

CFD simulation of gas–liquid rotational and perforated concurrent flows on the blade unit of a TRST

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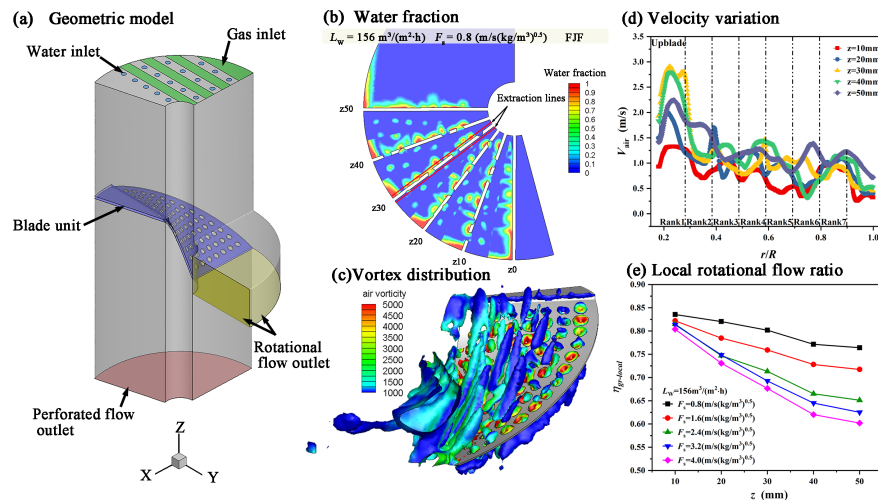
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Abstract

The blade unit of a tridimensional rotational flow sieve tray (TRST) is the origin for the rotational–perforated flow. The flow field of that was investigated using the Multi-fluid VOF method. The water fractions, and the gas perforation velocity on the blade unit were investigated. The liquid phase distribution in the jet and mixed flow is more dispersed than that in film and jet flow. The gas–liquid two-phase velocity fluctuated with the radial distance. The rotational and perforated flows on the blade unit were analyzed separately by the local rotational flow ratio. The variation range of the ratio for the gas-phase was 0.6 – 0.85, and that for the liquid-phase is 0.2 – 0.8. Based on the Q criterion, the vortices were mainly concentrated near the sieve holes. The simulation provides an important theoretical basis for the mass transfer investigation and structural optimization of the blade unit.

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