



# **A REPORT ON THE INDUSTRIAL VISIT TO TATA STEEL LONG PRODUCTS LTD.**



**( Blooming Mill )**



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## **AIM OF INDUSTRIAL VISIT:**

The aim of an industrial visit is to provide practical insights into real-world industrial processes and operations. It offers a first-hand experience of industry settings, enhancing theoretical knowledge gained in classrooms. The exposure fosters a better understanding of industrial practices, technology, and workplace dynamics, promoting a bridge between academia and industry.

## **NAME OF THE PLANT :**

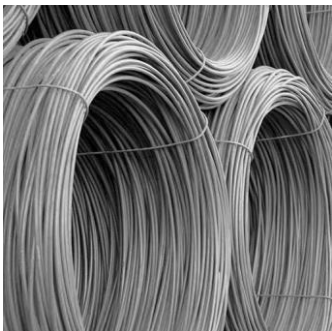
TATA STEEL LONG PRODUCTS LIMITED GAMHARIA

## **ABOUT THE PLANT :**

- Tata Steel Long Products Limited (TSLP), formerly known as Tata Sponge Iron Limited, is in the business of manufacturing high alloy steel, primarily for the auto sector and wire rope industry. At TSLP, they offer a wide range of high-end steel products for segments like forgings, bearings, fasteners and free-cutting, and cater to automotive, construction and infrastructure, general engineering, railways and agriculture.
- The plant has a long history of more than 50 years. Since its inception, it has been continuously adopting modern technologies in its manufacturing process and expanding its global presence to ensure close proximity to customer.

## **PRODUCT RANGE OF TSLPL GAMHARIA :-**

- Special bar quality (SBQ)
- DRI
- Wire rod
- Wire Ropes



## ABOUT BLOOMING MILL :

Blooming Mill is the final processing plant of Tata Steel Long Products Limited, Jamshedpur where Conversion of Bloom To RCS and Round bar is performed.

The raw material for this process is Bloom of Size **300x360, 200x200 and 200x240** from continuous casting shop.

The final product from this Division is Bar ranging from **RCS (Round Corner Square) 75mm to 150mm** and **Roundbar 70mm to 160mm** of various grades.



Figure 1: Blooming Mill at TSLPL

## PROCESS FLOW DIAGRAM OF THE MILL :

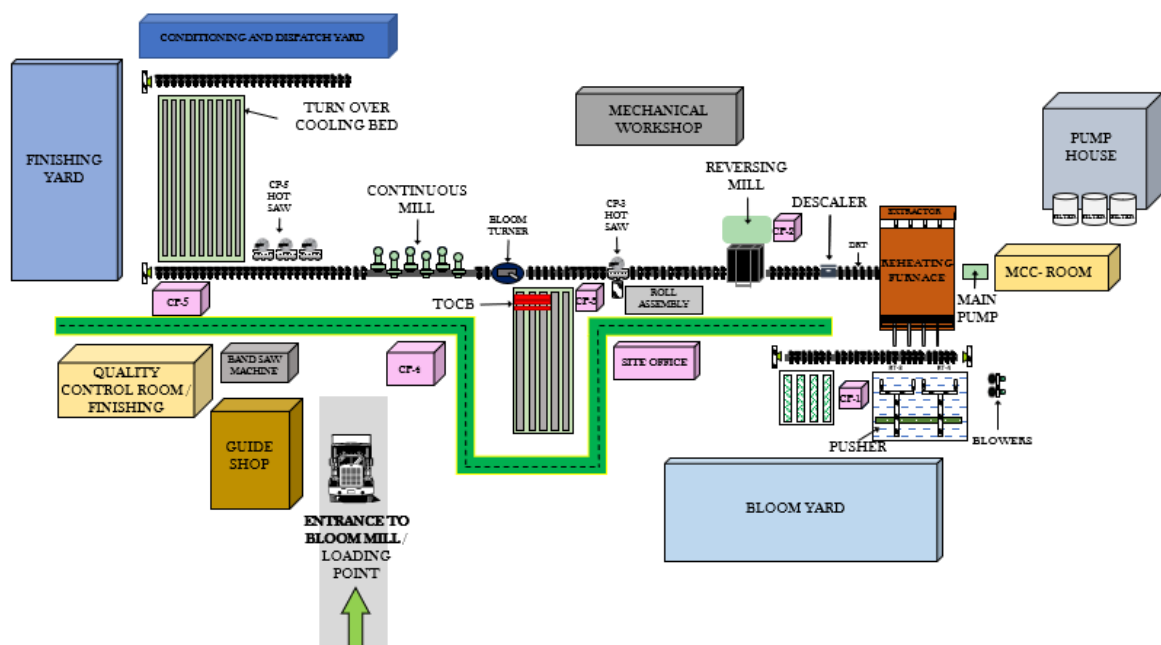


Figure 2: Process flowchart of Blooming Mill at TSLPL



## REGIONS OF THE MILL :-

1. Charging Bed
2. Walking Beam Furnace
3. Descaling Unit
4. Reversing Mill
5. Cooling Bed
6. Continuous Mill
7. Hot Saws for cutting
8. Pit Cooling
9. On-line Testing and Inspection unit

### CHARGING BED:

The blooms are kept in a yard and are picked up by a **magnetic EOT**. It is carried to the charging bed. The blooms then travel through roller tables and Then pushed into the re-heating furnace by the use of pushers.

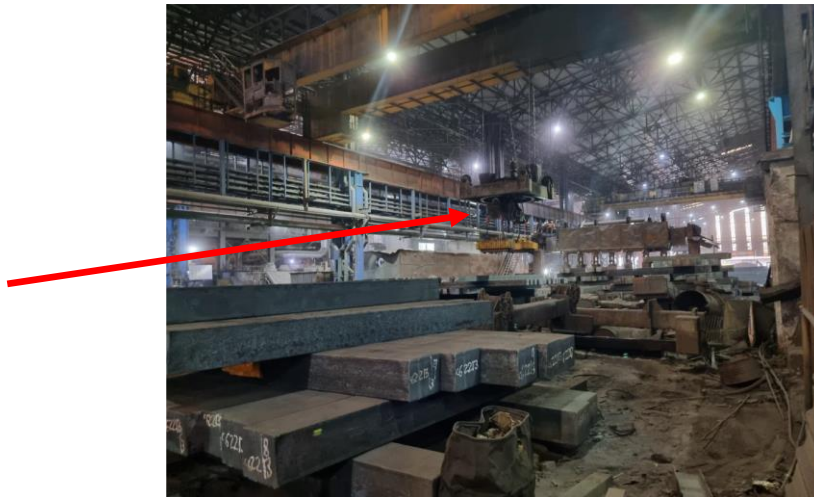


Figure 3: Charging Bed

### WALKING BEAM FURNACE

- The blooms then into the walking beam furnace with the help of a pusher. The furnace has a capacity of **55 TPH**.
- It runs on hydraulic cylinders (alternating lifting and traversing action). The heat source is Blast Furnace Gas and Liquid fuel.
- Pusher works on a hydraulic motors.



Figure 4: Walking Beam Furnace

## DESCALING UNIT :

Now, the hot blooms exit the WBF to the discharging roller table with the help of an extractor. The bloom then moves to a de-scaler which removes the scales formed. Hot blooms are descaled to remove the oxide scale that forms on the surface of the steel during the hot rolling process. This scale consists mainly of oxides which might cause further inclusions during rolling process.



Figure 5: Descaler

## REVERSING MILL:

Now, the descaled blooms need to go through multiple passes in the reversing mill for size reduction. The conveyor system is a gear type roller table with different sized roller groups. The to-and-fro motion is done by changing the rolling direction of the roller table. The reversing mill is manually operated.

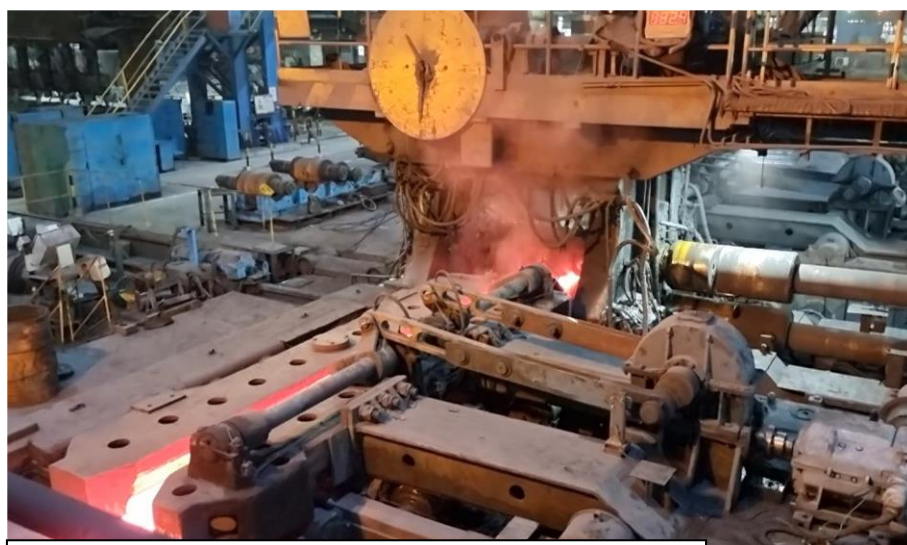


Figure 6: Reversing Mill

The output diameters of this mill are generally of that required in the finished product. If (100<dia<200). Generally the blooms are sent in this to-and-fro motion about 7 times but this

number of cycle can be increased or decreased depending on the different metallurgical grades of the blooms or the no. of cycles required to achieve final dimensions.

### CONTINUOUS MILL :

The bars which required further reduction, does not stop at Reversing mill. The final product of continuous mill is diameter 60mm, 70mm, 80mm etc.

The continuous mill is series of alternating sets of horizontal and vertical rollers on a line which are meant to uniformly decrease the width of the bars.

Products of this mill are of diameters 60mm, 70mm, 80mm etc.

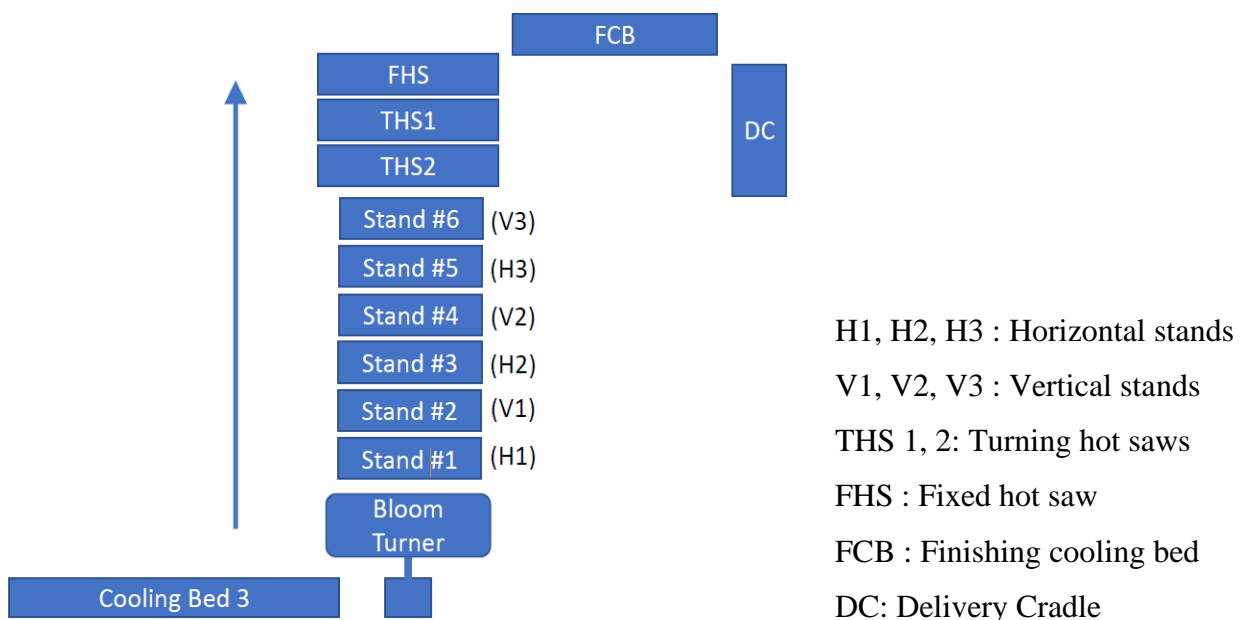


Figure 7: Process flowchart of Continuous mill

Blooms pass only once through this mill.

### HOT SAWS FOR CUTTING :

The bar exits the continuous mill, and a clamper clamps it to position. Travelling hot saws and fixed hot saw is used to cut them into multiple small pieces.



Figure 8: Hot Saw



## PIT COOLING BEDS :



Figure 8: Open Cooling



Figure 9: Closed pit cooling

The final RCS or SBQs can be cooled either in an open environment or a closed pit depending on their respective advantages. Open air cooling is simple and cost-effective. Closed pit cooling are more precisely regulated and employed when stringent quality is required.

## On-line Inspection :



Figure 8: Magnetic Inspection



Figure 8: UltraSonic Testing

Non-Destructive Testing such as Magnetic Inspection and Ultra sonic testing are applied in order to find out the defective products and remove them from the final product pool.