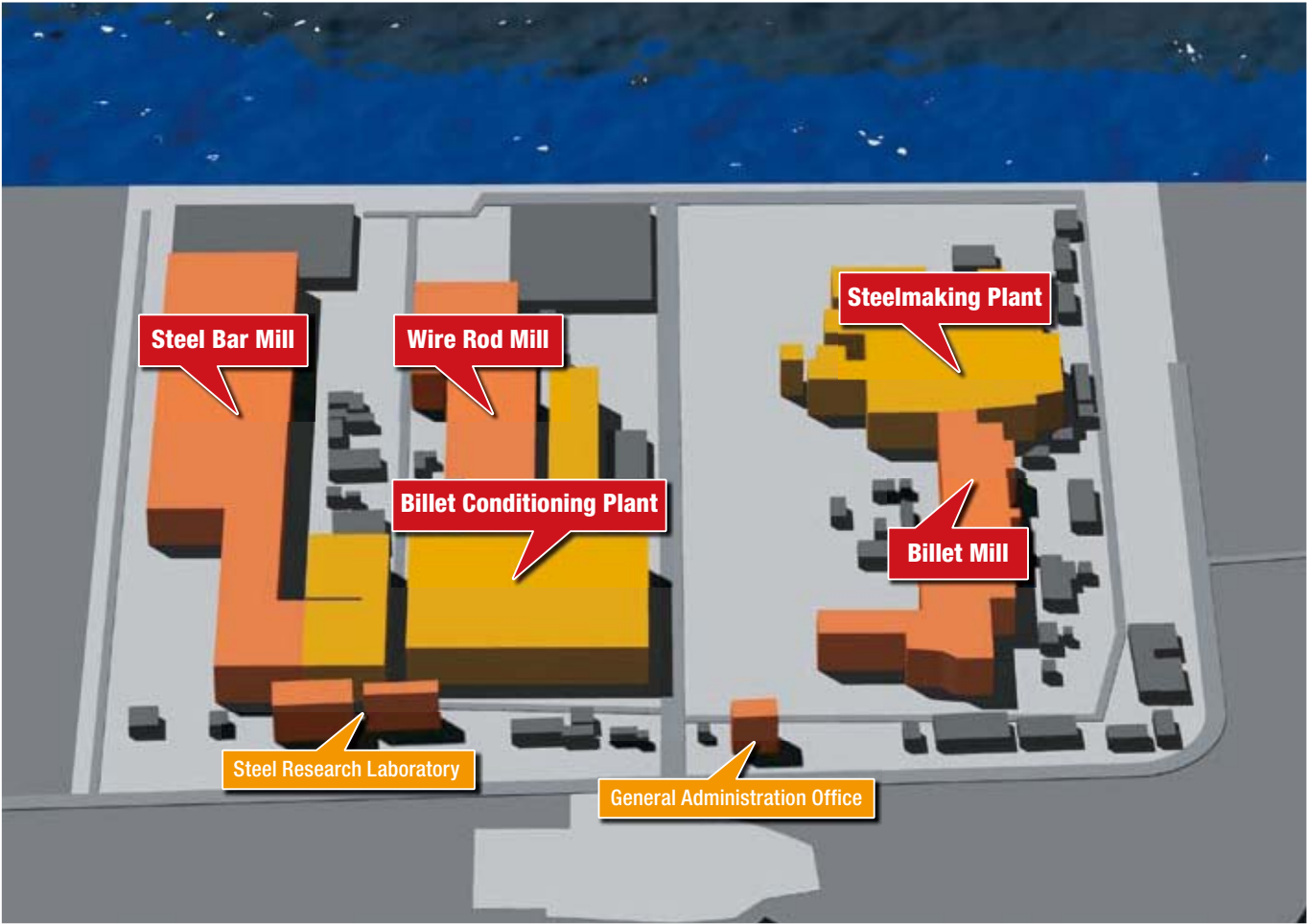




Overview

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
<with electro magnetic stirrer>
The molten steel is continuously cast into blooms.

(From West Japan Works)

Billet rolling
The bloom are rolled out into billets.

Wire rod rolling
Billets are rolled out into wire rods.

Steel bar rolling
Billets are rolled out into steel bars.

Wire rods ϕ 5.5 to 18mm

Steel bars
 ϕ 17 to 120mm

Bars in coil
 ϕ 16.7 to 52mm



Electric arc furnace (ECOARC)



Ladle refining equipment



Vacuum degassing equipment



Continuous casting machine



Billet rough rolling mill



Billet finishing rolling mill

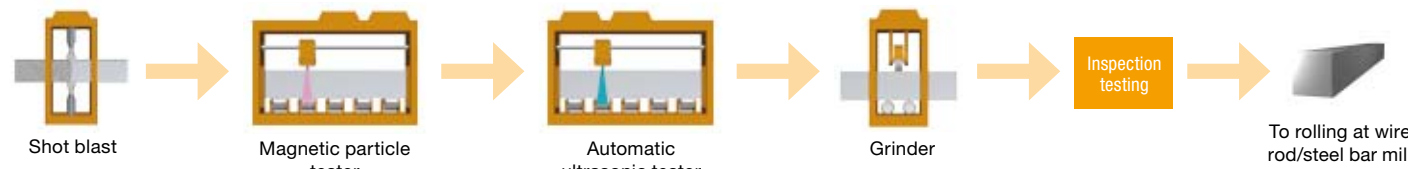
Equipment used in Steelmaking Plant			[Nominal capacity: 852,000 tons annually]
130T UHP electric arc furnace	75 MVA transformer, electrode 24 inch in dia. Eccentric bottom tapping type ecological and economical arc furnace	1 unit	
Ladle refining equipment	16 MVA transformer, electrode 16 in dia., LF 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: 310 mm (thickness) × 400 mm (width)

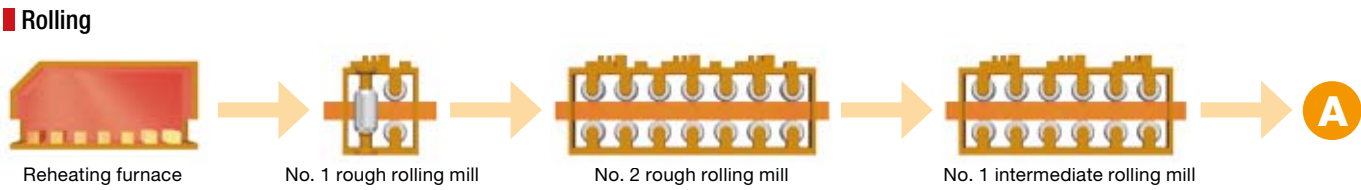
Manufacturing process at Billet Rolling Mill



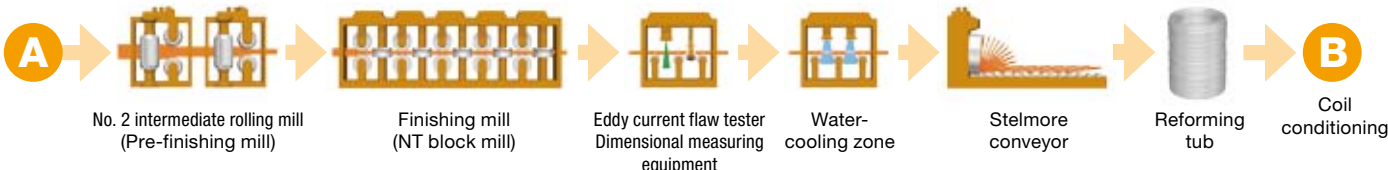
Manufacturing process at Billet Conditioning Plant



Manufacturing process at Wire Rod Mill



Finishing rolling/Stelmore conveyor <2 lines>



Coil conditioning



Equipment used in Billet Rolling Mill

Reheating furnace	Walking-beam type, 200 tons per hour	1 unit
Rough rolling mill	Horizontal dual reversible system	1 unit
Hot scarfer	Scarfig: 1.0 to 2.0 mm	1 unit
Finishing rolling mill	4 stands (V-H)	1 unit
Cooling bed	Rake type, 2 beds	1 unit

[Nominal capacity: 1,152,000 tons annually]

Equipment used in Billet Conditioning Plant

Shot blast	150 t/h	2 units
Magnetic particle tester	1 unit of automatic flaw-detecting device	4 units
Automatic ultrasonic tester	3MHz	1 unit
Billet grinder	With magnetic particle tester	7 units
Press straightener	—	1 unit

[Nominal capacity: 1,080,000 tons annually]

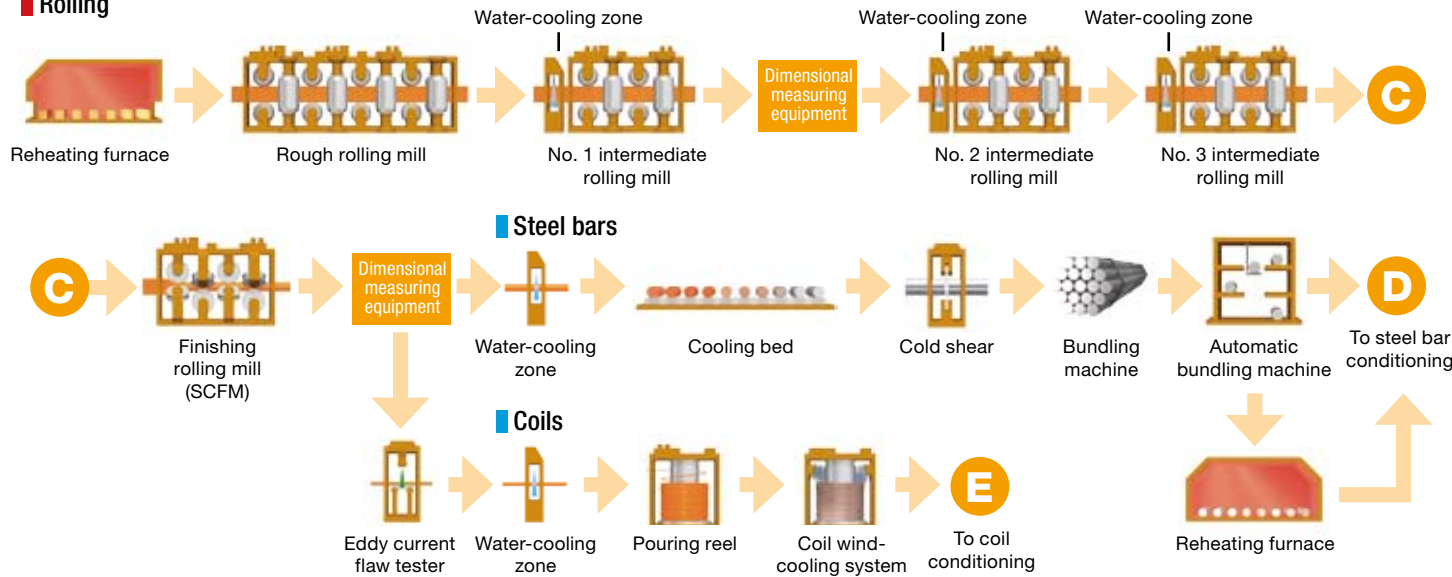
Equipment used in Wire Rod Mill

Reheating furnace	Walking-beam type, 130 tons per hour	—
Rolling mill	No. 1 rough rolling mill (continuous V-H system)	2 units
	No. 2 rough rolling mill (horizontal dual close top type)	7 units
	No. 1 intermediate rolling mill (horizontal dual close top type)	6 units
	No. 2 intermediate rolling mill (Pre-finishing mill)	2 units × 2 systems
	Finishing rolling mill (NT block mill)	2 stands
	Stelmore conveyor (forced-wind cooling type)	2 systems
	Eddy current flaw tester	2 units
	Dimensional measurement equipment	2 units
Conditioning inspection equipment	Magnetic particle tester	1 unit

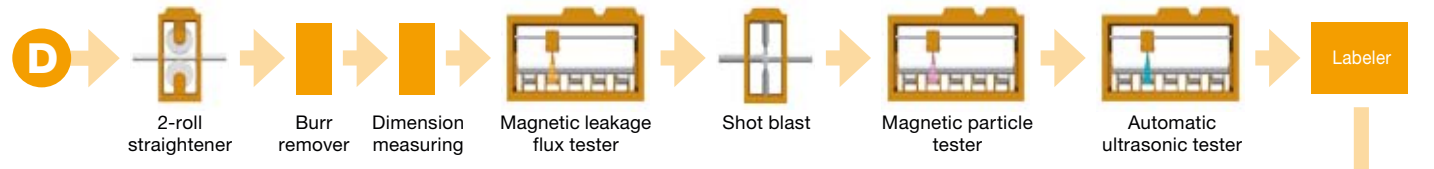
[Nominal capacity: 300,000 tons annually]

Manufacturing process at Steel Bar Mill

Rolling



Steel bar conditioning



Coil conditioning



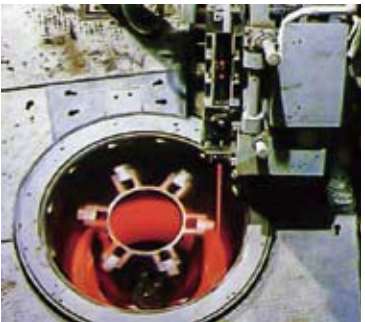
Equipment used in Steel Bar Mill

Reheating furnace	6 top and low zone walking-beam type, 3-split type, 180 tons per hour	—
Rolling mill	Rough rolling mill (Fully continuous H-V system)	8 units
	No. 1 intermediate rolling mill (Fully continuous H-V system)	4 units
	No. 2 intermediate rolling mill (Fully continuous H-V system)	4 units
	No. 3 intermediate rolling mill (Fully continuous H-V system)	4 units
	Finishing rolling mill: 3-roll type (SCFM: size-chance-free mill)	4 units
	Dimensional measuring equipment: projective continuous revolution type, etc.	3 units
	Reel: pouring type	2 units
	Cooling bed: rake type	1 unit
Conditioning inspection equipment	Cold shear: Down-cut type	2 units
	Straightener	3 units
	Burr remover	3 units
	Dimensional measuring equipment	3 units
	Magnetic leakage flux tester	3 units
	Magnetic particle tester	3 units
Reheating furnace	Automatic ultrasonic tester (phased array type)	2 units
	Roller-hearth non-oxidizing atmosphere furnace	1 unit

[Nominal capacity: 720,000 tons annually]



Steel bar rolling mill



Pouring reel



SCFM (size-chance-free mill)



Cooling bed