

MECHANICAL CHARACTERIZATION AND FORMABILITY PERFORMANCE OF TWIN ROLL CAST AA5754

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ABSTRACT

Twin roll casting (TRC) is as a well-established and economical method for producing all types of aluminum foil and heat exchanger fins as well as various grades of building and construction sheet. Due to the nature of solidification behavior of liquid metal, microstructural features of the materials and mechanical performance of the exhibit some differences compared to its counterpart produced with conventional production technique, that is DC casting and hot rolling. Recently, there has been an increasing interest in using twin roll casting as a method to produce low-cost/high-quality 5000 series aluminum sheet for automotive structural applications. Aluminum alloys employed for inner and outer panel applications of automotive industry necessitate alternative solutions to overcome cost barrier of conventional production technique banning it to be used extensively. This approach must aim the improvement of existing mechanical properties and formability performance, as well. Current study elucidates microstructural, mechanical properties and formability performance of twin roll cast AA5754 alloy. Tendency of the materials to localized necking and its plastic anisotropy were correlated with the FLD results through the material properties of n and r . Results were compared with those materials produced with DC casting and hot rolling processing route.

Keywords: Automotive sheet, formability, AA5754, forming limits diagrams.