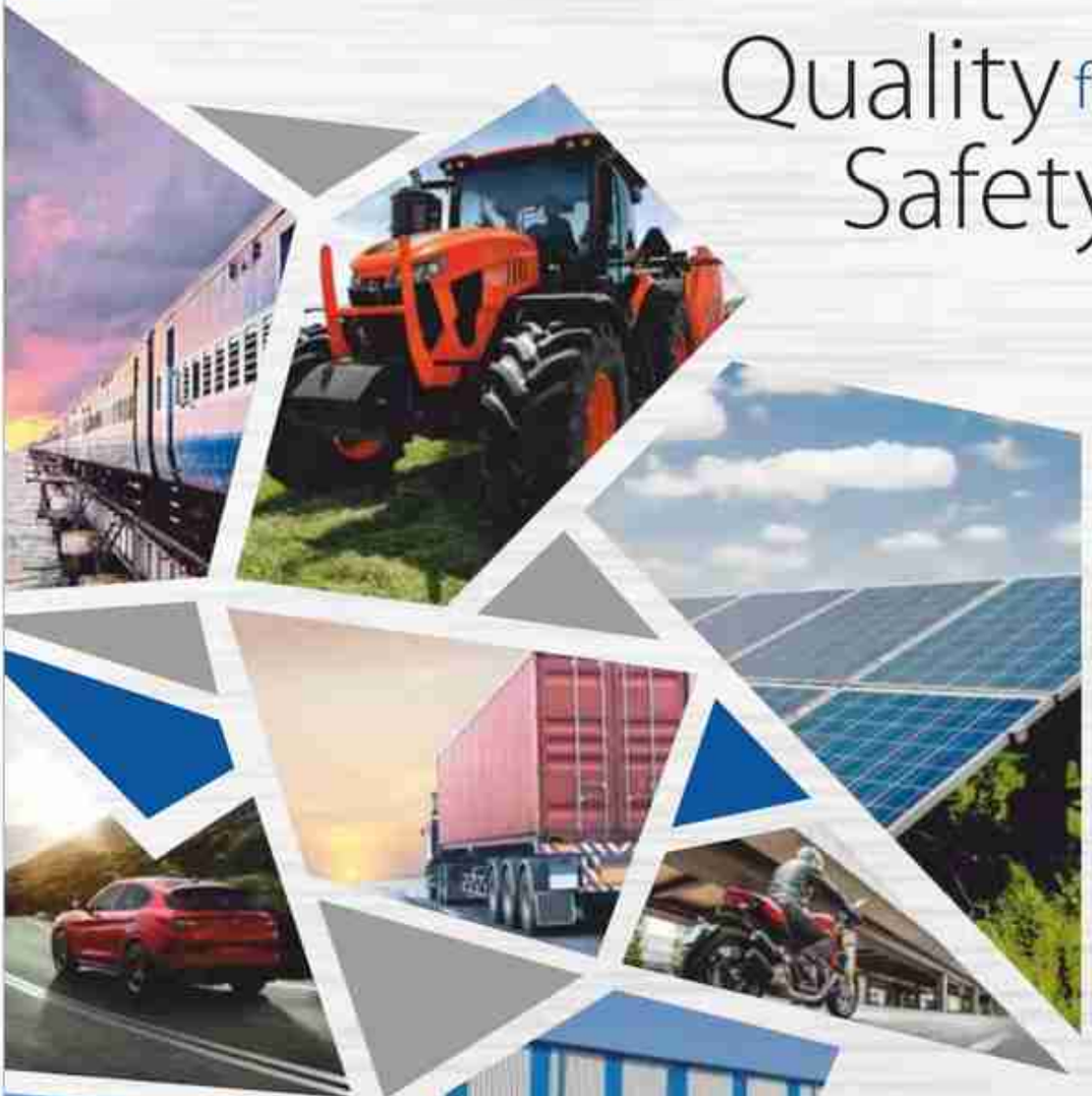
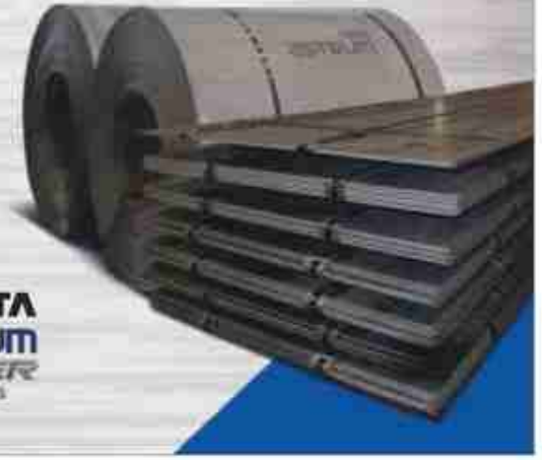
TATA STEEL
#WeAlsoMakeTomorrow

TATA
ASTRUM
HR SHEETS AND COILS

# Quality for growth
# Safety for life







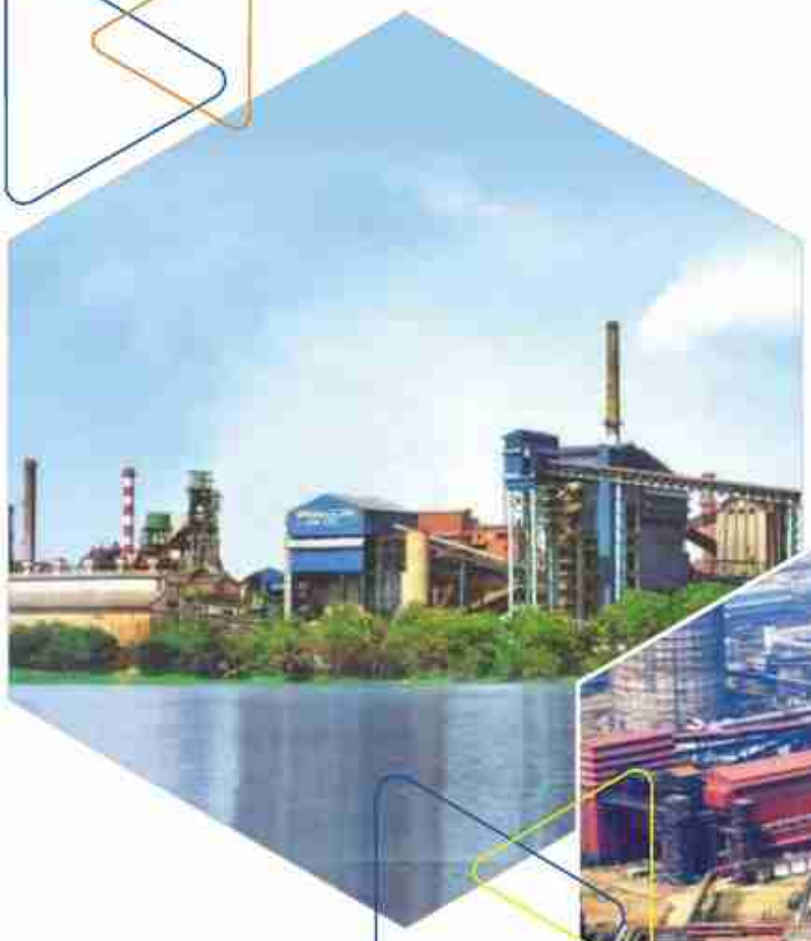
TATA ASTRUM HR SHEETS AND COILS | TATA ASTRUM SOLAR | TATA ASTRUM SUPER HR SHEETS

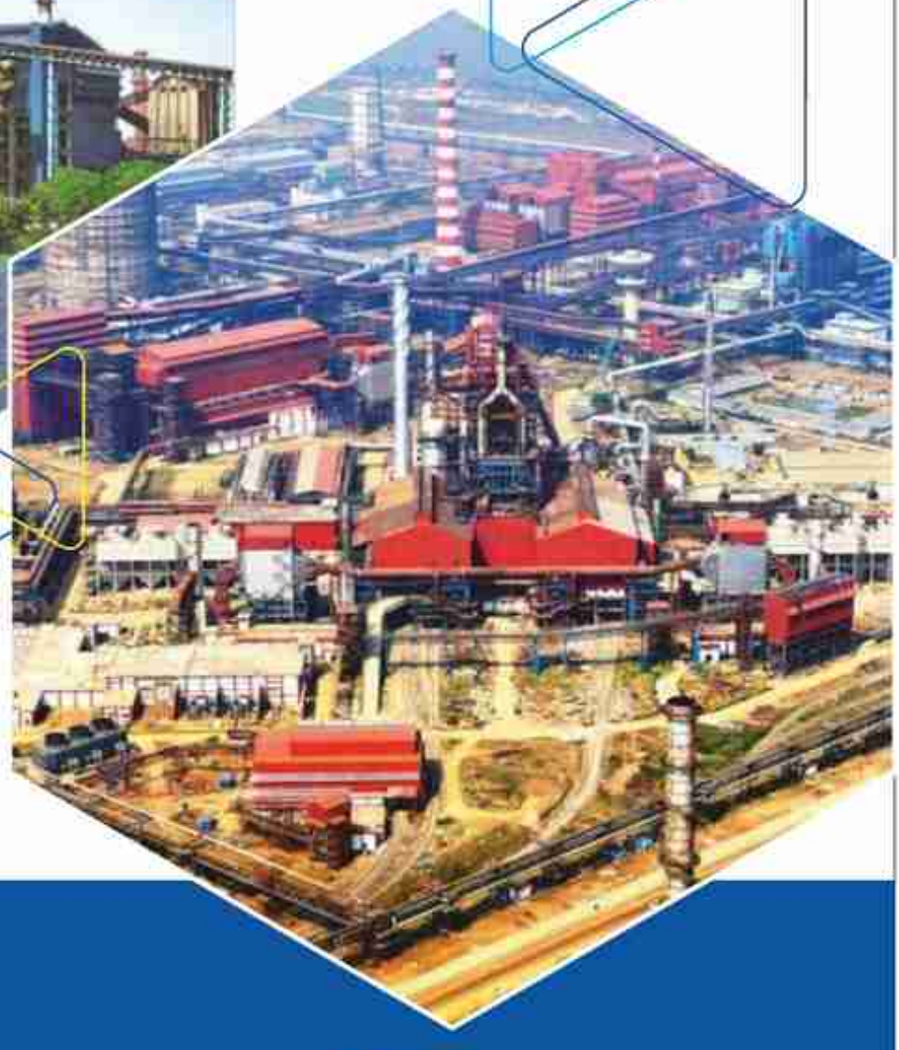


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# Tata Steel
# Pioneering innovation since 1907

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.

Pioneering innovation in products and services is ingrained in the culture of Tata Steel. Backed by continuous collaboration with its customers and keeping evolving needs in focus, the company has been able to roll out a series of initiatives to create unprecedented value.

Tata Astrum – first hot rolled steel brand of the country – comes as an offering from Tata Steel to ensure its customers remain competitive in global markets.

# Tata Astrum
# Partner in Progress

With a vision to cater to the aspirational needs of its customers, Tata Astrum was launched in 2012. It provides a basket of products and services, rooted in understanding and excellence, to ensure customers get a competitive edge.

These products meet the needs of a plethora of segments viz. Automotive, Yellow Goods, Project Fabrication, PEB, Solar, Railways, Transmission & Distribution etc. The vast product range is coupled with an array of unmatched services to ensure a hassle-free process for customers.









## Advantages













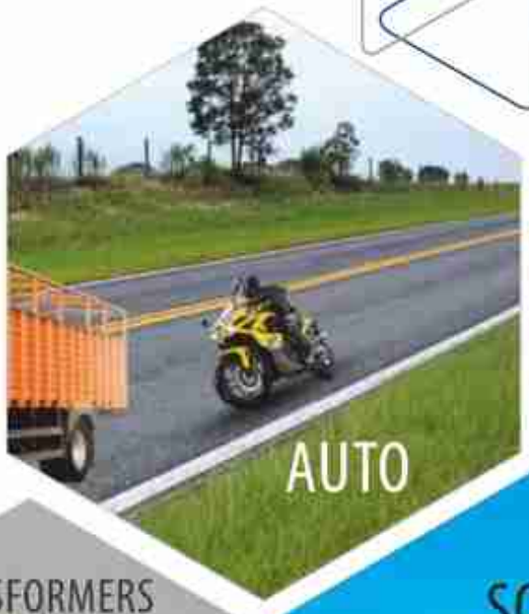







# Spectrum of applications
# Serving an array of segments



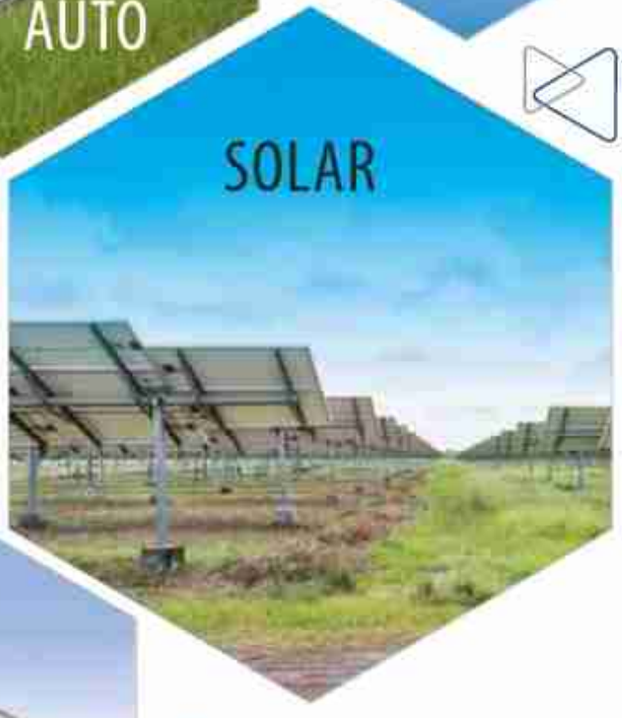










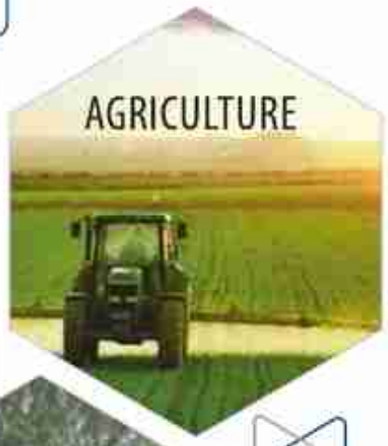





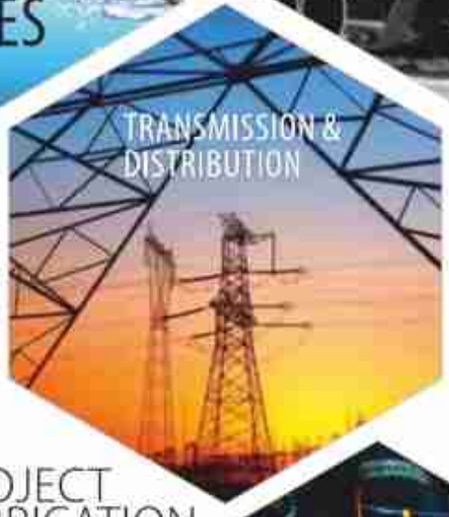


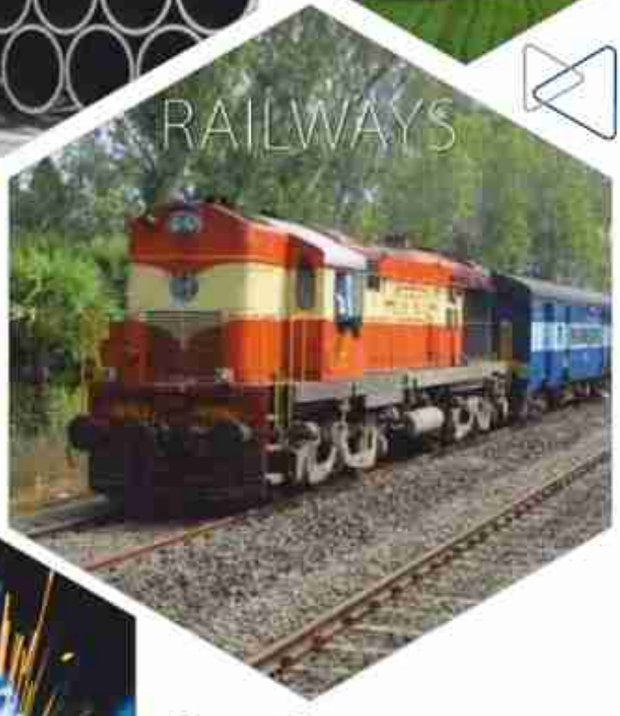









PROJECT
FABRICATION







# Adding new dimensions to serve you better

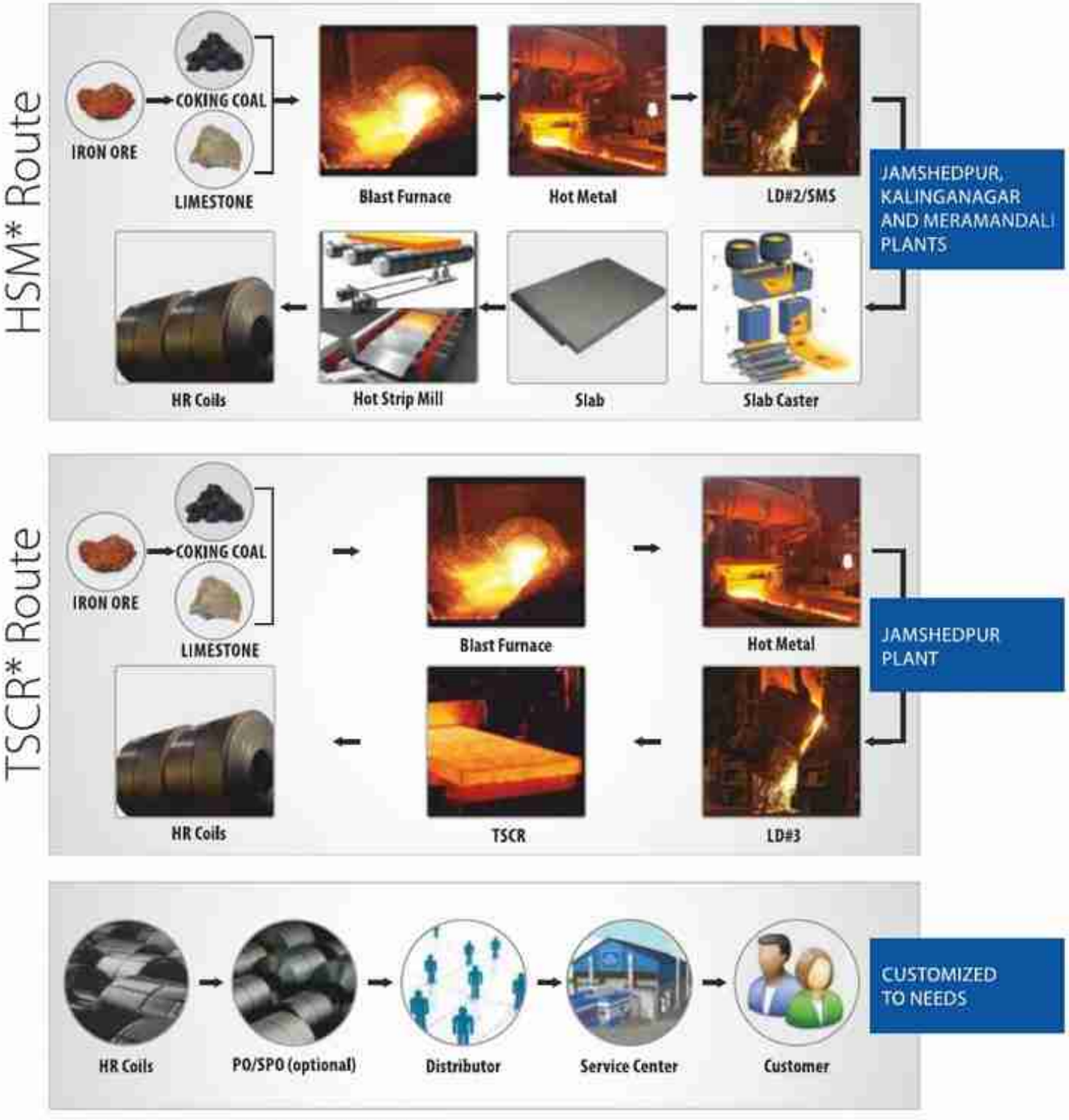
Products and grades required to serve various market applications are manufactured using state-of-the-art technologies at Tata Steel plants at Jamshedpur, Kalinganagar and Meramandali.

Tata Steel-Kalinganagar plant has added new dimensions to further cater to the needs of these segments and their applications.



# Manufacturing Process

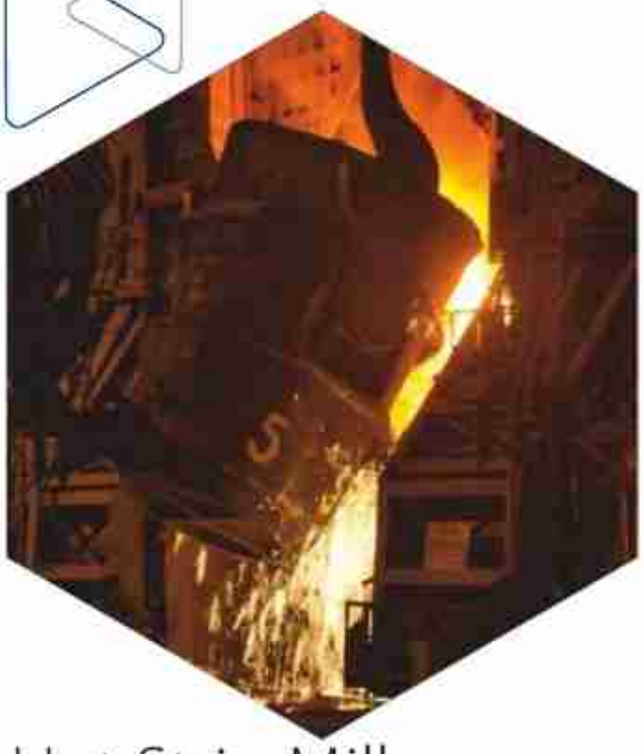
From steel making to final finishing, the entire production line incorporates state-of-the-art technologies and processes that make Tata Astrum a best-in-class product.




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

# 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 of steel.



# Hot Strip Mill

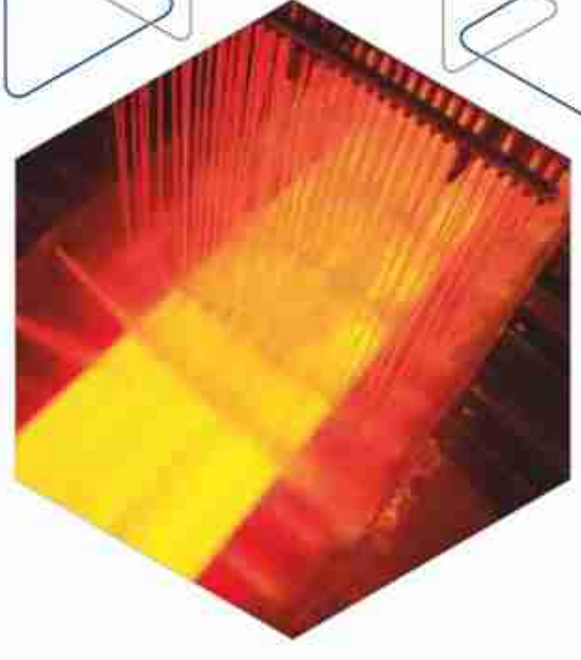
After the steel is cast into slabs, it is transferred to the Hot Strip Mill (HSM) where it is rolled to the desired thickness and width. The rolling and subsequent cooling is done in a manner so as to ensure that the final product (HR coil) attains its requisite mechanical properties (as per design parameters).



# LD#3 & TSCR Mill

## Thin Slab Caster & Rolling Mill

LD3 and TSCR 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. The mill is equipped with all the latest technologies to cater to different requirements of the customers.

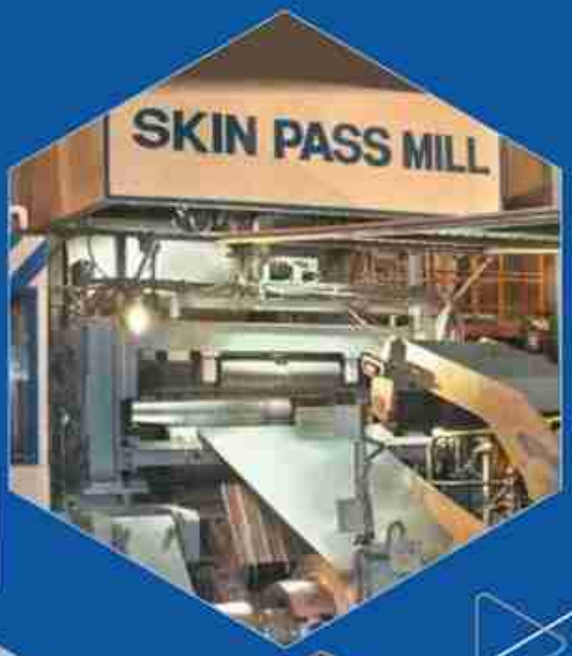


# Pickling, Oiling & Skin Passing

## PICKLING & OILING (HRPO)

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. Pickled and oiled steel sheets and coils are ideal for applications that require an even finish.

HRPO is available from our CRM Bara, CRC-W and BMW Gamharia mills.








## PICKLING, OILING & SKIN PASSING (HRSPO)

Skin-passing of the coils is done post the pickling & oiling process. It produces a smooth surface, makes the thickness of the coil uniform and does minor corrections in mechanical properties.

HRSPO is available from our CRM Bara and CRC-W mills.

*CRM Bara & BMW Gamharia – Jamshedpur, CRC-W – Tarapur

# Finishing Processes

## Shearing Line

The Shearing Line at the Hot Strip Mill enables Tata Steel to serve customers who require Hot Rolled Sheets and Plates of various grades.





## 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.

## Inspection

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





## Testing Parameters

Some of the parameters used for testing are chemical composition, elongation, tensile testing, impact testing, bend test etc.



# Product Offering

Tata Astrum comes in different forms to suit a variety of requirements. It conforms to Tata Steel's impeccable product quality standards.

## The product range includes

- **Hot Rolled Coils (HRC)**
- **Cut to length (CTL) Sheets**
- **Slit Coils**
- **Pickled & Oiled (PO)**
- **Skin Pass , Pickled & Oiled (SPO)**

# Tata Astrum TDCs

| | | | Thickness and Width | | | | Mechanical Properties | | | | Chemical Properties | | | | | | | | | Other Mechanical Properties | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Thickness Range (mm) | | Width Range (mm) | | YS (MPa) | | UTS (MPa) | | C | Mn | P | S | Si | Cr | Ni | Carbon Equivalent | Weld Alloys | Other Information | % Elongation | CVN | |
| TDC | Grade | Application | Min | Max | Min | Max | Min | Max | Min | Max | Max, unless otherwise specified | Max, unless otherwise specified | Max | Max | Max (IIW) | Max, unless otherwise specified | Max, unless otherwise specified | Max | | | Min | J | Temp |
| [illegible] | [illegible] | [illegible] | 3.00 | 4.50 | 900 | 2800 | 270 | - | 370 | - | 0.16 | 0.50 | 0.030 | 0.030 | 0.35 | - | 0.50 | - | - | - | 18 | - | - |
| [illegible] | [illegible] | [illegible] | 3.00 | 12.00 | 900 | 3050 | - | - | - | 460 | 0.18 | 0.40 | 0.025 | 0.025 | 0.35 | 0.50 | 0.50 | - | - | - | 25 | - | - |
| [illegible] | [illegible] | [illegible] | 2.00 | 4.50 | 900 | 2800 | 450 | - | 540 | 720 | 0.22 | 1.70 | 0.030 | 0.030 | - | - | 0.50 | 0.41 | - | - | 20 | - | - |
| [illegible] | [illegible] | [illegible] | 3.00 | 7.00 | 900 | 2800 | 460 | 540 | 560 | 690 | 0.23 | 1.60 | 0.035 | 0.025 | 0.50 | 0.50 | 0.50 | 0.41 | - | No Cold rings<br>If CVN min | 22 | - | - |
| [illegible] | [illegible] | [illegible] | 3.00 | 4.50 | 900 | 2800 | 500 | - | 610 | - | 0.21 | 1.50 | 0.030 | 0.030 | 0.40 | 0.50 | 0.50 | 0.43 | - | - | 20 | - | - |
| [illegible] | [illegible] | [illegible] | 3.00 | 12.00 | 1500 | 1500 | 540 | - | 660 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| [illegible] | [illegible] | [illegible] | 2.50 | 4.70 | 900 | 2800 | 570 | 670 | 670 | - | 0.21 | 1.50 | 0.030 | 0.030 | 0.40 | 0.50 | 0.50 | - | - | No Cold rings<br>If CVN min | 20 | - | - |
| [illegible] | [illegible] | [illegible] | 3.00 | 12.00 | 900 | 3050 | 570 | - | 670 | 840 | 0.21 | 1.50 | 0.030 | 0.030 | 0.40 | 0.50 | 0.50 | - | - | 6 IC | - | 27 | -20 |
| [illegible] | [illegible] | [illegible] | 6.00 | 6.00 | 6 | 6 | - | - | - | - | - | - | - | - | - | - | - | 0.50 | - | - | - | - | - |
| [illegible] | [illegible] | [illegible] | 4.00 | 6.00 | 6 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| [illegible] | [illegible] | [illegible] | 3.00 | 9.00 | 900 | 2800 | 570 | - | 670 | 840 | 0.21 | 0.35-0.65 | 0.03 | 0.02 | 0.5 | 0.5 | 0.5 | - | - | - | 20 | - | - |
| [illegible] | [illegible] | [illegible] | 4.00 | 6.00 | 6 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.07 Min | - | - | - |
| [illegible] | [illegible] | [illegible] | 2.00 | 12.00 | 900 | 1200 | - | - | - | - | 0.20 | 0.21 | 0.025 | 0.02 | 0.4 | 0.5 | 0.5 | - | - | - | - | - | - |
| [illegible] | [illegible] | [illegible] | 2.00 | 4.50 | 900 | 2800 | 650 | 800 | 690 | 830 | 0.20 | 1.50 | 0.04 | 0.035 | 0.50 | - | 0.50 | 0.43 | - | - | 17 | - | - |
| [illegible] | [illegible] | [illegible] | 1.20 | 4.50 | 900 | 2800 | 650 | - | 720 | - | 0.22 | 1.60 | 0.04 | 0.035 | 0.5 | - | - | - | - | - | 18 | - | - |
| [illegible] | [illegible] | [illegible] | 2.00 | 12.00 | 900 | 2800 | 700 | - | 790 | - | 0.20 | 0.70 | 0.04 | 0.04 | 0.5 | - | - | - | - | - | 16 | - | - |
| [illegible] | [illegible] | Tubes | 2.00 | 12.00 | 900 | 2800 | 700 | - | 790 | - | 0.20 | 0.70 | 0.04 | 0.04 | 0.5 | - | - | - | - | - | 16 | - | - |
| [illegible] | [illegible] | Steel Alloy Components requiring extra Strength | 2.00 | 4.50 | 900 | 1200 | - | - | - | 780 | 0.18 | 0.70 | 0.03 | 0.025 | 0.5 | 0.50 | 0.50 | - | - | - | 12 | - | - |
| [illegible] | [illegible] | Fabrication Requirement | 2.00 | 4.50 | 900 | 2800 | 700 | - | 810 | - | 0.22 | 1.50 | 0.040 | 0.040 | 0.5 | 0.50 | 0.50 | 0.41 | - | - | 12 | - | - |
| [illegible] | [illegible] | Fabrication Requirement | 3.00 | 12.00 | 900 | 2800 | 700 | - | 810 | - | 0.22 | 1.50 | 0.040 | 0.040 | 0.5 | 0.50 | 0.50 | 0.47 | - | Weld Alloys<br>0.53 Max | 12 | - | - |
| [illegible] | [illegible] | Fabrication Parts Requirement | 3.00 | 12.00 | 900 | 2800 | 700 | 810 | 810 | 940 | 0.22 | 1.50 | 0.040 | 0.040 | 0.5 | 0.50 | 0.50 | 0.43 | - | - | 12 | - | - |
| [illegible] | [illegible] | Tubes for Type Rods, Rockers for Earth Moving Equipment, PEB | 3.00 | 4.50 | 900 | 1600 | 650 | - | 800 | - | 0.20 | 1.50 | 0.03 | 0.02 | 0.5 | 0.50 | 0.50 | 0.43 | 0.53 CE IIW | - | 12 | 30 | -40 |
| [illegible] | [illegible] | Tubes for Type Rods, Rockers for Earth Moving Equipment, PEB | 3.00 | 4.50 | 900 | 1600 | 650 | - | 800 | - | 0.20 | 1.50 | 0.03 | 0.02 | 0.5 | 0.50 | 0.50 | 0.43 | 0.53 CE IIW | - | 12 | - | - |
| [illegible] | [illegible] | Structurals requiring Hot Dip Galvanizing | 3.00 | 12.00 | 900 | 1740 | 550 | 570 | 670 | 840 | 0.20 | 1.50 | 0.035 | 0.035 | 0.5 | 0.50 | - | - | - | - | 20 | - | - |
| [illegible] | [illegible] | Tube Blanks (Cross Compressor) | 3.00 | 7.00 | 900 | 2800 | 650 | - | 810 | - | 0.14-0.20 | 0.60-1.00 | 0.040 | 0.040 | 0.50 | - | 0.50 | - | - | - | 20 | - | - |
| [illegible] | [illegible] | Fabrication Structural | 3.00 | 12.00 | 900 | 1740 | 550 | - | 670 | - | 0.22 | 1.50 | 0.040 | 0.040 | 0.5 | 0.50 | 0.50 | - | - | - | 20 | 27 | - |
| [illegible] | [illegible] | Fabrication Parts Structurals | 3.00 | 6.00 | 900 | 1600 | 650 | - | 810 | 980 | 0.22 | 1.50 | 0.040 | 0.035 | 0.50 | 0.50 | - | - | - | - | 20 | - | - |
| [illegible] | [illegible] | Including Bulk Use Grade | 2.00 | 3.00 | 900 | 1600 | 650 | - | 810 | - | 0.22 | 1.50 | 0.040 | 0.040 | - | 0.50 | - | 0.43 | - | - | 18 | - | - |
| [illegible] | [illegible] | Structurals for Sale | 2.00 | 4.50 | 900 | 2800 | 550 | - | 690 | - | 0.20 | 1.50 | 0.04 | 0.04 | - | 0.50 | - | 0.43 | - | - | 22 | 27 | -40 |
| [illegible] | [illegible] | Structurals for Sale/ Fabrication Grade | 3.00 | 6.00 | 900 | 2800 | 550 | - | 690 | - | 0.20 | 1.50 | 0.04 | 0.04 | - | 0.50 | - | 0.43 | - | - | 22 | 27 | -20 |
| [illegible] | [illegible] | Fabrication/ Structurals | 3.00 | 9.00 | 900 | 1600 | 550 | - | 690 | 840 | 0.21 | 1.50 | 0.040 | 0.040 | 0.50 | 0.50 | - | 0.43 | - | - | 20 | 27 | - |
| [illegible] | [illegible] | Steel Metal Components requiring Bulk | 1.60 | 4.50 | 900 | 1600 | - | - | 540 | 820 | 0.20 | 0.60 | 0.04 | 0.035 | 0.5 | 0.50 | - | - | - | - | 20 | - | - |
| [illegible] | [illegible] | Bulk Structurals | 3.00 | 4.50 | 900 | 1200 | 650 | - | 690 | 820 | 0.22 | 1.50 | 0.04 | 0.04 | - | - | 0.50 | 0.43 | - | - | 20 | - | - |
| [illegible] | [illegible] | Tubes Pipe | 3.00 | 3.00 | 900 | 1600 | 650 | - | 670 | 820 | 0.20 | 1.40 | 0.025 | 0.020 | - | 0.50 | - | 0.43 | - | - | 22 | 27 | -20 |
| [illegible] | [illegible] | PEB | 2.50 | 4.50 | 900 | 1200 | 650 | - | 810 | - | 0.20 | 1.50 | 0.04 | 0.04 | - | - | - | 0.43 | Mn 0.50-0.80 | - | 22 | - | - |
| [illegible] | [illegible] | PEB | 3.00 | 12.00 | 900 | 1600 | 650 | - | 810 | - | 0.20 | 1.50 | 0.04 | 0.04 | - | - | - | 0.43 | Mn 0.90-1.60 | - | 22 | - | - |
| [illegible] | [illegible] | Tube Structurals | 2.50 | 4.50 | 900 | 2800 | 650 | 740 | 740 | 940 | 0.22 | 1.50 | 0.025 | 0.025 | - | 0.50 | 0.50 | 0.47 | Ni 0.50 max<br>Ti 0.040 max<br>V 0.030 max | - | 18 | - | -20 |
| [illegible] | [illegible] | Structural Fabrication | 3.00 | 4.50 | 900 | 1200 | - | 720 | - | 870 | 0.21 | 1.50 | 0.04 | 0.04 | 0.5 | - | 0.50 | - | - | - | - | - | - |
| [illegible] | [illegible] | Structurals | 3.00 | 7.00 | 900 | 1200 | 650 | - | 780 | 920 | 0.19-0.21 | 1.50-1.60 | 0.03 | 0.01 | 0.5 | 0.50 | 0.50 | 0.45 | Mn 0.50-1.60<br>Ni 0.50 max<br>Cu 0.70 max<br>Mo 0.07 Max<br>Ti 0.020 max | - | 21 | - | -5 |

*Name available from Manufacturer's Mill.

| | | | Thickness and Width | | | | Mechanical Properties | | | | Chemical Properties | | | | | | | | | | | Other Mechanical Properties | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Thickness Range (mm) | | Width Range (mm) | | YS (MPa) | | UTS (MPa) | | C | Mn | P | S | Si | Cr | Ni | Carbon Equivalent | Micro Alloys | Other Elements | % Elongation | CVN | |
| TC | Grade | Application | Min | Max | Min | Max | Min | Max | Min | Max | Max, Under Heat Inform Report | Max, Under Heat Inform Report | Max | Max | Max (PPM) | Max, Under Heat Inform Report | Max, Under Heat Inform Report | Max | | | Min | J | J (Avg) |
| HR201 | [illegible] | Structure | 4.00 | 12.00 | 900 | 1700 | 300 | | 500 | 620 | 0.150.20 | 1.50 | 0.035 | 0.030 | 120 | 0.150.20 | 0.20 | 0.41 | Nb+V+Ti 0.025-0.15 | Mo 0.07 max<br>Cu 0.50 max<br>Cu+Ni 0.70 max<br>Ni 0.30 max<br>Mo+Cr 0.35 max | 21 | 27 | 0 |
| HR202 | [illegible] | Structure & Mechanical | 3.00 | 12.00 | 1200 | 1600 | 350 | | 450 | 570 | 0.20 | 1.60 | 0.035 | 0.030 | 130 | | 0.30 | | | | 20 | | |
| HR203 | [illegible] | Structural Components | 2.50 | 12.00 | 900 | 1600 | 355 | | 470 | 630 | 0.20 | 1.60 | 0.035 | 0.030 | 130 | | 0.30 | 0.41 | | | 19 | | |
| HR204 | [illegible] | Tube and Components | 4.00 | 8.00 | 900 | 1600 | 345 | | 520 | 660 | 0.15 | 0.60 | 0.040 | 0.030 | 120 | | 0.30 | | | | 18 | | |
| HR205 | [illegible] | Oil & Gas | 5.00 | 12.00 | 800 | 1550 | - | | - | - | 0.08 | 0.50 | 0.025 | 0.020 | 90 | 0.30 | 0.30 | 0.32 | | | | | |
| HR206* | [illegible] | Steel HR Components | 3.00 | 6.00 | 800 | 1550 | | | | 620 | 0.18 | 0.90 | 0.040 | 0.030 | 140 | 0.15 | | | | | 20 | | |
| HR207 | [illegible] | Fabrication Tank Structures | 3.00 | 7.00 | 900 | 1550 | 250 | - | 400 | - | 0.20 | 1.50 | 0.035 | 0.030 | 120 | 0.30 | 0.30 | 0.41 | | | 21 | | |
| HR208 | [illegible] | Axle Structures | 5.00 | 7.00 | 900 | 1600 | 320 | 410 | 500 | 670 | 0.20 | 0.90 | 0.030 | 0.020 | 120 | 0.30 | 0.30 | | Nb 0.025 max<br>Ti 0.050 max<br>V 0.200 max | | 17 | | |
| HR209* | [illegible] | Fabrication Axle Structures | 5.00 | 7.00 | 900 | 1700 | 350 | | 470 | | 0.20 | 1.60 | 0.040 | 0.030 | 130 | 0.30 | 0.30 | 0.32 | | Nb 0.05 | 20 | | |
| HR210 | [illegible] | Steering Components | 5.00 | 6.00 | 900 | 1550 | - | | - | 680 | 0.15 | 0.90 | 0.040 | 0.030 | 120 | 0.30 | | 0.32 | | | 24 | | |
| HR211 | [illegible] | Axle Structures | 5.00 | 6.00 | 900 | 1600 | 320 | 410 | 500 | 650 | 0.20 | 1.60 | 0.035 | 0.030 | 120 | 0.30 | 0.30 | 0.41 | Nb 0.025 max<br>Ti 0.050 max<br>V 0.200 max | | 20 | | |
| HR212 | [illegible] | Axle Structures | 3.00 | 7.00 | 900 | 1600 | 350 | 450 | 500 | 650 | 0.20 | 0.90 | 0.030 | 0.020 | 120 | 0.30 | 0.30 | 0.32 | | | 20 | | |
| HR213 | [illegible] | Axle Components | 5.00 | 7.00 | 900 | 1600 | 320 | 410 | 500 | 650 | 0.20 | 1.60 | 0.035 | 0.030 | 120 | 0.30 | 0.30 | 0.41 | | | 20 | | |
| HR214 | [illegible] | Axle Structures | 3.00 | 6.00 | 900 | 1600 | 320 | 410 | 500 | 650 | 0.20 | 1.60 | 0.035 | 0.030 | 120 | 0.30 | 0.30 | 0.41 | Nb 0.025 max<br>Ti 0.050 max<br>V 0.200 max | | 20 | | |
| HR215 | [illegible] | Axle Structures | 3.00 | 6.00 | 900 | 1600 | 320 | 410 | 500 | 650 | 0.20 | 1.60 | 0.035 | 0.030 | 120 | 0.30 | 0.30 | 0.41 | Nb 0.025 max<br>Ti 0.050 max<br>V 0.200 max | | 20 | | |
| HR216 | [illegible] | Axle Structures | 3.00 | 6.00 | 900 | 1600 | 320 | 410 | 500 | 650 | 0.20 | 1.60 | 0.035 | 0.030 | 120 | 0.30 | 0.30 | 0.41 | Nb 0.025 max<br>Ti 0.050 max<br>V 0.200 max | | 20 | | |
| HR217 | [illegible] | Axle Structures | 3.00 | 6.00 | 900 | 1600 | 320 | 410 | 500 | 650 | 0.20 | 1.60 | 0.035 | 0.030 | 120 | 0.30 | 0.30 | 0.41 | Nb 0.025 max<br>Ti 0.050 max<br>V 0.200 max | | 20 | | |
| HR218 | [illegible] | Axle Structures | 3.00 | 6.00 | 900 | 1600 | 320 | 410 | 500 | 650 | 0.20 | 1.60 | 0.035 | 0.030 | 120 | 0.30 | 0.30 | 0.41 | Nb 0.025 max<br>Ti 0.050 max<br>V 0.200 max | | 20 | | |
| HR219 | [illegible] | Axle Structures | 3.00 | 6.00 | 900 | 1600 | 320 | 410 | 500 | 650 | 0.20 | 1.60 | 0.035 | 0.030 | 120 | 0.30 | 0.30 | 0.41 | Nb 0.025 max<br>Ti 0.050 max<br>V 0.200 max | | 20 | | |
| HR220 | [illegible] | Axle Structures | 3.00 | 6.00 | 900 | 1600 | 320 | 410 | 500 | 650 | 0.20 | 1.60 | 0.035 | 0.030 | 120 | 0.30 | 0.30 | 0.41 | Nb 0.025 max<br>Ti 0.050 max<br>V 0.200 max | | 20 | | |
| HR221 | [illegible] | Axle Structures | 3.00 | 6.00 | 900 | 1600 | 320 | 410 | 500 | 650 | 0.20 | 1.60 | 0.035 | 0.030 | 120 | 0.30 | 0.30 | 0.41 | Nb 0.025 max<br>Ti 0.050 max<br>V 0.200 max | | 20 | | |
| HR222 | [illegible] | Axle Structures | 3.00 | 6.00 | 900 | 1600 | 320 | 410 | 500 | 650 | 0.20 | 1.60 | 0.035 | 0.030 | 120 | 0.30 | 0.30 | 0.41 | Nb 0.025 max<br>Ti 0.050 max<br>V 0.200 max | | 20 | | |
| HR223 | [illegible] | Axle Structures | 3.00 | 6.00 | 900 | 1600 | 320 | 410 | 500 | 650 | 0.20 | 1.60 | 0.035 | 0.030 | 120 | 0.30 | 0.30 | 0.41 | Nb 0.025 max<br>Ti 0.050 max<br>V 0.200 max | | 20 | | |
| HR224 | [illegible] | Axle Structures | 3.00 | 6.00 | 900 | 1600 | 320 | 410 | 500 | 650 | 0.20 | 1.60 | 0.035 | 0.030 | 120 | 0.30 | 0.30 | 0.41 | Nb 0.025 max<br>Ti 0.050 max<br>V 0.200 max | | 20 | | |
| HR225 | [illegible] | Axle Structures | 3.00 | 6.00 | 900 | 1600 | 320 | 410 | 500 | 650 | 0.20 | 1.60 | 0.035 | 0.030 | 120 | 0.30 | 0.30 | 0.41 | Nb 0.025 max<br>Ti 0.050 max<br>V 0.200 max | | 20 | | |
| HR226 | [illegible] | Axle Structures | 3.00 | 6.00 | 900 | 1600 | 320 | 410 | 500 | 650 | 0.20 | 1.60 | 0.035 | 0.030 | 120 | 0.30 | 0.30 | 0.41 | Nb 0.025 max<br>Ti 0.050 max<br>V 0.200 max | | 20 | | |
| HR227 | [illegible] | Axle Structures | 3.00 | 6.00 | 900 | 1600 | 320 | 410 | 500 | 650 | 0.20 | 1.60 | 0.035 | 0.030 | 120 | 0.30 | 0.30 | 0.41 | Nb 0.025 max<br>Ti 0.050 max<br>V 0.200 max | | 20 | | |
| HR228 | [illegible] | Axle Structures | 3.00 | 6.00 | 900 | 1600 | 320 | 410 | 500 | 650 | 0.20 | 1.60 | 0.035 | 0.030 | 120 | 0.30 | 0.30 | 0.41 | Nb 0.025 max<br>Ti 0.050 max<br>V 0.200 max | | 20 | | |
| HR229 | [illegible] | Axle Structures | 3.00 | 6.00 | 900 | 1600 | 320 | 410 | 500 | 650 | 0.20 | 1.60 | 0.035 | 0.030 | 120 | 0.30 | 0.30 | 0.41 | Nb 0.025 max<br>Ti 0.050 max<br>V 0.200 max | | 20 | | |
| HR230 | [illegible] | Axle Structures | 3.00 | 6.00 | 900 | 1600 | 320 | 410 | 500 | 650 | 0.20 | 1.60 | 0.035 | 0.030 | 120 | 0.30 | 0.30 | 0.41 | Nb 0.025 max<br>Ti 0.050 max<br>V 0.200 max | | 20 | | |
| HR231 | [illegible] | Axle Structures | 3.00 | 6.00 | 900 | 1600 | 320 | 410 | 500 | 650 | 0.20 | 1.60 | 0.035 | 0.030 | 120 | 0.30 | 0.30 | 0.41 | Nb 0.025 max<br>Ti 0.050 max<br>V 0.200 max | | 20 | | |
| HR232 | [illegible] | Axle Structures | 3.00 | 6.00 | 900 | 1600 | 320 | 410 | 500 | 650 | 0.20 | 1.60 | 0.035 | 0.030 | 120 | 0.30 | 0.30 | 0.41 | Nb 0.025 max<br>Ti 0.050 max<br>V 0.200 max | | 20 | | |
| HR233 | [illegible] | Axle Structures | 3.00 | 6.00 | 900 | 1600 | 320 | 410 | 500 | 650 | 0.20 | 1.60 | 0.035 | 0.030 | 120 | 0.30 | 0.30 | 0.41 | Nb 0.025 max<br>Ti 0.050 max<br>V 0.200 max | | 20 | | |
| HR234 | [illegible] | Axle Structures | 3.00 | 6.00 | 900 | 1600 | 320 | 410 | 500 | 650 | 0.20 | 1.60 | 0.035 | 0.030 | 120 | 0.30 | 0.30 | 0.41 | Nb 0.025 max<br>Ti 0.050 max<br>V 0.200 max | | 20 | | |
| HR235 | [illegible] | Axle Structures | 3.00 | 6.00 | 900 | 1600 | 320 | 410 | 500 | 650 | 0.20 | 1.60 | 0.035 | 0.030 | 120 | 0.30 | 0.30 | 0.41 | Nb 0.025 max<br>Ti 0.050 max<br>V 0.200 max | | 20 | | |
| HR236 | [illegible] | Axle Structures | 3.00 | 6.00 | 900 | 1600 | 320 | 410 | 500 | 650 | 0.20 | 1.60 | 0.035 | 0.030 | 120 | 0.30 | 0.30 | 0.41 | Nb 0.025 max<br>Ti 0.050 max<br>V 0.200 max | | 20 | | |
| HR237 | [illegible] | Axle Structures | 3.00 | 6.00 | 900 | 1600 | 320 | 410 | 500 | 650 | 0.20 | 1.60 | 0.035 | 0.030 | 120 | 0.30 | 0.30 | 0.41 | Nb 0.025 max<br>Ti 0.050 max<br>V 0.200 max | | 20 | | |
| HR238 | [illegible] | Axle Structures | 3.00 | 6.00 | 900 | 1600 | 320 | 410 | 500 | 650 | 0.20 | 1.60 | 0.035 | 0.030 | 120 | 0.30 | 0.30 | 0.41 | Nb 0.025 max<br>Ti 0.050 max<br>V 0.200 max | | 20 | | |
| HR239 | [illegible] | Axle Structures | 3.00 | 6.00 | 900 | 1600 | 320 | 410 | 500 | 650 | 0.20 | 1.60 | 0.035 | 0.030 | 120 | 0.30 | 0.30 | 0.41 | Nb 0.025 max<br>Ti 0.050 max<br>V 0.200 max | | 20 | | |
| HR240 | [illegible] | Axle Structures | 3.00 | 6.00 | 900 | 1600 | 320 | 410 | 500 | 650 | 0.20 | 1.60 | 0.035 | 0.030 | 120 | 0.30 | 0.30 | 0.41 | Nb 0.025 max<br>Ti 0.050 max<br>V 0.200 max | | 20 | | |
| HR241 | [illegible] | Axle Structures | 3.00 | 6.00 | 900 | 1600 | 320 | 410 | 500 | 650 | 0.20 | 1.60 | 0.035 | 0.030 | 120 | 0.30 | 0.30 | 0.41 | Nb 0.025 max<br>Ti 0.050 max<br>V 0.200 max | | 20 | | |
| HR242 | [illegible] | Axle Structures | 3.00 | 6.00 | 900 | 1600 | 320 | 410 | 500 | 650 | 0.20 | 1.60 | 0.035 | 0.030 | 120 | 0.30 | 0.30 | 0.41 | Nb 0.025 max<br>Ti 0.050 max<br>V 0.200 max | | 20 | | |
| HR243 | [illegible] | Axle Structures | 3.00 | 6.00 | 900 | 1600 | 320 | 410 | 500 | 650 | 0.20 | 1.60 | 0.035 | 0.030 | 120 | 0.30 | 0.30 | 0.41 | Nb 0.025 max<br>Ti 0.050 max<br>V 0.200 max | | 20 | | |
| HR244 | [illegible] | Axle Structures | 3.00 | 6.00 | 900 | 1600 | 320 | 410 | 500 | 650 | 0.20 | 1.60 | 0.035 | 0.030 | 120 | 0.30 | 0.30 | 0.41 | Nb 0.025 max<br>Ti 0.050 max<br>V 0.200 max | | 20 | | |
| HR245 | [illegible] | Axle Structures | 3.00 | 6.00 | 900 | 1600 | 320 | 410 | 500 | 650 | 0.20 | 1.60 | 0.035 | 0.030 | 120 | 0.30 | 0.30 | 0.41 | Nb 0.025 max<br>Ti 0.050 max<br>V 0.200 max | | 20 | | |
| HR246 | [illegible] | Axle Structures | 3.00 | 6.00 | 900 | 1600 | 320 | 410 | 500 | 650 | 0.20 | 1.60 | 0.035 | 0.030 | 120 | 0.30 | 0.30 | 0.41 | Nb 0.025 max<br>Ti 0.050 max<br>V 0.200 max | | 20 | | |
| HR247 | [illegible] | Axle Structures | 3.00 | 6.00 | 900 | 1600 | 320 | 410 | 500 | 650 | 0.20 | 1.60 | 0.035 | 0.030 | 120 | 0.30 | 0.30 | 0.41 | Nb 0.025 max<br>Ti 0.050 max<br>V 0.200 max | | 20 | | |
| HR248 | [illegible] | Axle Structures | 3.00 | 6.00 | 900 | 1600 | 320 | 410 | 500 | 650 | 0.20 | 1.60 | 0.035 | 0.030 | 120 | 0.30 | 0.30 | 0.41 | Nb 0.025 max<br>Ti 0.050 max<br>V 0.200 max | | 20 | | |
| HR249 | [illegible] | Axle Structures | 3.00 | 6.00 | 900 | 1600 | 320 | 410 | 500 | 650 | 0.20 | 1.60 | 0.035 | 0.030 | 120 | 0.30 | 0.30 | 0.41 | Nb 0.025 max<br>Ti 0.050 max<br>V 0.200 max | | 20 | | |
| HR250 | [illegible] | Axle Structures | 3.00 | 6.00 | 900 | 1600 | 320 | 410 | 500 | 650 | 0.20 | 1.60 | 0.035 | 0.030 | 120 | 0.30 | 0.30 | 0.41 | Nb 0.025 max<br>Ti 0.050 max<br>V 0.200 max | | 20 | | |

* New products from Mukandnagar Mill

| | | | Thickness and Width | | | | Mechanical Properties | | | | Chemical Properties | | | | | | | | | | Other Mechanical Properties | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Thickness Range (mm) | | Width Range (mm) | | Yield Strength (MPa) | | UTS (MPa) | | C | Mn | P | S | Si | Cr | Ni | Carbon Equivalent | Work Hardening | Other Information | % Elongation | HBW | HRB |
| SN | Grade | Application | Min | Max | Min | Max | Min | Max | Min | Max | Min, Value Varies with Thickness and Width | Min, Value Varies with Thickness and Width | Max | Max | Max | Min, Value Varies with Thickness and Width | Max, Value Varies with Thickness and Width | Max | | | Min | Max | Max |
| 1 | [illegible] | Precision Tubes | 1.60 | 4.50 | 406 | 1000 | 276 | - | 530 | | 0.10 - 0.16 | 0.30 - 0.37 | 0.025 | 0.015 | 0.40 | 0.20 | 0.20 | 0.01 - 0.16 | | 0.10 - 0.18 mm | 32 | | |
| 2 | [illegible] | Direct Forming Applications | 1.60 | 3.20 | 406 | 660 | 310 | - | 530 | | 0.10 | 1.00 | 0.04 | 0.06 | 0.40 | 0.20 | 0.20 | 0.16 | | | 32 | | |
| 3 | [illegible] | Micro-HSS Components | 0.50 | 12.00 | 406 | 1000 | 310 | - | 470 | 620 | 0.10 | 1.00 | 0.025 | 0.025 | | | | 0.01 | | Micro-Hardness: 425 mm | 35 | 87 | 90 |
| 4 | [illegible] | Fabrication Structures | 2.00 | 8.00 | 406 | 1000 | 460 | - | 530 | 670 | 0.10 | 1.00 | 0.025 | 0.015 | | | | 0.03 | | Min 0.20 mm, Max 0.75 mm, ± 0.20 mm | 27 | 87 | 97 |
| 5 | [illegible] | | 2.00 | 4.50 | 406 | 650 | 310 | - | 460 | | 0.06 | 1.10 | 0.04 | 0.04 | 0.30 | 0.50 | 0.50 | 0.03 - 0.20 | | | 35 | 97 | 0 |
| 6 | [illegible] | Forming | 1.60 | 3.00 | 406 | 660 | | | | 610 | 0.10 | 0.30 - 0.45 | 0.04 | 0.025 | 0.20 | 0.70 | 0.70 | 0.28 | | 0.4 ± 0.02 mm | 32 | | |
| 7 | [illegible] | Fabrication & Pressurisation | 10.00 | 20.00 | 800 | 2000 | 310 | - | 450 | | 0.10 | 1.00 | 0.04 | 0.040 | 0.50 | 0.80 | 0.80 | 0.35 | 0.40 | | 28 | | |
| 8 | [illegible] | Fabrication & Pressurisation | 2.00 | 4.50 | 406 | 1000 | 276 | - | 530 | | 0.10 | 1.00 | 0.040 | 0.040 | 0.50 | 0.80 | 0.80 | 0.35 | 0.42 | | 26 | | |
| 9 | [illegible] | Fabrication & Structurals | 1.60 | 3.20 | 406 | 1000 | 276 | - | 530 | | 0.10 | 1.00 | 0.035 | 0.040 | 0.50 | 0.80 | | | 0.42 | | 27 | | |
| 10 | [illegible] | Fabrication & Structurals | 0.50 | 12.00 | 406 | 2000 | 276 | - | 530 | | 0.10 | 1.00 | 0.040 | 0.040 | 0.50 | 0.80 | | | 0.42 | | 27 | | |
| 11 | [illegible] | Environmental & Process Applications | 1.60 | 4.50 | 406 | 1000 | 310 | 510 | 530 | 670 | 0.10 | 0.16 | 0.03 | 0.01 | 0.40 | 0.20 | 0.20 | | | Min 0.20 mm, 0.8 mm max, 0.1 mm min | 27 | | |
| 12 | [illegible] | Oil Tool & Casing | 2.00 | 4.50 | 406 | 1000 | 310 | 450 | 460 | | 0.10 | 1.00 | 0.40 | 0.40 | 0.30 | 0.50 | 0.50 | 0.42 | 0.42 | | 26 | | |
| 13 | [illegible] | Fabrication, Auto | 2.00 | 4.50 | 406 | 1000 | 310 | - | 460 | 530 | 0.12 | 1.00 | 0.025 | 0.012 | 0.30 | 0.50 | | 0.33 | | Min 0.40 mm, 0.8 mm max, ± 0.20 mm | 32 | | |
| 14 | [illegible] | Fabrication Structures | 2.50 | 3.00 | 406 | 1000 | 276 | - | 450 | | 0.25 | 1.10 | 0.060 | 0.060 | 0.50 | 0.80 | 0.80 | 0.32 | 0.42 | | 26 | | |
| 15 | [illegible] | Fabrication Structures | 3.00 | 3.00 | 406 | 1000 | 310 | - | 470 | 530 | 0.10 | 1.00 | 0.30 | 0.30 | 0.50 | 0.80 | 0.80 | 0.32 | 0.42 | | 32 | 87 | 90 |
| 16 | [illegible] | Shortwalls/Commercial Tubes | 2.00 | 3.00 | 406 | 1000 | 310 | - | 460 | 600 | 0.08 - 0.12 | 0.30 - 0.50 | 0.025 | 0.02 | 0.30 | 0.50 - 0.80 | 0.50 - 0.80 | | | Min 0.20 mm, Max 0.80 mm | 29 | | |
| 17 | [illegible] | Fabrication Structures | 0.50 | 16.00 | 406 | 1000 | 310 | - | 460 | | 0.10 | 1.00 | 0.30 | 0.30 | 0.50 | 0.80 | 0.80 | 0.32 | 0.42 | | 27 | 87 | 90 |
| 18 | [illegible] | Fabrication Structures | 0.50 | 16.00 | 760 | 2000 | 310 | - | 460 | | 0.10 | 1.00 | 0.30 | 0.30 | 0.50 | 0.80 | 0.80 | 0.32 | 0.42 | Min 0.20 mm, 0.8 mm max, ± 0.20 mm | 25 | 87 | 90 |
| 19 | [illegible] | Shortwalls | 2.00 | 4.50 | 406 | 1000 | 310 | - | 470 | 610 | 0.10 | 1.00 | 0.30 | 0.30 | 0.50 | 0.80 | 0.80 | 0.32 | 0.42 | | 27 | 87 | 90 |
| 20 | [illegible] | Shortwalls | 1.60 | 3.20 | 406 | 1000 | 310 | - | 530 | 690 | 0.10 | 1.00 | 0.30 | 0.30 | 0.50 | 0.80 | 0.80 | 0.32 | 0.42 | | 23 | 87 | 90 |
| 21 | [illegible] | Shortwalls | 4.00 | 12.00 | 800 | 1000 | 310 | - | 530 | 690 | 0.10 | 1.00 | 0.30 | 0.30 | 0.50 | 0.80 | 0.80 | 0.32 | 0.42 | | 25 | 87 | 90 |
| 22 | [illegible] | Shortwalls | 12.00 | 16.00 | 800 | 1000 | 310 | - | 460 | 600 | 0.10 | 1.00 | 0.30 | 0.30 | 0.50 | 0.80 | 0.80 | 0.32 | 0.39 | | 25 | 87 | 90 |
| 23 | [illegible] | Fabrication & Structurals (High Wall Area) | 1.60 | 3.20 | 760 | 2000 | 310 | - | 530 | | 0.10 | 1.00 | 0.30 | 0.30 | 0.50 | 0.80 | 0.80 | 0.32 | 0.42 | 0.4 ± 0.02 mm | 27 | | |
| 24 | [illegible] | Fabrication & Structurals (High Wall Area) | 3.00 | 12.00 | 406 | 2000 | 310 | - | 510 | | 0.10 | 1.00 | 0.30 | 0.30 | 0.50 | 0.80 | 0.80 | 0.32 | 0.42 | 0.4 ± 0.02 mm | 27 | | |
| 25 | [illegible] | Fabrication & Structurals | 3.00 | 3.20 | 406 | 1000 | 310 | - | 530 | - | 0.10 | 1.00 | 0.040 | 0.040 | 0.50 | 0.80 | 0.80 | 0.32 | 0.42 | | 28 | | |
| 26 | [illegible] | Railways/Tubes Lorries | 1.00 | 3.00 | 800 | 2000 | 310 | - | 530 | 610 | 0.12 | 1.00 | 0.025 | 0.010 | 0.30 | 0.50 | 0.50 | 0.30 | 0.420 | Min 0.40 mm, 0.8 mm, ± 0.20 mm Micro-Hardness: 420 mm | 26 | | |
| 27 | [illegible] | Railways/Tubes Lorries | 4.00 | 12.00 | 800 | 2000 | 340 | - | 530 | 670 | 0.10 | 1.00 | 0.025 | 0.01 | 0.30 | 0.50 | 0.50 | 0.30 | 0.420 | Min 0.40 mm, 0.8 mm, ± 0.20 mm Micro-Hardness: 420 mm | 26 | | |
| 28 | [illegible] | Fabrication/Components | 3.00 | 3.20 | 406 | 2000 | 310 | - | 490 | 540 | 0.12 | 1.00 | 0.025 | 0.012 | | 0.20 | 0.20 | 0.33 | | Min 0.40 mm, 0.8 mm, ± 0.20 mm Micro-Hardness: 420 mm | 29 | 87 | 0 |

* Now available from Mynarmin 450 MX

| | | | Thickness and Width | | | | Mechanical Properties | | | | Chemical Properties | | | | | | | | | | Other Mechanical Properties | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Thickness Range (mm) | | Width Range (mm) | | YS (MPa) | | UTS (MPa) | | C | Mn | P | S | Si | Cr | Al | Carbon Equivalent | Micro Alloys | Other Elements | % Elongation | CVN | CVN |
| SN | Grades | Applications | Min | Max | Min | Max | Min | Max | Min | Max | Max. (Value may be adjusted for weight) | Max. (Value may be adjusted for weight) | Max | Max | Max | Max. (Value may be adjusted for weight) | Max. (Value may be adjusted for weight) | Max | | | Min | T | Sample |
| 0701 | [illegible] | Fabricated components | 6.00 | 12.00 | 800 | 2000 | 550 | 650 | 590 | 740 | 0.12 | 1.80 | 0.025 | 0.015 | | 0.50 | 0.075 | | Nb: 0.09 max; Ti: 0.15 max; V: 0.10 max; N: 0.015 max; others: 0.12 max | | 19 | 27 | 9 |
| 0702 | [illegible] grade | | 5.00 | 12.00 | 800 | 2000 | 650 | 750 | 590 | 740 | 0.12 | 1.80 | 0.025 | 0.015 | | 0.50 | 0.075 | | Nb: 0.09 max; Ti: 0.15 max; V: 0.20 max; others: 0.12 max | Mo: 0.50 max; B: 0.005 max | 19 | | |
| 0703 | [illegible] | Structural | 1.50 | 4.00 | 900 | 1500 | 550 | 670 | | | 0.20 | 1.60 | 0.035 | 0.030 | 0.50 | 0.50 | 0.050 | | Nb: 0.09 max; Ti: 0.15 max; V: 0.10 max; others: 0.12 max | | 23 | | |
| 0707 | [illegible] | High Strength HR Sheet in Coil (HSLA) Grade | 4.00 | 12.00 | 900 | 2000 | 700 | 750 | 650 | 800 | 0.10 | 1.50 | 0.025 | 0.015 | 0.05 | 0.30 | 0.075 | | Nb: 0.09 max; Ti: 0.15 max; V: 0.20 max; Mo: 0.50 max; B: 0.005 max; others: 0.12 max | Mo: 0.50 max; B: 0.005 max | 17 | | |
| 0708 | [illegible] | High Strength HR Sheet in Coil (HSLA) Grade | 4.00 | 12.00 | 900 | 2000 | | | | | 0.10 | 1.50 | 0.025 | 0.015 | 0.05 | 0.30 | 0.075 | | Nb: 0.09 max; Ti: 0.15 max; V: 0.20 max; Mo: 0.50 max; B: 0.005 max; others: 0.12 max | Mo: 0.50 max; B: 0.005 max | 17 | | |
| 0709 | [illegible] | Structural | 2.50 | 4.00 | 900 | 1250 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.035 | 0.030 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0710 | [illegible] | Fabrication & Structural | 2.50 | 4.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0711 | [illegible] | Tailored Coated Plates Blank | 1.20 | 3.00 | 900 | 1250 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.035 | 0.030 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0712 | [illegible] | Fabrication & Structural | 2.50 | 4.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0713 | [illegible] | Fabrication & Structural | 1.60 | 3.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0714 | [illegible] | Fabrication & Structural | 3.00 | 12.00 | 900 | 2000 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0715 | [illegible] | Fabrication & Structural | 2.50 | 4.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0716 | [illegible] | Fabrication & Structural | 1.60 | 3.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0717 | [illegible] | Fabrication & Structural | 3.00 | 12.00 | 900 | 2000 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0718 | [illegible] | Fabrication & Structural | 2.50 | 4.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0719 | [illegible] | Fabrication & Structural | 1.60 | 3.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0720 | [illegible] | Fabrication & Structural | 3.00 | 12.00 | 900 | 2000 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0721 | [illegible] | Fabrication & Structural | 2.50 | 4.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0722 | [illegible] | Fabrication & Structural | 1.60 | 3.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0723 | [illegible] | Fabrication & Structural | 3.00 | 12.00 | 900 | 2000 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0724 | [illegible] | Fabrication & Structural | 2.50 | 4.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0725 | [illegible] | Fabrication & Structural | 1.60 | 3.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0726 | [illegible] | Fabrication & Structural | 3.00 | 12.00 | 900 | 2000 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0727 | [illegible] | Fabrication & Structural | 2.50 | 4.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0728 | [illegible] | Fabrication & Structural | 1.60 | 3.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0729 | [illegible] | Fabrication & Structural | 3.00 | 12.00 | 900 | 2000 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0730 | [illegible] | Fabrication & Structural | 2.50 | 4.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0731 | [illegible] | Fabrication & Structural | 1.60 | 3.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0732 | [illegible] | Fabrication & Structural | 3.00 | 12.00 | 900 | 2000 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0733 | [illegible] | Fabrication & Structural | 2.50 | 4.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0734 | [illegible] | Fabrication & Structural | 1.60 | 3.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0735 | [illegible] | Fabrication & Structural | 3.00 | 12.00 | 900 | 2000 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0736 | [illegible] | Fabrication & Structural | 2.50 | 4.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0737 | [illegible] | Fabrication & Structural | 1.60 | 3.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0738 | [illegible] | Fabrication & Structural | 3.00 | 12.00 | 900 | 2000 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0739 | [illegible] | Fabrication & Structural | 2.50 | 4.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0740 | [illegible] | Fabrication & Structural | 1.60 | 3.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0741 | [illegible] | Fabrication & Structural | 3.00 | 12.00 | 900 | 2000 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0742 | [illegible] | Fabrication & Structural | 2.50 | 4.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0743 | [illegible] | Fabrication & Structural | 1.60 | 3.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0744 | [illegible] | Fabrication & Structural | 3.00 | 12.00 | 900 | 2000 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0745 | [illegible] | Fabrication & Structural | 2.50 | 4.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0746 | [illegible] | Fabrication & Structural | 1.60 | 3.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0747 | [illegible] | Fabrication & Structural | 3.00 | 12.00 | 900 | 2000 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0748 | [illegible] | Fabrication & Structural | 2.50 | 4.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0749 | [illegible] | Fabrication & Structural | 1.60 | 3.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0750 | [illegible] | Fabrication & Structural | 3.00 | 12.00 | 900 | 2000 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0751 | [illegible] | Fabrication & Structural | 2.50 | 4.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0752 | [illegible] | Fabrication & Structural | 1.60 | 3.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0753 | [illegible] | Fabrication & Structural | 3.00 | 12.00 | 900 | 2000 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0754 | [illegible] | Fabrication & Structural | 2.50 | 4.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0755 | [illegible] | Fabrication & Structural | 1.60 | 3.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0756 | [illegible] | Fabrication & Structural | 3.00 | 12.00 | 900 | 2000 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0757 | [illegible] | Fabrication & Structural | 2.50 | 4.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0758 | [illegible] | Fabrication & Structural | 1.60 | 3.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0759 | [illegible] | Fabrication & Structural | 3.00 | 12.00 | 900 | 2000 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0760 | [illegible] | Fabrication & Structural | 2.50 | 4.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0761 | [illegible] | Fabrication & Structural | 1.60 | 3.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0762 | [illegible] | Fabrication & Structural | 3.00 | 12.00 | 900 | 2000 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0763 | [illegible] | Fabrication & Structural | 2.50 | 4.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0764 | [illegible] | Fabrication & Structural | 1.60 | 3.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0765 | [illegible] | Fabrication & Structural | 3.00 | 12.00 | 900 | 2000 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0766 | [illegible] | Fabrication & Structural | 2.50 | 4.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0767 | [illegible] | Fabrication & Structural | 1.60 | 3.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0768 | [illegible] | Fabrication & Structural | 3.00 | 12.00 | 900 | 2000 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0769 | [illegible] | Fabrication & Structural | 2.50 | 4.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0770 | [illegible] | Fabrication & Structural | 1.60 | 3.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0771 | [illegible] | Fabrication & Structural | 3.00 | 12.00 | 900 | 2000 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0772 | [illegible] | Fabrication & Structural | 2.50 | 4.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0773 | [illegible] | Fabrication & Structural | 1.60 | 3.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0774 | [illegible] | Fabrication & Structural | 3.00 | 12.00 | 900 | 2000 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0775 | [illegible] | Fabrication & Structural | 2.50 | 4.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0776 | [illegible] | Fabrication & Structural | 1.60 | 3.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0777 | [illegible] | Fabrication & Structural | 3.00 | 12.00 | 900 | 2000 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0778 | [illegible] | Fabrication & Structural | 2.50 | 4.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0779 | [illegible] | Fabrication & Structural | 1.60 | 3.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0780 | [illegible] | Fabrication & Structural | 3.00 | 12.00 | 900 | 2000 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0781 | [illegible] | Fabrication & Structural | 2.50 | 4.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0782 | [illegible] | Fabrication & Structural | 1.60 | 3.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0783 | [illegible] | Fabrication & Structural | 3.00 | 12.00 | 900 | 2000 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0784 | [illegible] | Fabrication & Structural | 2.50 | 4.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0785 | [illegible] | Fabrication & Structural | 1.60 | 3.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0786 | [illegible] | Fabrication & Structural | 3.00 | 12.00 | 900 | 2000 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0787 | [illegible] | Fabrication & Structural | 2.50 | 4.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0788 | [illegible] | Fabrication & Structural | 1.60 | 3.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0789 | [illegible] | Fabrication & Structural | 3.00 | 12.00 | 900 | 2000 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0790 | [illegible] | Fabrication & Structural | 2.50 | 4.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0791 | [illegible] | Fabrication & Structural | 1.60 | 3.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0792 | [illegible] | Fabrication & Structural | 3.00 | 12.00 | 900 | 2000 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0793 | [illegible] | Fabrication & Structural | 2.50 | 4.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0794 | [illegible] | Fabrication & Structural | 1.60 | 3.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0795 | [illegible] | Fabrication & Structural | 3.00 | 12.00 | 900 | 2000 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0796 | [illegible] | Fabrication & Structural | 2.50 | 4.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0797 | [illegible] | Fabrication & Structural | 1.60 | 3.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0798 | [illegible] | Fabrication & Structural | 3.00 | 12.00 | 900 | 2000 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0799 | [illegible] | Fabrication & Structural | 2.50 | 4.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0800 | [illegible] | Fabrication & Structural | 1.60 | 3.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0801 | [illegible] | Fabrication & Structural | 3.00 | 12.00 | 900 | 2000 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0802 | [illegible] | Fabrication & Structural | 2.50 | 4.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0803 | [illegible] | Fabrication & Structural | 1.60 | 3.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0804 | [illegible] | Fabrication & Structural | 3.00 | 12.00 | 900 | 2000 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0805 | [illegible] | Fabrication & Structural | 2.50 | 4.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0806 | [illegible] | Fabrication & Structural | 1.60 | 3.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0807 | [illegible] | Fabrication & Structural | 3.00 | 12.00 | 900 | 2000 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0808 | [illegible] | Fabrication & Structural | 2.50 | 4.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0809 | [illegible] | Fabrication & Structural | 1.60 | 3.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0810 | [illegible] | Fabrication & Structural | 3.00 | 12.00 | 900 | 2000 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0811 | [illegible] | Fabrication & Structural | 2.50 | 4.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0812 | [illegible] | Fabrication & Structural | 1.60 | 3.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0813 | [illegible] | Fabrication & Structural | 3.00 | 12.00 | 900 | 2000 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0814 | [illegible] | Fabrication & Structural | 2.50 | 4.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0815 | [illegible] | Fabrication & Structural | 1.60 | 3.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0816 | [illegible] | Fabrication & Structural | 3.00 | 12.00 | 900 | 2000 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0817 | [illegible] | Fabrication & Structural | 2.50 | 4.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0818 | [illegible] | Fabrication & Structural | 1.60 | 3.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0819 | [illegible] | Fabrication & Structural | 3.00 | 12.00 | 900 | 2000 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0820 | [illegible] | Fabrication & Structural | 2.50 | 4.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0821 | [illegible] | Fabrication & Structural | 1.60 | 3.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0822 | [illegible] | Fabrication & Structural | 3.00 | 12.00 | 900 | 2000 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0823 | [illegible] | Fabrication & Structural | 2.50 | 4.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0824 | [illegible] | Fabrication & Structural | 1.60 | 3.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0825 | [illegible] | Fabrication & Structural | 3.00 | 12.00 | 900 | 2000 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0826 | [illegible] | Fabrication & Structural | 2.50 | 4.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0827 | [illegible] | Fabrication & Structural | 1.60 | 3.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0828 | [illegible] | Fabrication & Structural | 3.00 | 12.00 | 900 | 2000 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0829 | [illegible] | Fabrication & Structural | 2.50 | 4.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0830 | [illegible] | Fabrication & Structural | 1.60 | 3.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0831 | [illegible] | Fabrication & Structural | 3.00 | 12.00 | 900 | 2000 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0832 | [illegible] | Fabrication & Structural | 2.50 | 4.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0833 | [illegible] | Fabrication & Structural | 1.60 | 3.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0834 | [illegible] | Fabrication & Structural | 3.00 | 12.00 | 900 | 2000 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0835 | [illegible] | Fabrication & Structural | 2.50 | 4.00 | 900 | 1800 | 550 | 700 | 590 | 740 | 0.20 | 1.60 | 0.040 | 0.040 | 0.50 | 0.50 | 0.050 | 0.21 | | | 23 | | |
| 0836 | [illegible] | Fabrication & Structural | 1.60 | 3.00 | 900 |

| | | | Thickness and Width | | | | Mechanical Properties | | | | Chemical Properties | | | | | | | | | | Other Mechanical Properties | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Thickness Range (mm) | | Width Range (mm) | | YS (MPa) | | UTS (MPa) | | C | Mn | P | S | Al | Si | Cr | Carbon Equivalent | Work Hardening | Other elements | % Elongation | CVN | CVDT |
| TM | Grade | Application | Min | Max | Min | Max | Min | Max | Min | Max | Max, Value Above which Ladle Analysis is not Applicable | Max, Value Above which Ladle Analysis is not Applicable | Min | Max | Max (IIW) | Max, Value Above which Ladle Analysis is not Applicable | Max, Value Above which Ladle Analysis is not Applicable | Max | | | Min | J | J (Max) |
| [illegible] | [illegible] | Structural & Mechanical Tubing | 8.00 | 12.00 | 400 | 1000 | 350 | - | 450 | 590 | 0.20 | 0.90 | 0.030 | 0.030 | 0.20 | 0.70 | 0.20 | 0.43 | 0.3333-0.50 Micro Alloyed 0.12 max | | 20 | | |
| [illegible] | [illegible] | Structural & Mechanical Tubing | 5.00 | 20.00 | 400 | 1000 | 290 | - | 470 | | 0.18 | 1.40 | 0.030 | 0.030 | 0.20 | 0.70 | 0.20 | 0.43 | 0.3333-0.50 Micro Alloyed 0.20 max | | 17 | | |
| [illegible] | [illegible] | Fabrication & Structural | 12.00 | 16.00 | 800 | 2000 | 277 | - | 414 | - | 0.18 | 1.40 | 0.025 | 0.020 | 0.20 | 0.70 | 0.20 | 0.43 | Grade Type A | [illegible] | 20 | 27 | - |
| [illegible] | [illegible] | Fabrication & Structural | 2.00 | 5.99 | 800 | 2000 | 310 | - | 456 | - | 0.20 | 1.50 | 0.030 | 0.030 | 0.20 | 0.70 | 0.20 | 0.43 | | | 20 | 27 | 20 |
| [illegible] | [illegible] | Fabrication & Structural | 5.00 | 7.99 | 800 | 2000 | 310 | - | 456 | - | 0.18 | 1.50 | 0.030 | 0.030 | 0.20 | 0.70 | 0.20 | 0.43 | | | 20 | 27 | 20 |
| [illegible] | [illegible] | Structural | 16.01 | 20.00 | 800 | 2000 | 310 | - | 470 | 630 | 0.20 | 1.50 | 0.025 | 0.025 | 0.20 | 0.70 | 0.20 | 0.43 | | 0.2-0.3 max | 20 | 27 | 20 |
| [illegible] | [illegible] | Fabrication & Structural | 2.00 | 4.99 | 800 | 2000 | 310 | - | 456 | - | 0.20 | 1.50 | 0.030 | 0.030 | 0.20 | 0.70 | 0.20 | 0.43 | Micro Alloyed 0.12 max | | 20 | | |
| [illegible] | [illegible] | Fabrication & Structural | 5.00 | 7.99 | 800 | 2000 | 310 | - | 456 | - | 0.18 | 1.50 | 0.030 | 0.030 | 0.20 | 0.70 | 0.20 | 0.43 | Micro Alloyed 0.20 max | | 20 | | |
| [illegible] | [illegible] | Fabrication & Structural | 8.00 | 12.00 | 800 | 2000 | 310 | - | 456 | - | 0.20 | 1.50 | 0.030 | 0.030 | 0.20 | 0.70 | 0.20 | 0.43 | Micro Alloyed 0.20 max | | 20 | | |
| [illegible] | [illegible] | Fabrication & Structural | 12.00 | 16.00 | 800 | 2000 | 310 | - | 456 | - | 0.20 | 1.50 | 0.030 | 0.030 | 0.20 | 0.70 | 0.20 | 0.43 | Micro Alloyed 0.20 max | | 20 | | |
| [illegible] | [illegible] | Structural | 16.01 | 20.00 | 800 | 2000 | 310 | - | 470 | 630 | 0.20 | 1.50 | 0.025 | 0.025 | 0.20 | 0.70 | 0.20 | 0.43 | Micro Alloyed 0.20 max | | 20 | 27 | 20 |
| [illegible] | [illegible] | Fabrication & Structural (High Yield Pipes) | 4.00 | 5.99 | 800 | 2000 | 450 | - | 550 | - | 0.20 | 1.50 | 0.030 | 0.030 | 0.20 | 0.70 | 0.20 | 0.43 | Micro Alloyed 0.20 max | | 17 | 27 | 20 |
| [illegible] | [illegible] | Fabrication & Structural (High Yield Pipes) | 6.00 | 7.99 | 800 | 2000 | 450 | - | 550 | - | 0.20 | 1.50 | 0.030 | 0.030 | 0.20 | 0.70 | 0.20 | 0.43 | Micro Alloyed 0.20 max | | 17 | 27 | 20 |
| [illegible] | [illegible] | Fabrication & Structural (High Yield Pipes) | 8.00 | 12.00 | 800 | 2000 | 450 | - | 550 | - | 0.20 | 1.50 | 0.030 | 0.030 | 0.20 | 0.70 | 0.20 | 0.43 | Micro Alloyed 0.20 max | | 17 | 27 | 20 |
| [illegible] | [illegible] | Fabrication & Structural (High Yield Pipes) | 12.00 | 16.00 | 800 | 2000 | 450 | - | 550 | - | 0.20 | 1.50 | 0.030 | 0.030 | 0.20 | 0.70 | 0.20 | 0.43 | Micro Alloyed 0.20 max | | 17 | 27 | 20 |
| [illegible] | [illegible] | Fabrication & Structural (High Yield Pipes) | 16.01 | 20.00 | 800 | 2000 | 450 | - | 550 | - | 0.20 | 1.50 | 0.030 | 0.030 | 0.20 | 0.70 | 0.20 | 0.43 | Micro Alloyed 0.20 max | | 17 | 27 | 20 |
| [illegible] | [illegible] | Tube | 1.50 | 3.99 | 800 | 2000 | 275 | - | 370 | - | 0.20 | 1.50 | 0.030 | 0.030 | 0.20 | 0.70 | 0.20 | 0.43 | | | 18 | | |
| [illegible] | | | | | | | | | | | | | | | | | | | | | | | |
| [illegible] | [illegible] | Fabrication & Structural | 2.00 | 4.99 | 800 | 1600 | 290 | - | 420 | - | 0.20 | 1.50 | 0.030 | 0.030 | 0.20 | 0.70 | 0.20 | 0.43 | Micro Alloyed 0.20 max | | 20 | 27 | 20 |
| [illegible] | [illegible] | Fabrication & Structural | 5.00 | 12.00 | 800 | 1600 | 290 | - | 420 | 600 | 0.20 | 1.50 | 0.030 | 0.030 | 0.20 | 0.70 | 0.20 | 0.43 | Micro Alloyed 0.20 max | | 20 | 27 | 20 |
| [illegible] | [illegible] | Fabrication & Structural | 12.00 | 16.00 | 800 | 1600 | 290 | - | 420 | 600 | 0.20 | 1.50 | 0.030 | 0.030 | 0.20 | 0.70 | 0.20 | 0.43 | Micro Alloyed 0.20 max | | 20 | 27 | 20 |
| [illegible] | [illegible] | Fabrication & Structural | 0.00 | 0.00 | 0 | 0 | 290 | 320 | 420 | - | 0.20 | 1.50 | 0.030 | 0.030 | 0.20 | 0.70 | 0.20 | 0.43 | | Mo 0.05 max | 20 | 27 | 20 |
| [illegible] | [illegible] | Fabrication & Structural | 5.00 | 12.00 | 800 | 1600 | 290 | 320 | 420 | - | 0.20 | 1.50 | 0.030 | 0.030 | 0.20 | 0.70 | 0.20 | 0.43 | Micro Alloyed 0.20 max | | 20 | 27 | 20 |
| [illegible] | | | | | | | | | | | | | | | | | | | | | | | |
| [illegible] | [illegible] | Fabrication & Structural Transmission Line Towers | 2.00 | 4.99 | 800 | 2000 | 290 | - | 400 | - | 0.12-0.18 | 0.60-0.90 | 0.03 | 0.02 | 0.20 | 0.70 | 0.20 | 0.42 | Nb 0.15 max Ti 0.15 max Micro Alloyed 0.20 max | Cu 0.35 max Cr 0.30 max Mo 0.10 max Ni 0.30 max B 0.005 max | 20 | 27 | 20 |
| [illegible] | [illegible] | Fabrication & Structural Transmission Line Towers | 5.00 | 7.99 | 800 | 2000 | 290 | - | 420 | - | 0.12-0.18 | 0.60-0.90 | 0.03 | 0.02 | 0.20 | 0.70 | 0.20 | 0.42 | Nb 0.15 max Ti 0.15 max Micro Alloyed 0.20 max | Cu 0.35 max Cr 0.30 max Mo 0.10 max Ni 0.30 max B 0.005 max | 20 | 27 | 20 |
| [illegible] | [illegible] | Fabrication & Structural Transmission Line Towers | 8.00 | 12.00 | 800 | 2000 | 290 | - | 420 | - | 0.12-0.18 | 0.60-0.90 | 0.03 | 0.02 | 0.20 | 0.70 | 0.20 | 0.42 | Nb 0.15 max Ti 0.15 max Micro Alloyed 0.20 max | Cu 0.35 max Cr 0.30 max Mo 0.10 max Ni 0.30 max B 0.005 max | 20 | 27 | 20 |

| | | | Thickness and Width | | | | Mechanical Properties | | | | Chemical Properties | | | | | | | | | | Other Mechanical Properties | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Thickness Range (mm) | | Width Range (mm) | | Yield Pt | | UTS (MPa) | | C | Mn | P | S | Si | Cr | Ni | Cu+5xSn+Ni | Micro Alloy | Other Elements | % Elongation | Y.S/T.S | CVN |
| Sr. | Grade | Application | Min | Max | Min | Max | Min | Max | Min | Max | Max. (Heat Analysis / Product Analysis) (Weight %) | Max. (Heat Analysis / Product Analysis) (Weight %) | Max | Max | Max. (PCM) | Max. (Heat Analysis / Product Analysis) (Weight %) | Max. (Heat Analysis / Product Analysis) (Weight %) | Max | | | Min | | |
| 0001 | S 355 J2 (+N) or NR (+N) Gr | Fabrication & Structures / Transmission Line Towers | 12.00 | 16.00 | 900 | 2800 | 359 | - | 479 | - | 0.15 / 0.16 | 0.80 / 0.81 | 0.03 | 0.02 | 0.50 | 0.30 / 0.34 | 0.60 | 0.70 | Nb: 0.11 max<br>Ti: 0.05 max<br>Micro Alloy: 0.22 max | Cu: 0.70 max<br>Al: 0.10 max<br>Mo: 0.10 max<br>N: 0.012 max<br>B: 0.0007 max | 22 | 0.87 | 27 |
| 0002 | S 355 J2 (+N) or NR (+N) Gr | Fabrication & Structures / Transmission Line Towers | 16.01 | 30.00 | 900 | 2800 | 359 | - | 479 | - | 0.15 / 0.16 | 0.80 / 0.81 | 0.03 | 0.02 | 0.50 | 0.30 / 0.34 | 0.60 | 0.70 | Nb: 0.11 max<br>Ti: 0.05 max<br>Micro Alloy: 0.22 max | Cu: 0.70 max<br>Al: 0.10 max<br>Mo: 0.10 max<br>N: 0.012 max<br>B: 0.0007 max | 22 | 0.87 | 27 |
| 0003 | S 355 J2 (+N) or NR (+N) Gr | Fabrication & Structures / Transmission Line Towers | 7.00 | 8.99 | 900 | 2800 | 359 | - | 479 | - | 0.15 / 0.16 | 0.80 / 0.81 | 0.03 | 0.02 | 0.50 | 0.30 / 0.34 | 0.60 | 0.70 | Nb: 0.11 max<br>Ti: 0.05 max<br>Micro Alloy: 0.22 max | Cu: 0.70 max<br>Al: 0.10 max<br>Mo: 0.10 max<br>N: 0.012 max<br>B: 0.0007 max | 22 | 0.87 | 27 |
| 0004 | S 355 J2 (+N) or NR (+N) Gr | Fabrication & Structures / Transmission Line Towers | 9.00 | 11.99 | 900 | 2800 | 359 | - | 479 | - | 0.15 / 0.16 | 0.80 / 0.81 | 0.03 | 0.02 | 0.50 | 0.30 / 0.34 | 0.60 | 0.70 | Nb: 0.11 max<br>Ti: 0.05 max<br>Micro Alloy: 0.22 max | Cu: 0.70 max<br>Al: 0.10 max<br>Mo: 0.10 max<br>N: 0.012 max<br>B: 0.0007 max | 22 | 0.87 | 27 |
| 0005 | S 355 J2 (+N) or NR (+N) Gr | Fabrication & Structures / Transmission Line Towers | 12.00 | 14.00 | 900 | 2800 | 359 | - | 479 | - | 0.15 / 0.16 | 0.80 / 0.81 | 0.03 | 0.02 | 0.50 | 0.30 / 0.34 | 0.60 | 0.70 | Nb: 0.11 max<br>Ti: 0.05 max<br>Micro Alloy: 0.22 max | Cu: 0.70 max<br>Al: 0.10 max<br>Mo: 0.10 max<br>N: 0.012 max<br>B: 0.0007 max | 22 | 0.87 | 27 |
| 0006 | S 355 J2 (+N) or NR (+N) Gr | Fabrication & Structures / Transmission Line Towers | 14.00 | 16.00 | 900 | 2800 | 359 | - | 479 | - | 0.15 / 0.16 | 0.80 / 0.81 | 0.03 | 0.02 | 0.50 | 0.30 / 0.34 | 0.60 | 0.70 | Nb: 0.11 max<br>Ti: 0.05 max<br>Micro Alloy: 0.22 max | Cu: 0.70 max<br>Al: 0.10 max<br>Mo: 0.10 max<br>N: 0.012 max<br>B: 0.0007 max | 22 | 0.87 | 27 |
| 0007 | S 355 J2 (+N) or NR (+N) Gr | Fabrication & Structures / Transmission Line Towers | 16.01 | 30.00 | 900 | 2800 | 359 | - | 479 | - | 0.15 / 0.16 | 0.80 / 0.81 | 0.03 | 0.02 | 0.50 | 0.30 / 0.34 | 0.60 | 0.70 | Nb: 0.11 max<br>Ti: 0.05 max<br>Micro Alloy: 0.22 max | Cu: 0.70 max<br>Al: 0.10 max<br>Mo: 0.10 max<br>N: 0.012 max<br>B: 0.0007 max | 22 | 0.87 | 27 |
| **Structural Steel Plates for Shipbuilding (EH36 Grade)** | | | | | | | | | | | | | | | | | | | | | | | |
| 0021 | EH36-Z | Shipbuilding / Boat building | 6.00 | 7.99 | 900 | 2800 | 355 | - | 490 | 620 | 0.20 | 0.90 max | 0.025 | 0.025 | 0.50 | 0.90 | 0.80 | | | | 22 | | |
| 0022 | EH36-Z | Shipbuilding / Boat building | 8.00 | 11.99 | 900 | 2800 | 355 | - | 490 | 620 | 0.20 | 0.90 max | 0.025 | 0.025 | 0.50 | 0.90 | 0.80 | | | | 22 | | |
| 0023 | EH36-Z | Shipbuilding / Boat building | 12.00 | 14.00 | 900 | 2800 | 355 | - | 490 | 620 | 0.20 | 0.90 max | 0.025 | 0.025 | 0.50 | 0.90 | 0.80 | | | | 22 | | |
| 0024 | EH36-Z | Shipbuilding / Boat building | 14.01 | 24.00 | 900 | 2800 | 355 | - | 490 | 620 | 0.20 | 0.90 max | 0.025 | 0.025 | 0.50 | 0.90 | 0.80 | | | | 22 | | |
| **Steel for Cold Forming (CF)** | | | | | | | | | | | | | | | | | | | | | | | |
| 0025 | 1010 CF | Cycle Chain Links | 2.00 | 7.99 | 850 | 1250 | - | - | - | - | 0.12 max | 0.60 max | 0.040 | 0.040 | - | - | - | 0.30 | - | | - | - | - |
| 0026 | 1213 CF | Auto Spare Nuts | 2.00 | 7.99 | 850 | 1250 | - | - | 310 | 380 | 0.13 max | 0.60 max | 0.040 | 0.040 | 0.10 | 0.075 | 0.15 | 0.30 | - | | - | - | - |
| 0027 | 1541 | Tractors | 2.00 | 8.00 | 850 | 1250 | - | - | 510 | 650 | 0.36 max | 0.60 max | 0.040 | 0.040 | 0.10 | 0.150 | - | 0.30 | - | | - | - | - |
| 0028 | 1213 | Fasteners for Electric Cabling Work | 2.00 | 8.00 | 850 | 1250 | - | - | 310 | 380 | 0.13 max | 0.60 max | 0.040 | 0.040 | 0.10 | 0.075 | 0.15 | 0.30 | 0.40 max | | - | - | - |
| 0029 | 1541 | Fasteners for Electric Cabling Work | 2.00 | 8.00 | 850 | 1250 | - | - | 510 | 650 | 0.36 max | 0.60 max | 0.040 | 0.040 | 0.10 | 0.150 | - | 0.30 | 0.40 max | | - | - | - |

| Dimension Tolerance | | |
|---|---|---|
| Thickness Tol (mm) | Thickness 1.60 to 2.80 | -0.14/+0.06 |
| | Thickness 2.81 to 3.10 | -0.16/+0.08 |
| | Thickness 3.11 to 4.99 | -0.17/+0.08 |
| | Thickness 5.00 to 5.99 | -0.19/+0.08 |
| | Thickness 6.00 to 8.99 | -0.21/+0.10 |
| | Thickness 9.00 to 12.00 | -0.23/+0.10 |
| | Thickness 12.01 to 16.00 | -0.25/+0.10 |
| | Thickness 16.01 to 20.00 | -0.27/+0.12 |
| | Thickness 20.01 to 25.00 | -0.29/+0.12 |
| | | |
| Width Tol - Coils (mm) | All widths | +20/-0 (untrimmed) |
| Width Tol - Plates (mm) | All widths | +20/-0 (untrimmed) |
| | Width < 1250 mm | +4/-0 (trimmed) |
| | Width > 1250 mm | +5/-0 (trimmed) |
| Length Tol - Plate (mm) | +10/-0 mm | |
| Out of Squareness | 0.7 mm per 100 mm width for sheets/plates | |

| Flatness Tolerance | |
|---|---|
| Refer Table 1 | |
| Camber | As per TPR |
| Bow | As per TPR |
| Telescopicity, mm | 100 max |
| Fish/ Tongue, m | 0.75 max |

** Subject to Tata Steel capability, T: Thickness, TPR: Technical Processing Requirement provided by Application Engineer*

| Special Remarks |
|---|
| Tata Steel shall stand guarantee for 96% of the coil length for quality.<br>Acceptance norms for surface quality to be decided based on mutually agreed limit samples. |

**Note**

- For guaranteed supply of special tolerance please contact nearest Tata Steel representative.
- 96% length of coil will be guaranteed within dimensional tolerance and flatness.
- All the processing dimensional tolerances are from Tata Steel certified service centres. Please contact nearest Tata Steel representative for details.
- Thickness tolerance is valid upto C40 (C40 means 40 mm away from any of the edges of coil)
- Steel will be fully killed
- HR - Hot rolled, HRPO - Hot rolled pickled and oiled, HRSPO - Hot rolled pickled and oiled with skin pass, Slitted and cut to length materials are available. Please contact nearest Tata Steel representative for material selection advice.
- Defined supply will be as 'As-rolled' Optional - HRPO and HRSPO (conditions may be subject to dimensional restrictions)
- Weight of as rolled coil - HSM: 28 MT max and TSCR - 32.70 MT max.
- Any claim will be settled as per Tata Steel claim policy. Please contact nearest Tata Steel representative for details.

Table 1 *Standard flatness tolerances for cut lengths (including descaled material)

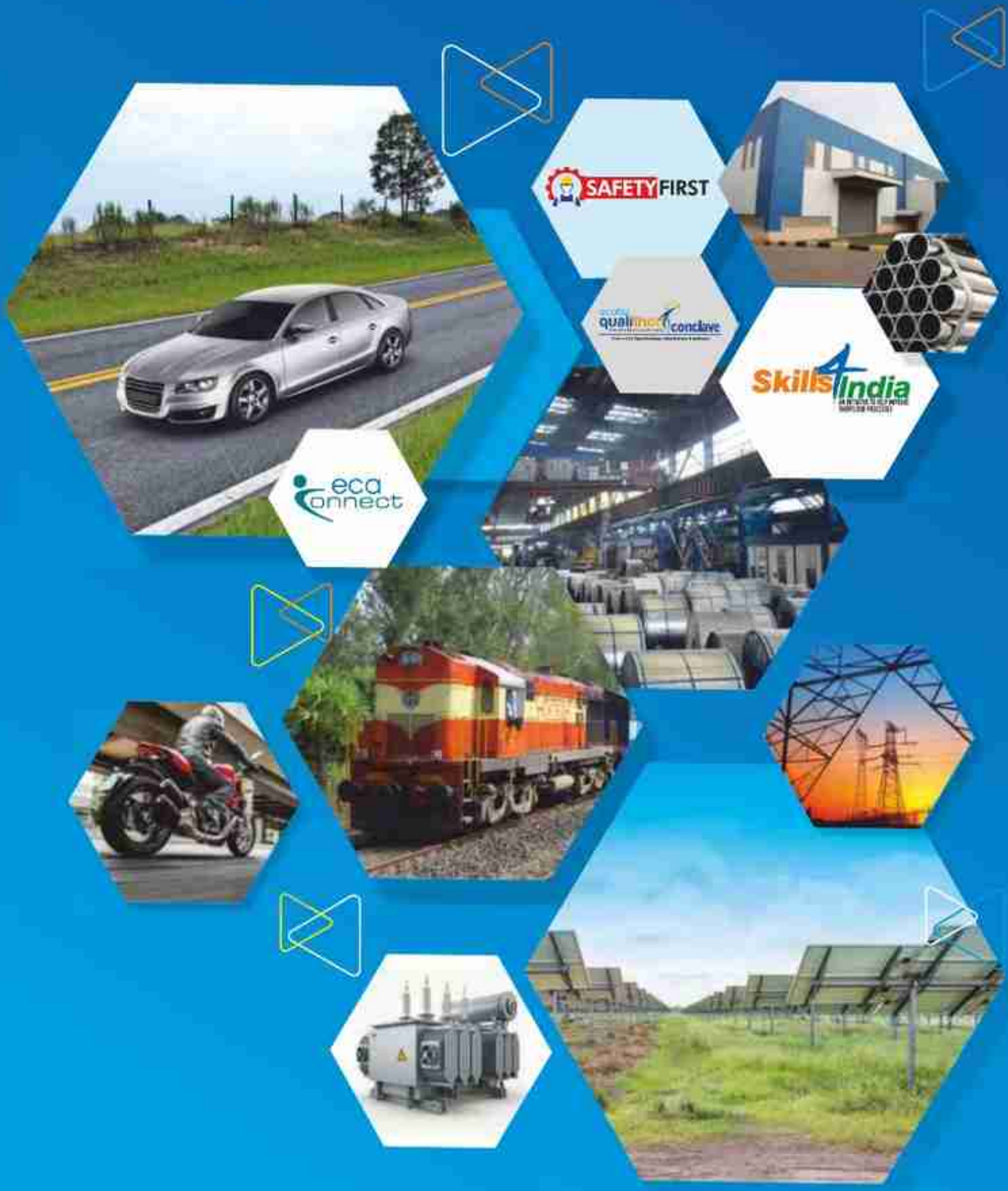
| Specified Thickness, mm | Specified Width, mm | Flatness Tolerance, mm | | |
|---|---|---|---|---|
| | | Specified strength level of Re | | |
| | | <220 N/mm² | 220 to 320 N/mm² | >320 N/mm² |
| ≤ 2.0 | ≤ 1200 | 21 | 26 | 32 |
| | >1200 ≤ 1500 | 25 | 31 | 38 |
| | >1500 | 30 | 38 | 45 |
| > 2.0 | ≤ 1200 8 | 22 | 27 | |
| | >1200 ≤ 1500 | 23 | 29 | 34 |
| | >1500 | 28 | 35 | 42 |

** Flatness tolerance is as per IS/ISO 16160:2005. It is applicable for hot rolled coils also.*

**Note:** Maxium deviation from flat horizontal surface: with the sheet lying under its own weight on a flat surface, the maximum distance between lower surface of the sheet and the flat horizontal surface is the maximum deviation from flatness (Refer figure 3 of IS/ISO 16160:2005). Above table also applies to sheet cut to length from coil by the customer when agreed-upon flattening procedures are performed.

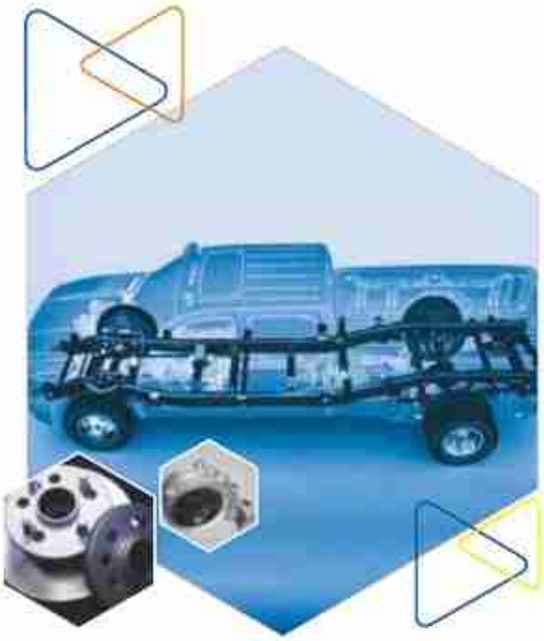


# Customised offerings across applications



# Automotive Industry

Tata Astrum is geared to meet the needs of the automotive component segment. Its 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 final product quality.



*"Tata Astrum's wide product range have helped us to increase our productivity and growth. The enthusiasm in development of new product by Tata Steel is commendable specially in E34 of higher thicknesses. We are satisfied with development of customised thickness like 6.35 and 7.6 mm. We wish to have a substantial relationship for many more future endeavours."*

**Reliable Autotech Pvt Ltd**

## TDCs for Automotive Industry

| | | | | Width and Thickness | | | | Mechanical Properties | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TDC | Grade | Remarks | Equivalent Standard | Thickness Range (mm) | | Width Range (mm) | | YS (MPa) | | UTS (MPa) | |
| | | | | Min | Max | Min | Max | Min | Max | Min | Max |
| HR02 | IS 1079 DD | Dry/PO | Sheet Metal components | 1.60 | 12.00 | 900 | 2050 | - | - | - | 400 |
| HR03 | SAPH 440 | Dry/PO | Auto Structurals | 2.21 | 4.99 | 900 | 1500 | 305 | - | 440 | 520 |
| HR04 | BSK 46 | Dry/PO | Auto Structurals | 5.00 | 7.99 | 900 | 1680 | 460 | 540 | 500 | 640 |
| HR05 | IS 2062 E 250 A (LC-MA) | Dry/PO | Fabrication | 2.00 | 4.99 | 800 | 2050 | 250 | - | 410 | - |
| HR08 | IS 2062 E 250 A (LC-MA) | Dry/PO | Fabrication/ Auto Structurals | 5.00 | 12.00 | 900 | 1680 | 250 | - | 410 | 600 |
| HR14 | IS 5986 Fe 410 | Dry/PO | Auto Structural/Axle Support | 2.00 | 4.99 | 800 | 2050 | 265 | 400 | 430 | 520 |
| HR17 | IS 1079 EDD | Dry/PO | Sheet Metal components (requiring extra deep draw) | 2.00 | 6.50 | 900 | 1540 | - | - | - | 380 |
| HR20 | IS 2062 E 250 A (Peritectic) | Dry | Fabrication/ Auto Structurals | 5.00 | 12.00 | 800 | 2050 | 255 | 370 | 410 | 600 |
| HR36 | BSK46 (Thin) | Dry/PO | Auto Structurals | 3.00 | 4.99 | 900 | 1680 | 460 | 540 | 500 | 640 |
| HR45 | IS 2062 E 250 GR. A | Dry | Fabrication/ Auto Structurals | 5.00 | 7.99 | 800 | 2050 | 250 | - | 410 | - |
| HR49 | E-38 SHEET | Dry/PO | Auto Structurals | 1.60 | 4.99 | 900 | 1680 | 373 | 461 | 441 | 558 |
| HR50 | JIS G 3113 SAPH 370 | Dry/PO | Auto Structurals | 2.00 | 5.00 | 900 | 1680 | 225 | - | 370 | - |
| HR51 | E-38 SS 4012 A | Dry | Auto Structurals | 5.00 | 7.99 | 900 | 1680 | 372 | 461 | 441 | 560 |
| HR53 | FE 360 | Dry | Rim Application (for wheels) | 8.00 | 12.00 | 900 | 1680 | 240 | - | 350 | 410 |
| Hr54 | SAPH440 | Dry | Auto Structurals | 5.00 | 8.00 | 900 | 1540 | 305 | - | 440 | - |
| HR55 | E-34 SHEET | Dry/PO | Auto Structurals | 2.50 | 4.99 | 900 | 1680 | 333 | 412 | 392 | 470 |
| HR56 | E 34 SS4012A | Dry | Auto Structurals | 3.00 | 7.99 | 900 | 1680 | 333 | 412 | 392 | 470 |
| HR57 | E 34 SS4012A | Dry | Auto Structurals | 8.00 | 12.00 | 900 | 1680 | 333 | 412 | 392 | 470 |
| HR58 | BSK-46/E-46 | Dry | Auto Structurals | 8.00 | 12.00 | 900 | 1540 | 460 | - | 500 | 640 |
| HR59 | E-36 SHEET | Dry/PO | Auto Structurals | 2.50 | 4.99 | 900 | 1540 | 355 | 450 | 430 | 550 |
| HR61 | SAPH440 | HRSPO | Auto Structurals | 2.00 | 4.50 | 900 | 1540 | 305 | - | 440 | 520 |
| HR65 | E-34 | HRSPO | Auto Internals | 2.51 | 4.50 | 900 | 1620 | 333 | 412 | 392 | 470 |
| HR95 | EN10149 S460MC | Dry | Fabrication & Structurals | 5.00 | 8.00 | 900 | 2000 | 460 | - | 520 | 670 |
| HT10 | EN 10149 S355 MC | Dry | Fabrication/ Auto | 2.00 | 4.99 | 900 | 2000 | 355 | - | 430 | 550 |

# Lifting & Excavation

There is no doubt that Hot Rolled Products form 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 functionality 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 smaller engine/cabin components.



*Our workability of Tata Astrum product is of optimum level as compared to other HR products because of Tata Steel's quality finish and chemistry.*
*We appreciate the prompt response that we received from the team and we are very thankful to Tata Steel & Naresh Steel.*

**Surin Automotive Pvt Ltd**

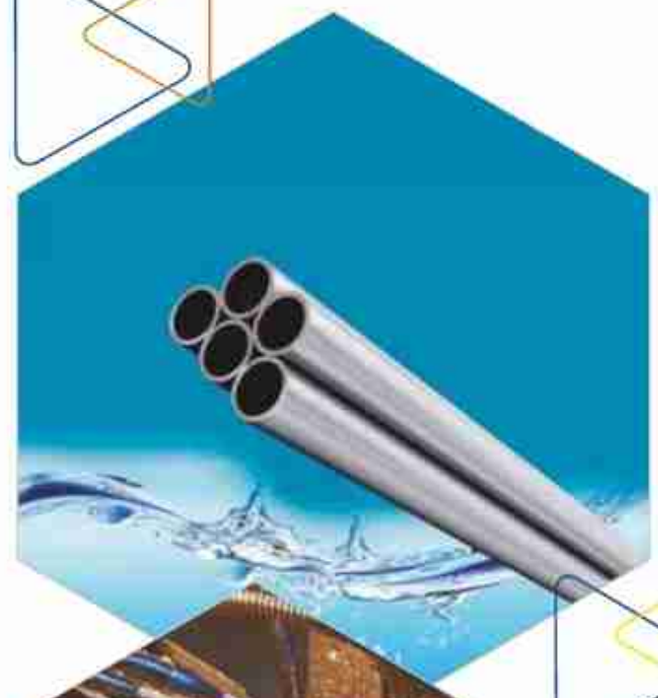
## TDCs for Lifting & Excavation

| | | | | Width and Thickness | | | | Mechanical Properties | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TDC | Grade | Remarks | Equivalent Standard | Thickness Range (mm) | | Width Range (mm) | | YS (MPa) | | UTS (MPa) | |
| | | | | Min | Max | Min | Max | Min | Max | Min | Max |
| HR21 | DIN 17100 ST 52.3 | Dry | Tipper Body, Buckets for Earth Moving Equipment, PEB | 5.00 | 8.00 | 900 | 1680 | 355 | - | 490 | - |
| HR22 | DIN 17100 ST 52.3 | Dry/PO | Tipper Body, Buckets for Earth Moving Equipment, PEB | 2.00 | 4.99 | 900 | 1680 | 355 | - | 490 | - |
| HR67 | DIN 17100 ST 52.3 | Dry | Tipper Body, Buckets for Earth Moving Equipment, PEB | 8.00 | 12.00 | 900 | 1680 | 355 | - | 490 | - |
| HR33 | ST 52.3 (Low Si) / EN 10025 S355 J2 | Dry | Tipper Body | 5.00 | 8.00 | 900 | 1680 | 355 | - | 470 | 630 |
| HR87 | EN 10025 S355 J2 | Dry | Structurals | 8.00 | 12.00 | 900 | 1680 | 355 | - | 470 | - |
| HR28 | IS 2062 E 350 Gr C | Dry/PO | Structurals for Solar/Transmission towers | 2.00 | 4.99 | 800 | 2050 | 350 | - | 490 | - |
| HR29 | IS 2062 E 350 Gr C | Dry | Structurals for Solar/Transmission towers | 5.00 | 8.00 | 800 | 2050 | 350 | - | 490 | - |
| HR66 | IS 2062 E 350 Gr C | Dry | Fabrication/ Structurals | 8.00 | 12.00 | 800 | 2050 | 350 | - | 490 | - |
| HR33 | IS 2062 E 350 Gr C | Dry | Fabrication/ Structurals | 12.01 | 16.00 | 900 | 2000 | 350 | - | 490 | - |
| HT85 | IS 2062 E 450 Gr A | Dry | Fabrication & Structurals | 5.00 | 7.99 | 900 | 2000 | 450 | - | 570 | - |
| HR95 | EN10149 S460MC | Dry | Fabrication/ Structurals | 5.00 | 8.00 | 900 | 2000 | 460 | - | 520 | 670 |

# Tubes & Pipes Manufacturing

Tubes are used for a wide array of applications, which include water/liquid conveyance, gas conveyance, structural framework, automotive/bicycle components, etc.

Tata Astrum caters to these needs of tube manufacturers with appropriate products. It is offered in different thickness & width combinations and slit to the requisite sizes. Owing to its better tolerances and optimal widths, it also helps to reduce wastage.





## TDCs for Tubes & Pipes Manufacturing

| | | | | Width and Thickness | | | | Mechanical Properties | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TDC | Grade | Remarks | Equivalent Standard | Thickness Range (mm) | | Width Range (mm) | | YS (MPa) | | UTS (MPa) | |
| | | | | Min | Max | Min | Max | Min | Max | Min | Max |
| HR01 | IS 10748 Gr 1 | Dry/PO | Tubes | 1.60 | 4.99 | 900 | 2050 | 170 | - | 290 | - |
| HRT1 | Tata PT(H) | Dry/PO | Precision Tubes | 1.60 | 8.00 | 800 | 2050 | 195 | - | 320 | 480 |
| HR16 | IS 10748 Gr-1 | Dry | Tubes | 5.00 | 12.00 | 800 | 2050 | 170 | - | 290 | - |
| HR80 | ASTM A622(MOD) | Dry/PO | Precision Tubes | 1.60 | 6.00 | 900 | 1680 | 250 | | 350 | - |
| SCF3/HG34 | IS 10748 Gr. 2 | Dry/PO | Tubes | 1.20 | 9.00 | 800 | 2050 | 210 | - | 330 | - |

# Railways

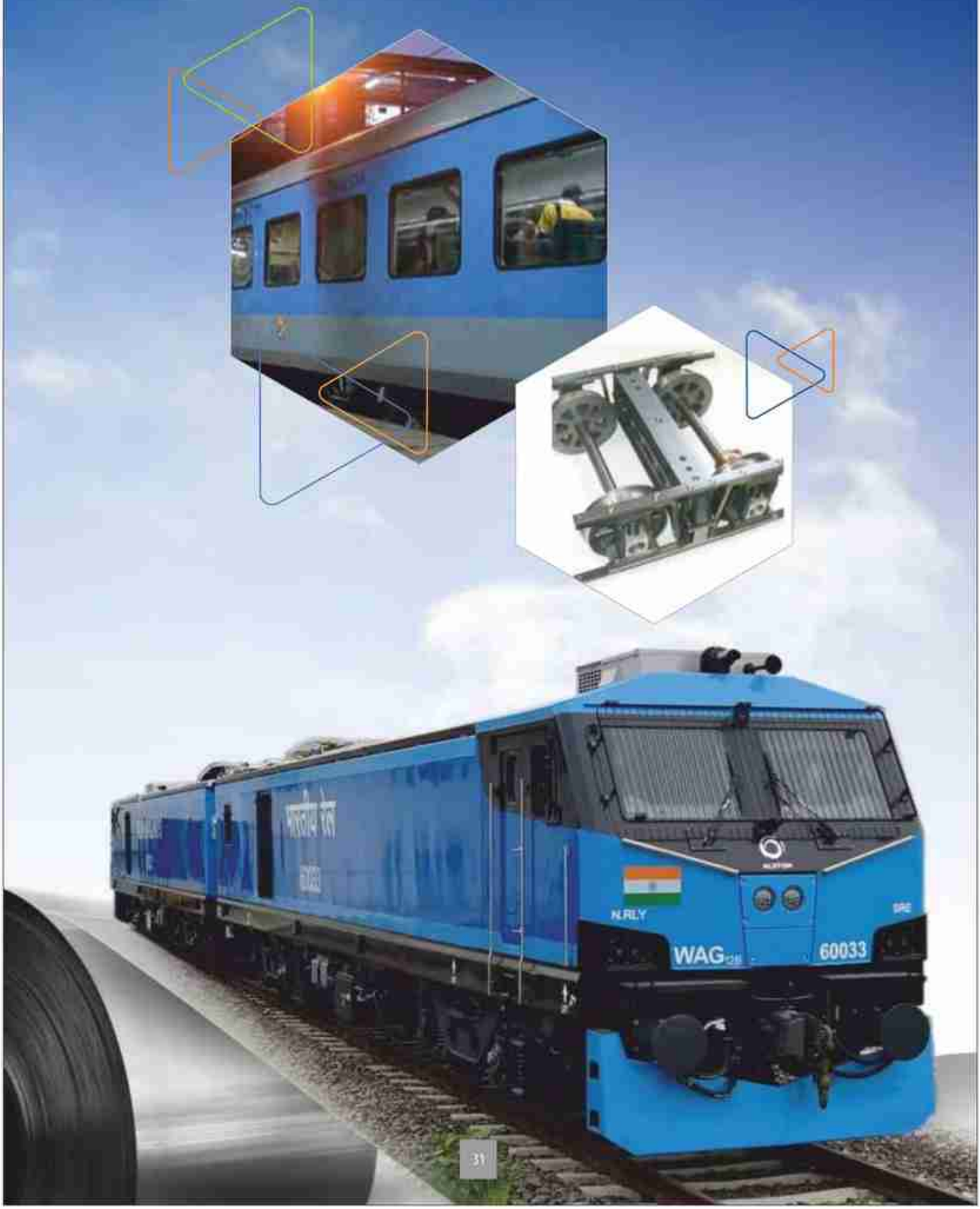


The Railways is a segment where Tata Steel's products have found ample use for over a decade now. Tata Astrum complies to BIS and IRS standards which are mandatory requirements of Directorate of Railways. Tata Astrum finds its uses in a host of applications like engine coach components, spring planks,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



## TDCs for Railways

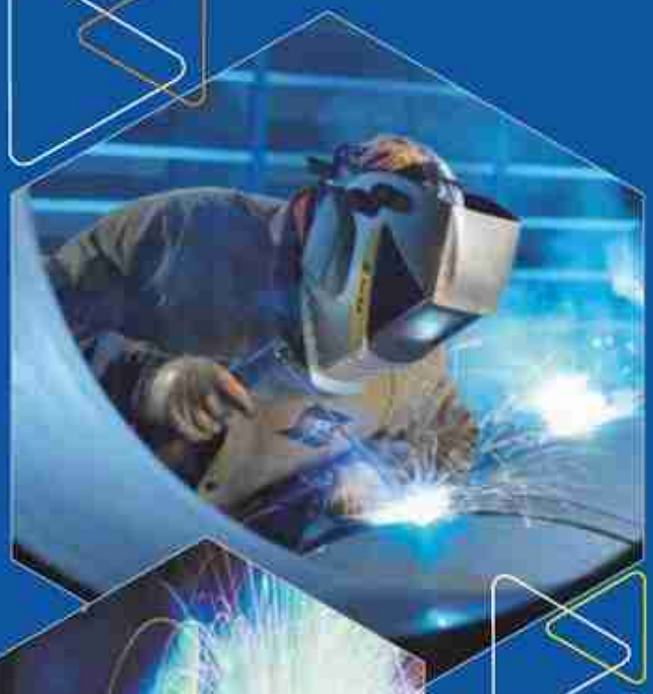
| | | | | Width and Thickness | | | | Mechanical Properties | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TDC | Grade | Remarks | Equivalent Standard | Thickness Range (mm) | | Width Range (mm) | | YS (MPa) | | UTS (MPa) | |
| | | | | Min | Max | Min | Max | Min | Max | Min | Max |
| HR06 | IRS M41 | Dry | Railway Coach/Panel/Roof | 5.00 | 12.00 | 1100 | 1500 | 340 | - | 480 | - |
| HU37 | IRS M41 (Corten) | Dry | Railway Coach/Panel/Roof | 5.00 | 8.00 | 900 | 2000 | 340 | - | 480 | - |
| HU38 | IRS M41 (Corten) | Dry | Railway Coach/Panel/Roof | 2.00 | 4.99 | 900 | 2000 | 340 | - | 480 | - |
| HU39 | IRS M41 (Corten) | Dry | Railway Coach/Panel/Roof | 8.00 | 12.00 | 900 | 2000 | 340 | - | 480 | - |
| HU09 | IS 2062 E 250 A (CU) | Dry | Railway Coach/Panel/Roof | 5.00 | 7.99 | 800 | 2050 | 250 | - | 410 | - |
| HU10 | IS 2062 E 250 A (CU) | Dry | Railway Coach/Panel/Roof | 2.00 | 4.99 | 900 | 2000 | 250 | - | 410 | - |


N.RLY
WAG
60033

# Projects & Fabrication

As India moves ahead on a growth trajectory, infrastructure is an area which is expanding 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 to meet the needs of this segment.







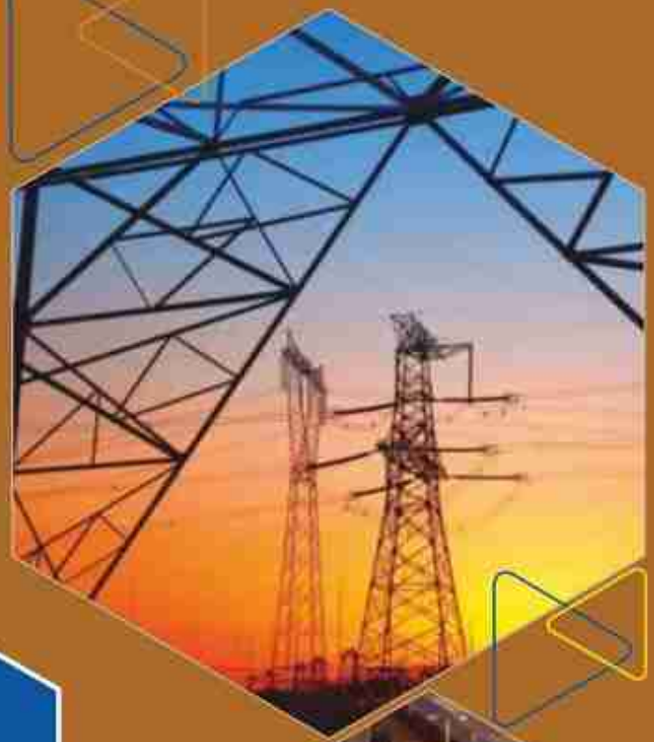




# TDCs for Projects & Fabrication

| TDC | Grade | Remarks | Equivalent Standard | Width and Thickness | | | | Mechanical Properties | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Thickness Range (mm) | | Width Range (mm) | | YS (MPa) | | UTS (MPa) | |
| | | | | Min | Max | Min | Max | Min | Max | Min | Max |
| HR05 | IS 2062 E 250 A (LC-MA) | Dry/PO | Fabrication | 2.00 | 4.99 | 800 | 2050 | 250 | - | 410 | - |
| HR07 | IS 2062 E 250 A (Perfectic) | Dry | Fabrication/ Auto Strucurals | 2.51 | 4.99 | 800 | 2050 | 255 | 370 | 410 | - |
| HR08 | IS 2062 E 250 A (LC-MA) | Dry/PO | Fabrication/ Auto Structurals | 5.00 | 12.00 | 900 | 1680 | 250 | - | 410 | 600 |
| HR12 | ASTM 622M | HRSPO | Compressor Shell | 1.60 | 4.50 | 1000 | 1540 | - | - | - | - |
| HR15 | IS 5986 Fe 360 | Dry/PO | Structural/Fabrication | 1.60 | 4.99 | 800 | 2050 | 235 | - | 370 | - |
| HR18 | BS 2062 Gr E250 BR | Dry/PO | Fabrication/ Structurals | 2.00 | 4.99 | 800 | 2050 | 250 | - | 410 | - |
| HR19 | BS 2062 Gr E350 BR | Dry | Fabrication/ Structurals | 5.00 | 12.00 | 800 | 2050 | 250 | - | 410 | - |
| HR20 | IS 2062 E 250 A (Perfectic) | Dry | Fabrication/ Auto Structurals | 5.00 | 12.00 | 800 | 2050 | 255 | 370 | 410 | 600 |
| HR23 | IS 2062 E 250 A | Dry | Structurals requiring Hot Dip Galvanizing | 5.00 | 12.00 | 900 | 1540 | 255 | 370 | 410 | 600 |
| HR25 | IS 2062 E 250 Gr-B0 | Dry | Fabrication/ Structurals | 5.00 | 12.00 | 900 | 1540 | 250 | - | 410 | - |
| HT03 | IS 2062 E 250 A | Dry | Fabrication & Structurals | 16.01 | 20.00 | 800 | 2050 | 250 | - | 410 | - |
| HR27 | IS 2062 E 450 A | Dry | Hi strength structurals | 2.00 | 5.00 | 900 | 1680 | 450 | - | 570 | - |
| HR30 | IS2062 E 250 Gr B0 | Dry | Fabrication/ Structurals | 12.01 | 16.00 | 900 | 1680 | 250 | - | 410 | 600 |
| HR31 | IS 1079 Gr D | Dry/PO | Sheet Metal Components requiring draw | 1.60 | 6.00 | 900 | 1680 | - | - | 240 | 420 |
| HR40 | IS 5986 235 (THICK) | Dry | Fabrication & Structurals | 5.00 | 12.00 | 1200 | 1680 | 235 | - | 360 | 470 |
| HR41 | IS 5986 255 (THICK) | Dry | Fabricated Compoonents | 5.01 | 12.00 | 900 | 1680 | 255 | - | 410 | 520 |
| HR42 | IS 5986 205 | Dry | Fabricated Components | 6.01 | 9.00 | 900 | 1680 | 205 | - | 330 | 440 |
| HR43 | IS:11513 CR2 | Dry | HR for CR | 1.60 | 12.00 | 800 | 2050 | - | - | - | - |
| HR44 | IS 1079 HR 2 | Dry | Direct HR Components | 1.60 | 6.00 | 800 | 2050 | - | - | - | 420 |
| HR45 | IS 2062 E 250 GR A | Dry | Fabrication/ Auto Structurals | 5.00 | 7.99 | 800 | 2050 | 250 | - | 410 | - |
| HR47 | IS 2062 E 250 GR A | Dry | Fabrication/ Auto Structurals | 1.60 | 2.50 | 800 | 1700 | 250 | - | 410 | - |
| HR63 | IS 1079 HR 2 | Dry | Drawing Components | 5.00 | 7.99 | 800 | 2050 | 170 | - | - | 420 |
| HR64 | IS 5986 FE 360 | HRSPO | Panels | 1.60 | 4.50 | 900 | 1620 | 235 | - | 370 | - |
| HR66 | IS 2062 E 350 C | Dry | Fabrication/ Structurals | 8.00 | 12.00 | 800 | 2050 | 350 | - | 490 | - |
| HR68 | IS 2062 E250 GR A (GAL) | Dry | Fabrication/ Structurals (Requring galvanizing) | 2.00 | 4.99 | 900 | 1680 | 255 | 370 | 410 | 600 |
| HR69 | IS 2062 E450 A | Dry | Fabrication & Structurals | 5.00 | 12.00 | 900 | 1540 | 450 | - | 570 | - |
| HR70 | IS 2062 E 250 B0 | Dry | Structurals | 8.00 | 12.00 | 900 | 2050 | 250 | - | 410 | - |
| HR76 | BS 2062 E 250 BR | Dry | Fabrication/ Structurals | 16.01 | 20.00 | 800 | 2050 | 250 | - | 410 | - |
| HR78 | IS 2062 E 250 GR A | Dry | Fabrication/ Structurals | 12.01 | 16.00 | 800 | 2050 | 250 | - | 410 | - |
| HR81 | IS 5986 235 (PANEL) | Dry/PO | Direct Forming Applications | 1.60 | 2.50 | 900 | 1680 | 235 | - | 370 | - |
| HU12 | BS 2062 E 250 BR | Dry | Fabrication & Structurals | 1.60 | 4.99 | 900 | 2000 | 250 | - | 410 | - |
| HU13 | BS 2062 E 250 BR | Dry | Fabrication & Structurals | 5.00 | 7.99 | 900 | 2000 | 250 | - | 410 | - |
| HU14 | BS 2062 E 250 BR | Dry | Fabrication & Structurals | 8.00 | 12.00 | 900 | 2000 | 250 | - | 410 | - |
| HU30 | EN 10025 S275 J2 (Si>0.14) | Dry | Structurals | 2.00 | 4.99 | 900 | 2050 | 275 | - | 410 | 580 |
| HU31 | EN 10025 S275 J2 (Si>0.14) | Dry | Structurals | 5.00 | 7.99 | 900 | 2000 | 275 | - | 410 | 580 |
| HU32 | EN 10025 S275 J2 (Si>0.14) | Dry | Structurals | 8.00 | 12.00 | 900 | 2000 | 275 | - | 410 | 580 |
| HU33 | EN10025 S355J2 (Si>0.14) | Dry | Structurals | 2.00 | 4.99 | 900 | 2000 | 355 | - | 470 | 680 |
| HU34 | EN10025 S355J2 (Si>0.14) | Dry | Structurals | 5.00 | 7.99 | 900 | 2000 | 355 | - | 470 | 630 |
| HU34 | EN10025 S355J2 (Si>0.14) | Dry | Structurals | 5.00 | 7.99 | 900 | 2000 | 355 | - | 470 | 630 |
| SRP1 | IS 1079 Gr D | HRSPO | Panels | 1.60 | 4.50 | 900 | 1540 | - | - | - | 420 |
| HT90 | EN 10149 S500 MC | Dry | Railways/ Fabrication | 5.00 | 7.99 | 800 | 2050 | 500 | - | 550 | 650 |
| HT91 | EN 10149 S500 MC | Dry | Railways/ Fabrication | 8.00 | 12.00 | 800 | 2050 | 500 | - | 550 | 650 |
| HT92 | EN 10149 S550 MC | Dry | Fabricated Components | 5.00 | 7.99 | 800 | 2050 | 550 | - | 600 | 760 |
| HT93 | EN 10149 S550 MC | Dry | Fabricated Components | 8.00 | 12.00 | 800 | 2050 | 550 | - | 600 | 760 |
| HT95 | HS650 (ATM grade) | Dry | ATM Safe | 10.00 | 13.00 | 900 | 2000 | 650 | - | 700 | 790 |
| HT97 | EN10149-2 S700MC | Dry | High Strength HR for CF, ATM Safe | 4.00 | 13.00 | 900 | 2000 | 700 | - | 750 | 950 |
| HU44 | HR ENAMELLING IS 2062 E250 GR A | Dry/PO | Structurals (HR Steel for Enamelling ) | 2.00 | 4.99 | 900 | 1680 | 250 | - | 410 | - |
| HU46 | HR ENAMELLING IS 2062 E250 GR A | Dry/PO | Structurals (HR Steel for Enamelling ) | 5.00 | 7.99 | 900 | 1680 | 250 | - | 410 | - |
| HU45 | HR ENAMELLING IS 2062 E250 GR A | Dry/PO | Structurals (HR Steel for Enamelling ) | 8.00 | 12.00 | 900 | 1680 | 250 | - | 410 | 700 |
| HT34 | IS 2062 E250 GR C | Dry | Structurals | 2.00 | 4.99 | 900 | 1680 | 250 | - | 410 | 600 |
| HT35 | IS 2062 E250 GR C | Dry | Structurals | 5.00 | 7.99 | 900 | 1680 | 250 | - | 410 | 600 |
| HT36 | IS 2062 E250 GR C | Dry | Structurals | 8.00 | 12.00 | 900 | 1680 | 250 | - | 410 | 600 |
| HT37 | IS 2062 E250 GR C | Dry | Structurals | 12.01 | 16.00 | 900 | 1680 | 250 | - | 410 | 600 |

# Transmission & Distribution

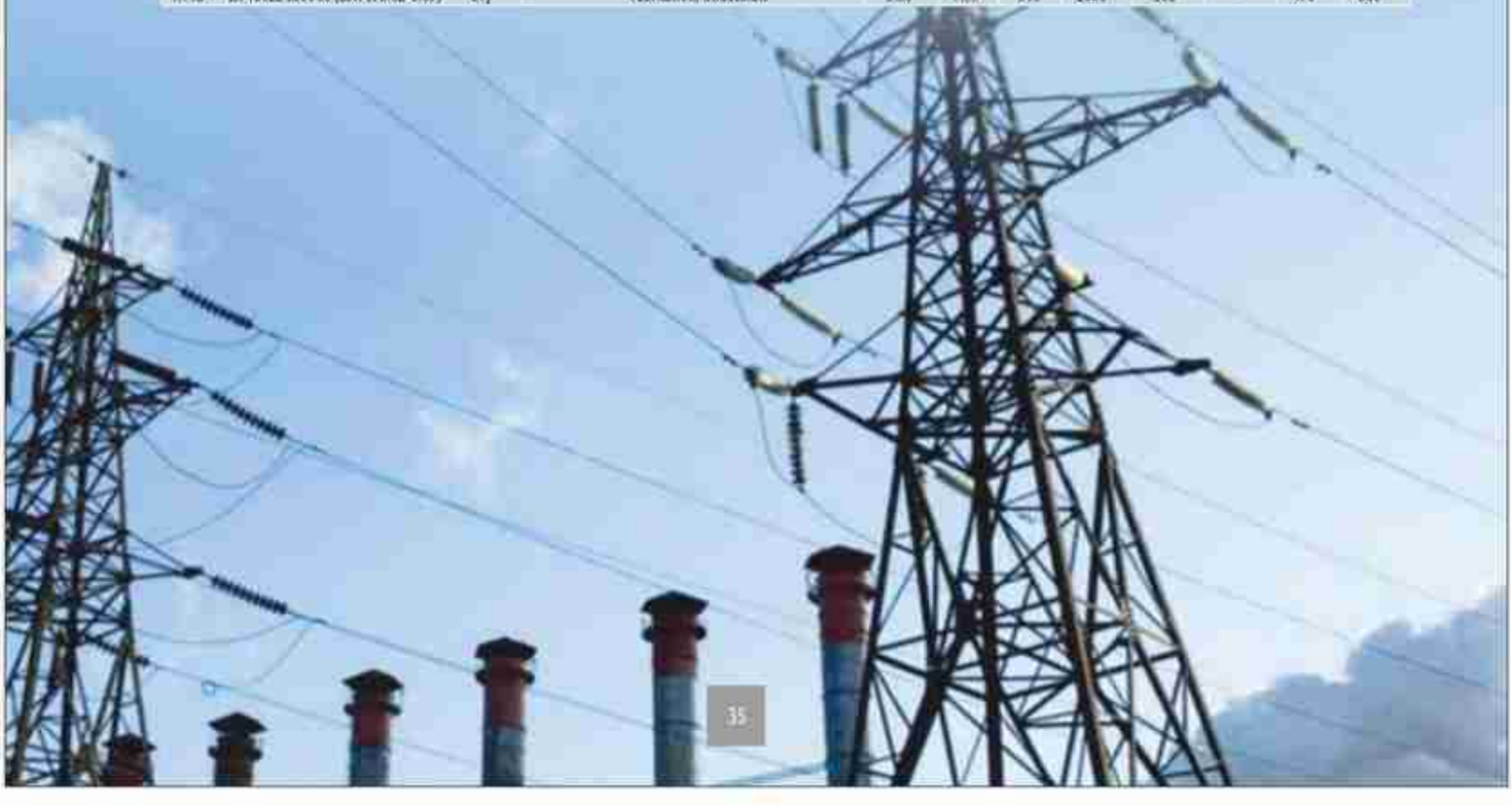




The India power industry is undergoing a major transformation phase owing to the efforts taken by the government to improve electricity access in the country. In the T&D industry, improving the efficiency of the grid is the key to an efficient and reliable delivery of electricity. Tata Astrum has been offering segment specific products to ensure application suitability as well as value addition for strength and improved corrosion resistance.

# TDCs for Transmission & Distribution

| TDC | Grade | Remarks | Application | Width and Thickness | | | | Mechanical Properties | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Thickness Range (mm) | | Width Range (mm) | | YS (MPa) | | UTS (MPa) | |
| | | | | Min | Max | Min | Max | Min | Max | Min | Max |
| HP01 | IS 2062 E250 Gr BR (Hi Si) | Dry | Transmission Line Towers | 2.00 | 4.99 | 900 | 2000 | 250 | - | 410 | - |
| HP02 | IS 2062 E250 Gr BR (Hi Si) | Dry | Transmission Line Towers | 5.00 | 7.99 | 900 | 2000 | 250 | - | 410 | - |
| HP03 | IS 2062 E250 Gr BR (Hi Si) | Dry | Transmission Line Towers | 8.00 | 12.00 | 900 | 2000 | 250 | - | 410 | - |
| HP04 | IS 2062 E250 Gr BR (Hi Si) | Dry | Transmission Line Towers | 12.00 | 16.00 | 900 | 2000 | 250 | - | 410 | - |
| HP05 | IS 2062 E250 Gr BR (Hi Si) | Dry | Transmission Line Towers | 16.01 | 20.00 | 900 | 2000 | 250 | - | 410 | - |
| HP06 | IS 2062 E350 Gr C (Hi Si) | Dry | Transmission Line Towers | 2.00 | 4.99 | 900 | 2000 | 350 | - | 490 | - |
| HP07 | IS 2062 E350 Gr C (Hi Si) | Dry | Transmission Line Towers | 5.00 | 7.99 | 900 | 2000 | 350 | - | 490 | - |
| HP08 | IS 2062 E350 Gr C (Hi Si) | Dry | Transmission Line Towers | 8.00 | 12.00 | 900 | 2000 | 350 | - | 490 | - |
| HP09 | IS 2062 E350 Gr C (Hi Si) | Dry | Transmission Line Towers | 12.00 | 16.00 | 900 | 2000 | 350 | - | 490 | - |
| HP10 | IS 2062 E350 Gr C (Hi Si) | Dry | Transmission Line Towers | 16.01 | 20.00 | 900 | 2000 | 350 | - | 490 | - |
| HU28 | IS 2062 E250 Gr A (Si>0.14) | Dry | Transmission & Distribution | 5.00 | 7.99 | 900 | 1540 | 280 | - | 420 | - |
| HU29 | IS 2062 E250 Gr A (Si>0.14) | Dry | Transmission & Distribution | 8.00 | 12.00 | 900 | 1540 | 280 | - | 420 | - |
| **Other TDCs** | | | | | | | | | | | |
| HU30 | EN 10025 S275 J2 (Si>0.14) | Dry | Structurals | 2.00 | 4.99 | 900 | 2050 | 275 | - | 410 | 580 |
| HU31 | EN 10025 S275 J2 (Si>0.14) | Dry | Structurals | 5.00 | 7.99 | 900 | 2000 | 275 | - | 410 | 580 |
| HU32 | EN 10025 S275 J2 (Si>0.14) | Dry | Structurals | 8.00 | 12.00 | 900 | 2000 | 275 | - | 410 | 580 |
| HU33 | EN10025 S355J2 (Si>0.14) | Dry | Structurals | 2.00 | 4.99 | 900 | 2000 | 355 | - | 470 | 680 |
| HU34 | EN10025 S355J2 (Si>0.14) | Dry | Structurals | 5.00 | 7.99 | 900 | 2000 | 355 | - | 470 | 680 |
| HU35 | EN10025 S355J2 (Si>0.14) | Dry | Structurals | 8.00 | 12.00 | 900 | 2000 | 355 | - | 470 | 680 |
| HU40 | EN 10025 S275 J2 (Si>0.14) | Dry | Structurals | 12.01 | 16.00 | 900 | 2000 | 275 | - | 410 | 580 |
| HU50 | EN10025 S355J2 (Si>0.14) | Dry | Structurals | 16.01 | 20.00 | 900 | 2000 | 355 | - | 470 | 630 |
| HU56 | EN 10025 S275 J2 (Si>0.14) | Dry | Structurals | 16.01 | 20.00 | 900 | 2000 | 275 | - | 410 | 560 |
| HT81 | ASTM A572 GR 65 Type 2 (Low Si) | Dry | Fabrication & Structurals (High Mast Poles) | 5.00 | 7.99 | 900 | 2000 | 450 | - | 550 | - |
| HT82 | ASTM A572 GR 65 Type 2 (Low Si) | Dry | Fabrication & Structurals (High Mast Poles) | 8.00 | 12.00 | 900 | 2000 | 450 | - | 550 | - |
| HO75 | ASTM A572 GR 65 Type 2 | Dry | Fabrication & Structurals (High Mast Poles) | 5.00 | 7.99 | 900 | 2000 | 450 | - | 550 | - |
| HO76 | ASTM A572 GR 65 Type 2 | Dry | Fabrication & Structurals (High Mast Poles) | 8.00 | 12.00 | 900 | 2000 | 450 | - | 550 | - |
| HO77 | ASTM A572 GR 65 Type 2 | Dry | Fabrication & Structurals (High Mast Poles) | 12.00 | 16.00 | 900 | 2000 | 450 | - | 550 | - |
| HO78 | ASTM A572 GR 65 Type 2 | Dry | Fabrication & Structurals (High Mast Poles) | 16.01 | 20.00 | 900 | 2000 | 450 | - | 550 | - |
| HT14 | EN 10025 S355 J0 (Low Si 0.02-0.05) | Dry | Fabrication/ Structurals | 2.00 | 4.99 | 900 | 2000 | 355 | - | 470 | 680 |
| HT17 | EN 10025 S355 J0 (Low Si 0.02-0.05) | Dry | Fabrication/ Structurals | 8.00 | 12.00 | 900 | 2000 | 355 | - | 470 | 680 |
| HT18 | EN 10025 S355 J0 (Low Si 0.02-0.05) | Dry | Fabrication/ Structurals | 5.00 | 7.99 | 900 | 2000 | 355 | - | 470 | 680 |



# Solar Panel Modular Mounting Structure

India's future prosperity rests on a steady supply of affordable, clean and reliable energy. Solar power in India is a fast developing industry. India's policy ambitions, notably the target to reach 450 GW of renewable capacity by 2030 portends explosive growth for this sector. Tata Astrum Solar was launched to further the country's mission of tapping India's solar energy potential to ensure clean power in every corner of the country, and reduce the carbon footprint. The offering is a specialised high tensile steel grade with enhanced strength, durability and weather resistance for Module Mounting Structures of Solar Panels, supported by a spectrum of services that ensure value creation for the customer.



"Tata Astrum Solar is an offering to meet the evolving needs of India's solar industry and spearhead development by helping to electrify every corner of the country."

**KEC International Limited, Jaipur**

## TDCs for Solar

| | | | | Width and Thickness | | | | Mechanical Properties | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TDC | Grade | Remarks | Equivalent Standard | Thickness Range (mm) | | Width Range (mm) | | YS (MPa) | | UTS (MPa) | |
| | | | | Min | Max | Min | Max | Min | Max | Min | Max |
| Hr2E | IS 2062 E 350 Gr C | Dry/PO | Structurals for Solar/ Transmission Towers | 2.00 | 4.99 | 800 | 2050 | 350 | - | 490 | - |
| HR29 | IS 2062 E 350 Gr C | Dry | Structurals for Solar/ Transmission Towers | 5.00 | 8.00 | 800 | 2050 | 350 | - | 490 | - |
| HR05 | IS 2062 E 250 A (LC-MA) | Dry/PO | Fabrication | 2.00 | 4.99 | 800 | 2050 | 250 | - | 410 | - |
| HR08 | IS 2062 E 250 A (LC-MA) | Dry/PO | Fabrication/ Auto Structurals | 5.00 | 12.00 | 900 | 1680 | 250 | - | 410 | 600 |

# Pre-Engineered Buildings

With the thrust on Smart Cities and growth of infrastructure, the PEB segment is witnessing phenomenal growth. PEBs are delivered as a complete finished product to the site with a basic structural steel framework with attached factory-finish roofing and cladding. Tata Astrum is geared to meet the structural requirements of PEB projects with its product and service advantages. The scope of using PEBs ranges from showrooms, low-height commercial complexes, industrial buildings and workshops, stadiums, schools, bridges, fuel stations to aircraft hangers, exhibition centres, railway stations and metro applications.



*We are proudly associated with Tata Steel for all our hot rolled sheets and plates requirements since last 5 years. The product quality in terms of dimensional tolerance and weldability are most important to our process and we are fully satisfied with Tata Steel for these parameters. Product marking is an added benefit which helps establish confidence with our customers on the raw material being used.*

**Paramount Building Solutions Pvt Ltd**

## TDCs for Pre-Engineered Buildings

| | | | | Width and Thickness | | | | Mechanical Properties | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TDC | Grade | Remarks | Equivalent Standard | Thickness Range (mm) | | Width Range (mm) | | YS (MPa) | | UTS (MPa) | |
| | | | | Min | Max | Min | Max | Min | Max | Min | Max |
| HR21 | DIN 17100 ST 52.3 | Dry | PEB | 5.00 | 8.00 | 900 | 1680 | 355 | - | 490 | - |
| HR22 | DIN 17100 ST 52.3 | Dry | PEB | 2.00 | 4.99 | 900 | 1680 | 355 | - | 490 | - |
| HR34 | ASTM A 572 Gr 50 Type 1 | Dry/PO | PEB | 2.50 | 4.99 | 900 | 1500 | 345 | - | 450 | - |
| HR35 | ASTM A 572 Gr 50 Type 1 | Dry | PEB | 5.00 | 10.00 | 900 | 1680 | 345 | - | 450 | - |
| HR28 | IS 2062 E 350 Gr C | Dry/PO | Structurals for Solar/ Transmission towers | 2.00 | 4.99 | 800 | 2050 | 350 | - | 490 | - |
| Hr29 | IS 2062 E 350 Gr C | Dry | Structurals for Solar/ Transmission Towers | 5.00 | 8.00 | 800 | 2050 | 350 | - | 490 | - |
| HR66 | IS 2062 E 350 C | Dry | Fabrication/ Structurals | 8.00 | 12.00 | 800 | 2050 | 350 | - | 490 | - |
| HT33 | IS2062 E350 GR.C | Dry | Fabrication/ Structurals | 12.01 | 16.00 | 900 | 2000 | 350 | - | 490 | - |
| HT85 | IS2062 E450 Gr A | Dry | Fabrication & Structurals | 5.00 | 7.99 | 900 | 2000 | 450 | - | 570 | - |

# Ensuring authenticity, Ensuring your trust

### Processed Material

Tata Astrum is processed at service centres, owned and operated by our channel partners and certified to the highest quality standards for service and quality. These service standards are evaluated every year and upgraded to raise the benchmark for service.



## SOURCE AUTHENTICITY

### Test Certificate

A Test Certificate is provided with every to ensure source authenticity.




### Marking

The logo, Tata Astrum, i printed on the sheets a guarantee of source authenticity.



### Packaging & Material Identification

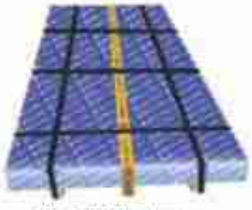
Tata Steel's stringent packaging standards have been developed to ensure failsafe packing. Each coil/ bundle has a label carrying the consignment and material details. It ensures proper identification and traceability.



Dry HR Packaging



Coil Packaging



PO & SPO Packaging

Stickers






# Services to enhance competitiveness

## Product Application Engineer support

Tata Astrum's team of Application Engineers work with customers to help them choose the right grade for their application and offer every kind of technical support.

ecafez | ecafez qualithon | SAFETY FIRST | eca connect

## Value Creation through focused engagement programs

Programmes such as Ecafez Qualithon create a forum for offline and online knowledge sharing on topics that impact quality. The objective is to create a mindset of quality thinking at every level of the organisation and ensure customers' competitiveness in rapidly evolving markets.

> *The Ecafez Qualithon session was excellent. I would like to attend other such sessions. Detailed programme on lean manufacturing and ZED initiative would be appreciated.*
>
> ***Vijay Kathote***
> *Plant Head, P S Camshafts Pvt. Ltd.*

> *Safety First programme was very useful and such training should be conducted in future . Accident prevention , fire safety and housekeeping sessions were very good Machine Maintenance Plan and Tool Maintenance Plan should be included in future seminars.*
>
> ***Naresh Tyagi***
> *Quality Head, Neumann Components Pvt. Ltd.*

> *Technical support and knowledge sharing have had admirable effects in our customer services. Product range of Tata Astrum is useful to cater new customers as well as new developments. We expect continuation & long term association in business opportunities.*
>
> ***Vijay Kathote***
> *Plant Head, P S Camshafts Pvt. Ltd.*

Collaborative Reform with ECAs for Advanced Technological Excellence
create

## Collaborating to Excel

Our marketing and technical teams collaborate with customers to jointly develop offerings which are customised to their needs, thus reducing cost and improving process efficiency.

ecafez

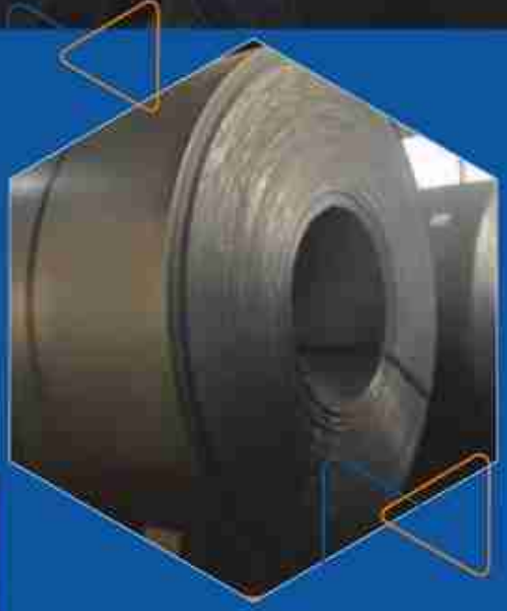
Digital Knowledge Sharing Platform
**www.ecafez.com**

# Pan-India Distribution Network





Tata Astrum's pan-India distribution network ensures faster delivery and consistent availability of the material in the required sizes.





## NORTH ZONE

| Distributor Name | Territory | Contact Person | Mobile No. | E-Mail ID | Address |
|---|---|---|---|---|---|
| Bansal Brothers | Delhi | Mr Ravi Bansal | 25786522 / 9810015757 | bansalbrothers@yahoo.com | X-39, Loha Mandi, Naraina, New Delhi- 110028 |
| Bhagirath Steel Sales | Chandigarh | Mr Pawan Bhargava | 9872207882 | info@bss.in.com | 979, Industrial Area Phase-II, Chandigarh- 160 002 |
| Dharamveer & Brothers | Ludhiana | Mr Virender Aggarwal | 9876561764 / 9814063764 | dvb_jsp@yahoo.co.in | SCO Nos. 402, Back Side Ramgi Haraan, Industrial Area 'B', Miller Ganj, Ludhiana- 141003 |
| Fatehpur Enterprises | Ludhiana | Mr Mahavir Garg | - | fatehpurbore1@gmail.com | Fatehpur Steels Pvt. Ltd., 9/ D, 209, Tanda Road, Jalandhar City- 144 004, Punjab |
| Fatehpur Steels Pvt Ltd | Ludhiana | Mr. Mahavir Garg | 98142 29911 | fatehpurbore1@gmail.com | Fatehpur Steels Pvt. Ltd., 9/ D, 209, Tanda Road, Jalandhar City- 144 004, Punjab |
| Ferro Steel Solutions | Faridabad | Mr Rajeev Aggarwal | 9810003106 / 9990101615/75 | info@ferrosteelsolutions.com | B1-B2-B3, Nehru Ground, NIT, Faridabad- 121001 |
| G R Gupta & Brothers | Faridabad | Mr Sanjay Gupta | 9810052058 / 9311569052 | sanjay@grgupta.com | 7-A, Nazarana Warehousing Area, New Delhi- 110 028 |
| GRG Steels Pvt Ltd | Ghaziabad | Mr Rajiv Gupta | 9810057959 / 9311569022 | rajiv.gupta@grggroup.com | 7-A, Nazarana Warehousing Area, New Delhi- 110 028 |
| Hasanoy Steels | Faridabad | Mr Bhavuk Bansal | 9810015357 | hasanoysteels2@yahoo.co.in | C-55/1, Mathura Ground, NIT, New Industrial Town, Faridabad- 121001, Haryana |
| India Steel | Kanpur | Mr Ramanuj Agarwal | | indiasteel.distributors@gmail.com | |
| Kiran Marwa | Jaipur | Mr Manish Khandelwal | | kiranmarwa12@rediffmail.com | E/150, K.H.B. Area, Jaipur- 302013, Rajasthan |
| M/s Dhanji Lal Kewal Kumar | Faridabad | Mr Mohit Gupta | 9811163446 | dlkl.steel@gmail.com | Neeram Gupta, F-131, Loha Mandi, Naraina, New Delhi- 110028 |
| MS Jagdish Udyog | Kanpur | Mr Sandeep Bansal | 9839039929 | anupamsteel@gmail.com | 81/56/118D, Kaushal Puri, Sarsaini Nagar, Kanpur- 208012 |
| P S Enterprises | Ghaziabad | Mr Deepak Garg | 98100 34231 / 93111 93777 | deepakpsenterprises@gmail.com | C-183, B.S. Road Industrial Area, Ghaziabad- 201 009, Uttar Pradesh |
| Parshwa Overseas Pvt Ltd | Jaipur | Mr Sanjeev Shanda | 9829010100 | pelitandyal@yahoo.com | Office No- 405, Suraj and Ahuja Chambers, Near Ajmeri Pole, Ajmeri Road, Jaipur- 302013 |
| Punjab Agro Engineering Works | Ludhiana | Mr Vinod Kumar Singla | 98140-49009 | dwdpa@yahoo.com | 987, Industrial Area-B, Ludhiana- 141 003 |
| R R Steel Industries | Ludhiana | Mr Rishi Bansal | | rrsteel.rsh@gmail.com | 490, Daresi Road, Ludhiana, Punjab- 141003 |
| Rakesh Steels | Faridabad | Mr Anil Bansal | 9971010019 | rpsfbd@rakeshsteels.in | B368, Nehru Ground, NIT, Faridabad- 121001 |
| Sangeeta Steel Corporation | Ludhiana | Mr Sanjay Bhatia | 9814650665 | sbatia@sangeetasteel.co.in | 529, Daresi Road, Agarwal Market, 1st Floor, Ludhiana- 141 003 |
| Sangeeta Steel Corporation | Chandigarh | Mr Sanjay Bhatia | 9814650665 | sbatia@sangeetasteel.co.in | Near M & Dharam Kanta, Bodhreal Road, NH- Sonda'a', Chandigarh Road- 141132, Ludhiana |
| Sanjeev Industrial Corporation | Faridabad | Mr Sanjeev Aggarwal | 9810009699 | info@sanjeevindustrial.com | B167, Nehru Ground, NIT, Faridabad- 121001 |
| TSPDL Faridabad | Faridabad | | 8979981979 | amritsar@tspdl.com | 358, Industrial Area, NIT Faridabad- 121001 |
| TSPDL Ghaziabad | Ghaziabad | | 8979982979 | amritsar@tspdl.com | C-87/1 & 88 & 5 Road, Industrial Area, Ghaziabad- 201009 |
| TSPDL Ludhiana | Ludhiana | | 9216658481 | amritsar@tspdl.com | 1st Floor, SCF No-112, Phase-1, Urban Estate, Jamalpur, Ludhiana-141010 |
| TSPDL Uttarakhand | Pantnagar | | 8979005214 | pushpendra@tspdl.com | Plot No-57, Sector-13, IE Pantnagar, Uttarakhand- 263154 |
| Vardhaman Steels Pvt Ltd | Jaipur | Mr Krishan Kishore | 9829015661 | kkhemani@vsfy.com | S-1, Usha Plaza, 2nd Floor, Opp. MI India Radio, M.I. Road, Jaipur- 302 001, Rajasthan |
| Vikrant Iron Pvt Ltd | Ghaziabad | Mr Rajat Bansal | 9312287902 | rajat.bansal@vikrantgroup.in | 113/8 Nangia Market, 1st Floor, Ghaziabad- 201 001, Uttar Pradesh |

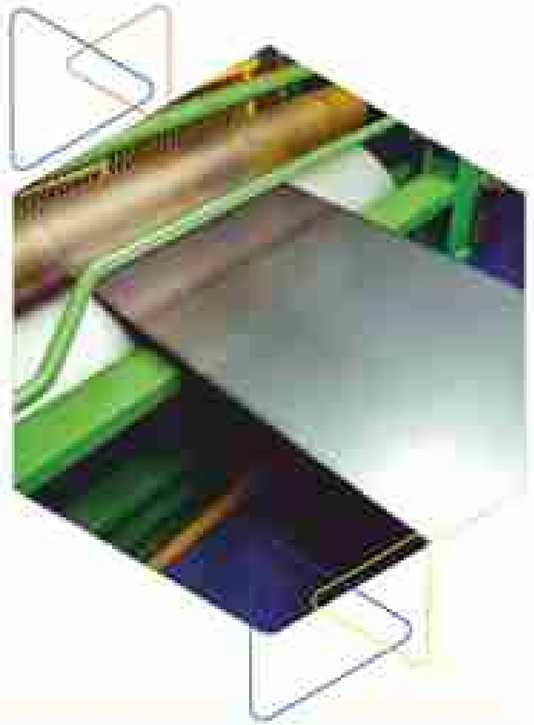




## EAST ZONE

| Distributor Name | Territory | Contact Person | Mobile No. | E-Mail ID | Address |
|---|---|---|---|---|---|
| A K Steel Enterprise | Kolkata | Mr Sunil Kumar Khemka | 9038022334 | khemka123@gmail.com | 28, Maharshi Debendra Road, 1st Floor, Room 12, Kolkata- 700007 |
| Bharma Distributors Pvt Ltd | Bhubaneshwar | Mr Kishori Lal Agarwal | 9437027797 | info@bharmagroup.com | Gaurishankar Bihar, 278 C, Dutta Square, 4th Floor, Tagar Estate, Kolkata- 700003 |
| Bimla Industrial & Business Enterprise Pvt Ltd | Ranchi | Mr Sunil Agarwal | 9431021268 | bimlaltd@gmail.com | 401, Tagar Towers, Gali Opposite Road, Near Abhyapur Masjid, Guwahati - 781001, Assam |
| BMW Ventures Ltd | Patna | Mr Nitin Kishanpuria | 9239667222 | nitin@bmwventures.com | Tata Centre (4th Floor), 43, Jawaharlal Nehru Road, Kolkata- 700071 |
| Bright Steel | Bhubaneshwar | Mr Virendra Khetia | | brightsteel_bbsr@rediffmail.com | 1st Floor, Maria Cinema Complex, East Gandhi Maidan, Patna- 800004, Bihar |
| Integral Koppo Pvt Ltd | Bhojpur | Mr Deepak Bhalotia | 9431020628 | bhalotiadeepak@gmail.com | 31/A, 2nd Floor, Suite- 12, Maharshi Debendra Road, Kolkata- 700007, West Bengal |
| Pawan Kr. Kanoi | Kolkata | Mr Sumit Kanoi | 9831011777 | pawankumarkanoi@gmail.com | 28, Maharshi Debendra Road, 2nd Floor, Room No- 4013, Kolkata- 700007 |
| PSPL Steel Processors Private Limited | Jamshedpur | Mr Binod Jain | 9835944700 | psplbinod@gmail.com | Tagar Estate, 278 C, Dutta Square, Room No- 17, 2nd Floor, Kolkata- 700003 |
| PSPL Steel Processors Pvt Ltd | Kolkata | Mr Nirmal Jain | 9836244444 | pspljamshedpur@gmail.com | 16, Ancillary Industrial Area, Tupudana, Hatia, Ranchi, Jharkhand- 834001 |
| R. S. Bokaro Metal Pvt Ltd | Bokaro | Mr Deepak Bajoria | 9431027628 | bkadeepak@gmail.com | C-4, Phase- VI, Adityapur Industrial Area, Jamshedpur- 832109, Jharkhand |
| Ramesh Company | Kolkata | Mr Rajesh Bihani | 9835032701 | rameshcal@hotmail.com | Purulia Road, Bokaro Steel City- 827013, Jharkhand |
| Sagar Steels | Guwahati | Mr Hemant Kr. Agarwal | 9864028704 | hemant@sagarsteels.co.in | Pilgrim Road, College Square, Cuttack- 753003, Orissa |
| Shrimati Sheni Trading Co | Kolkata | Mr Sushil Tibrewal | 9831078886 | shrimatisheni@yahoo.co.in | Plot No- 1317, Jhotgoa, Bhubneswar Talcang, Nayabasta- 754041, Dist- Jajpur(Jagatsinghpur), Odisha |
| TVPSL Bhubaneswar | Bhubaneshwar | | 9437047999 | tvpltamang@rediff.com | Tata Centre (4th Floor), 43, Jawaharlal Nehru Road, Kolkata- 700071 |
| TVPSL Kolkata | Kolkata | | 9830055434 | arjun.sahu@tvpsl.com | 36, Cuttack Road, Bhubaneswar- 751006 |





## WEST ZONE

| Distributor Name | Territory | Contact Person | Mobile No. | E-Mail ID | Address |
|---|---|---|---|---|---|
| ARMI Ispat Pvt Ltd, Ahmedabad | Ahmedabad | Mr Tarun Navinchandra Mehta | 9898706433 | [illegible] | 31, Shyam Ind. Estate, B/H. Devang Steel, Near Hill, Sarkhej-Gandhinagar Highway, Changodar, Ahmedabad |
| ARMI Ispat, Mumbai | Mumbai | Mr Tarun Navinchandra Mehta | 9867706733 | [illegible] | 308 Platinum, Jawahar Road, Ghatkopar (East), Mumbai- 400077, Maharashtra |
| Naresh Steel Industries Pvt Ltd | Mumbai | Mr Saurabh Shah | 9820121894 | [illegible] | C-501, Neelkanth Business Park, Opposite Vidyavihar Rly Stn., Vidyavihar (West), Mumbai - 400 086 |
| Pipa Associates Pvt Ltd | Raipur | Mr Yogesh Bansal | 9977436709 | [illegible] | 202, Guru Shankar Plaza, Amanaka, G.E. Road, Raipur 492001, Chhattisgarh |
| Prestige Metallics Pvt Ltd | Raipur | Mr Sumanth Gupta | 9755021000 | [illegible] | Mahal Lotus Bazar, Ring Road No. 2, Hirapur, Raipur- 492001 |
| Prince Steel Industries (P) Ltd | Nagpur | Mr Amit Gupta | 9850342469 | | 117-118, Small Factory Area, Bagadganj, Nagpur- 440008 |
| Rohit & Company, Ahmedabad | Ahmedabad | Mr Raghav Bihani | 9825013791 | [illegible] | B-601, Sumaan, Behind Navrangpura Bus Stand, Navrangpura, Ahmedabad- 380 009 |
| Rohit & Company, Mumbai | Mumbai | Mr Raghav Bihani | 9867276003 | [illegible] | 83/1003, Maadhavi Annexe, Opp. Peninsula Corporate Park, Off Ganpatrao Kadam Marg, Lower Parel (w), Mumbai- 400013 |
| SKM Steels, Indore | Indore | Mr AMITABH MANDOI | 9826051117 | [illegible] | 311 & 312, Princess Business Sky Park, Plt. 3, Scheme No. 114, Opposite Orbit Mall, A. B. Road, Indore |
| SKM Steels, Mumbai | Mumbai | Mr Ravi M Shah | 9833191011 | [illegible] | 12, 1850 House, Khotachi 4th Lane, Near Alankar Cinema, S.V.P. Road, Mumbai- 400 004 |
| Tejkaran Ramniwas Agrawal | Nagpur | Mr Sumit Agrawal | 9823249659 | [illegible] | 629, Dhan Road, Nagpur- 440018 |
| TOPOS, Pune | Pune | | 9112135208 | [illegible] | 206, 2nd Floor, Business Guild, Law College Road, Erandawane, Pune- 411004 |







## SOUTH ZONE

| Distributor Name | Territory | Contact Person | Mobile No. | E-Mail ID | Address |
|---|---|---|---|---|---|
| Bansal Steel, Hyderabad | Telangana | Mr. Dinesh Agarwal | | bansal_agro@yahoo.com | 5-2-199 & 200/3, Doddikey Road, Secunderabad- 500003, Telangana |
| CMG Steels Pvt. Ltd. | Chennai | Mr. Pawan Kumar Goyal | 9840538882 | info@cmgsteels.com | No. 8, Ellaithamman, Poonamallee High Road, Manali, Chennai - 600103 |
| Durga Steel Industries | Bangalore | Mr. Harsh Agarwal | 9243100101 | harsh@durgasteel.in | No. 268-A, Jigani Link Road, Bommasandra Industrial Area, Survey No. 127, Jigani Hobli, Anekal Taluk, Bengaluru- 562106 |
| G.R. Ispat Pvt Ltd, Bangalore | Bangalore | Mr. Gopal Ki Agarwal | | ho@grsteels.com | 465/1, K. Siddi, Prestige Walkali, 2nd Floor, A Lalit Cooper Road, Bangalore 560001 |
| G.R.Ispat Pvt Ltd, Hyderabad | Hyderabad | Mr. Ratan Ki Agarwal | 9866484047 | rathan@grispat.com | Unit No: A3, Bansal Chambers, Plot No.207/1 & 7, SVCHE, Phase 1, Balanagar, Hyderabad 500037 |
| Govindaraja Mudaliar Sons Pvt. Ltd. | Chennai | Mr. Karthik | 9840791771 | karthik@ygmgsk.net | Old 202, New 244, Thambu Chetty Street, Chennai - 600001 |
| HST Steels Pvt. Ltd. | Hyderabad | Mr. Alok Gupta | 9347043711 | hststeels@rediffmail.com | Plot No. 40/A, IDA, Kukatpally, Hyderabad- 500 037, Andhra Pradesh |
| Karthik Steels | Chennai | Mr. Karthikeyan | 9841298982 | karthiksteels@yahoo.co.in | 59/10, Bharathi Express Road, Kamarajar Nagar, Manali, Chennai- 600057 |
| Kunnamchery Steels | Cochin | Mr. K.B. Mathai | 9847444014 | mathai@kunnamcherysteels.com | 1117/115 A, Kollissery Road, Kunnamam, Thrippunithura, Ernakulam - 682304 |
| Kalyani Ramesh Gold Pvt. Ltd. | Telangana | Mr. Manish Kumar Kothmasira | | manish@kalyaniexotica1903.com | Door No. 14-9-1, CC No. 1140/3, Gandimaisamma- Dundigal Mandal, Dhulapally Village, Medchal-Malkajgiri, Telangana- 500014 |
| Ramsarup & Sons | Bangalore | Mr. Rajan Aggarwal | 9900126001 | rmsflame@hotmail.com | Survey: 191/1, 191/2, 191/21, Mindahalli, Malara Halli, Hobli, 100/1, 28.1, Mindahalli, 17th Km, Old Madras Road, Bangalore- 560049 |
| Sakthivel Steels Pvt. Ltd. | Hyderabad | Mr. Raja Sam | 9849011289 | rajasam@sakthisteelsgroup.com | Flat No: 17 to 120, Alkapuri Mansion H No: 1-11-252/1A to 10, S/ No. 3, Begumpet, Hyderabad - 500016. |
| Shakthiff Calcium | Chennai | Mr Sunil Kumar Shakthiff | | info@shakthiffcalcium.co.in | 1st Floor, Alsa Mall, No. 4, Montieth Road, Egmore, Chennai- 600008, Tamil Nadu |
| Shiva Ferro Pvt Ltd | Bangalore | Mr. SUDHIR PRAKASH PUROHIT | 9448051695 | sanjay@shivaferro.com | No. 191 Shri Sadan, 4th Floor, Bunty Bieg Rd, Opp. to RCC Apt., Near Royal Enfield Showroom, R Narayanpura, Bangalore - 560016. |
| Sri Balaji Steel Traders | Chennai | Mr. P.S.S. SRIDHAR | 9444034467 | sbs@vsnl.in | No. 11, Anna Street, Mannadi, Chennai - 600001 |
| Thirupathy Steels | Chennai | Mr. Suresh Kumar Gupta | 9380127181 | tsthembaiah@yahoo.in | No. 19, Seethaladevi Street, Chennai - 600 001 |
| TVPSL Bangalore | Bangalore | | 9448387892 | shivakumar@tvpsl.com | No. 19, SP Building, Apple Villa, 2nd Floor, Lal Bagh, Main Road, Bangalore - 560027 |
| TVPSL Chennai | Chennai | | 9176608363 | bmw@tvpsl.com | No. 3/3 Chamiraj Sigapi Achi Building 8th Floor, Rukmini Lakshmipathy Road, Egmore, Chennai - 600008 |

# Pan-India Service Centres




## EAST ZONE

- Guwahati
- Jamshedpur
- Kolkata
- Patna
- Ranchi
- Kalinganagar
- Meramandali

## NORTH ZONE

- Bhiwadi
- Chandigarh
- Faridabad
- Ghaziabad
- Jaipur
- Kanpur
- Ludhiana
- Pantnagar







## SOUTH ZONE

- Bangalore
- Chennai
- Kochi
- Secunderabad

## WEST ZONE

- Ahmedabad
- Indore
- Mumbai
- Pune
- Nagpur



# Tata Steel Sales Offices

## North Zone

**Delhi** : C/O Tata Steel BSL Limited
Mira Corporate Suites-Ground Floor Plot 1&2,
Ishwar Nagar Mathura Road
New Delhi – 110065

**Ghaziabad** : Plot No. 1227-1229,GT Road, Lalkuan
Ghaziabad – 201 001

**Faridabad** : 2nd Floor, Business Centre, 33-B NIT,
Faridabad
Haryana – 121001

**Chandigarh** : SCO-16 1st Floor, Sector 26, Madhya Marg
Chandigarh – 160 019

**Kanpur** : 16/97, Navroz Building, The Mall,
Kanpur – 208 001

**Ludhiana** : C44-47, Phase-II, Near Majestic Auto,
Focal Point, Ludhiana – 141010

**Jaipur** : G - Business Park, 6th Floor, D-34,
Near Agrasen Circle, Subhash Marg,
C-Scheme, Jaipur – 302 001

## West Zone

**Mumbai** : 3rd Floor, One Forbes
1, Dr V B Gandhi Marg, Fort,
Mumbai – 400001

**Ahmedabad** : 2nd Floor, Premchand House,
Annexe, P.O. Box No. 4096,
Ashram Road, Old High Court Way,
Ahmedabad – 380 009

**Indore** : 3rd Floor , NRK Business Park ,
Block B-1 , PU-4, Scheme No 54,
Vijay Nagar Square , A B Road
Indore – 452010

**Nagpur** : Museum Road, Civil Lines
Nagpur – 440 001

**Pune** : Office No. 6 and 7, Second floor, Wing B,
Great Eastern Plaza (Bajaj Allianz
Building), Airport Road
Pune – 411001

**Raipur** : Office No. 539, 5th Floor, Magneto
Offizo, Raipur – 492001

## East Zone

**Kolkata** : 52 Jawaharlal Nehru Road,
Kolkata – 700 071

**Bhubaneswar** : 2 - B , Fortune Tower
Chandrasekharpur
Bhubaneswar - 751023, Odisha

**Jamshedpur** : B Road East, N Town, Bistupur,
Jamshedpur – 831001

**Guwahati** : Guwahati Sales Office
4th floor, Subham Velocity,
Honuram Boro Path,
Opp. Wallford, G.S.Road,
Guwahati – 781005

**Patna** : 401, Orchid Mall, Boring Road,
Patna – 800001

## South Zone

**Chennai** : 8th Floor, Chettinad Sigapi Achi
Building, 18/3- Rukmini
Lakshmipathy Road, Egmore,
Chennai – 600008

**Bangalore** : A Wing, 2nd Floor, Jubilee Building,
45 Museum Road,
Bangalore – 560 025

**Secunderabad** : 6th Floor, Surya Towers,
104 Sardar Patel Road,
Secunderabad – 500 003

**Kochi** : Santha Nivas, Door No. 41/3393,
Manakkapady Lane, PRA No. 52,
Padivattom Edappally (Post)
Kochi – 682 024





## CUSTOMER CARE



Toll free number
**1800-108-8282**



Website
**www. tataastrum.com**

Digital Knowledge Sharing Platform **www.ecafez.com**

TATA STEEL

Tata Steel Limited, Tata Centre, 43, Jawaharlal Nehru Road, Kolkata-700 071
Phone: 91 33 2288 7051/8251