Manufacturing processes and equipment

Overview

Electric arc furnace
Iron scraps are melted and refined to produce molten steels.

Secondary refining
Ladle refining and vacuum degassing
Non-metallic inclusions are further removed from the molten steel to achieve higher quality.

Continuous casting
Electric arc furnace (ECOARC)
Ladle refining equipment
Vacuum degassing equipment
Continuous casting machine
Billet rough rolling mill
Billet finishing rolling mill

Non-metallic inclusions are further removed from the molten steel to achieve higher quality.

Bloom
(From West Japan Works)

Iron scraps are melted and refined to produce molten steels.

The molten steel is continuously cast into blooms.

Bloom

The bloom are rolled out into billets.

Billet rolling
Billet conditioning plant
Billet finishing rolling mill
Billet rough rolling mill
Continuous casting machine
Vacuum degassing equipment
Ladle refining equipment
Electric arc furnace (ECOARC)

Billet rolling
Billet are rolled out into steel bars.

Steel bar rolling
Billet are rolled out into wire rods.

Wire rod rolling
Billets are rolled out into wire rods.

Wire rods
5.5 to 18mm

Billet dimensions: 330 mm (thickness) × 400 mm (width)
5.5 to 18mm
17 to 120mm
16.7 to 52mm

Equipment used in Steelmaking Plant
[Nominal capacity: 522,000 tons annually]

130T UHP electric arc furnace
75 MVA transformer, electrode 24 inch in dia.
Eccentric bottom tapping type ecological and economical arc furnace 1 unit
Ladle refining equipment 16 MVA transformer, electrode 16 in dia., LF process truck type 1 unit
Vacuum degassing equipment 2-vessel revolving type, oxygen top blowing possible 1 unit
Continuous casting machine Fully curved continuous casting, 4 strand *2 1 unit

*2: Bloom dimensions: 330 mm (thickness) × 400 mm (width)
Manufacturing processes and equipment

**Manufacturing process at Billet Rolling Mill**
- Reheating furnace
- Rough rolling mill
- Hot scarfer
- Finishing rolling mill
- Shear
- To coil conditioning

**Manufacturing process at Billet Conditioning Plant**
- Shot blast
- Magnetic particle tester
- Automatic ultrasonic tester
- Grinder
- Inspection testing
- To rolling at wire rod/steel bar mill

**Manufacturing process at Wire Rod Mill**
- Reheating furnace
- No. 1 rough rolling mill
- No. 2 rough rolling mill
- No. 1 intermediate rolling mill
- Rolling mill
- No. 2 intermediate rolling mill (Pre-finishing mill)
- Finishing mill (NT block mill)
- Eddy current flaw tester
- Magnetic particle tester
- Dimensional measuring equipment
- Stelmore conveyor
- Reheating furnace
- No. 2 intermediate rolling mill (Pre-finishing mill)
- Reheating furnace
- No. 1 rough rolling mill
- No. 1 intermediate rolling mill (horizontal dual close top type)
- No. 2 intermediate rolling mill (horizontal dual close top type)
- No. 1 intermediate rolling mill (horizontal dual close top type)
- No. 2 intermediate rolling mill (3-roll type)
- No. 1 rough rolling mill (continuous V-H system)
- No. 3 intermediate rolling mill (fully continuous H-V system)
- Hot scarfer
- Cooling bed
- Water-cooling zone
- Shot blast
- Magnetic particle tester
- Stelmore conveyor
- Automatic ultrasonic tester
- Magnetization testing
- Magnetic particle testing, etc.
- Appearance testing, identification testing, dimensional measuring equipment, etc.

**Coil conditioning**
- Hook conveyor
- Appearance testing, identification testing, magnetic particle testing, etc.
- Bundling machine
- Shipment

**Rolling**
- Reheating furnace
- Rough rolling mill
- No. 1 intermediate rolling mill
- No. 2 intermediate rolling mill
- No. 3 intermediate rolling mill
- Steel bars
- Finishing rolling (SCFM)
- Steel bars
- Magnetic leakage flux tester
- Magnetic particle tester
- Bundling machine
- Automatic ultrasonic tester
- Shipment

**Equipment used in Steel Bar Mill**
- Reheating furnace
- Rough rolling mill
- No. 1 intermediate rolling mill
- No. 2 intermediate rolling mill
- No. 3 intermediate rolling mill
- Steel bars
- Magnetic leakage flux tester
- Magnetic particle tester
- Bundling machine
- Automatic ultrasonic tester
- Shipment

**Equipment used in Billet Rolling Mill**
- Temperature: 950°C
- Rolling speed: 30 m/min
- No. of stands: 7
- No. of rolls: 4
- Roll diameter: 800 mm

**Equipment used in Billet Conditioning Plant**
- Reheating furnace
- Shot blast
- Magnetic particle tester
- Automatic ultrasonic tester
- Billet grinder
- Automatic ultrasonic tester
- Finishing rolling mill (3-roll type)
- Eddy current flaw tester
- Magnetic particle testing
- Dimensional measuring equipment
- Stelmore conveyor
- Magnetization testing
- Magnetic particle testing, etc.
- Appearance testing, identification testing, etc.
- Bundling machine
- Shipment

**Nominal capacity**
- 1,080,000 tons annually
- 30,000 tons annually
- 720,000 tons annually
- 1,152,000 tons annually

**Nominal capacity (Pre-finishing mill)**
- Shot blast
- 150 t/h
- 2 units

**Nominal capacity (NT block mill)**
- Shot blast
- 150 t/h
- 2 units