Ti ≤0.15	Cu-0.50, Ni-0.30, Cr-0.30, Mo-0.15	0.25
API 5L Grade PSL 2	X - 42M	0.22	1.30	0.015	0.025	0.45	-	-	Nb+V+Ti ≤0.15	Cu-0.50, Ni-0.30, Cr-0.30, Mo-0.15	0.25
API 5L Grade PSL 2	X - 46M	0.22	1.30	0.015	0.025	0.45	-	-	Nb+V+Ti ≤0.15	Cu-0.50, Ni-0.30, Cr-0.30, Mo-0.15	0.25
API 5L Grade PSL 2	X - 52M	0.22	1.40	0.015	0.025	0.45	-	-	Nb+V+Ti ≤0.15	Cu-0.50, Ni-0.30, Cr-0.30, Mo-0.15	0.25
API 5L Grade PSL 2	X - 56M	0.22	1.40	0.015	0.025	0.45	-	-	Nb+V+Ti ≤0.15	Cu-0.50, Ni-0.30, Cr-0.30, Mo-0.15	0.25
API 5L Grade PSL 2	X - 60M	0.12	1.60	0.015	0.025	0.45	-	-	Nb+V+Ti ≤0.15	Cu-0.50, Ni-0.30, Cr-0.30, Mo-0.15	0.25
API 5L Grade PSL 2	X - 65M	0.12	1.60	0.015	0.025	0.45	-	-	Nb+V+Ti ≤0.15	Cu-0.50, Ni-0.30, Cr-0.30, Mo-0.15	0.25
API 5L Grade PSL 2	X - 70M	0.12	1.70	0.015	0.025	0.45	-	-	Nb+V+Ti ≤0.15	Cu-0.50, Ni-0.30, Cr-0.30, Mo-0.15	0.25

Hot Rolled Steel Plates For Line Pipes Application

Mechanical Properties ('t' = thickness in mm & 'GL' = Gauge Lenght

YS (Mpa) min	UTS (Mpa) min	%El (min) GL: 50mm	YS / UTS Ratio	Bend (180 deg)	Im-pact Temp C	Impact (J) min
241	410	As per customer requirement	-	-	-	As per customer requirement
245 - 450	415 - 655	As per customer requirement	0.93	-	-	As per customer requirement
290 - 495	415 - 655	As per customer requirement	0.93	-	-	As per customer requirement
320 - 525	435 - 655	As per customer requirement	0.93	-	-	As per customer requirement
360 - 530	460 - 760	As per customer requirement	0.93	-	-	As per customer requirement
390 - 545	490 - 760	As per customer requirement	0.93	-	-	As per customer requirement
415 - 565	520 - 760	As per customer requirement	0.93	-	-	As per customer requirement
450 - 600	535 - 760	As per customer requirement	0.93	-	-	As per customer requirement
485 - 636	570 - 760	As per customer requirement	0.93	-	-	As per customer requirement

Steel for Re-Rolling Application

National / International Standard	Thick Range (mm)	Chemical Composition (%)							Mechanical Properties			
		C	Mn	S max	P max	Si max	MAE	Al	YS (MPa)	UTS (MPa)	% EL Min	Bend Test
SAE 1006 / IS 11513 CR2	1.4 – 6.0	0.08 Max	0.40 Max	0.03	0.035	0.05	-	0.02 Min	-	400 Max	33	Close
IS 11513 CR3	1.4 – 6.0	0.08 Max	0.40 Max	0.03	0.03	0.05	-	0.02 Min	-	380 Max	36	Close
SAE 1008	1.5 – 6.0	0.10 Max	0.30-0.50	0.05	0.03	-	-	-	-	-	-	-
SAE 1020	2.2 – 6.0	0.18-0.23	0.30-0.60	0.05	0.03	-	-	-	-	-	-	-
SAE 1030	2.5 - 6.0	0.28-0.34	0.60-0.90	0.05	0.03	-	-	-	-	-	-	-
SAE 1040 / MC 11	2.5 - 6.0	0.37-0.44	0.60-0.90	0.05	0.03	-	-	-	-	-	-	-
SAE 1055 / MC 12	2.8 - 6.0	0.55-0.65	0.60-0.90	0.05	0.03	-	-	-	-	-		-

Width Range: 920 – 1300 mm

Steel for Chequered Plate (infra / cons)

National / International Standard	Thick Range (mm)	Chemical Composition (%)							Mechanical Properties				
		C	Mn	S max	P max	Si max	MAE mAX	Al	YS (MPa)	UTS (MPa)	% EL Min	Bend Test	Bend Test
EN 10025 S235JR	1.5 – 12	0.17	1.4	0.035	0.035	0.2	-	0.02	235 Min	360 – 510	26	1t	-
IS 2062 GR.A / IS 3502 / ASTM A36 / ASTM A786	2.5 – 12	0.22	1.5	0.04	0.04	0.4	0.1	0.02	240 Min	410 Min	25	2t	-

Steel for Pressure Vessel

National / International Standard	Thick Range (mm)	Chemical Composition (%)							Mechanical Properties				
		C max	Mn	S max	P max	Si max	MAE Max	Al Min	YS (MPa)	UTS (MPa)	% EL Min	Bend Test	ECV mm
IS 6240 GR.1 / EN 10120 PN245NB	2 – 6	0.16	0.30 Min	0.025	0.025	0.25	0.10	0.02	240 Min	350 – 450	25	1t	13.5 Min
JIS G 3116 SG 255 / EN 10120 PN265NB	2 – 6	0.19	0.40 Min	0.025	0.025	0.25	0.10	0.20	265 Min	410 – 500	24	1t	-
JIS G 3116 SG 295	2 – 6	0.2	1.0 Max	0.025	0.025	0.35	0.10	0.20	295 Min	440 Min	26	1.5t	-
ASTM A 516 GR.55	1.5 - 12	0.18	0.55-0.98	0.035	0.035	0.13- 0.45	0.10	0.02	205 Min	380-515	27	-	-
ASTM A 516 GR.60	1.5 - 12	0.21	0.55-0.98	0.035	0.035	0.13- 0.45	0.10	0.02	220 Min	415-550	25	-	-
ASTM A 516 GR.65	2.5 - 12	0.24	0.79-1.30	0.035	0.035	0.13- 0.45	0.15	0.02	240 Min	450-585	23	-	-
ASTM A 516 GR.70	3.0 - 12	0.27	0.79-1.30	0.035	0.035	0.13- 0.45	0.15	0.02	260 Min	485-620	21	-	-

Steel for Forming & Drawing Application

National / International Standard	Thick Range (mm)	Chemical Composition (%)							Mechanical Properties			
		C	Mn	S max	P max	Si max	MAE	Al	YS (MPa)	UTS (MPa)	% EL Min	Bend Test
IS 1079 HR2 / EN 10111 DD 11	1.4 – 6	0.08	0.40	0.03	0.035	0.05	0.1	0.02	-	420 Max	33	Close
IS 1079 HR3	1.4 – 6	0.08	0.35	0.03	0.03	0.05	0.1	0.02	-	400 Max	33	Close
IS 1079 HR4	1.4 – 6	0.08	0.35	0.03	0.03	0.05	0.1	0.02	-	380 Max	36	Close

Steel for Automotive/ Consumable Durables

		Chemical Composition (%)							Mechanical Properties			
National / International Standard	Thick Range (mm)	C Max	Mn Max	S max	P max	Si max	MAE Max	Al Min	YS (MPa)	UTS (MPa)	% EL Min	Bend Test
JIS G 3113 SAPH 310	1.4 – 12.0	0.10	0.25	0.04	0.04	0.05	0.10	0.020	185 Min	310 Min	36	Close
JIS G 3113 SAPH 370	2.0 – 12.0	0.10	0.70	0.04	0.04	0.10	0.10	0.020	225 Min	370 Min	35	Close
JIS G 3113 SAPH 400 / JIS G 3101 SS400 / SS 4012A E-34	2.0 – 12.0	0.10	0.90	0.04	0.04	0.20	0.10	0.020	340 Min	400 Min	32	1t
JIS G 3113 SAPH 440/EN10149 S355MC/ SS 4012AE-38	2.0 – 12.0	0.12	1.40	0.04	0.04	0.50	0.10	0.020	340 Min	440 Min	32	1t
EN 10149 S420MC	2.8 – 12.0	0.12	1.60	0.015	0.025	0.50	0.22	0.015	420 Min	480-620	20	0.5t
DIN 17100 ST 52.3 / SS 4012A E-46 / BSK 46	3.0 – 12.0	0.12	1.40	0.025	0.030	0.20	0.10	0.020	460 Min	500 Min	28	1t
EN 10149 S460MC	3.2 – 12.0	0.12	1.60	0.025	0.030	0.50	0.15	0.020	460 Min	520 Min	25	1t
ASTM A 572M Gr.65	4.0 – 12.0	0.12	1.70	0.025	0.030	0.50	0.15	0.020	500 Min	550 Min	22	1t
JIS G 3134 SPFH 590	4.0 – 12.0	0.12	1.54	0.025	0.030	0.40	0.15	0.020	420 Min	590 Min	22	1.5t

Steel for Structural Application (Infra/Cons)

		Chemical Composition (%)							Mechanical Properties			
National / International Standard	Thick Range (mm)	C Max	Mn Max	S max	P max	Si max	MAE Max	Al Min	YS (MPa)	UTS (MPa)	% EL Min	Bend Test
EN 10025 S235	1.5 – 12.0	0.10	0.70	0.025	0.025	0.20	-	0.020	235 Min	360-510	26	1t
IS 2062 E250 /IS 5986 ISH410S/EN 10025 S275	1.5 – 12.0	0.20	1.20	0.040	0.040	0.40	0.10	0.020	250 Min	410 Min	23	2t
ASTM A572 M GR.50	2.5 – 12.0	0.23	1.35	0.050	0.040	0.40	0.10	0.020	345 Min	450 Min	21	2t
IS 2062 E350 / IS 5986 ISH490S/ EN 10149 S420MC / JIS G 3101 SS 490	3.0 – 12.0	0.20	1.50	0.050	0.040	0.45	0.10	0.020	350 Min	490 Min	22	2t
DIN 17100 ST52.3	3.0 – 12.0	0.20	1.50	0.040	0.040	0.40	0.15	0.020	355 Min	510-620	20	2t
IS 2062 E450	4.0 – 12.0	0.22	1.60	0.040	0.040	0.45	0.15	0.020	450 Min	570 Min	20	2t

Steel for Pipes & Tube Application

National / International Standard	Thick Range (mm)	Chemical Composition (%)							Mechanical Properties			
		C	Mn	S max	P max	Si max	MAE	Al	YS (MPa)	UTS (MPa)	% EL Min	Bend Test
IS 10748 GR. 1 / JIS G 3132 SPHT 1	1.5 – 12	0.10	0.5	0.04	0.04	0.35	-	0.02	170 Min	290 Min	30	1t
IS 10748 GR. 2 / JIS G 3132 SPHT 2	1.5 – 12	0.12	0.6	0.04	0.04	0.35	-	0.02	210 Min	340 Min	28	2t
IS 10748 GR. 3 /JIS G 3132 SPHT 3/ IS 5986 Fe 410	1.5 – 12	0.16	1.2	0.04	0.04	0.35	0.1	0.02	240 Min	410 Min	25	2t
IS 10748 GR. 4	2.0 – 12	0.20	1.3	0.04	0.04	0.35	0.1	0.02	275 Min	430 Min	20	3t
IS 10748 GR. 5 / JIS G 3132 SPHT 4	3.0 – 12	0.25	1.3	0.04	0.04	0.35	0.1	0.02	310 Min	490 Min	15	3t

Weathering Steel / Corten Steel (infra/cons/consumable durables)

Standard	Thick Range (mm)	Chemical Composition (%)												Mechanical Properties			
		C Max	Mn	S	P	Si	Ni	Cr	Cu	MAE (V+Nb+Ti)		Al	Mo	YS (MPa)	UTS (MPa)	% EL Min	Bend Test
										Nb	V						
IRS M 41-97	3.0 – 12.0	0.10	0.25-0.45	0.03 Max	0.075-0.14	0.28-0.72	0.20-0.47	0.35-0.60	0.3-0.6	0.04 Max	0.05 Max	0.08 Max	0.05 Max	340 Min	480 Min	22	1t
IS 1079 Gr. O Cu	1.8-6	0.15	0.60 Max	0.04 Max	0.04 Max	0.10 Max	0.05	0.05	0.17-0.38	0.10 Max		0.02 Min	-	-	270-440	24	2t
IS 2062 E250 Cu	2.0-12	0.2 Max	1.20 Max	0.04 Max	0.04 Max	0.40 Max	0.20 Max	-	0.17-0.38	0.10 Max		0.02 Min	-	250 Min	410 Min	23	2t
IS 2062 E350 Cu	3.0-12	0.2 Max	1.50 Max	0.04 Max	0.04 Max	0.45 Max	0.20 Max	-	0.17-0.38	0.10 Max		0.02 Min	-	350 Min	490 Min	22	2t
IS 2062 E450 Cu	4.0-12	0.22	1.60	0.04	0.04	0.45	0.20 Max	-	0.17-0.38	0.15 Max		0.02 Min	-	450 Min	570 Min	20	2.5t
ASTM A 242	3.0-12	0.15 Max	1.0 Max	0.05 Max	0.15 Max	0.50 Max	0.65 Max	0.30-1.25	0.20 Min	-		0.02 Min	-	345 Min	480 Min	21	1t


LTD
14607802

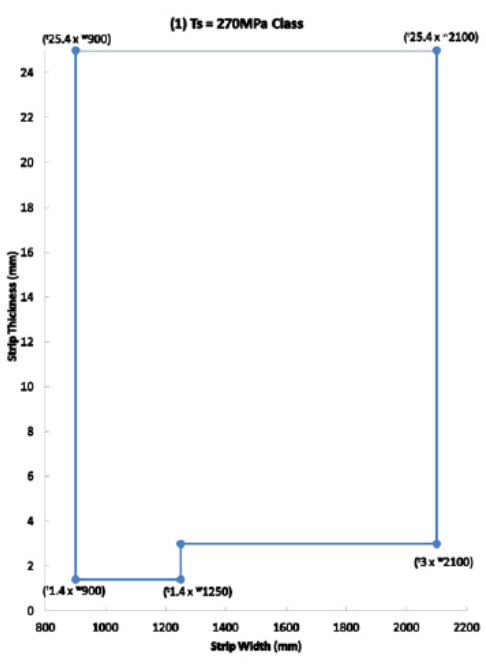

JSW

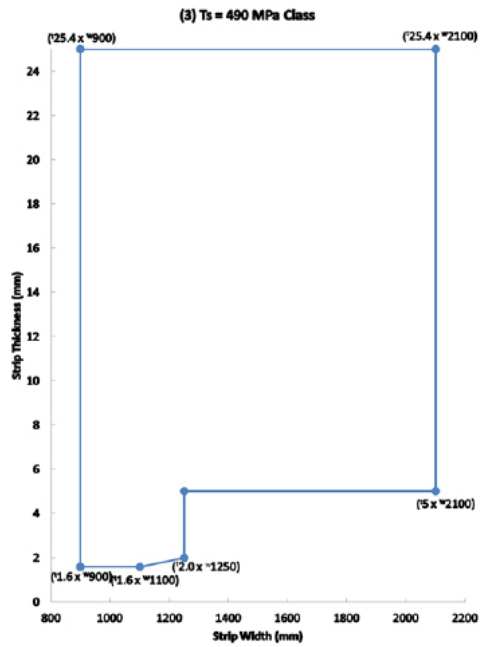
GWT Matrix : Vijayanagar

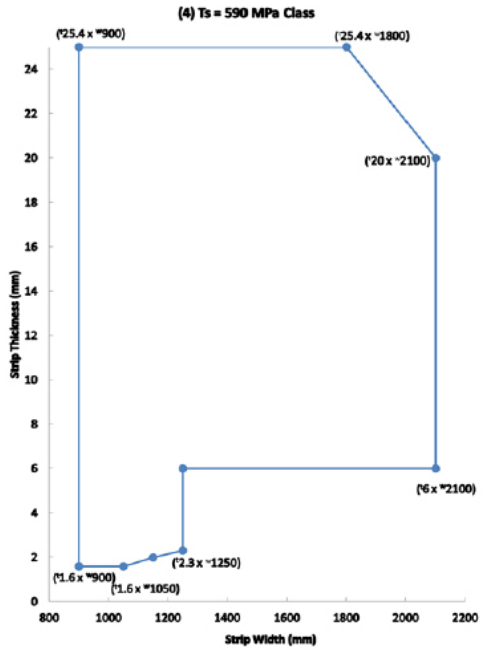
Product / Grade		HSM - 1	HSM - 2
Cold Rolling / Welded Tube		1.6/1.8 x (900-1050) (2.0-3.0) x (900-1280) ›=3.0 x (900-1320)	(1.4-2.0) x (900-1250) (2.0-3.0) x (900-1500) ›=3.0 x (900-2100)
Plain Carbon Structural		1.6/1.8 x 900 (2.0-2.8) x (900-1100) ›=2.8 x (900-1250)	1.4/1.8 x (900-1250) (2.0-4.0) x (900-1500) (4.0-25.0) x (900-2100)
Medium Carbon Grade		(2.2-3.5) x (900-1000) (3.5-6.0) x (900-1150)	(2.2-3.5) x (900-1250) (3.5-6.0) x (900-1400)
High Tensile Grades (E 350)		(2.5-3.0) x (900-1000) (3.0-4.0) x (900-1100) ›=4.0 x (900-1250)	(1.6-2.0) x (900-1200) (2.0-3.0) x (900-1250) (3.0-6.0) x (900-1500) (6.0-25.0) x (900-2100)
High Tensile Grades (E 450 / SPFH 590)		(3.2-4.5) x (900-950)	(2.0-2.5) x (900-1200) (2.5-4.0) x (900-1250) (4.0-6.0) x (900-1500) (6.0-25.0) x (900-2000)
API 5L Grades*	X42 / X46 / X52 / X56	-	(4.0-6.0) x (1000-1500) (6.0-25.4) x (1000-2000)
	X60 / X65	-	(4.0-8.0) x (1000-1500) (8.0-25.4) x (900-2000)
	X70	-	(6.0-8.0) x (900-1500) (8.0-18.0) x (900-2000) (18.0-25.4) x (900-1600)
	X80	-	(6.0-8.0) x (900-1500) (8.0-18.0) x (900-2000)
Low Carbon, EDD, IF Steel		›=2.0 x (900-1300) for Low Carbon	(1.6-1.8) x (900-1250) ›=3.0 x (900-2100)
Dual Phase Steel*		-	(3.0-5.0) x (900-1500) (5.0-6.5) x (900-1800)

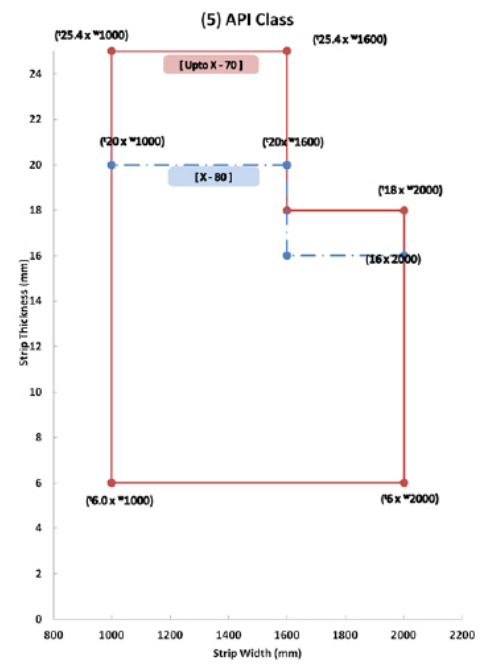
*Supply conditions and Sizes of API Steel sizes shall be discussed at the time of ordering.
For IF Steel, depending on the end application, HR sizes shall be agreed with the customer.

GWT Graphical Representation







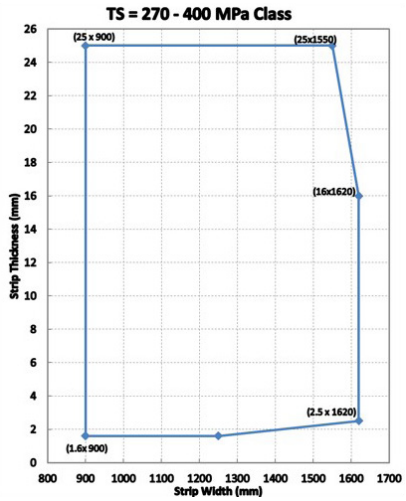


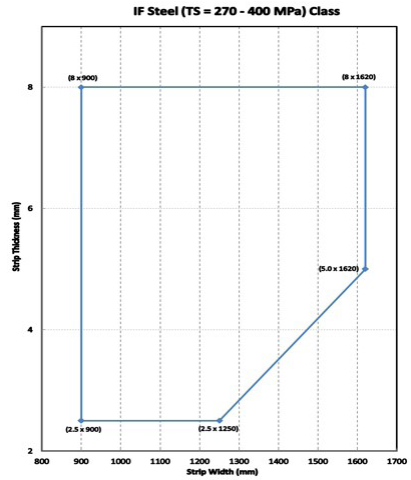
GWT Matrix Gradewise : Dolvi Plant

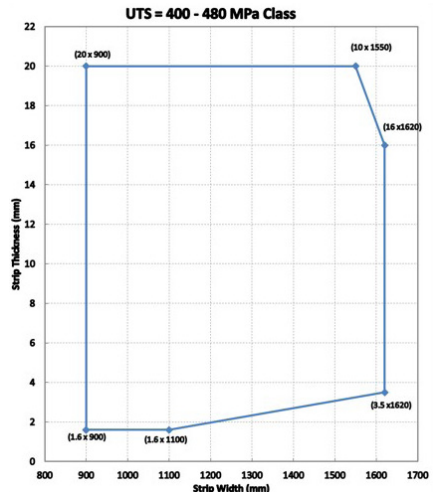
Product / Grade	CSP	HSM - 2
Cold Rolling / Welded Tube	1.6/1.8 x (900-1050) (2.0-3.0) x (900-1280) 3.0 min. X (900-1550)	(1.4-2.0) x (900-1250) (2.0-3.0) x (900-1500) 3.0 X (900-1620)
Plain Carbon Structural	1.6/1.8 x 900 (2.0-2.8) x (900-1100) 2.8 min.X (900-1250)	1.4/1.8 x (900-1250) (2.0-4.0) x (900-1500) (4.0-20.0) X (900-1620)
Medium Carbon Grade	(2.2-3.5) x (900-1000) (3.5-6.0) x (900-1150)	(2.2-3.5) x (900-1250) (3.5-6.0) x (900-1400)
High Tensile Grades (Fe 510)	(2.5-3.0) x (900-1000) (3.0-4.0) x (900-1100)	(1.6-2.0) x (900-1200) (2.0-3.0) x (900-1250)
	〉=4.0 x (900-1250)	(3.0-6.0) x (900-1500) (6.0-25.0) x (900-2100)
High Tensile Grades (Fe 510)	-	(2.0-2.5) x (900-1200) (2.5-4.0) x (900-1250) (4.0-6.0) x (900-1500) (6.0-25.0) x (900-2100/2000)
APIPSL 2 Grades (Up to X70)	(4.0-8.0) x (900-1250)	(4.0-16.0) X (1000-1620)
Low Carbon, EDD	(1.6-10) X (900-1300)	(1.6-1.8) x (900-1250) 3.0 X10 (900-1620)
IF Steel, Electrical Steel	-	2.4 X (900-1250) (2.41-2.9)X(900-1350), (2.91-3.49)X(900-1550), (3.5-16)X(900-1620)

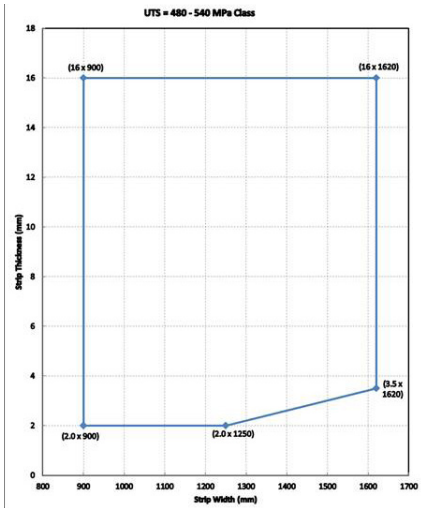
Note: All above values are typical production values. However, the GWT will comply all the national/international standards as per signed technical delivery condition

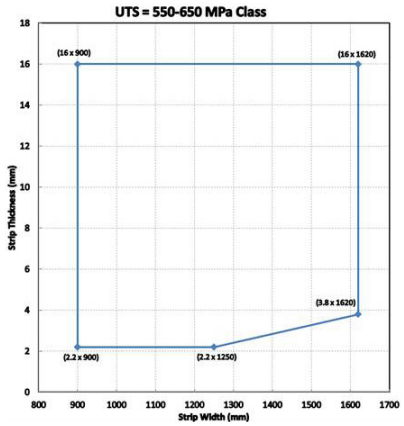
GWT Graphical Representation

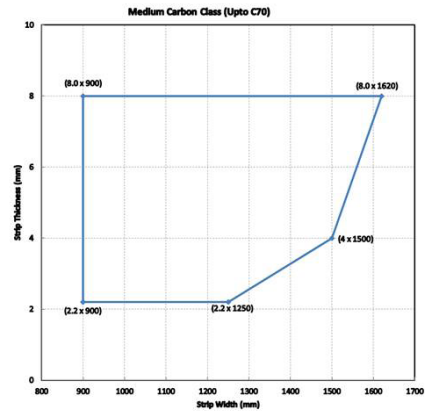












Testing Facilities

Vijayanagar

Parameters	Equipment
Chemical Composition	Optical Emission Spectrometer, CS Analyzer, ONH (Oxygen,Nitrogen& Hydrogen) Analyzer
Internal Cleanliness	Macro Etching
Tensile Properties	Computerized UTM 10T/25T/30T/60T/120T
Hardness	Vickers/Rockwell Hardness Tester
Impact Energy	Impact Testing m/c - (ISO 450J/ASTM600J)
Bend Test	Bending and folding m/c - 100 Ton
Cupping Value	Hydraulic Erichsen Cupping Tester
Drop Weight Tear Test	DWTT m/c - 30,000J
Microstructure	Metallurgical Microscope with Image Analyzer
HIC, SSC for API Sour Grade Application	NACE Lab
Hole Expansion Ratio	Hole Expansion Ratio Testing Machine with thickness upto 5mm

Anjar Works

Parameters	Equipment
Chemical Composition	OPTICAL EMISSION SPECTROMETER, Shimadzu, JAPAN [28 channels]
Internal Cleanliness	MACRO ETCHING, Buehler, USA and Microscopes
Tensile Properties	ROBOTIC UNIVERSAL TENSILE TESTING, Zwick Roell, Germany, [1,200 kN]
Hardness	HARDNESS TEST MACHINE, Zwick Roell, Germany, [0.1 to 30 kgF]
Impact Energy	CHARPY IMPACT TESTING, Tinus Olsen, USA, [542.3 Joules]
Bend Properties	BEND TEST MACHINE, Micro Control system, [150 T]
Fracture Toughness	DROP WEIGHT TEAR TESTER, Zwick Roell, Germany, [80,000 Joules]
Metallography Examination	METALLURGICAL MICROSCOPE, Leica, Germany , [25X – 1000X]
Simulation Heat Treatment	SIMULATION HEAT TREATMENT FURNACE, Therelek Furnaces, India, [up to 1100° C]
Internal Soundness	AUTOMATED ONLINE UT, GE IT, Germany, [80mmx 4500mmx 28000mm]

Dolvi

Parameters	JSW Steel ltd dolvi (Testing facilities) Phase 1
Chemical Composition	Optical Emission Spectrometer, CS Analyzer, ONH (Oxygen,Nitrogen& Hydrogen) Analyzer
Internal Cleanliness	Macro Etching
Tensile Properties	Computerized UTM 600KN-03nos.
Hardness	Vickers/Rockwell Hardness Tester
Impact Energy	Impact Testing m/c -Charpy - 0 to 300 Joules Izod - 0 to 170 Joules
Bend Test	-
Cupping Value	Hydraulic Erichsen Cupping Tester up to 6 mm Thk.
Drop Weight Tear Test	DWTT m/c - 30,000J
Microstructure	Metallurgical Microscope with Image Analyzer
HIC, SSC for API Sour Grade Application	-
Hole Expansion Ratio	-

Parameters	JSW Steel ltd dolvi (Testing facilities) Phase 2- (Test lab equipments of Phase 2 is Under Installation)
Chemical Composition	Optical Emission Spectrometer, CS Analyzer, ONH (Oxygen,Nitrogen& Hydrogen) Analyzer
Internal Cleanliness	Macro Etching
Tensile Properties	Computerized UTM (250KN , 600 KN , 1500 KN)
Hardness	Vickers/Rockwell Hardness Tester
Impact Energy	Impact Testing m/c -Charpy - 0 to 700 Joules
Bend Test	Bending Folding Machine
Cupping Value	Llyods Cupping Tester up to 6 mm Thk.
Drop Weight Tear Test	Zwick DWTT m/c - 80,000J
Microstructure	Metallurgical Microscope with Image Analyzer
HIC, SSC for API Sour Grade Application	-
Hole Expansion Ratio	HER in Llyods Cupping Tester up to 6 mm Thk.

BPSL : SMS 1 Lab

Equipment	Details
Spectro 4 Nos.	Spectro m 12 model - 2 nos. Spectro ARL model4460 - 2 nos. For process samples of SMS & final samples testing.
Gas analyser (ONH)	(A) Leco - cs model 230 (B) Leco - cs model 744 for raw material & high sulphur analsis.
Gas analyser (ONH)	Leco-ONH 836 - For gas analysis
XRF	Thermofisher – perform x For raw material & by product analysis. (for both sms1 & sms2)
XRF - sample preparation equipments	Briquetting press - 2 nos. Pulverizer/vcm - 2 nos.
Spectro sample preparation Equipments	Double disc polishig machines - 2 nos. Single disc polishing machines - 2 nos. Milling machine - under installation.
Jaw crusher	Jaw crusher - 1 no. For ferro alloys
Roller crusher	For fluxs. (dololime /quicklime) - 1 no.
Punching machine	For gas analysis (button samples) - 1 no.
Chemical Lab	Muffel furnace - 2 nos. Hot air oven - 2 nos. Facilities for proximate analysis. Loi, reactivity of lime & moisture.
Cut off machine	To cut the billet sample - 1 no.

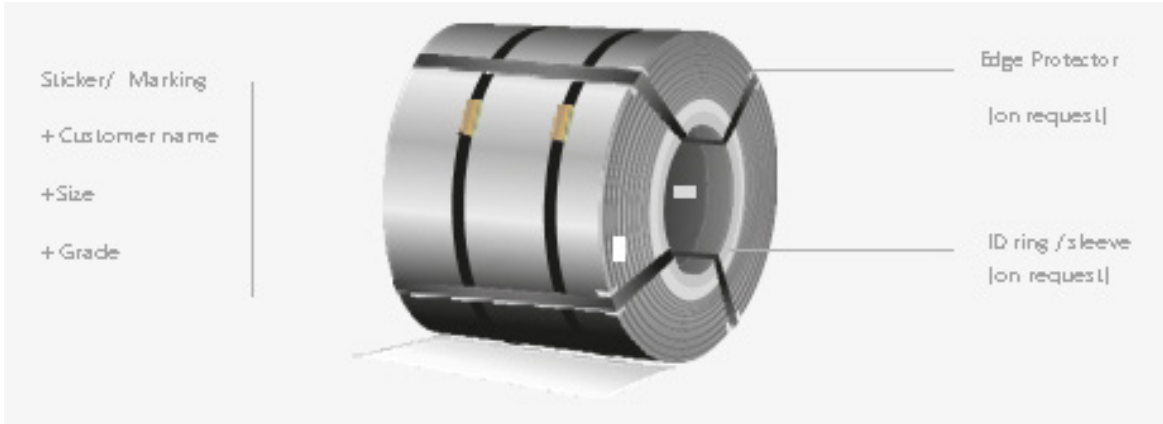
BPSL : SMS 2 Lab

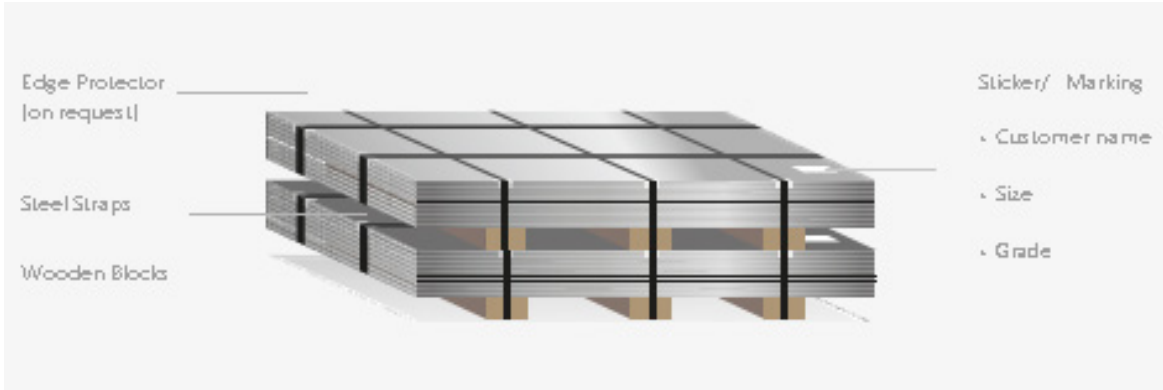
Equipment	Details
Spectro 2 nos.	Spectro ARL model 8860 1 no. Spectro labs - 1 no. In transit For process samples of sms & final samples testing.
Carbon sulphur analyser	leco - cs model 744 for raw material & high sulphur analsis.
Gas analyser (onh)	Leco -onh 836 For gas analysis
Spectro sample preparation Equipments	Single disc polishing machines - 2 nos.
Cut off machine	1 no. To cut the billet sample.


Stand-3
Mill Stand-4

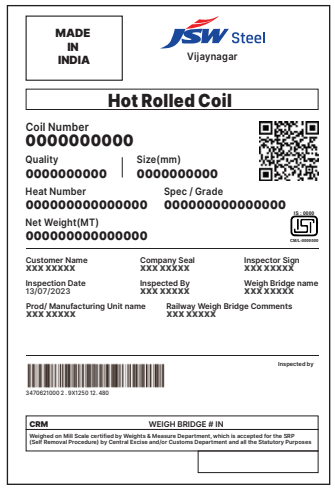
Packing Standards
Hot Rolled Coil

Customer Type	Thickness mimimum mm	Thickness maximum mm	Width mimimum mm	Width maximum mm	Bare Steel Strapping (2 digit Numeric code) First Digit: Eye strap Second Digit: Circum strap
Domestic	1.4	25.4	900	2150	32 or as agreed (with ID Steel Ring for nominal thickness up to 2.6mm)
Export & API	Export & API	Export & API	Export & API	Export & API	43 or as agreed (with ID Steel Ring for nominal thickness up to 2.6mm)





Marking of Hot Rolled Coils
Two labels, one on ID of the coil and the other on OD of the coil will have the following details. Manufacturer Name, Customer Name, Coil No., Heat No., Size (T x W in mm), Grade, Coil Weight, Typical Adhesice Label (refer to the adjacent figure)


MADE IN INDIA

JSW Steel
Vijaynagar

Hot Rolled Coil

Coil Number
0000000000

Quality
0000000000

Size(mm)
0000000000

Heat Number
000000000000000

Spec / Grade
000000000000000

Net Weight(MT)
000000000000000

Customer Name	Company Seal	Inspector Sign
XXX XXXXX	XXX XXXXX	XXX XXXXX
Inspection Date	**Inspected By**	**Weigh Bridge name**
13/07/2023	XXX XXXXX	XXX XXXXX
Prod/ Manufacturing Unit name	**Railway Weigh Bridge Comments**	
XXX XXXXX	XXX XXXXX	

Inspected by

CRM WEIGH BRIDGE # IN

Weighed on Mill Scale certified by Weights & Measure Department, which is accepted for the SRP (Self Removal Procedure) by Central Excise and/or Customs Department and all the Statutory Purposes

Note: Packaging and Marking are mutually agreed based on customer requirements.


JSW
JSW
JSW
SORT
5S

Environmentally Responsible
Hot Rolled Steel

An EPD declaration is available for JSW Steel's Hot Rolled Coils manufactured at JSW Steel Limited's Vijayanagar Plant (India). The EPD is in accordance with ISO 14025 and EN 15804.

The life cycle assessment (LCA) in the EPD provides a holistic approach measuring the environmental performance of Hot Rolled Steel by considering the potential impacts from all stages of manufacturing. product use and end-of-life stages.

The constituent materials used within our products are responsibly sourced and we apply the principles of Sustainable Develapment and of Environmental Stewardship as a standard business practice in our operations. Protecting the environment by preserving non-renewable natural resources, increasing energy efficiency, reducing the environmental emissions, limiting the impact of materials transpartation to and fram our operations is part of our way in doing business.

S-P-01413 EPD®
environdec.com

EPD Information

Programme	The international EPD System, www.environdec.com
Programme operator	EPD International AB Box 210 60, SE - 100 31 Stockholm, Sweden
Declaration holder	JSW Steel Limited Vijaynagar Works,Vidyanagar P.O. Ballari,Dist,Karnataka-583275
Product	Hot Rolled Coil
CPC Code	41211 Flat-rolled products of non-alloy steel,not further worked than hot rolled,of a width of 600mm or more
EPD Registration Number	S-P-01413
Publication Date	2019-01-12
Validity Date	2024-07-11
Geographical Date	India
Reference Standards	ISO 14020:2001,ISO 14025:2008,EN 15804:2012

Sales Office

AHMEDABAD
JSW steel Ltd.
Office No 501/502,Mondeal
Height B-Wing, Lascon Cross road
Near Novotel Hotel
Opp Karnavati Club
S.G.Highway
Ahmedabad -380054
Mb:08128833390

AURANGABAD
JSw steel Ltd
Office no 306,3rd floor,05/1
A,B,C East Beside ,Prozone Mall
Chikaithana MIDC
Aurangabad

BANGALORE
JSW steel ltd
The Estate , Nest to Manipal Centre
9th Floor,East wing ,121,
Dickenson road
Bangalore-560042
Tel (08042448888)

BHUBANESWAR
JSW steel Ltd
JSS STP ,2nd Floor , Block B
Infocity, Chandrasekharpur E -1/1
Bhubaneswar-751024
Tel: 0674-6658904

CHENNAI
JSW Steel Ltd
5th Floor ,South Tower 2
Harrington road
Chetpet,
Chennai-600031
Tel :0732532158

COIMBATORE
]SW Steel Ltd.
211, 2nd Floor, Sathya Complex,
ESR Avenue Nr Post office,
TV Swamy Road (East),
Coimbatore – 541002

DELHI
JSW Steel Ltd.
4'"Floor, NTH Complex,
A-2, Shaheed Jeet Singh Marg,
Qutub Institutional Area,
New Delhi - 110067
Tel: (011) 48178600

FARIDABAD
]SW Steel Ltd.
Nain Sadan, Sector 20A,
Plot No- 35,
Near EF3 Mall,
Faridabad - 121001
Tel: (0129) 2239248, 2232387

GUWAHATI
]SW Steel Ltd.
6th Floor, Unique Avenue,
Front Side,
Opp. Fire Station,
Super Market,
Dispur, Guwahati - 781 005,

HUBLI
]SW Steel Ltd,
2nd Floor, Signature Mall,
Airport Road,
Gokul Road,
Hubli - 580030

HYDERABAD
]SW Steel Ltd.
Babu Khan Millenniums Centre,
7'" Floor, Somajiguda,
Hyderabad -500082
Tel : (040) 27846669 / 79

INDORE
JSW Steel Ltd.
Bloc No: 22,23,24,
Scheme no. 54,
Princess Business
Sky Park,
Commercial, opp. Orbit,
AB Road,
Indore - 452010
Tel: (0731) 2532156 to 59

JAIPUR
JSW Steel Ltd.' 3rd floor, 304-307,
Signature Tower,
Behind Police HQ,
Lal kothi,
Tonk Phatak,
Jaipur- 302015 (Rajasthan)
Tel: (0141) 4629200

KANPUR
JSW Steel Ltd.
2ndFloor, 14/75,
Plot No. 1, Gopal Vihar,
Civil Lines, Kanpur – 208001

KOCHI
JSW Steel Ltd.
34/138L3, New No 41/150A3,
2nd Floor,
Above Dhe Puttu Restaurant
Service Road
NH By-pass
Edapally, Kochi ,
Kerala 682024

KOLKATA
JSW Steel Ltd.
Godrej Waterside,
101" Floor, Tower - 1
Unit No 1003,
Plot- DP-5 Sector V,
Salt Lake City
Kolkata - 700091
Tel : (033) 40002020

LUDHIANA
JSW Steel Ltd.
3'd Floor, SCO 7-8,
Canal Colony,
Firoz Gandhi Market,
Pakhowal Road,
Ludhiana - 141008
Tel.: (0161) 6611700

MUMBAI
JSW Steel Ltd
JSW Centre ,Bandra Kurla Complex
Bandra East
Mumbai-400051
Mb: 022-42863000

NAGPUR
JSW Steel Ltd.
L&T Building,
3'º Floor (Back Side),
Plot No: 12,
Shivaji Nagar,
Nagpur: 440 010

NAVI MUMBAI
JSW Steel Ltd.
1101-1102 a 1704-1707,
17'" Floor,
Plot No. 4 a 6,
Greenscape Cyber One,
Sector 30 A, Vasi,
Navi Mumbai - 400 705
Tel : 022 69337000

NOIDA
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Tel: (020) 66662300

VIJAYWADA
JSW Steel Ltd
VRN House Corporate,
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Beside MG Road,
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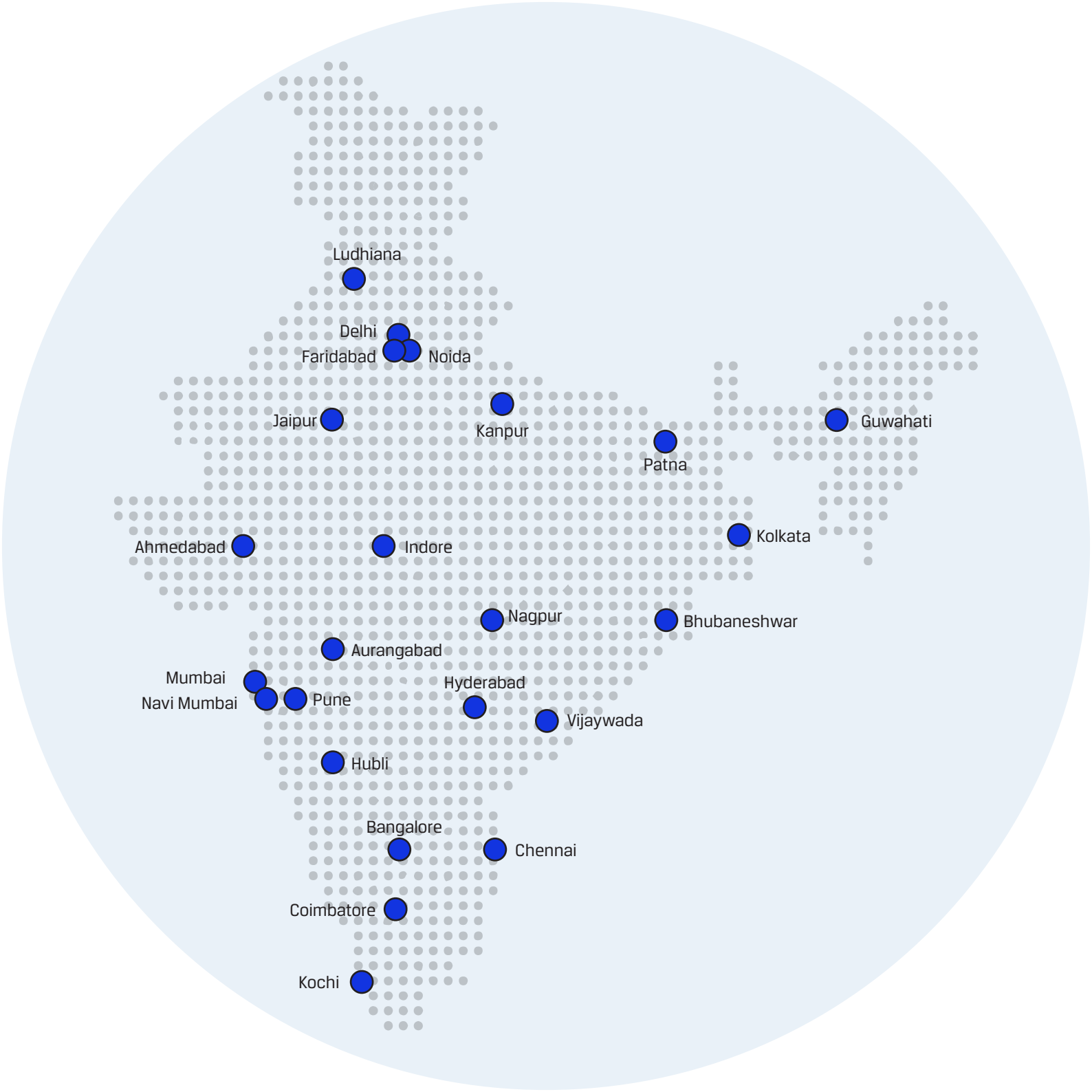
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