NMDC IRON AND STEEL PLANT, NAGARNAR.

Modern Facilities of fTSR
NISP : PROCESS-CUM-MATERIAL FLOW SHEET

IRON ORE FINES: 3,826,900
COKE BREEZE: 295,000
IRON ORE LUMP: 1,052,800
BURDEN SINTER: 4,214,600
BURDEN COKE: 1,195,600

SP: 1 x 460 m²
CO: 2 x 67, 7m tall
BF: 1 x 4500 m³

3,321,200 GHM
2,976,000 HM
3,000,000 LS

BOF: 2 x 175
LF: 2 x 175 t
RH-OB: 175 t
3,000,000 Liq Steel

PCM
TSC coupled with HSM

2.9 mtpa
HR COILS

COKING COAL: 2,289,300
Flexible Thin Slab Casting and Rolling (fTSR) Plant

CONSULTANT : M/S MECON India Limited
TECHNOLOGY SUPPLIER : M/S DANIELI & C with ANDRITZ METALS
TECHNOLOGICAL LAYOUT OF THE fTSR

- 2 STRAND VERTICAL CURVED CASTERS WITH PENDULUM SHEAR
- PENDULUM SHEAR
- 240 METERS LONG TUNNEL FURNACE
- EMERGENCY HYDRAULIC SHEAR
- HIGH PRESSURE WATER DESCALER
- 2 ROUGHING STANDS
- INTENSIVE COOLING UNIT
- SECONDARY DESCALER
- 4 FINISHING STANDS WITH PROVISION FOR 5TH STAND IN FUTURE
- WATERWALL TYPE LAMINAR COOLING SECTION
- 2 DOWNCOILERS
- TOTAL fTSR PLANT LENGTH APPROX 440 M (excluding coil handling & STORAGE)
### Technological Parameters of Hot Strip Mill

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Item</th>
<th>Unit</th>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Capacity – HR coil</td>
<td>Mt/yr</td>
<td>2.90</td>
</tr>
<tr>
<td>2.</td>
<td>In put Slab Thickness</td>
<td>mm</td>
<td>50 to 90</td>
</tr>
<tr>
<td></td>
<td>Width</td>
<td>mm</td>
<td>900 – 1650</td>
</tr>
<tr>
<td></td>
<td>Weight</td>
<td>t</td>
<td>35 max.</td>
</tr>
<tr>
<td>3.</td>
<td>Finished product</td>
<td></td>
<td>HR coils</td>
</tr>
<tr>
<td></td>
<td>Strip thickness</td>
<td>mm</td>
<td>1.0 – 16</td>
</tr>
<tr>
<td></td>
<td>Width</td>
<td>mm</td>
<td>900 – 1650</td>
</tr>
<tr>
<td></td>
<td>Specific-coil weight</td>
<td>kg/mm</td>
<td>22 (max)</td>
</tr>
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</table>
Modern Features in NMDC fTSR

- Camber gauge.
- Roll Thermal Crown control system.
- Work roll bending.
- Intensive cooling.
- Secondary descaler.
- Coil conveying system.
Camber Gauge

Camber gauge is installed at the exit of Roughing stand R2 gives the feedback for Steering control by tilting correction.

Advantages:

- Increase the capability of the plant to produce low camber transfer bars by improving the control of wedge and camber of the material exiting the Roughing Mill.
RTC header installed in Mill Stand is to control the Work Roll cross-temperature profile, in order to control the strip profile.
Roll Thermal Crown System

**Advantages:**

- Effective WR thermal crown control.
- Short transient to steady state condition.
- Increased strip crown control capability.
Work Roll Bending

Work Roll Bending System in Mill to modify the deflection of the Work Rolls to control the exit shape of the strip from the Mill.

Positive WR Bending

Negative WR Bending
Work Roll Bending

Advantages:

- Wide strip crown control range
- Wide range of gauges can be rolled with one set of WR.
**Intensive Cooling**

- Control of bar temperature before entering Finishing stands.
- Complete recrystallization mechanism before the FM rolling.
- Microstructural change: Coarser Austenitic grain size alters to finer grain.
Salient Design Features of Hot Strip Mill

- **Secondary Descaler**
  - Secondary Water Descaler before FM train.
  - High pressure of 380 bar.

**Advantages:**
- Superior surface quality
- Lesser chances of scale imprinting.
Salient Design Features of Hot Strip Mill

- **Coil conveying system**

- Circumferential Strapping
- Radial Strapping
- Coil Marking Machine
- Coil conveyor
THANK YOU