10:05

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Section 1: Computer simulation

Creep behavior of purging plug during its periodic service process: a numerical approach

Purging plugs are widely used in secondary metallurgy, and their service life determines the downtime and usage efficiency of the whole ladle. For achieving long service life, thermomechanical mechanism analysis of a purging plug is of great importance. This research aims to analyze the creep behavior of a purging plug in the periodic service process by numerical simulations. The creep model was employed to predict the failure of the purging plug, and the creep test at evolution temperature was applied to obtain the mechanical properties of the purging plug. The simulation results showed that the creep behavior mostly located at the working surface of the purging plug. The corner of rectangular slits is more likely to result in irreversible strain due to stress concentration. Furthermore, the thermal distortion of a purging plug with circular slits is less than that of a purging plug with rectangular slits, which could be the reason that a purging plug with circle slits has a longer service life.

Keywords: failure mechanism; thermomechanical; purging plug; plastic strain

There may be changes in the time schedule.
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