

5 Conclusion

Numerical simulation has been performed to investigate the temperature distribution of the bar in hot mill process. The domain of hot mill process from Roughing mill to Finishing mill is transformed to time dependent problem passing through the position of the bar. The temperature was modified using the experimental data to improve the accuracy of the predicted value.

The skin depth of the bar is predicted to investigate induction current affected area. A significant decrease in temperature is found from the surface to center of the bar. Heating efficiency of the real model in the width direction were predicted by applying internal heat generation distribution about the Cold bar test, and Cold bar test for temperature rise amounts were calculated by back calculation method then, heating rate of surface in the width direction was calculated and verified.

The temperature increases uniformly across the width direction with setting temperature value while passing through the heaters. However, temperature drop near edge area cannot be avoided due to the cooling of the side surface. This edge effect occurs at 13% length of the width.

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