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## Section 1: Computer simulation

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### Numerical investigation of interaction between refractory lining and molten steel



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A transient 3D numerical model has been established using volume of fluid-discrete phase model technology to study the gas-oil-water three-phase flow in a RH degasser water model. The breakup and coalescence of gas bubble was taken into account, the bubble diameter being changed with static pressure. The wall shear stress and turbulence intensity were employed to predicate the erosion rate of the lining refractory, while the diffusion coefficient of the refractory material and the slag property at high temperature were used to consider the corrosion rate. The effects of the operational parameters on the refractory wear rate were clarified.

In order to study the effect of refractory graphite content and heating temperature on carbon pick-up of ultra-low-carbon steel from magnesia-carbon refractory, a transient axisymmetric mathematical model has been established. The momentum, heat and mass transfer between the refractory and the molten steel was modeled by using porous medium. Arrhenius law was employed to define the rate of the carbothermic reduction reaction of the magnesia. Besides, a series of experiments were carried out to verify the model.

There may be changes in the time schedule.  
See the current information on the [website](#)

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