

Clogging Mechanism of Ladle Nozzle in Bloom Casting

KU-LING CHANG*, YIU-YI KUO, WEN-HSIENCHOU** and CHEN-LONG KAO****

**Steel and Aluminum Research and Development Department*

***Steelmaking Department*

China Steel Corporation

Ladle nozzle clogging sometimes occurs during the transfer of molten steel from ladle to tundish. The clogging has led to serious operational problems and increase of production costs. This phenomenon was different from the frequent occurrence of clogging in the tundish nozzle in the continuous casting process. The clogged ladle nozzles were sampled and analyzed by SEM and EPMA. The results indicated that the Al-rich calcium-aluminates with a few spinel inclusions had accumulated at the bottom of the ladle nozzle. The generation mechanism of clogging inclusions was studied, and counter measures were developed. Consequently, the occurrences of ladle nozzle clogging were significantly reduced.