Overview

- **Sintering plant**: Iron ore and limestone are heated and hardened to form sintered ore.
- **Blast furnace**: Iron ore is melted and reduced to pig iron.
- **Steel converter**: After the pig iron is poured into the furnace, oxygen is blown in to remove carbon and refine it to molten steel.
- **Coke oven**: Coke is manufactured from baked coal at high temperatures in the coke plant.
- **Hot-metal pretreatment**: Oxygen and lime are blown into hot metal to remove impurities such as sulfur and phosphorus.
- **Secondary refining**: Non-metallic inclusions are further removed from the molten steel to achieve higher quality.
- **Ingot casting**: The molten steel is cast into ingots with ingot molds.
- **Continuous casting**: The molten steel is continuously cast into blooms.
- **Billet rolling**: The blooms are rolled out into billets.
- **Steel bar and wire rod rolling**: Billets are rolled out into steel bars and wire rods.
- **Wire rod secondary processing**: Pickling, pickling + spheroidizing + wire drawing
- **Cold-drawn wire rods**: Bars in coil and wire rods

**Equipment used in No. 1 Steelmaking Plant**

- **Furnace**: Steel converter, 200 t / operation, 3 units
- **Secondary refining equipment**: Ladle refining equipment, 200 t / operation, 1 unit
- **Vacuum degassing equipment**: Vacuum degassing equipment, 2 units
- **Continuous casting machine**: Fully curved continuous casting, 4 strand *1, 1 unit
- **Ingot casting equipment**: Ingot casting machine, 2 units

*1: Bloom dimensions: 300 mm (thickness) × 400 mm (width), and 400 mm (thickness) × 560 mm (width)
**Manufacturing processes and equipment**

### Manufacturing Process at Billet Mill

- **Rolling**
  - Reheating furnace
  - Rough rolling mill (BD mill)
  - Finishing mill (VH mill)

- **Conditioning A (Product)**
  - General round bars
    - Magnetic leakage flux tester
    - Grinder
  - Peeling round bars
    - Peeling machine
    - Eddy current flaw tester
    - Grinder
    - Shipments

- **Conditioning B (to the steel bar and wire rod mill)**
  - Round billets (φ 175 mm)
    - Magnetic leakage flux tester
    - Automatic ultrasonic tester
    - Grinder
  - Square billets (√150 mm)
    - Magnetic leakage flux tester
    - Automatic ultrasonic tester
    - Grinder
    - To rolling at the steel bar and wire rod mill

**Equipment used in Billet Mill**

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rolling mill</td>
<td>Rough rolling mill (high lift dual reversible system) 1 unit</td>
</tr>
<tr>
<td></td>
<td>Finishing rolling mill (dual continuous type, VH mill) 4 stands</td>
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<tr>
<td></td>
<td>Plane stripping machine 2 units</td>
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<tr>
<td></td>
<td>Magnetic leakage flux tester 1 unit</td>
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<tr>
<td></td>
<td>Automatic ultrasonic tester for round bar full cross section 2 units</td>
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<tr>
<td></td>
<td>Magnetic particle tester 2 units</td>
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<tr>
<td></td>
<td>Peeling machine 2 units</td>
</tr>
<tr>
<td></td>
<td>Eddy current flaw tester 1 unit</td>
</tr>
</tbody>
</table>

**Nominal capacity:** 1,440,000 tons annually

### Manufacturing process at Steel Bar and Wire Rod Mill

- **Rolling**
  - Reheating furnace
  - Compact mill
  - Rough rolling mill
  - Intermediate rolling mill
  - Finishing rolling mill
  - KS mill (4-roller mill for steel bars)

- **Bars in coil (φ 16 to 38 mm)**
  - Eddy current flaw tester
  - Cold shearer
  - To coil conditioning

- **Steel bar conditioning**
  - Eddy current flaw tester
  - Magnetic particle tester 1 unit
  - Automatic ultrasonic tester for round bar full cross section 2 units
  - Magnetic leakage flux tester 2 units
  - Straightener 2 units
  - KS mill (4-roll mill for wire rods) 3 stands
  - Wire rod finishing rolling mill (block mill) 10 stands
  - Rough rolling mill Intermediate rolling mill 8 units
  - Intermediate rolling mill (H-V system) 6 units
  - Rough rolling mill (VH system) 4 units
  - KS mill (4-roller mill for steel bars) 2 stands
  - Wire rod finishing rolling mill (block mill) 10 stands
  - Eddy current flaw tester 3 stands

- **Wire rods (φ 4.2 to 19 mm)**
  - Eddy current flaw tester
  - Magnetic particle tester
  - Automatic ultrasonic tester
  - Swelmore conveyor
  - Reforming mill
  - To coil conditioning

### Coil conditioning

- **Equipment used in Steel Bar and Wire Rod Mill**
  - Rough rolling mill (VH system) 8 units
  - Intermediate rolling mill (H-V system) 6 units
  - Rough rolling mill (low lift in system) 4 units
  - KS mill (4-roller mill for steel bars) 2 stands
  - Wire rod finishing rolling mill (block mill) 10 stands
  - Eddy current flaw tester 3 stands
  - Magnetic particle tester 1 unit

**Nominal capacity:** 560,000 tons annually