Tata Steel
Legacy of Trust

Tata Steel is amongst the top ten global steel companies with a crude steel production capacity of 26.5 million tonnes per annum (mtpa). A Fortune 500 Company, the Tata Steel Group is the world's second most geographically diversified steel producer, employing over 80,000 people in nearly 50 countries.

The Group’s Vision is to be the world steel industry benchmark in “Value Creation” and “Corporate Citizenship” through the excellence of its people, its innovative approach and overall conduct. The Tata Steel Group recorded a turnover of US $26.13 bn in the year ended March 31, 2012.

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Tata Astrum, HR sheets & coils from Tata Steel, is the new star in the manufacturing industry that will redefine the norms of the market by virtue of its impeccable quality and best-in-class service offerings.

Hot rolled coils and sheets have been the backbone of the infrastructure and manufacturing sector for years now. Tata Astrum shall strive to support the growth in these sectors by addressing the unmet needs of customers and providing end to end solutions. With its wide range of products, Tata Astrum can serve customers from different segments viz. Automotive, Railways, Yellow Goods, Agriculture, Fabrication, etc.

Pan-India network of distributors to serve
Wide Range of grades for a host of applications
you at your convenience
Steady availability in various thickness & width combinations
Cut-to-length sheets/slit coils from certified service centers
Product Marking to ensure source authenticity
Product Application Engineer Support to recommend the correct grade and usage
Test certificates with mechanical properties
Customer Engagement & Knowledge Sharing Programs
PROCESS FLOW
RAW MATERIAL TO END PRODUCT

Leading Edge Technologies

From steel making to final finishing, the entire production line incorporates state-of-the-art technologies and processes that make Tata Astrum a best-in-class product.

* HSM - Hot Strip Mill  * TSCR - Thin Slab Caster & Rolling Mill
Steel making

The first level of differentiation takes place in the steel making shop to meet the variety of customer requirements through appropriate grade chemistry.

Our steel is made and cast to the requisite parameters in LD2 & Slab Caster (Steel-Making & Casting Shop). The shop is equipped with all modern facilities to be able to produce the best quality steel adhering to stringent quality parameters.

It has the following facilities:
- Desulphurization stations for low-sulphur steel
- Argon stirring and alloy additions at ladle furnace
- Degassing facility (RH) for low residuals and gas levels, required for high grade steels
- One vertical bending (improved cleanliness) and two curved casters
- A semi-automatic scarfing machine for inspecting surface level defects

LD2 & Slab Caster is capable of producing a very wide range of steels – from low carbon steels to special alloy and high carbon steels.

Hot Strip Mill

After the steel is cast into slabs, it is transferred to the Hot Strip Mill (HSM) where it is rolled to the desired thickness & width. The rolling and subsequent cooling are done in a manner so as to ensure that the final product (HR coil) attains its requisite mechanical properties (as per design parameters).

In order to meet the quality and volume requirements the HSM is equipped with 3 Re-heating Furnaces, 1 Reversing Mill and 1 six-stand finishing mill (4-Hi).

The unit is equipped with:
- Automatic controls to ensure proper heating of slabs
- Automatic Width Control (AWC) facilitates width control and adjustments based on online inputs with the help of activated hydraulic cylinders
- Coil-box for temperature homogenization leading to uniformity in properties along the length
- Profile Contour & Flatness Control (PCFC) helps in maintaining perfect flatness through online monitoring & adjustment
- Automatic Gauge Control (AGC) ensures consistent thickness by hydraulic gap and gauge control
- Continuous Variable Crown (CVC) ensures minimal & uniform crown throughout the length of the coil
**Pickling and Skin Passing**

**PICKLING & OILING**
Hot Rolled coils have an oxide film or scales on their surface. Pickling cleans these scales to give the hot rolled coil surface a better look and finish.

Through a continuous process, the HR coil is uncoiled and sent through a series of inorganic acid bath (hydrochloric or sulphuric acid) that removes the oxides/scales (rust) from the surface (top & bottom). Post the pickling process, the strip is properly rinsed and then oiled. Pickling and oiling process enhances the surface finish and improves the shelf life of steel. Pickled and oiled steel sheets and coils are ideal for applications that require an even finish.

**PICKLING, OILING & SKIN PASSING**
Skin-passing of the coils is done post the pickling & oiling process. Skin passing is a light cold rolling operation which suppresses the appearance of stretcher strain and minimizes coil break during uncoiling and subsequent processing. It produces a smooth surface, makes the thickness of the coil uniform and does minor corrections in mechanical properties.

The skin-passing process involves passing the coil through a set of rolls. The rolls induce a predefined amount of force on the HR surface which makes the surface smoother and corrects the yield point phenomenon.

**Tata Steel supplies HRPO & HRSPPO steel from its in-house facilities in CRM Bara as well as from its EAPAs.**

**CRM, Bara Specifications for HRPO:**

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<tr>
<th>Parameters</th>
<th>Values</th>
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<td>Strip Thickness</td>
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<td>Strip Width</td>
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<tr>
<td>Coil O/D</td>
<td>1000mm to 2150mm</td>
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**BMW, Gamharia Specifications for HRPO:**

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</thead>
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<tr>
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<td>Weight</td>
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**CRM, Bara Specifications for HRSPPO:**

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<tbody>
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<tr>
<td>Strip Width</td>
<td>800mm to 1270mm</td>
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<td>Coil ED</td>
<td>610 mm</td>
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<tr>
<td>Coil O/D</td>
<td>2150mm (max)</td>
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**Thin Slab Caster & Rolling Mill**
The Thin Slab Caster & Rolling Mill (TSCR) is the newest addition to the Flat Products Complex. The mill was commissioned on the 14th of February ’12 and is equipped with all the latest technologies to cater to different requirements of the customers.

It is an integrated shop where steel is made in the steel making shop (LD#3), then cast and rolled continuously. Unlike the HSM, there is no slab stage in this mill and thus it reduces the time lag.

**LD#3 & TSCR has the following facilities:**
- 2 De-sulphurization Stations, 2 BOF Converters,
- 2 Online Purging (OLP) Stations & 2 Single Strand Casters
- Two tunnel furnaces and one emergency crop shear
- One 6 Hi 6 (+1) stand finishing mill with laminar cooling facility followed by 2 down-coilers

**Unique Features to ensure best-in-class product:**
- Vertical Caster equipped with Liquid Core Reduction and Dynamic Soft Reduction for better segregation control
- Calcium treatment for higher steel cleanliness
- Mill capable of rolling thinner (1 mm min) and wider (1680 mm max) sections
- Dynamic Continuous Variable Crown (CVC) and Work Roll Bending (WRB) technology for better control of profile, flatness and contour of rolled strip
- Dynamic Disturbance Compensators (DDC) for improved thickness tolerances
- Hydraulic Gap Control (HGC) for roll gap adjustment & Automatic Gauge Control (AGC)
- Edge masking on the run-out table for homogeneous mechanical properties
The Shearing Line at the Hot Strip Mill enables Tata Steel to serve customers who require Hot Rolled Sheets and Plates of various grades.

The Shearing Line is about 100 metres long with the following facilities: uncoiler, 5 roll flattener, 9 & 17 roll levellers, flying shear, conveyor belts, stackers, discharge table and weigh bridge in a continuous line. The line is controlled by a highly automated system employing control desks, sensors and transducers, programmable logic controllers and man-machine interfaces which are integrated with level-3 control systems.

Automated systems ensure proper dimension of the product. The line is equipped with a manual inspection provision where trained inspectors screen the product for any abnormality. Other features of the Shearing Line include automatic production recording of plates and bundles.

**Shearing Line**

**Quality & Process Control**

All the production lines are equipped with the latest technologies and have robust quality control mechanisms to check any abnormality in the process which might hamper the product quality.

Continuous Variable Crown, Thickness Control, Profile Control and Flatness Control (PCFC) and Automatic Width Control (AWC) are some of the features which enable us to ensure that the material produced meets customer needs.

**Inspection:**

Since the surface of the hot rolled steel is critical to any application, we have dedicated surface inspection systems to ensure top quality. These include:

- Online Surface Inspection System (SISS): The system inspects coils during processing and helps detect the surface quality correctly. This improves accuracy and reduces decision-making time.

- Manual Inspection – Certain grades of coils which are used for specialised operations and have extreme critical surface requirements are uncoiled and manually inspected for any defects. *

**Thickness Control**

* Only coils of certain grades and meant for certain applications are checked manually.
Testing Parameters

Chemical Composition: The chemical composition of the steel is tested at the steel making stage and the results are mentioned in the test certificate.

Elongation: The elongation of a material is basically the percentage change in the length of the material when tension is applied along the length. All our materials are tested for their elongation and the value is mentioned in the test certificate.

Tensile Testing: Tensile testing helps in finding out the maximum tensile load that the material can bear. It helps in specifying the UTS* as well as YS** of the material.

Impact Testing: It helps in establishing the impact load bearing capability of the material, that is, the force required to fracture it. It is a measure of the toughness of the material.

Bend Test: The bend test essentially measures a metal's ductility. Ductility defines how easily a metal can bend without breaking. The higher the ductility of a metal, the more it can bend without breaking or becoming deformed from its original shape. Our labs are equipped with the machinery to carry out the bend test and provide the tested value on the Test Certificate.

*Ultimate Tensile Strength
**Yield Strength
We believe that Hot Rolled Products forms the building blocks of lifting and excavation equipment. Be it the cabin of a tipper or the bucket of the excavator, each has to be made from the right grade of steel to ensure style and durability. Our range of hi-tensile steel suits the requirements of load bearing components and our formable grades of steel can be used to manufacture the smaller engine/cabin components.

Tata Steel has been a preferred steel supplier to almost all the major automobile manufacturers and their vendors in the country for over a decade. From our years of serving auto customers we have developed competencies that are important for the industry. Be it customized size requirement or prudent stock management, we are capable of partnering our customers in their progress. Tata Astrum can be used for manufacture of LM/CM, axles, wheel components, brackets, mountings etc. Ashok Leyland, Tata Motors, Toyota are some of our major HR customers.

Tata Astrum is supplied along with a test certificate which carries the details of all the mechanical properties of the supply lot, to make work easier for our customers.
As India treads its growth trajectory, infrastructure is an area which will grow at breakneck speed. Industrial projects and fabrication jobwork will aid this growth. Tata Astrum’s structural and hi-tensile grade steels are available in a wide range of thicknesses and widths. In order to authenticate the material as Tata Astrum, the logo of the brand will be imprinted on the surface *(will be available in some time). Our water-marked test certificates further help in differentiating our material.

*HR sheets can be made available to our customers in the sizes that they require, if suitably packed.

Railways

Railways is a segment where Tata Steel’s products have found ample use for over a decade now. Tata Astrum complies to BIS and IRS standards which are mandatory requirements of Directorate of Railways. Tata Astrum finds its uses in a host of applications like engine / coach components, spring planks, axles etc.