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Inclusion characterization for quality control in steelmaking

Narottam Behera¹ and Ahmad Shahreer²¹HADEED Research and Technology Center, Saudi Arabia²SABIC T&I, SABIC Technology Center, Saudi Arabia

Demand for clean steel has been increasing every year. The level required for clean steel varies with steel grade and downstream applications. Steel cleanness depends on the amount, morphology, and size distribution of non-metallic inclusions in steel. Cleanness level in the long and flat products vary dramatically and clearly differentiated based on the de-oxidation process used. In order to assist inclusions formation, samples from ladle furnaces and casting were collected and analysed using Scanning electron microscope (SEM) with an automated feature analysis in order to evaluate morphology, composition and distribution of inclusions. Thus, internal quality control of semi-finished products might be correlated to product defects and process abnormalities. Examples from Al-killed and Si-Killed steels are presented to understand the process conditions necessary for clean steel making and thus product quality improvement.

beheranar@hadeed.sabic.com