

Numerical Simulation for the Straight Pipeline after a Sonic Nozzle and Its Influence on the Discharge Coefficient

Han Ke¹, Luo Dong²,
Shen Yuming³

¹ University of Shanghai for Science and Technology, hanke_happy@126.com, Shanghai, China

² University of Shanghai for Science and Technology, Shanghai, China

³ University of Shanghai for Science and Technology, Shanghai, China

E-mail: ym-shen@usst.edu.cn

By establishing the model, a nozzle outlet and its internal flow field for the straight pipeline after the sonic nozzle is simulated by the CFD software. According to the simulation results, pressure changes strongly from the nozzle outlet, and slowly rises to the back pressure after the 3D (D is pipe diameter) from the nozzle outlet. With the 5D length of the straight pipeline after a sonic nozzle, the nozzle throat will keep critical flow when the back pressure ratio is less than or equal to 0.849, and the straight pipeline after a sonic nozzle has little influence on the discharge coefficient. But when the back pressure ratio is less than 0.507, the pressure in the pipeline appears fluctuations.
