



JSW Steel

GRINDING MEDIA



ABOUT JSW GROUP

The **US\$ 22 billion JSW Group** is ranked among India's leading business houses. JSW's **innovative and sustainable presence** in various sectors including **Steel, Energy, Infrastructure, Cement, Paints, Venture Capital and Sports** is helping the Group play an important role in driving India's economic growth. The Group strives for excellence by leveraging its strengths & capabilities including a successful track-record of executing large capital-intensive & technically complex projects, differentiated product-mix, state-of-the-art manufacturing facilities and greater focus on pursuing sustainable growth.

With a culturally **diverse workforce** spread across **India, USA, Europe and Africa**, JSW Group directly **employs nearly 40,000 people**. It also has a strong social development focus aimed at **empowering local communities** residing around its Plant & Port locations. JSW Group is known to create value for all its stakeholders by combining its growth roadmap, superior execution capabilities and a relentless drive to be **#BetterEveryday**.

JSW STEEL SALEM WORKS

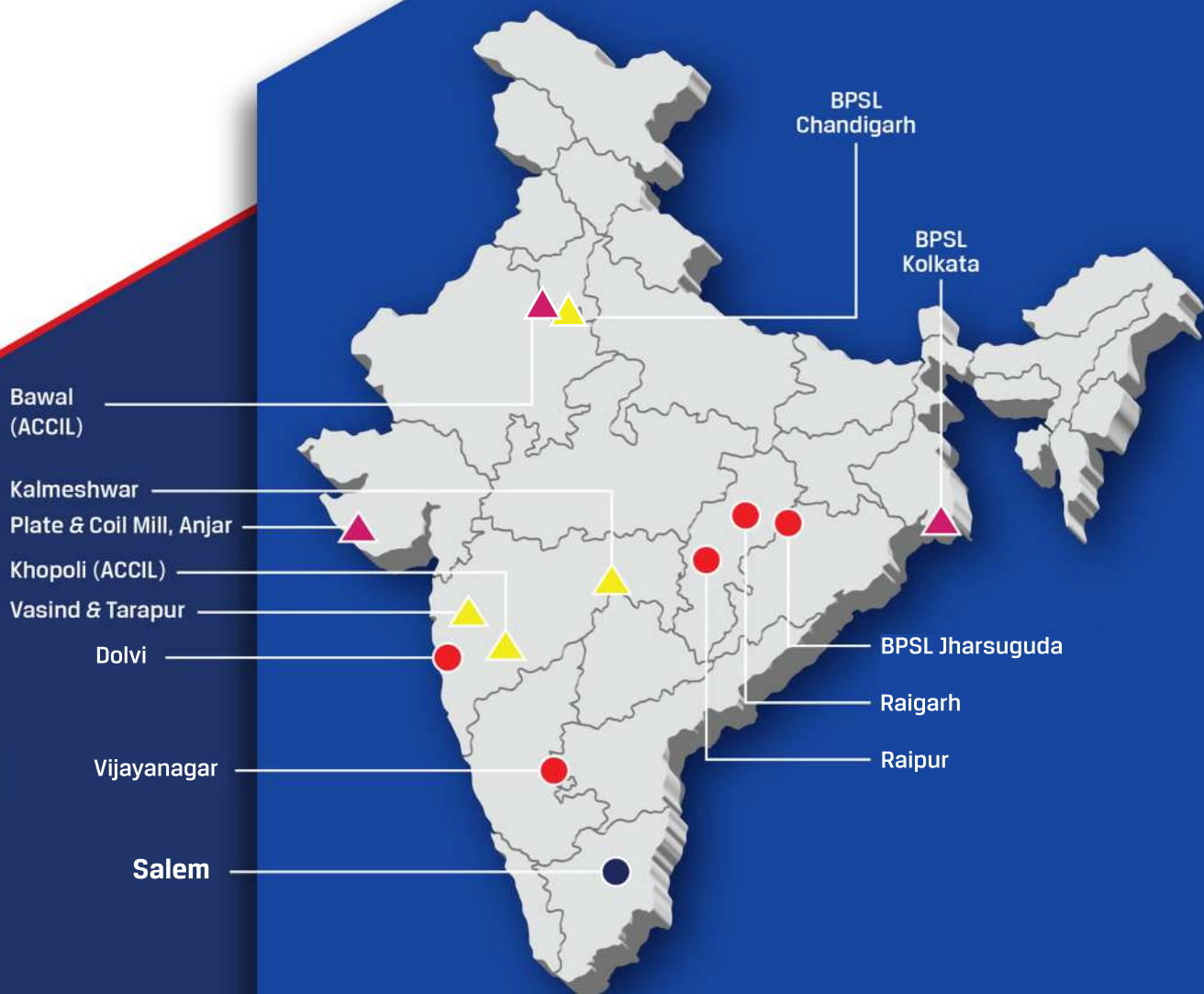
JSW Steel Salem Works is **India's largest** integrated special steel plant (long products) located in Salem, Tamil Nadu, India with an installed capacity of **1.15 million tons per year**.

Product mix comprises **Cast Blooms/Billets, Hot Rolled Round Bars, RCS Bars, Flat Bars** and **Wire Rod** catering to various Auto and Non-Auto Customers across the Globe.

Grinding Media, one of the main consumables for the mining Industry, is added to the product mix with the installation of **Grinding Media Mill** with a **capacity of 0.1 million tons per year at Salem Works**.

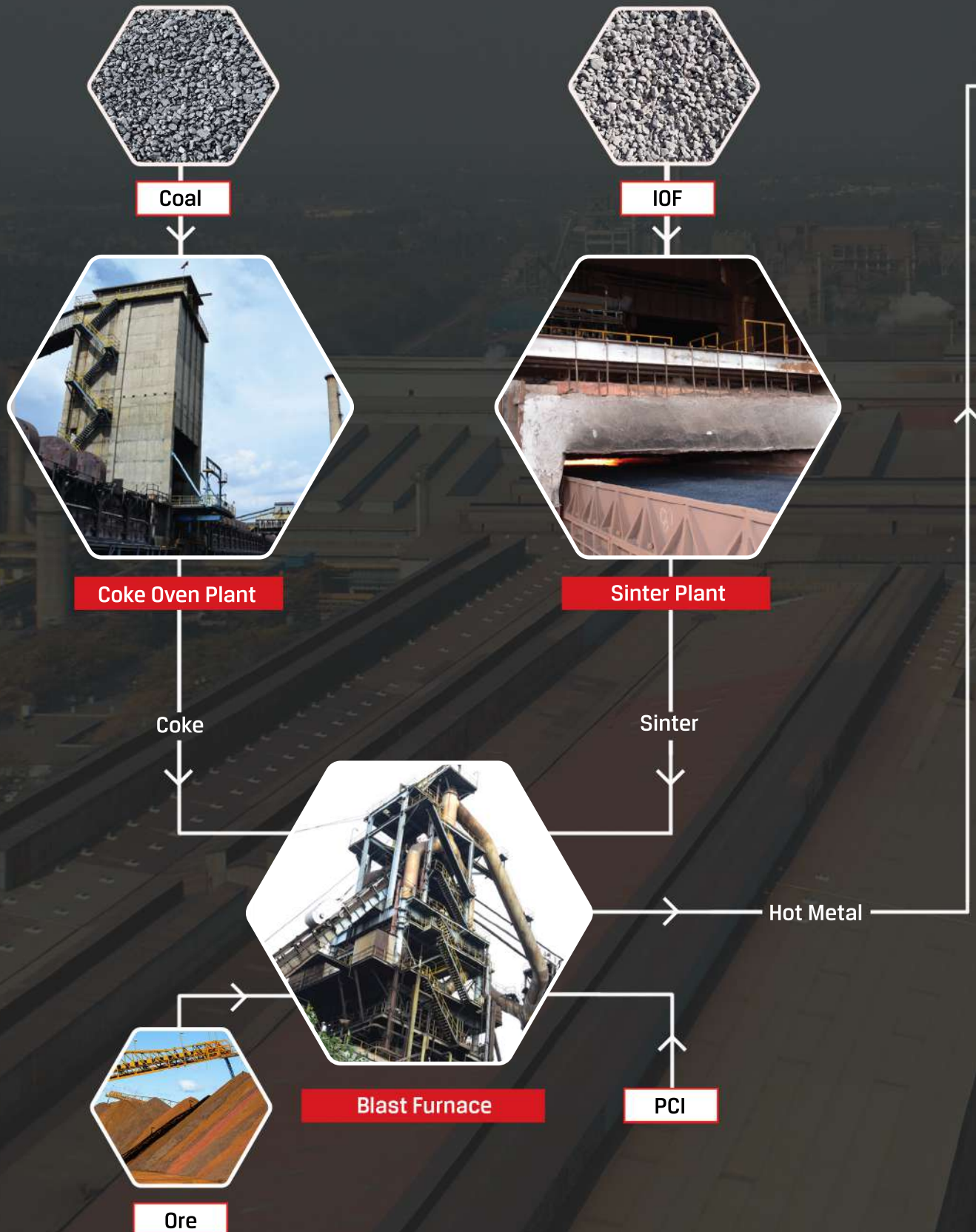


- JSW Salem
- Other Steel Plants
- ▲ Downstream facilities
- ▲ JV and Associates- Downstream facilities



MANUFACTURING PROCESS ROUTE

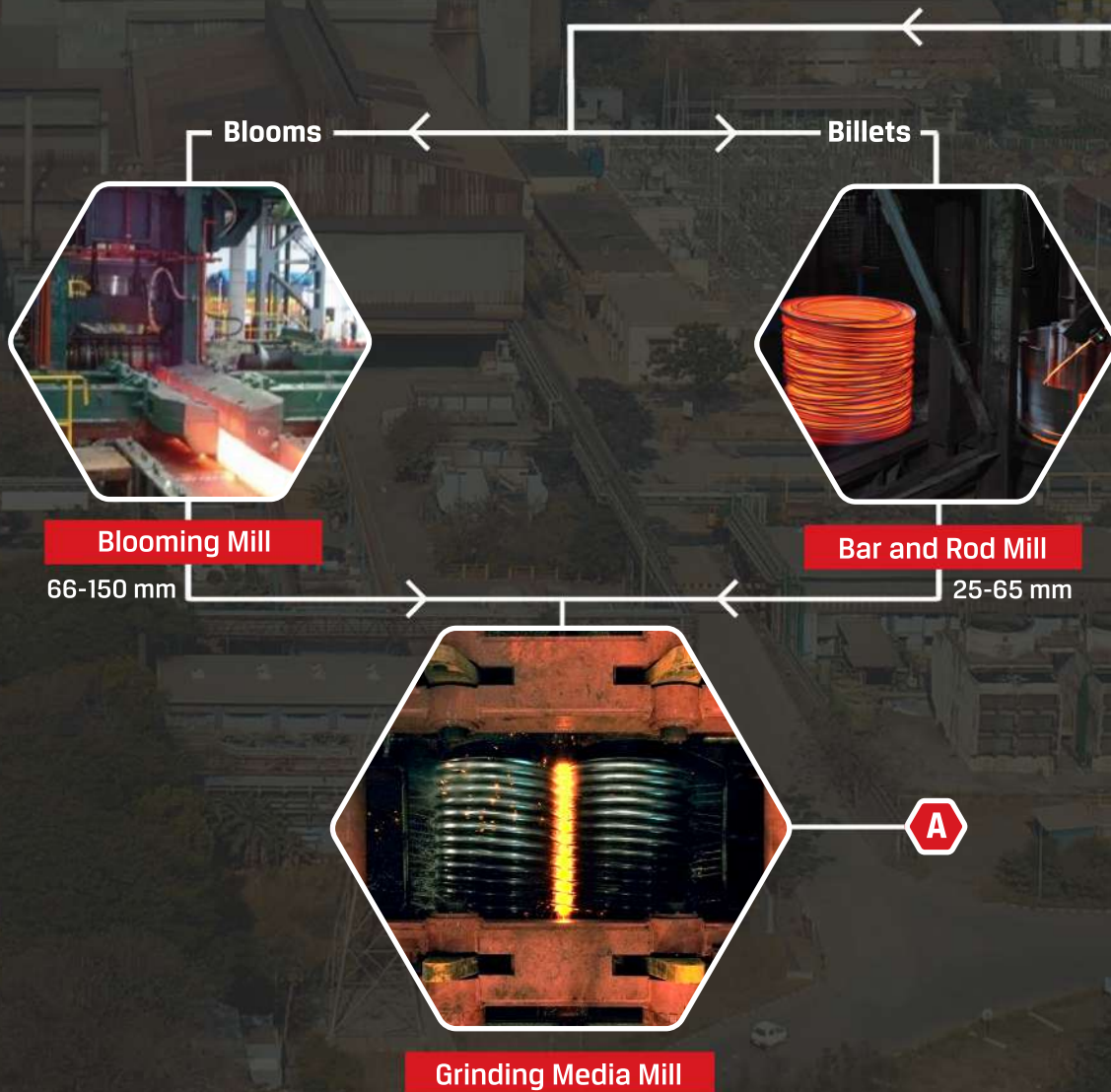
IRON COMPLEX



STEEL COMPLEX



ROLLING MILLS

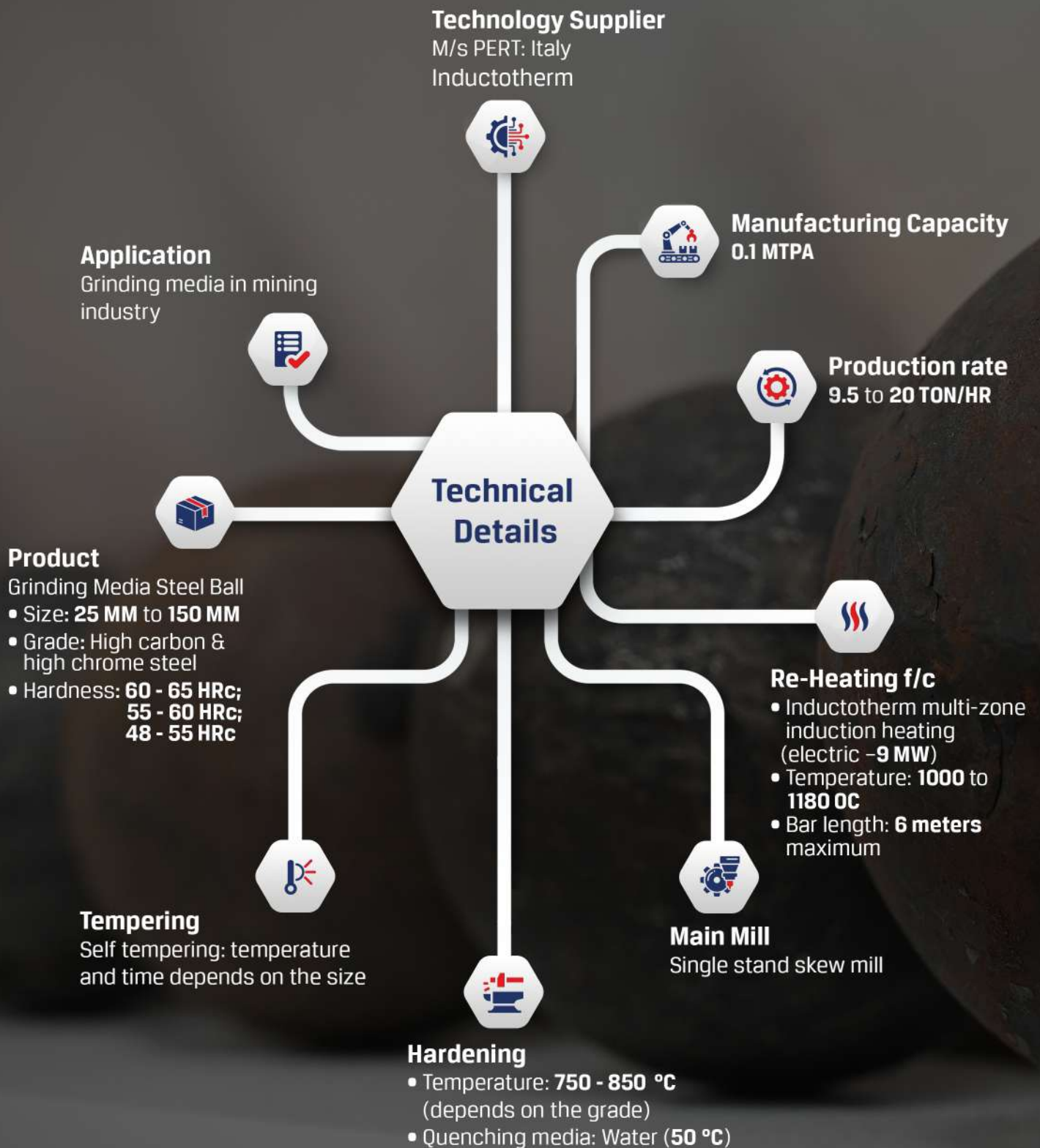


MANUFACTURING PROCESS ROUTE

The **Grinding Media Mill (GMM)** is the **first of its kind in India**, with a **production capacity of 0.1 million tonnes per year**. GMM will cater to both **Domestic and Export Market** with the required quality for **mining industries**.



GRINDING MEDIA MILL



STATE OF THE ART TESTING FACILITY



- Input hot rolled bars undergo **Chemical Test, Ultrasonic Test, Magnetic Particle Inspection, Mechanical & Metallurgical Tests** and **Spark Test** as per Specific Requirement.
- **Ball drop test (for impact resistance)**
 - Ball on anvil method as per **IS 12658:2018** (unless specified by the customer) – drop height is **10 meters (18,000 cycle times)**
 - Additionally for **SAG Grinding Balls**, ball on ball drop test is done

● Other testing facilities for **Grinding Media Steel Balls** :

Chemical

- Optical Emission Spectrometer

Mechanical

- Brinell Hardness Tester
- Rockwell Hardness Tester
- Micro Vickers Hardness Tester

Metallurgical

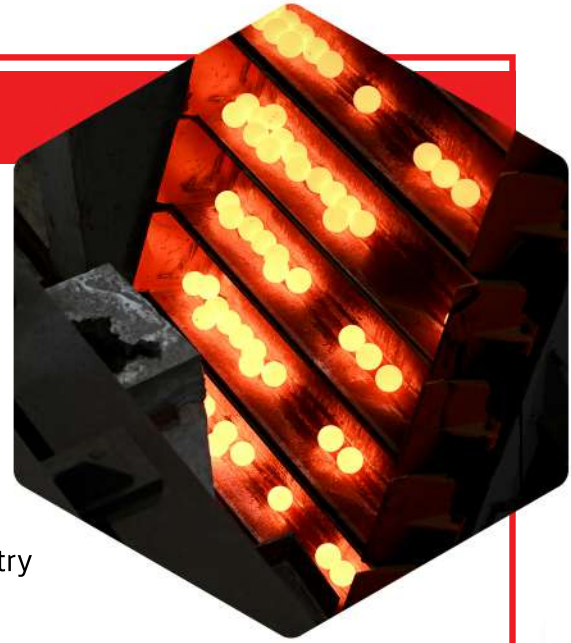
- Optical Microscope
- Scanning Electron Microscope



PRODUCT - MIX

PRODUCTION STANDARDS

- **IS 12658:2018** : Grinding Media Rolled / Forged Carbon and Carbon – Chromium Steel – Specification.
- **GOST-7524-2015** : Specification for Steel Grinding Balls for Ball Mills.
- **DSTU 8538 – 2015** : Steel Milling Balls for Ball Mills.
- Customer Specific Requirement (**Customized Products**).
- The **Surface** and **Volumetric Hardness** varies with chemical composition as per Customer Requirement.
- **Steel Composition Capability** - Cr: 3.00% Max and overall alloy content upto 5.00% Max, within which we can adjust the chemistry as per Customer Specific Requirement.



Grinding Media

Suited for Secondary/Regrind Ball Milling: Fully Heat treated for Maximum Hardness & Abrasive Resistance

Ball Size (mm)	Size Tolerance (mm)	Surface Hardness (HRc)	Volumetric Hardness (HRc)	Ball Weight (Kg)	C%	Si%	Mn%	P%	S%	Cr%
25	± 1.0	60-65	60-65	0.06	0.62-0.67	0.15-0.30	0.70-0.85	0.025 max	0.015 max	0.30-0.40
30	± 2.0	60-65	60-65	0.11	0.62-0.67	0.15-0.30	0.70-0.85	0.025 max	0.015 max	0.30-0.40
35	± 2.0	60-65	60-65	0.18	0.62-0.67	0.15-0.30	0.70-0.85	0.025 max	0.015 max	0.30-0.40
40	± 2.0	60-65	60-65	0.26	0.62-0.67	0.15-0.30	0.70-0.85	0.025 max	0.015 max	0.30-0.40
50	± 2.5	60-65	60-65	0.51	0.62-0.67	0.15-0.30	0.70-0.85	0.025 max	0.015 max	0.30-0.40
60	± 3.0	60-65	60-65	0.89	0.62-0.68	0.20-0.40	0.85-1.00	0.025 max	0.015 max	0.60-0.70
70	± 3.0	60-65	60-65	1.41	0.62-0.68	0.20-0.40	0.85-1.00	0.025 max	0.015 max	0.60-0.70
80	± 3.0	60-65	60-65	2.10	0.62-0.68	0.20-0.40	0.85-1.00	0.025 max	0.015 max	0.60-0.70
90	± 3.0	60-65	60-65	3.00	0.62-0.68	0.20-0.40	0.85-1.00	0.025 max	0.015 max	0.60-0.70

SAG Grinding Media

Appropriate for SAG Milling or Primary Ball Milling: Heat treated to achieve Optimum Hardness & High Impact Resistance

Ball Size (mm)	Size Tolerance (mm)	Surface Hardness (HRc)	Volumetric Hardness (HRc)	Ball Weight (Kg)	C%	Si%	Mn%	P%	S%	Cr%	Mo%
100	± 3.0	55-60	55-60	4.11	0.57-0.62	0.35-0.45	0.95-1.12	0.025 max	0.010 max	0.75-0.80	0.055-0.065
125	± 3.0	48-55	48-55	8.03	0.57-0.62	0.35-0.45	0.95-1.12	0.025 max	0.010 max	0.75-0.80	0.055-0.065
150	± 3.0	48-55	48-55	13.87	0.57-0.62	0.35-0.45	0.95-1.12	0.025 max	0.010 max	0.75-0.80	0.055-0.065

WHAT MAKES US STAND OUT?

1

Consistent Product Quality

- Our **Induction heater** ensures **minimum scale loss** as the residence **time inside the furnace** is as **low** as possible to achieve the **temperature** requirement of **1,180 °C**
- **Rolled Grinding Media** will be **superior** in the following parameters compared to Cast balls
- Accurate dimension
- No or Minimum equator line
- Uniformity in wear pattern
- No pole defect
- Higher impact energy
No defects like porosities which reduces the life
- Internal soundness is very high due to a reduction ratio of 4:1 min

2

Commitment to Sustainability

The **Induction heater** operates at a **full load efficiency of 95%**, whereas traditional walking beam furnaces operate at about 65-70% efficiency. In addition to this, there are **no emissions** in the **heating process** and there is **zero fossil fuel consumption** in the **induction heater**, thus making it **environment friendly**.

3

Wide Range of Products

JSW Salem can produce **Grinding media sizes** ranging from **25 mm to 150mm** as the rolled bars are available from existing rolling mills.



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