

**SESSION 6: LIGHT ALLOYS, MARITIME HALL**

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## **Modeling on tail pinch in finishing rolls during hot strip rolling**

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### **ABSTRACT**

Instability in finishing rolls during hot strip rolling may result in serious problems. As the strip becomes thinner and thinner, the stability of strip rolling is sensitive to process parameter fluctuation. Bending, wrinkling, or warping of strip may occur during high-speed finishing rolling process. These undesirable instabilities may cause flap of the strip tail on finishing rolls. This phenomenon is often referred as strip-end crashing or tail pinch. Tail pinch may cause folding of the strip and may damage the finishing roll surface and leave defects or indentation on the strip and would seriously affect the yield rate. The mechanisms of tail pinch and the possible causes for the instability are very complicated in finishing roll stands.

In this study, a preliminary approach on the finite element modeling of the tail pinch phenomenon between finishing rolls during hot strip rolling process was explored. Referring to the boundary condition of hot rolling production line, the FEM model consisting of strip, finishing rolls, side guide, and upper guide was established. The operation parameters, such as rolling speed, level of roller, and gap between side guides, were considered. The strip end model was established having a hook shape, which was measured after the rough rolling process prior finish rolling. The preliminary results reveal a realistic numerical duplication of the strip end flap and the tail pinch phenomenon. To reduce or to eliminate tail pinch of strip, the relationship between mill level and degree of strip tail deviation was analyzed. The concept can be used in the level setting strategy during finishing rolling process to reduce the geometric deviation of strip and to eliminate the tail pinch phenomenon.