

KAWASAKI STEEL TECHNICAL REPORT

No.37 (October 1997)

Technologies for High Speed Rolling and Gauge Control in Cold Tandem Mill for Ultra-Thin Gauge Strip*



Synopsis:

High productivity and gauge accuracy are required of

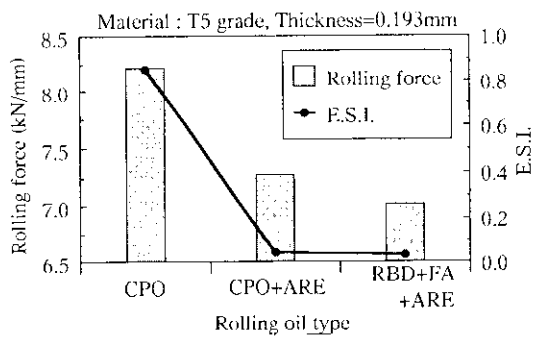


Fig. 3 Effect of improvement by rolling oil

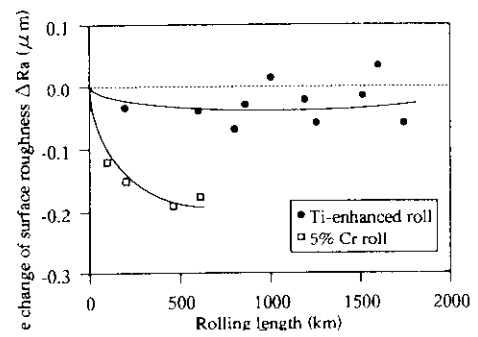
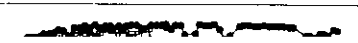


Fig. 4 The change in surface roughness of work roll at finishing stand

(min) 2500



No. Deformation Total Delivery Rolling

2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
-6.0
-7.0
-8.0
-9.0
-10.0
-11.0
-12.0
-13.0
-14.0
-15.0
-16.0
-17.0
-18.0
-19.0
-20.0
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-31.0
-32.0
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-42.0
-43.0
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-45.0
-46.0
-47.0
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-82.0
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-84.0
-85.0
-86.0
-87.0
-88.0
-89.0
-90.0
-91.0
-92.0
-93.0
-94.0
-95.0
-96.0
-97.0
-98.0
-99.0
-100.0

#1BUR

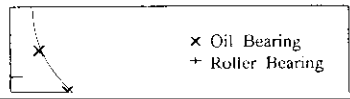
#3BUR

#2BUR

#4BUR

#5BUR

5.00
4.00



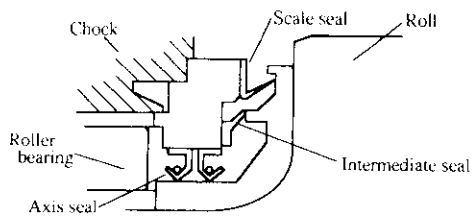


Fig. 11 Structure of seal in roller bearing BUR

result, the life of back-up roll bearings is likely to be extremely short if standard roller bearings are used. The life of a roller bearing can be calculated using the following formula.

$$L = \left(\frac{C}{F} \right)^{10/3} \cdot 10^6 / (60 \cdot n) \quad (1)$$

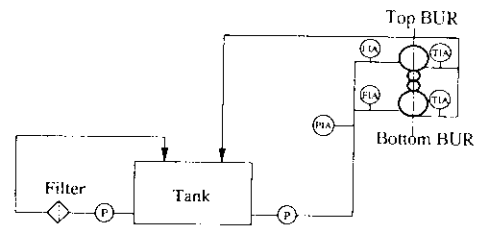
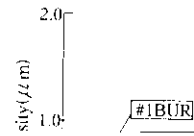


Fig. 12 Lubrication system of roller bearing BUR





5 Conclusion

(1) In order to improve the plating-out of rolling oil, an additive for restraining emulsification and a base oil

(5) Modification of mill motors for higher speed response was found to be effective in improving gauge accuracy during acceleration and deceleration. A gauge accuracy of better than $\pm 15\%$ could be obtained with a speed response of 45 rad/s.

lubrication.

(2) By developing Ti-enhanced work rolls with excellent grindability at a reasonable cost, it was possible to roll at the most suitable roughness of work roll surface and operate at maximum rolling speed irrespec

References

- 1) T. Saito, Y. Yamada, F. Kosumi, K. Takazawa, and Y. Kuga: *CAMP-ISIJ* 7(1994)7 446