About Jindal Steel & Power Limited

Jindal Steel and Power Limited (JSPL) is one of India’s primary & integrated steel producers with a significant presence in sectors like Mining, Power Generation and Infrastructure.

With an annual turnover of over US$ 3.6 billion, JSPL is a part of the about US$ 18 billion diversified O.P. Jindal Group and is consistently tapping new opportunities by increasing production capacity, diversifying investments, and leveraging its core capabilities to venture into new businesses. The company has committed investments exceeding US$ 30 billion in the future and has several business initiatives running simultaneously across continents.

From the widest flat products to a whole range of long products, JSPL today sports a product portfolio that caters to varied needs in the steel market. The company also has the distinction of producing the world’s longest 121 metre rails and introducing large size parallel flange beams in India.

JSPL operates the largest coal based sponge iron plant in the world and has an installed capacity of 5.5 MTPA of steel at Raigarh in Chhattisgarh and Angul in Odisha.

The company has an installed capacity of:
- 0.75 MTPA Rail & Universal Beam Mill at Raigarh, Chhattisgarh
- 0.6 MTPA Medium & Light Structural Mill and 1.0 MTPA Plate Mill at Raigarh, Chhattisgarh
- 1.3 MTPA Plate Mill producing Plates upto 5 meter wide at Angul, Odisha
- 0.6 MTPA Wire Rod Mill and 1.0 MTPA Rebar Mill at Patratu, Jharkhand

The company aims for a fast-paced growth so as to contribute substantially to India’s long term prosperity.

An enterprising spirit and the ability to discern future trends have been the driving force behind the company’s remarkable growth story. The company has scaled new heights with the combined force of innovation, adaptation of new technology and the collective skills of its 15,000 strong, committed workforce.
JSPL, Raigarh

JSPL’s Raigarh Works has many distinctions and firsts to its credits, from producing the world’s longest 12.1 metre long rails to introducing parallel flange beams and columns in India, bringing in widest coils and plates in the country in 2007.

JSPL operates the world’s largest rotary kiln based sponge iron plant and has an installed capacity of 3.0 MTPA of crude steel at Raigarh with a forward integration model comprising of SD/DR-EAF-LRF-VDF/RH-CCR route based iron making and steel making facilities. The facility has come a long way from its initial days as a small sponge iron production unit to a large steelmaking complex. Rolling facilities at JSPL Raigarh comprise of a 0.75 MTPA Rail & Universal Beam Mill, a 0.6 MTPA Medium & Light Section Mill, and a 1.0 MTPA Heavy Plate & coil Mill (Stackle Mill). A very wide range of products ranging from continuous cast products such as Rounds/Billets/Blooms/ Beam Blanks/ Slabs, to rolled sections such as Light/Medium/Heavy Angles, Channels, Universal Beams & Columns, Crane/ Gantry Rails, Track Rails, Hot Rolled Coils and Plates are being supplied from these mills in a wide range of sizes and steel grades to customers globally.

JSPL pioneered the production of Parallel Flange Sections and long Rails in India through Universal Rolling Technology from its 0.75 MTPA capacity Rail & Universal Beam Mill (RUBM) in 2003. Leveraging on the unstinted support of its valued customers, consultants, and structural designers through all these years who realized the inherent advantages and saving potential of the Parallel Flange Beams & Columns over the conventional tapered flange beams. JSPL has today carved a name for its Parallel Flange Sections in every corner of the country and has also established a name for its sections in the global structural sections market.

The Mill is equipped with a walking beam type reheating furnace, high efficiency water descaling system, Breakdown Mill, a modern Universal Tandem Mill incorporating a ‘Universal Rougher, Universal Edger and Universal Finishing Mill’, one of the longest 123-meter long cooling bed, high capacity 9 roll vertical and 9 roll horizontal straightening machine, cut-off, stacking, bundling, and marking machines. These enable production of structural steel sections with a very high degree of dimensional compliance to the specifications in desired lengths with adequate packaging and marking.

JSPL today rolls 47 different sizes/ series and over 160 different variants (unit-weights) of Parallel Flange Beams & Columns (NPB/PE; WPB/PH; UB & UC Sections) in nominal depths ranging from 150mm to 900mm and with unit-weights ranging from 23 kg/meter to 333kg/meter conforming to Indian specification (IS-12778) as well as European specifications for Standard Beams and Wide Flange Beams. Besides beams & columns, this mill also rolls Indian (ISMC) channels in size 250, 300, 400mm & angle of 150mm.
Long Rails from JSPL

JSPL RUBM mill is also one of the most modern rail production facilities in the world capable of producing upto 121 meter long finished length Class A rails.

JSPL rails are evaluated and cleared by RDSO, Lucknow as being compliant to Indian Railways rail specification. The company is today producing and supplying rails as per rail specifications IS:75-12-2009, various international standards such as UIC-860, EN13674-1, etc. Rails supplied by JSPL in the domestic market are inspected and certified by RDSO.

While we have the common facilities of RUBM for production of Structural Steel Sections such as reheating furnace, rolling stands, straightening machine and bundling/stacking unit; JSPL Rail mill boasts of additional and latest finishing & testing equipment required for compliance with stringent rail specifications of Indian Railways and other international railways.

JSPL RUBM also produces crane rail sections CR90 & CR100 for gantry applications as per IS:3443 in addition to as Track Rail sections 52kg/mtr, 54 kg/mtr and 60kg/mtr as per IS:75-12-2009, various international standards such as UIC-860, EN13674-1, etc.

JSPL has commissioned facility to produce Heat Hardened Rails as well.

Medium and Light Structural Mill (MLSM)

Aiming to provide a complete product basket and an enhanced structural section size range to its customers, JSPL has commissioned the state-of-the-art 0.6MTPA capacity Medium and Light Structural Mill (MLSM) at Raigarh.

With a wide range of light & medium beam & column sections, channels, & angles, the mill, along with the existing sections from RUBM, has enabled JSPL to offer the widest range of light, medium, heavy and jumbo structural steel sections from an Integrated Steel manufacturer in India.

A first of its kind in India, MLSM is a 15 stand continuous mill equipped with advanced rolling mill technology and equipment from Danieli, Italy. MLSM is equipped with a walking beam type reheating furnace, besides a high efficiency water descaling system, modern universal cartridge type rolling stands, on-line profile check machine, 90 meter long cooling bed, high capacity straightening machine, on-line shearing, sawing, stacking, bundling, and marking machines. These enable production of light & medium beams, angles, and channels with a very high degree of dimensional compliance to the specifications in customers' desired lengths and sizes with high quality packaging and marking.

The mill is capable of producing Ultra Light, Light, and Medium Parallel Flange Beams & Columns in depths ranging from 100mm to 300 mm, Channels in depths 75mm to 300mm, and Angles in size 65mm to 200mm, in unit weights ranging from 5kg/mtr to 75kg/mtr. The mill can also roll flat bars in size 50mm to 300mm which is currently in developmental stage.
Parallel Flange Beams & Columns

Beams and Columns are characterized by their profile, their length, and their material. JSPL manufactures Parallel Flange Beams and columns in various configurations:

- Narrow Parallel Flange Beams
- Wide Parallel Flange Beams
- Universal Beams
- Universal Columns

Characteristics

To cater to the broader market segment and comply to the different needs of various industries, JSPL offers structural sections with various characteristics in this segment:

- Wide dimensional range
- Superior Weldability
- Cost effective
- Multiple sectional weights
- High strength to weight ratio
- Atmospheric corrosion resistance
- Multiple Sectoral Weights

Dimensional Range

These are widely used in the construction industry to provide support for buildings and load-bearing walls. They are available in a variety of standard sizes and selected based on the applied load for the required application.

- NFB - Narrow Parallel Flange Beams as per IS 12778:
  2004 (Equivalent to IPE Series-European Standard Narrow Flange Beams)
  - NFB 180x90 to NFB 600x220 [IPE 180 to IPE600]
- WFB - Wide Parallel Flange Beams as per IS 12778:
  2004 (Equivalent to HE Series-European Wide Flange Beams)
  - WFB 320x300 to WFB 900x300 [HE 320 to HE900]
- UB - Universal Beam as per IS-4 Part 1:1993
  - UB 203x133 to UB 610x229
- UC - Universal Columns per IS-4 Part 1:1993
  - UC 152x152 to UC 356x406

Applications

Beams generally carry vertical gravitational forces but can also be used to carry horizontal loads (i.e., loads due to an earthquake or wind). The loads carried by a beam are transferred to columns, walls, or girders, which then transfer the force to adjacent structural compression members. Corrosion resistant grades finding application in places exposed to outside atmosphere which are prone to corrosion. Various places where beams and columns find application can be listed as follows:

- Construction support beams for commercial and residential construction
- Support frames and columns for trolley ways, lifts and hoists
- Mezzanines and platforms

- Trailer and truck bed framing
- Support beams and columns in bridges
- Machine bases
- Freight cars

Some of our Valued Customers
Channels
One of the hot rolled structural shapes which JSPL offers is the tapered flange channel which is available in a wide range of sizes and thicknesses. The shape provides superior structural support, making it an ideal product for frames and braces used for machinery, enclosure, vehicle, building and structural support applications.

Characteristics
JSPL channel offers various characteristics which make it suitable for use in various industrial segments and as a support structure:
- Mild to High tensile strength
- Superior weldability
- Atmospheric corrosion resistance
- Wide dimensional range

Dimensional Range
In order to meet the requirements of different segments, the tapered flange channels from JSPL are available as per Indian [IS 808] and various international standards:
- ISMC 75x40 to 400x100mm

Applications
Tapered flange channel sections from JSPL find application in a wide range of segments. The various applications of Channel sections include the following:
- Truck and trailer frame supports
- Equipment and machinery frames and supports
- Building frames and other support components.
- Bridges
- Freight cars
- Poles

Some of our Valued Customers

[Images of various company logos]
Angles

JSPL is the manufacturer of hot-rolled equal leg angles which are available in a variety of grades and sizes, making it ideal for structural applications, general fabrication, machining and repairs.

Characteristics

Angles are one of the most widely used products in the construction industry. It offers various characteristic features as a low-cost material:

- Wide dimensional range
- Superior Weldability
- Excellent surface finish
- Close dimensional tolerances
- Formable, and machinable

Dimensional Range

JSPL produces equal leg angles with a wide dimensional range:
- 65x65 to 200x200mm

Applications

Angles are used in a range of industrial applications, including:

- Transmission towers & lines
- Buildings, bridges, and other structures for support
- General structural use in construction
- Transportation frames and corners
- Support frames that require welding, riveting or bolting on bridges and buildings
- Machinery and equipment frames, braces and corners
- Precipitators

Some of our Valued Customers

[Logos of various companies]
### Technical Specification for Structural Sections

#### Annex A: European Beams

<table>
<thead>
<tr>
<th>European Designation</th>
<th>Section Shape</th>
<th>Flange Depth</th>
<th>Flange Thickness</th>
<th>Web Depth</th>
<th>Web Thickness</th>
<th>Moment of Inertia Ix</th>
<th>Moment of Inertia Iy</th>
<th>Section Modulus Zx</th>
<th>Section Modulus Zy</th>
<th>Shear Stress Flow Shear</th>
<th>Shear Stress End Shear</th>
<th>Ultimate End Shear</th>
<th>Ultimate Flow Shear</th>
</tr>
</thead>
<tbody>
<tr>
<td>300x100 HEB 300</td>
<td>H</td>
<td>360</td>
<td>12</td>
<td>281</td>
<td>5</td>
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<td>1,100</td>
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#### Standard IPE beams

<table>
<thead>
<tr>
<th>Standard Designation</th>
<th>Flange Depth</th>
<th>Flange Thickness</th>
<th>Web Depth</th>
<th>Web Thickness</th>
<th>Moment of Inertia Ix</th>
<th>Moment of Inertia Iy</th>
<th>Section Modulus Zx</th>
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<th>Ultimate Flow Shear</th>
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<tr>
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<tr>
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<td>1,100</td>
<td>53,800</td>
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</tbody>
</table>

### Notes

- Moment of inertia is calculated using the parallel axis theorem.
- Shear stress values are based on the assumption of constant stress distribution.

*Product characteristics are subject to change without notice.*
## Technical Specification for Structural Sections

### Dimensional Norms

<table>
<thead>
<tr>
<th>Length</th>
<th>UC 356 x 406 x 235</th>
<th>UC 356 x 368 x 153</th>
<th>Other grades can be supplied with prior agreement</th>
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<tbody>
<tr>
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<td>12.3 20.7 15.2 194.8</td>
<td>48590 17550 2684 947.5</td>
<td>15.79 9.49</td>
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<td>99880 38680 16.5 10.35075 1939</td>
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<tr>
<td></td>
<td>UC 305 x 305 x 97 96.9 307.9 305.3 9.9 15.4 15.2</td>
<td>UC 254 x 254 x 167 167.1 289.1 265.2 19.2 31.7 12.7</td>
<td>212.9 30000 9870 2075 744.3 11.87 6.81</td>
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<tr>
<td></td>
<td>UC 254 x 254 x 132 132.0 276.3 261.3 15.3 25.3 12.7</td>
<td>UC 254 x 254 x 107 107.1 266.7 258.8 12.8 20.5 12.7</td>
<td>138.1 22530 7531 1631 576.4 11.58 6.69</td>
</tr>
<tr>
<td></td>
<td>UC 254 x 254 x 89 88.9 260.3 256.3 10.3 17.3 12.7</td>
<td>UC 305 x 305 x 198 198.1 339.9 314.5 19.1 31.4 15.2</td>
<td>252.4 50900 16300 2995 1037 14.2 8.04</td>
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</table>

### Remarks

- ISMC 250x82 38.98 30.60 250.00 82.00 9.00 14.10 96.00 12.00 3.20 2.23 4080.00 244.00 326.40 40.87 10.23 2.50 356.72 73.90 22.88 26.86 192.7 5.8 21.4 SC SC
- ISMC 200x75 28.41 22.30 200.00 75.00 6.20 11.40 96.00 11.00 3.20 2.20 1830.00 141.00 183.00 26.60 8.03 2.23 211.26 51.07 9.90 10.12 150.3 6.6 24.2 SC SC
- ISMC 100x50 12.18 9.56 100.00 50.00 5.00 7.70 96.00 9.00 2.40 1.54 192.00 26.70 38.40 7.72 3.97 1.48 43.83 14.30 2.26 0.46 63.8 6.5 12.8 SC SC
- ISMC 125x65 16.69 13.10 125.00 65.00 5.30 8.20 96.00 9.50 2.40 1.95 425.00 61.10 68.00 13.43 5.05 1.91 77.15 25.56 3.59 1.74 85.3 7.9 16.1 SC SC
- ISMC 75x40 9.10 7.14 75.00 40.00 4.80 7.50 96.00 8.50 2.40 1.32 78.50 12.90 20.93 4.81 2.94 1.19 24.17 8.69 1.59 0.12 41.1 5.3 8.6 SC SC
- AS PER BS4-1:1993
- For exports: On theoretical weight basis on nominal size & length
- For exports: 30 MT per size per length per grade for grades S275JR/equivalent and lower; Total order quantity: Min 500 MT
- For domestic sales: 5 MT per size per length and 22 MT in total. (In case of lesser order quantity, freight for full trailer/truck load shall be applicable)
- For IPE/NPB sections
- DIN 17100 St 44.3/52.3
- EN 10025 S235/S275/S355 JR/J0/J2/K2
- Grades
- 235 381 394 18 30 15.2 79080 30990 16.3 10.24 151 1570
- AS PER UIC/EN/IRS norm as applicable
Advantages of JSPL Parallel Flange Beams & Columns Rolled with Universal Rolling Technology

- **Wide Range**: Widest product range available in the country lending more flexibility to designers and a more cost-effective option to project owners.

- **Exceptional Sectional Properties**: Better sectional properties as compared to conventional tapered flange beams leading to efficient design and lower steel usage. Availability of hi-tensile steel grades enables designers/users to further cut on steel tonnage.

- **Steel Saving**: Steel savings with parallel flange sections under bending load as well as under axial compression are appreciable when compared with tapered flange sections enabling usage of lower beam sizes.

- **Higher Load Carrying Capacity**: Exhibits higher load-carrying capacity with Parallel Flange Beams sections under direct compression (when used as columns) owing to their higher radius of gyration values about “y” axes and reduced slenderness ratio of beams, thus increasing stress-bearing limits.

- **Faster Construction**: Simpler direct bolting of connections to flanges possible, as taper washers are not required. Flange-to-flange welding possible as flanges are parallel.

- **Ease in design**: Enables complex design and fabrication in high volumes because of the inherent functional advantages of Parallel Flange Beams.

**Quality Assurance**

Using virgin raw material from its captive iron ore mines and with an automated production facility, from the raw material stage to the final product delivered to customers, JSPL Sections assures consistent quality at every step and full compliance to desired specifications. With an automated production facility stationed with continuous checkpoints at every level, JSPL has been able to produce best quality structural sections and rails and establish an enviable reputation in the country, as well as, its overseas customers. Its strong quality and control assurance systems are equipped with modern testing facilities, which conform to stringent quality standards and are manned by well-qualified personnel.

**Quality Control Facilities at JSPL**

- Prestigious NABIL accredited lab
- Fully equipped mechanical testing laboratory
- Universal Testing Machines (Load capacity: up to 1000KN)
- Impact Testing Machine (to carry out both Charpy as well as Izod tests)
- Bend Testing Machine
- Brinell Cumi Rockwell Hardness Tester
- CNC Wirecut Machine - To cut complex notches for tests like fracture toughness etc.
- Strain Indicator - Used for measuring the residual stresses in rails
- Falling Weight Test-Unique test carried out for rails to ascertain the capacity of rails to withstand shock loading without failure.
- MTS 810 machine - The state-of-the-art testing facility for conducting fracture toughness and fatigue testing for rails.
- Profile check
- Laser straightness checking
- Eddy current testing
- Ultrasonic testing

**Packing & Delivery**

**Packing**: All the sections are supplied bare and either loose and/or in mill standard packing of maximum SMT weight, each.

**Marking**: All of above sections are supplied with details of size/length/steel grade/heat number marked with indelible white paint on pieces and on the bundles, with bundle number additionally appearing on the bundle. Embossing on the sections are also done as per customer requirement.