Setup System of Selective Roll Cooling Based on Profile Prediction in Aluminum Hot Strip Mill

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In aluminum strip production, profile formed in hot rolling is critical to flatness control in the subsequent cold rolling, and selective work roll cooling is marked by the flexible control of complex high-order shape defects. Therefore, a setup system of selective cooling is developed to achieve the whole cross-section profile control in hot rolling. It includes a real-time work roll thermal model based on finite deference method and a strip profile predictive model based on RBF network. A spray pattern is obtained using an iteration method, as the "basic pattern" for the setup, for the situation when roll thermal contour need to be maintained. Based on the predicted profile error, adjustment of the basic pattern is made by fuzzy inference to get the final setup spray pattern, under which the profile error can be reduced during the threading.

Keywords: Shape Control, Work Roll Cooling, Finite Deference Method, RBF Network.

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