

**Fe550D**

The Unmatched Strength Of Steel





# Welcome to the future of TMT Rebars

As we look to the future, we have anticipated what will be required for our country to achieve lean steel structure that is yet the strongest and brings value for money.

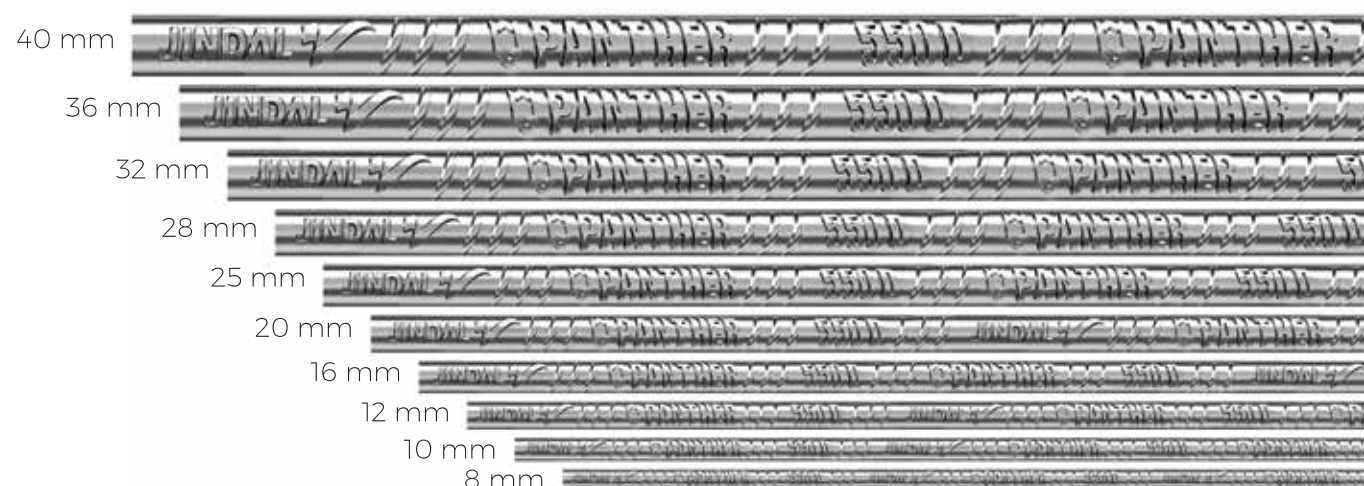
Steel offers the widest range of strength compared to other metals giving it significant advantage in construction. There are more than 200 grades of steel globally, and we take pride in offering Jindal Panther™ Fe 550D - the strongest grade in TMT so far in practice.

This grade of steel is produced using a technology such that it has two desirable properties simultaneously, higher strength and higher ductility, thereby making it most suitable for earthquake resistant structures. Higher strength is achieved by the addition of certain alloying elements, keeping the percentage of carbon lower, thereby ensuring that the steel remains sufficiently ductile.

Ductility is the degree of plastic deformation before fracture or simply how much strain a material can hold before fracture.

Jindal Panther™ Fe 550D has enhanced physical, chemical and mechanical properties as compared to the bars in other strength grades. This is achieved by highly controlled and advanced manufacturing processes at JSPL's own manufacturing plants.

## TMT Rebar sizes available



# Unmatched benefits of Fe 550D

Jindal Panther™ Fe 550D TMT Rebars offer 32% higher strength than conventional steel (415 MPa vs 550 MPa)

Here's how stronger steel affects your construction

## **Reduction of Steel Consumption**

Designing structures with Fe 550D reduces the steel consumption by 12-15% with optimisation, using consistent primary steel.

## **Reduction Bar Congestion**

Using stronger grade steel means reduction in bar diameter that results in increased bar spacing as fewer rebars are needed.

## **Reduction in Labour Cost**

Using lesser steel requires less labour and saves on labour cost.

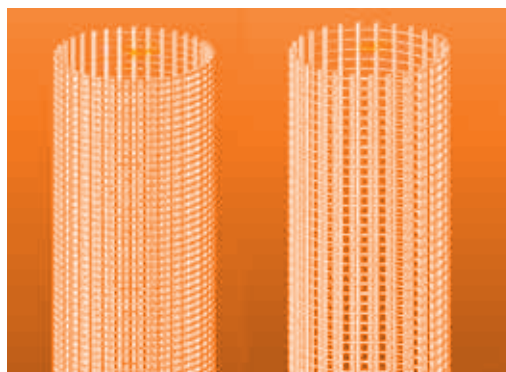
## **Faster Construction**

Less time is wasted on placing/ tying of bars. And less weight on cranes improves construction efficiency.

## **Bigger Savings**

Since Fe 550D rebars are stronger than other rebars, the overall steel consumption comes down leading to cost savings.

It also results in increased Floor Space Index thus giving monetary benefit of extra space generated.

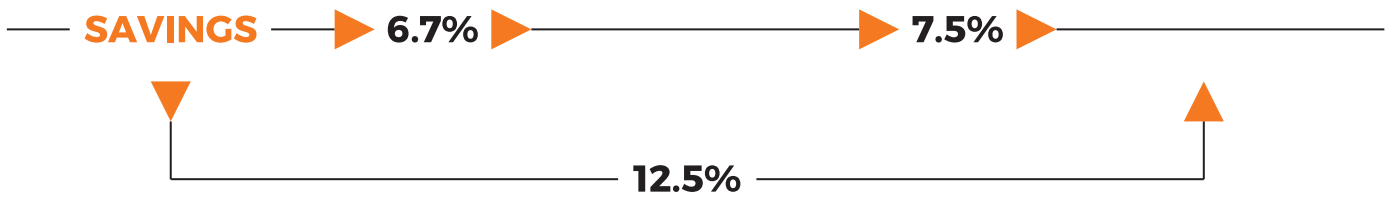
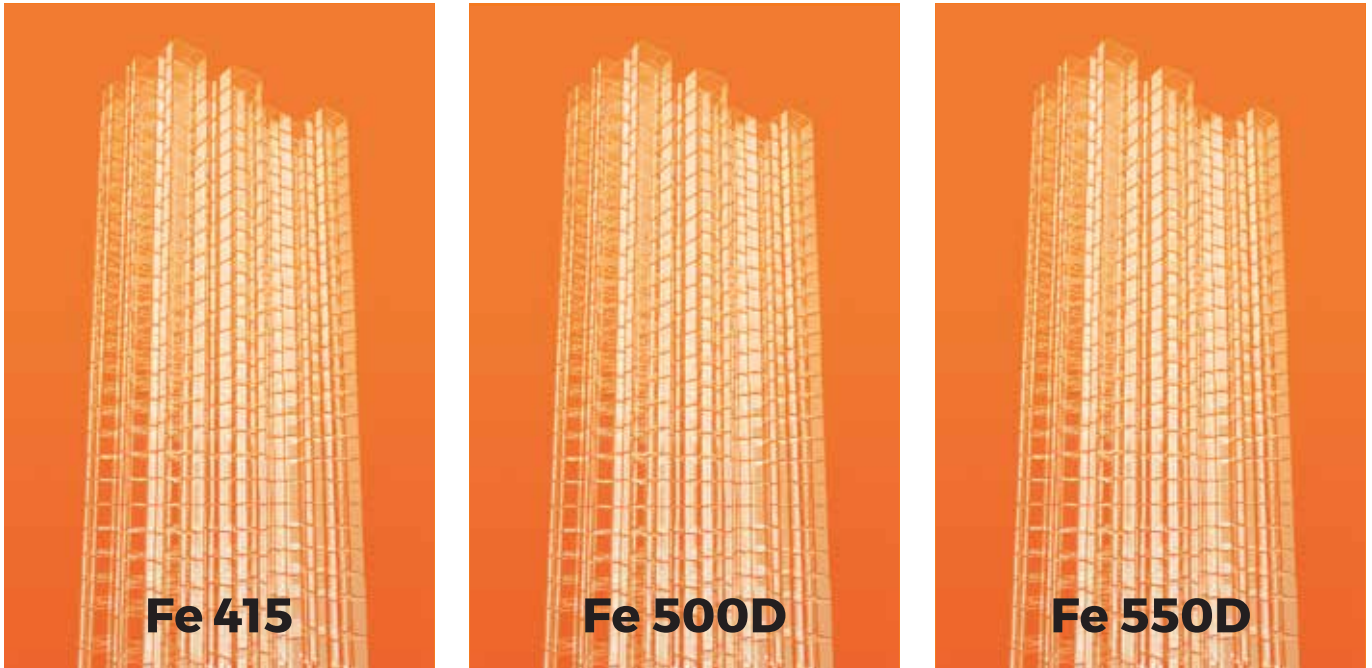


High density of Fe 415 grade TMT rebars

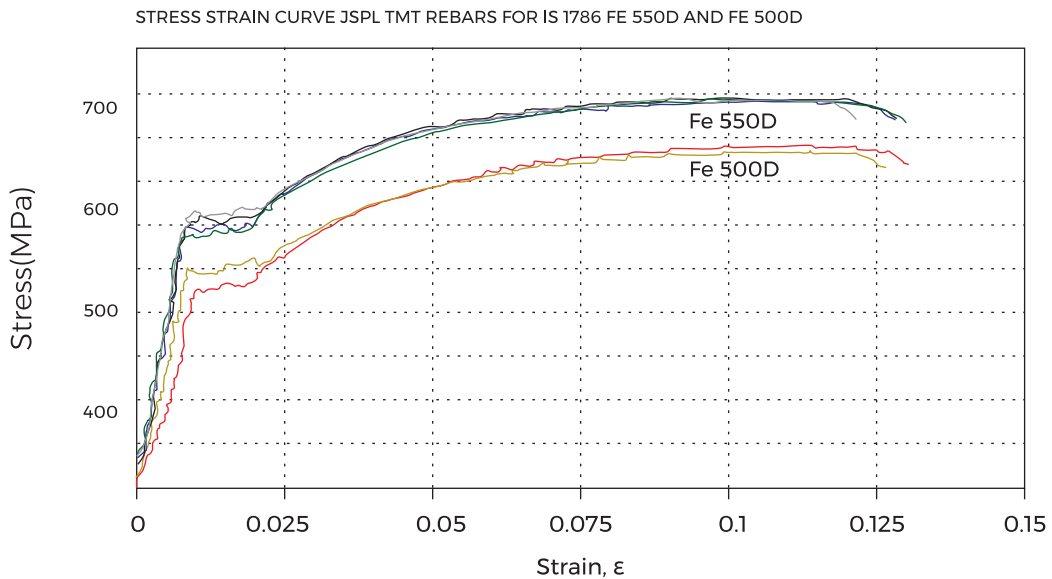
Increased spacing due to lesser rebars of Fe 550D



Constructing the same structure with 3 different grades of steel  
G + 22 Storeys + 2 Basements (Zone-4)



Stress Strain Curve Comparison of Fe 500D & Fe 550D



Fe 550D, Yield Strength (N/mm <sup>2</sup> ) Min	- 550 MPa (BIS)	Actual - 575 MPa
% Elongation (Min)-	14.5	Guarantee - 18%
Actual -		21.75%
Fe 500D Yield Strength (N/mm <sup>2</sup> ) Min	- 500 MPa (BIS)	Actual - 530 MPa
% Elongation (Min)-	16.0	Guarantee - 18%
Actual -		21.60%

<b>BEAM DESIGN WITH M30</b>	
230x450 Beam <i>Reinforcement saving</i> 415/550D ~ 55% 500/550D ~ 9%	800x1800 Beam <i>Reinforcement saving</i> 415/550D ~ 57% 500/550D ~ 18%
<b>COLUMN DESIGN WITH M40</b>	
300x750 Column <i>Reinforcement saving</i> 415/550D ~ 17% 500/550D ~ 7%	600x750 Column <i>Reinforcement saving</i> 415/550D ~ 20% 500/550D ~ 7%

## Chemical & Mechanical Properties of Jindal Panther™ Fe 550D

Rebar Grade	BIS Fe 550D	Jindal Panther™ Fe 550D
% Carbon	0.25	0.22-0.25
% Silicon	---	0.15-0.25
% Manganese	---	0.95-1.05
% Sulphur (max)	0.04	0.03
% Phosphorous (max)	0.04	0.03
% Sulphur + Phosphorous (max)	0.075	0.055
% Carbon Equivalent (CE)	0.42	0.35-0.41
Yield Stress (N/mm <sup>2</sup> ) min	550	575
% Elongation (min)	14.5	16
Tensile Strength (N/mm <sup>2</sup> ) min	600	645
UTS/YS Ratio	1.08	1.12

# Awards & recognition



## India's Most Trusted Brand

Jindal Panther™ TMT Rebar is a proud recipient of the India's Most Trusted Brand Award 2017 at IBC Corporate Awards 2017 by IBC Infomedia (IBC Corp USA)



## Best Product Brand of the Year

Jindal Panther™ TMT Rebar has been awarded Best Product Brand of the Year (Steel & TMT Category) at INEX Interior & Exterior Awards 2018



## Best Steel Company of the Year

JSPL also won the Best Steel Company of the Year 2017 Award at Making of Developed India (MODI) Awards 2018 by ET Now





# Applications of Fe 550D

Due to changing application such as high rise buildings and long span structures, it has become imperative for innovative and conscientious steel makers to commercially produce grade Fe 550D - a grade vastly superior over the existing grade.



Jindal Panther™ Fe 550D TMT Rebar has been made to impart strength and superior ductility for construction of a stronger India.

This is achieved by using enhanced steel quality, superior chemical properties and better rolling techniques.

Armed with better ductility, Fe 550D provides enhanced seismic resistant properties for all construction based on RCC structure design.

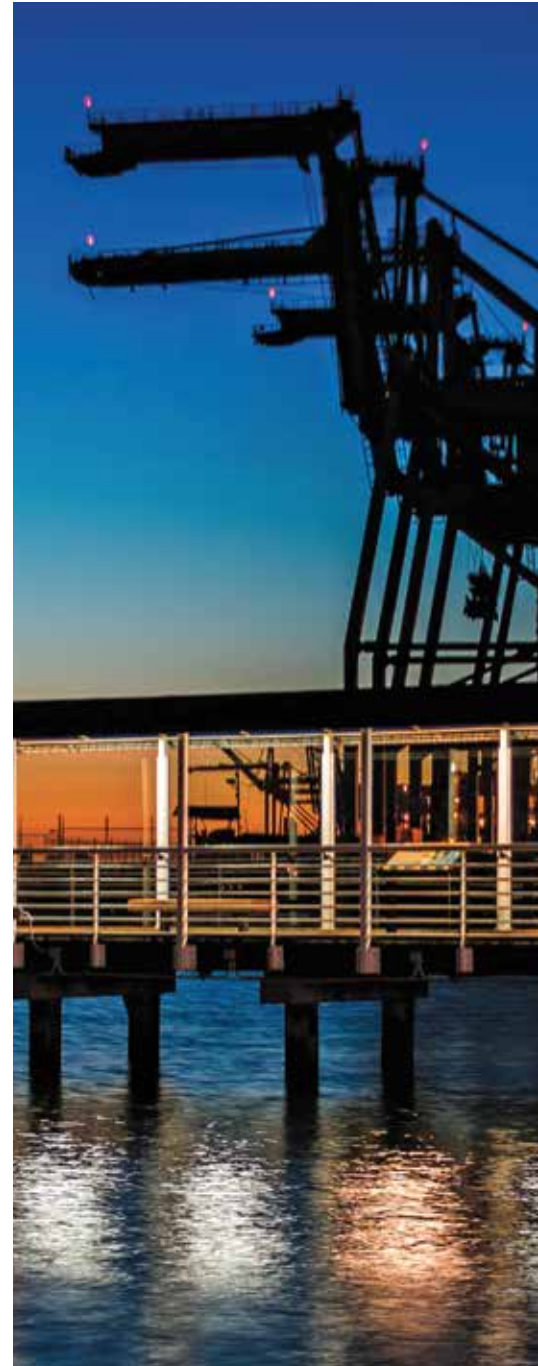


# Applications of Fe 550D



Modern Tall Buildings

Rail & Metro Networks



Ports

With an ever growing demand for stronger infrastructure, Jindal Panther™ Fe 550D TMT Rebar finds extensive use in a variety of modern construction.





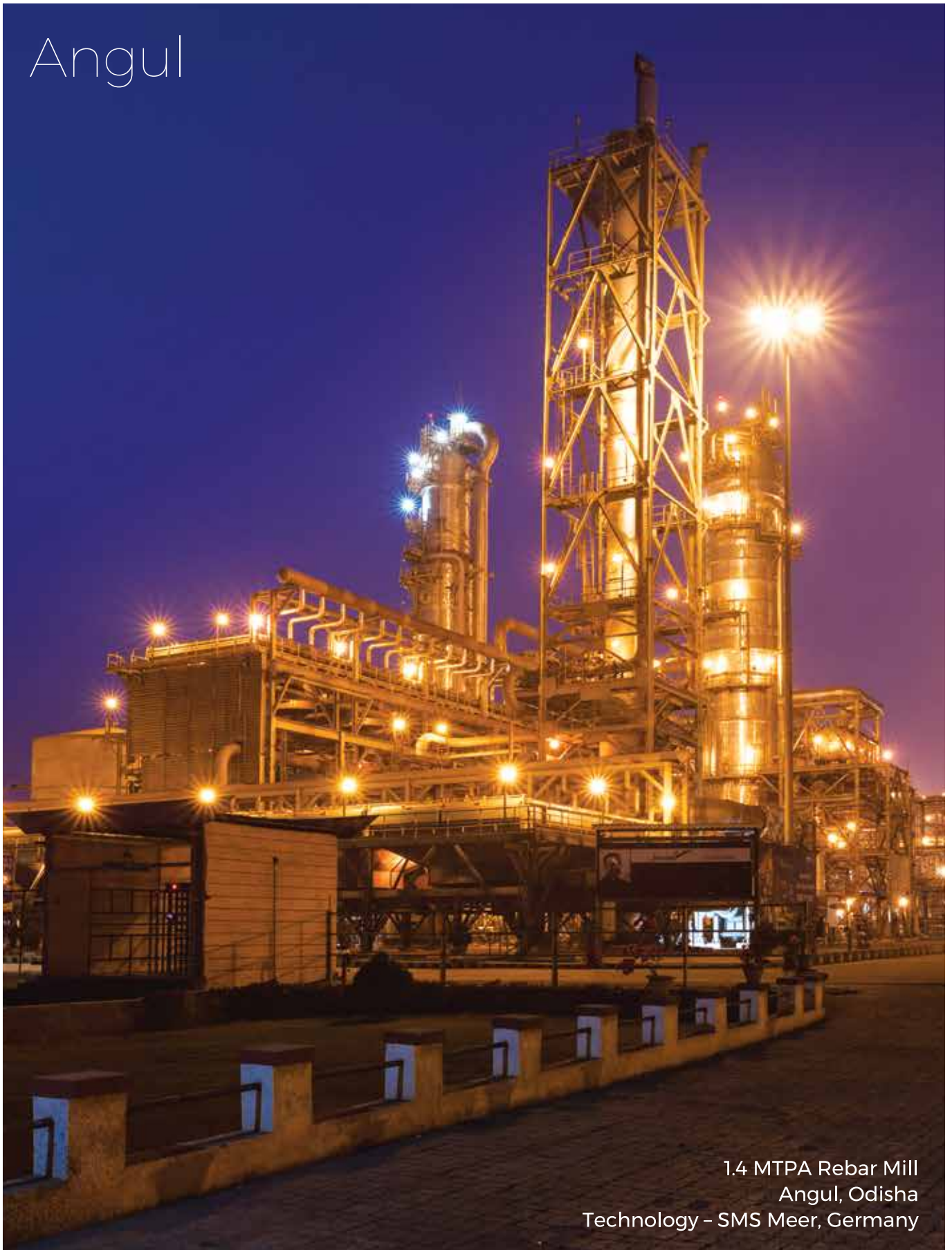
Airports

Bridges



# Our plants

Angul



1.4 MTPA Rebar Mill  
Angul, Odisha  
Technology – SMS Meer, Germany



# Sohar

1.4 MTPA Rebar Mill  
Sohar, Oman  
Technology - Danieli, Italy



# Patratu

1.0 MTPA Rebar Mill  
Patratu, Jharkhand  
Technology - Morgan, USA









## Key highlights of our plants Patratu, Angul, Oman

Our plants are amongst the most modern across the world. Equipped with the latest technologies and infrastructure, they produce the finest quality steel and TMT rebars.

Walking beam type reheating furnace

High pressure water de-scaling facility

Single strand high speed continuous mill

Interstand tension control rolling

Online rapid water quenching unit

Production of HYQST/HYST TMT rebars in straight length

Cooling beds of movable rack design

Uniformly air-cooling of TMT rebars

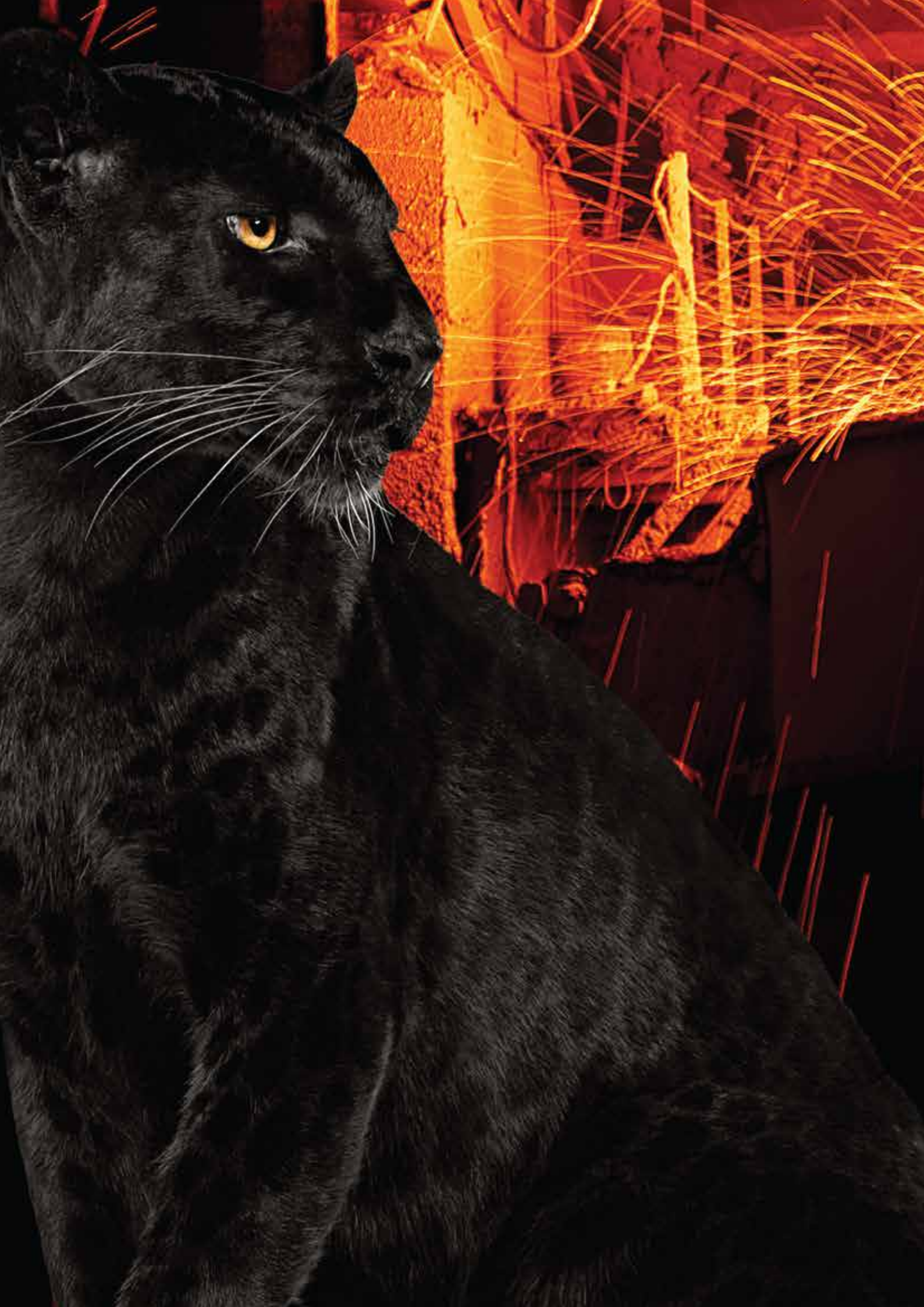
Transporting in a phased manner from the entry of the cooling bed to discharge side

Automatic mill shears for head/ tail cropping dividing, sampling or scrapping, and cutting-to-length


Automatic bundling & tying facilities for rolled product in straight length

Level 2 mill automation and control









Our advanced  
processes under  
expert supervision  
make all the  
difference

# Our process

Jindal Panther™ Fe 550D TMT Rebars are manufactured using the unique iron making, steel making and rolling process, which makes them stronger, safer and more ductile than any other TMT rebars, thus ensuring utmost quality.

## A rebar is not a rebar if it is not TMT

Thermo mechanical processing, also known as Thermo-Mechanical Treatment (TMT), is a metallurgical process that integrates work hardening and heat treatment into a single process, while the quenching process produces high strength bars from low carbon steel. The process presses the surface layer of the bar, which pressurises and deforms the crystal structure of the intermediate layers, and simultaneously begins to temper the quenched layers using the heat from the bar's core.

## High quality output from HYQST technology for Patratu & HYST for Angul

High Yield Quenching and Self Tempering (HYQST) is an internationally renowned Thermo Mechanical Treatment technology from Morgan, USA, for manufacturing TMT rebars. This technique employs a special split style nozzle cooling process for producing fine grain multiphase composite rebar with superior strength and ductility.

Our rebar mill from SMS MEER, Germany and Morgan, USA for Angul & Patratu, with state-of-art technology ensures a robust process.



## Step 1: Quenching

The hot rolled bar from the finishing mill at 1050° Celsius is rapidly quenched by special split style nozzle cooling process. The quenching converts the bar surface layer to martensite, which causes it to shrink. The shrinkage pressurises the core helping it to form the correct crystal structures, while the core remains hot and austenite.

## Step 2: Self Tempering

The bar leaves the quench box with a temperature gradient through its cross section and as the bar cools, heat flows from the bar centre to its surface and the bar heat and pressure correctly tempers an intermediate ring of martensite and bainite.

## Step 3: Atmospheric Cooling

Finally, the slow cooling after quenching automatically tempers the austenite core to ferrite and pearlite on the cooling bed, that now has a strong and tough, tempered martensite on the surface layer of the bar, an intermediate layer of tough martensite and bainite and a refined, ferrite and pearlite core, giving it the ductile property.





## A look at our Lab Testing Equipment

JSPL has a state-of-art testing facility where some of the tools we use to ensure an almost zero defect product include:

Optical Emission Spectrometers

Metal Analysers

X-Ray, Fluorescence & X-Ray Diffraction Analysers

LECO Analysers for Carbon/ Sulphur, Oxygen/ Nitrogen/ Hydrogen

Linder Test Apparatus for characteristics of Iron Ore/ Pellets

Gas Chromatographs

Universal Testing Machines

Hardness Testers

Bend & Rebend Testing Machine

Impact Test Machines

Well-equipped Wet Analysis Laboratory

Micro Structures

Besides the latest computerised machines, our employees are trained and skilled to monitor the quality 24x7 to produce the finest TMT rebars

JSPL mills are accredited with latest Integrated Management System : ISO 9001 : 2015, ISO 14001 : 2015, OHSAS 18001 : 2007

Sohar Plant is approved by UK CARES and DCL (Dubai Central Laboratory)

Angul Bar Mill's approval for UK CARES BS4449, Grade B500B is under process



# Our network

The presence of Jindal Panther™ is across the country through its network of stockyards, plants, distributors and dealers.

Additionally, our products are available online at <http://shop.jindalpanther.com> and can be accessed from the remotest areas of India.

For any enquiries, the Jindal Panther™ Toll-free number 1800 208 2008 is there to assist you.

## Sales Team Contact Details

Regional Sales Office	Contact Person	Mobile Number
Ahmedabad	Abhinav	9650904545
Bhopal	Pramod Mishra	9957458606
Bhubaneswar	Anand Prakash	9007914231
Bihar	Arvind kumar	9771492573
Chennai	Ajit Kumar	9849295542
Cochin	K Giridharan	9717991494
Delhi	Umesh Singh	9792208587
Guwahati	Anand Prakash	9007914231
Haryana	Renu Sharma	9958599010
Hyderabad - Telengana	Ajit Kumar	9849295542
Hyderabad - Vizag	Ramchand Gullipalli	8978983210
Jaipur	Pramod Mishra	9957458606
Jharkhand	Arvind kumar	9771492573
Kanpur	Prateek Singh	9918900000
Karnataka	Pranay Kant	9771404361
Kolkata	Anand Prakash	9007914231
Ludhiana	R P Singhla	9815550951
Mumbai	Abhinav	9650904545
Raipur	Sumeet Mishra	7067999958





### Operational Yards

1. Agra
2. Chandigarh
3. Faridabad
4. Guwahati
5. Hyderabad
6. Jaipur
7. Kanpur
8. Kolkata
9. Ludhiana
10. Nagpur
11. Patratu
12. Varanasi
13. Visakhapatnam

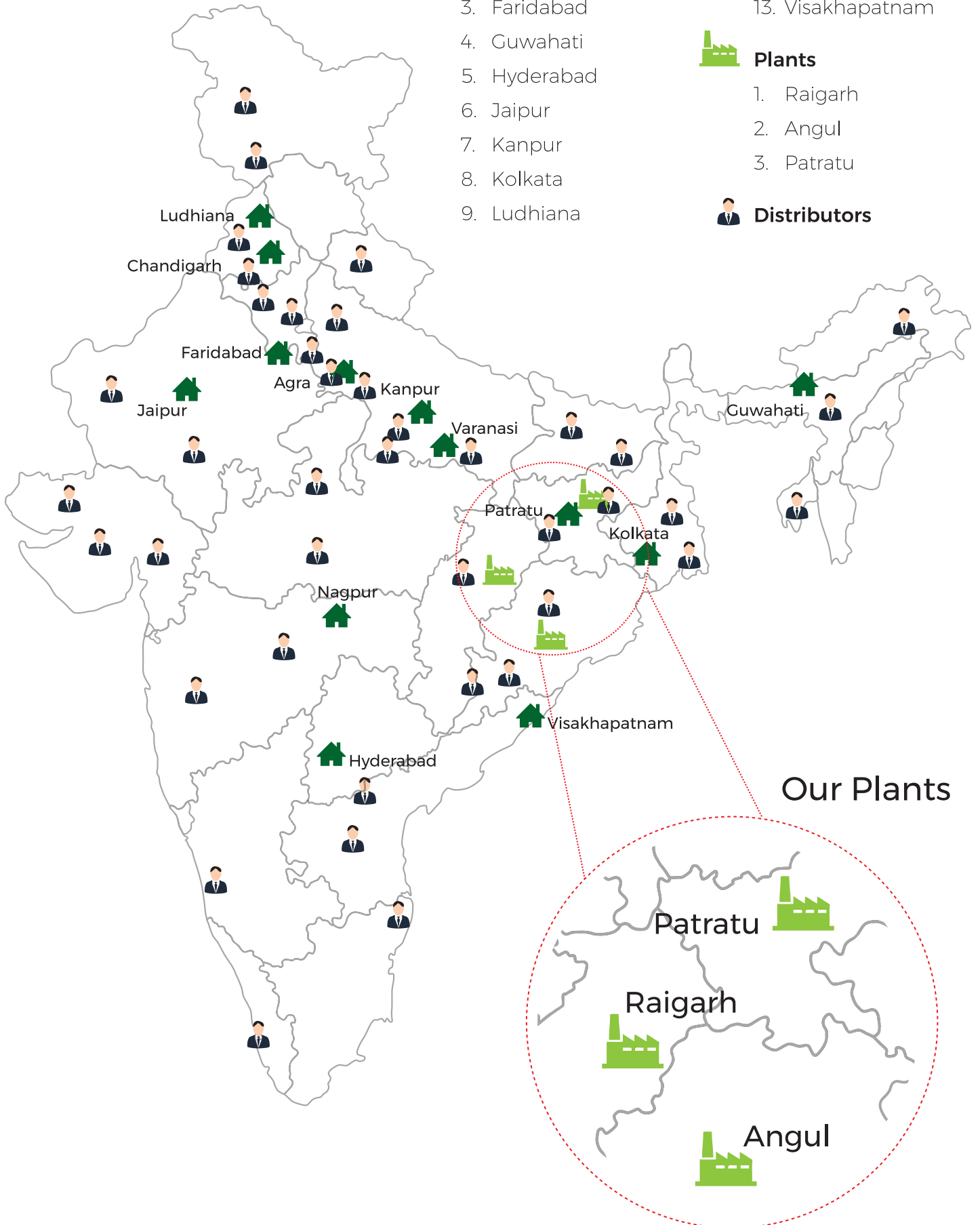


### Plants

1. Raigarh
2. Angul
3. Patratu



### Distributors





**JINDAL**  
**PANTHER™**  
TMT REBARS



# The future of construction is here!

Now buy online at <http://shop.jindalpanther.com>



**A PRODUCT OF JINDAL STEEL & POWER LIMITED**

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# Fe550D