

Manufactured capital

Maintaining cost and quality leadership

Tata Steel continuously invests in improving the efficiency of its iron-making, steelmaking and rolling facilities and warehouses, along with logistics operations, while ensuring the safety and reliability of its operations.

We have been strengthening our operations through a combination of organic and inorganic growth initiatives. Our steelmaking operations have secure raw material supply from captive iron ore mines, which enables us to maintain and drive efficiencies.

Impact on SDGs



FY 2019-20 Highlights

13.16 MnT
Crude steel production

12.32 MnT
Deliveries

Strategic linkage

S01 S02

Material issues addressed

- Business growth
 - Long-term profitability
 - Product quality, price offerings and delivery
 - Technology, product and process innovation
- Efficient operations and value chain are critical to meet growth aspirations and address the evolving needs of customers
 - We continue to invest in facilities that enable us to be a leader in steel technology

S01 - Industry leadership in steel S02 - Consolidate position as a global cost leader

TATA STEEL JAMSHEDPUR (TSJ)

The Jamshedpur plant is the flagship facility of Tata Steel. Continuous improvement efforts over the years have helped us sustain production levels and progress towards operational excellence. In the process, we have also lowered our coke rate, reduced waste generation, improved waste utilisation and maximised energy and material efficiency. The facility produced over 10 MnT of crude steel in FY 2019-20. Consistent focus on asset management using data analytics and predictive modelling has resulted in more than 90% availability of our key manufacturing units at Jamshedpur.

of 1.5 MnT of gross coke, Sinter Plant with a gross production capacity of 5.75 MnT, Steel Melting Shop with the largest Converter in India (310-tonne), and Hot Strip Mill designed to produce high-strength steel for various segments with a wide range of features (up to 1,200 million pascals tensile strength, 2,050 mm width and 25 mm thickness of Hot Rolled Coils).

The plant's cost competitiveness is driven by automation and proximity to ports and captive mines. TSK recently became the first

Indian plant to be included in the elite Global Lighthouse Network of the World Economic Forum for its leadership in applying Industry 4.0 technologies. In line with the Company's objectives, TSK has continued on its journey of operational excellence. In FY 2019-20, the fuel rate at the blast furnace was improved substantially through increased Pulverised Coal Injection (PCI), thereby improving cost, CO₂ emission and energy intensity. The plant achieved 99.7% capacity utilisation during the period under review.

Availability of critical manufacturing units at TSJ in FY 2019-20

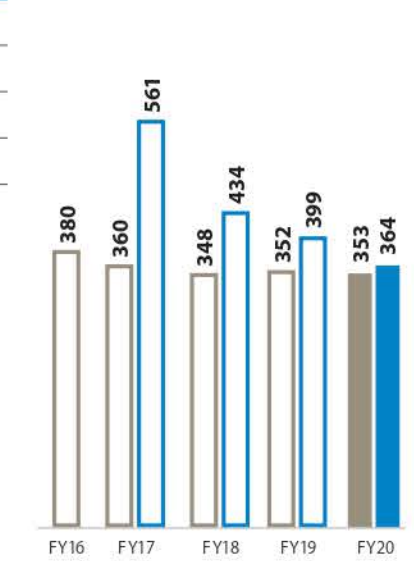
Coke Ovens	>99%
Blast Furnaces	>96%
Agglomerates	>92%
Steelmaking	>93%

TATA STEEL KALINGANAGAR (TSK)

Phase I (3 MnTPA) of TSK started commercial production in June 2016 and attained production levels at its rated capacity in less than two years. The plant embodies scale and technological excellence in steelmaking with a 3.3 MnT Blast Furnace (4,330 cubic metre capacity), two Coke Ovens that are stamp charged gas recovery type batteries

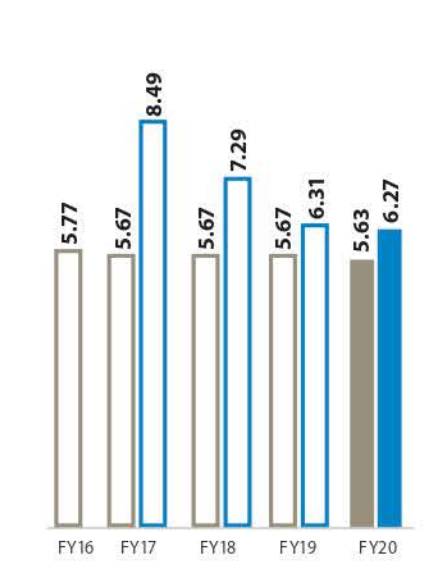
COKE RATE*

(Kg/tonne of hot metal) Good ▾



ENERGY INTENSITY

(Gcal/tonne of crude steel) Good ▾



* Defined as amount (in kilograms) of coke (fuel made from heating coal) used to produce one ton of hot metal (liquid iron) during iron making process

OUR CAPITALS — MANUFACTURED CAPITAL (contd)

RAW MATERIAL MINING AND PROCESSING

Tata Steel is India's most integrated steel company with captive mines of iron ore and collieries located around its manufacturing facilities. The highest standards of environmental management are followed in mining locations while using the best available technologies.

IRON AND STEEL MAKING

We produce steel through the conventional blast furnace route. Raw materials are converted to hot metal and crude steel through various processes including coke making, sinter making and palletisation. The processes are designed to deliver high productivity with the available resources while managing slag rate and steelmaking requirements.

ROLLING AND PROCESSING

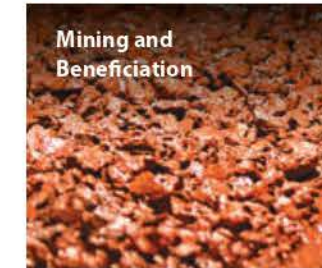
The rolling mills help in manufacturing a diverse product mix with customised shapes, sizes, and various chemical and technical properties. Aligned with customer specifications and requirements, these products undergo stringent quality checks and assurance processes. We also produce a range of value-added products for the retail markets and provide customised solutions to industrial buyers.



Sardar Patel Stadium, Ahmedabad — We are proud to be the major steel supplier to this world-class project, having supplied 75% of the rebars, besides 41,000 couplers and 8,400 threads to expedite the completion.

OUR ASSETS

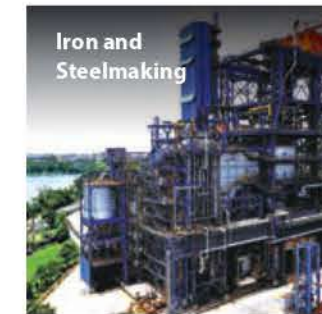
Process



Mining and Beneficiation

Facilities/Equipment

- Iron ore, coal, chrome and manganese ore mines
- Heavy earth-moving machines
- Beneficiation plant
- Logistics and handling facilities



Iron and Steelmaking

- Bell-less top charge high-capacity blast furnaces
- Basic oxygen furnace for steelmaking
- Coke, sinter and pelletising plants
- Raw material handling facilities
- Online granulation of blast furnace slag
- Stamp charging battery
- Coke Dry Quenching (CDQ)
- Desulphurisation facility
- Secondary steelmaking



Rolling mills

- Flat and long products mills
- Wire rods/drawing facilities
- Tube-making facility
- Slab to coil facility
- Billet to bar/rod facility
- Rolling Tandem Mill for pickling and rolling
- Hot dip galvanising facility



By-products processing

- Metal recovery plant
- Slag processing plant

INBOUND LOGISTICS

Tata Steel's operations are strategically located for inbound supplies and import of raw materials sourced from around the world routed through the major ports of Dhamra, Paradip and Haldia. Given the challenges of logistics in eastern India, a multi-modal logistics chain, which includes roads, railways and shipping, is used. Currently, inbound logistics for raw material transportation is completely dependent on the Indian Railways. Inbound logistics ensures uninterrupted supply of >40 MnTPA of raw materials from ports and captive mines through railway wagons, ensuring quality and optimal cost.

OUTBOUND LOGISTICS

Outbound logistics is dependent 60-75% on railways and 20-40% on roadways at various locations. It consists of a network of warehouses and Steel Processing Centres (SPCs), ensuring timely delivery and transportation of finished products to meet on-time delivery expectations of customers through a network of hubs and stockyards at strategic locations across India to ensure delivery cycles as low as 48 hours from the stockyards.

BY-PRODUCTS MANAGEMENT

Our Industrial By-products Management Division (IBMD) deals in a variety of by-products and scrap in the entire steel value chain and fundamentally operates on the 3R principle of Recover, Reuse and Recycle. Over the years, IBMD has become a profit centre by virtue of managing by-products and creating value out of waste. In FY 2019-20, India's first steam ageing facility for 'accelerated weathering' of LD slag was commissioned at TSJ. Also, IBMD supplied its highest ever scrap of 960 kilotonnes to steel melt shops, facilitating lower volume GHG emissions at TSJ and TSK.

WAY FORWARD

Expedite commissioning of the pellet plant and cold rolling mill at Kalinganagar

Improve availability and utilisation of plants to achieve best-in-class levels