DISC 곡률 반경이 밸브 개구 시간에 미치는 영향

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Effect of Disc Curvature Radius on Opening Time in S/R Valve

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Key Words: Safety and Relief Valve(안전밸브), Disc(격막), Curvature of Radius(곡률 반경), Shock Wave(충격파).

Abstract : A study on the valve opening time in rupture disc type S/R valve for the high pressure vessel is necessitated to assure the safety and relief of the high pressure vessel. So, in the present study, an experimental study by using a shock tube facility with dimensional analysis is performed to estimate the effects of diaphragm curvature radius, pressure ratio and the depth of the groove on the valve opening time. As a result, it is found that the radius of curvature of the rupture disc becomes smaller, the thickness of the rupture disc is thinner, the ultimate strength of the rupture disc is smaller for the same conditions, the valve opening time is shorter, and, the radius of curvature and the ultimate strength of the rupture disc for the same conditions are smaller, the maximum pressure rise caused by the coalescences of the compression wave is smaller.

안정 성층인 채널유동에서 난류의 감쇠

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Turbulence suppression in stably stratified channel flow

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Key Words: Stably stratified turbulence (안정 성층난류), Large-eddy simulation (대와류 모사).

Abstract : Suppression of turbulence in stably stratified flow is investigated in this study using large eddy simulation. Stably stratified turbulent flow owing to negative buoyancy or adverse density gradient is important phenomenon that is frequently observed in geophysical flow as well as in engineering flow. Severe suppression of turbulence or relaminarization was reported from many experiments but it was not reproduced by using numerical simulation typically performed for not only low Richardson number but also low Reynolds number flow. In this study, near-wall behavior of suppression of turbulence in stably stratified channel flow was investigated in both wide range of Richardson number and Reynolds number. To accomplish sufficiently high Reynolds number flow and to diminish a numerical error, large eddy simulation employing spectral method is conducted.