

KAWASAKI STEEL TECHNICAL REPORT

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Rolling Technology and Modernization of Chiba Works

Endless Hot Strip Rolling in the No. 3 Hot Strip Mill at the Chiba Works

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Synopsis :

Fully continuous finishing rolling, so called "endless hot strip rolling", started at No. 3 hot strip mill in Chiba Works of Kawasaki Steel for the first time in the world, depending on the development of sheet bar joining process and establishment of continuous rolling system. For joining the head and tail ends of sheet bars, an induction heating and an upsetting method was adopted. This method made it possible to join the sheet bar ends in a short time, like 5 s. Strength of joint is equal to its mother materials and no scale residue was found across the joint. Accordingly, an ideal joining technology was established. Sheet bar ends are joined before reaching the finishing mill while the bar moving. Continuous finishing hot strip rolling is performed under an uninterrupted tension between rolling stands. As a result, product quality, like thickness accuracy, productivity and stability of rolling were extremely improved. In addition, ultra-thin strip and thin-wide strip have been able to be produced without trouble.

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The body can be viewed from the next page.

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Synopsis:

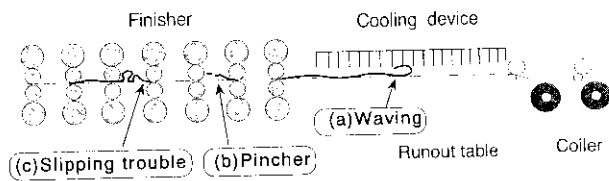


Fig. 1 Problems of the usual "batch process"

3.1.1 Quality stabilization and increase in yield

Finish rolling is conducted by joining about 10 sheet bars in endless rolling. Applied tension is maintained throughout the process from the finishing mill to the coiler except for the head end of the first sheet bar and the tail end of the last sheet bar, enabling rolling and threading to occur in an ideal condition without shape disturbance.

Therefore, the accuracy of gauge and temperature control improves greatly and variations in the gauge and

in thickness can be produced if the strip width does not

making crowns suitable for the target of each bar in con-

exceed 1 250 mm.

3.1.4 Stable production of new materials by

tinuous rolling, and a shape control technique so that the strip shape is not disturbed.

The fourth challenge is to develop a technique for

High speed furnace
Carriage speed; 2m/min
Extractor; 40sec/cycle

Sheet bar coiler
Continuous bar supply
Recolling min. pitch; 40sec

Sheet bar joining machine
Induction heating and upset joining
Self driving with sheet bar carriage

High speed strip shear
Flying type shear
Cut speed; max.1200m/min

Bar Joining Machine

Deburring Machine

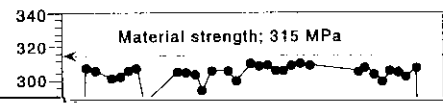
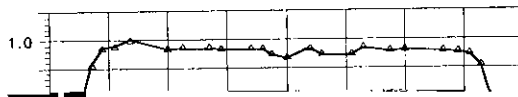
Clamping the bar

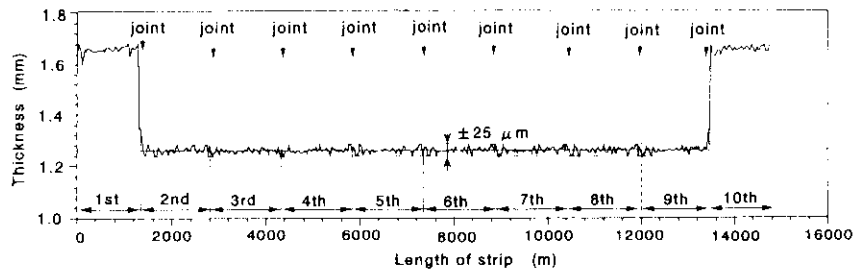
Induction heating

Unsettling

Joining

Deburring





(strip thickness; 1.66 → 1.26 → ... → 1.26 → 1.66 mm)

