EFFECT OF SEMI-SOLID PROCESS ON MICROSTRUCTURE AND MECHANICAL PROPERTIES OF MEDIUM CARBON STEEL PRODUCED BY CONTINUOUS CASTING

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ABSTRACT

The effect of semi-solid process on the microstructure and mechanical properties of medium carbon steel (0.6% C) produced by continuous casting route was investigated. Both the microstructure and mechanical properties have been affected by semi solid process. The microstructure tends to consist mainly of martensite at the bottom of the casting. The volume fraction of martensite at the bottom of the semi solid casting is higher than that for the continuous casting. Carbides start to appear in the microstructure at the grain boundaries at higher levels of the vertical axis in both semi solid and continuous casting molds.

Hardness measurements for semi solid casting are higher than those for continuous casting especially at the bottom. Away from the bottom of two ingots, hardness gradually decreases to reach almost the same values at the top. Impact energy for semi solid casting is lower than that for the continuous casting.

KEYWORDS: Medium Carbon Steel, Semi-Solid, Continuous Casting, Microstructure, Mechanical Properties