

## Large eddy simulation of vortexing flow of molten steel in continuous casting mold

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### **Abstract**

Large eddy simulation of vortexing flow of molten steel in the continuous casting mold was conducted. The influence of the SEN(surged entry nozzle) port angle and the SEN position to the “turbulent vortex” was analyzed. The mechanism of the “turbulent vortex” and the “biased vortex” was found. A new vortex brake was designed to eliminate the vortexing flow. The fluid flow with and without the vortex brake was simulated. The simulation results show that the “turbulent vortex” is caused by the turbulent energy; Increase of the SEN port angle and the depth of the SEN below the surface increases the duration of the “turbulent vortex” in the free surface. The “biased vortex” is caused by the off-center of SEN and the turbulent energy. The new vortex brake can eliminate the “turbulent vortex” and decrease the strength of the “biased vortex”

**Keyword:** *(continuous casting, mold, vortexing flow, large eddy simulation)*