

## 하천수 열원이용 2단압축 열펌프시스템의 최적 중간압에 대한 실험

김종률<sup>†</sup> · 이영수\* · 나호상\*(KIER)

### Experimental Investigation of Optimum Inter-stage Pressure of 2-stage Heat Pump System Using River Water Heat Source

J. R. Kim, Y. S. Lee, H. S. Ra

**Key Words:** Heat Pump(열펌프), Two-stage Cycle(2단압축 시스템), Inter-stage Pressure(중간압력), Intercooling(중간냉각), HFC-134a

**Abstract :** The inter-stage pressure for two-stage vapor compression cycle is commonly taken as the geometric mean of the refrigerant evaporation and condensation pressure, which is only applicable for a perfect gas with complete intercooling between the stages. However, when the flash inter-cooler is incorporated, there is considerable difference between the geometric mean and the optimal pressure value. In this paper, experimental investigation for the optimum performance of HFC-134a multi-stage heat pump system was conducted to suggest optimal inter-stage pressure.

## 글로브 밸브의 동특성 분석을 위한 유동가시화

양상민<sup>†</sup> · 신성기\*(한빛파워서비스) · 이호영\*\* · 조택동\*\* · 고성호\*\*(충남대)

### Flow Visualization for Dynamic Analysis of Globe Valve

S.M. Yang, S.K. Shin, H.Y. Lee, T.D. Cho and S.H. Ko

**Key Words:** Flow Visualization(유동가시화), Globe Valve(글로브밸브)

**Abstract :** Globe valves are used to control the flow or the pressure of the pipe system in a nuclear power plant. The periodic diagnosis of them has been carried out to guarantee the safety of a nuclear power plant. Therefore it is necessary to study on the flow dynamics of globe valves in order to analyze its faults and performance. We acquired the 3D design information of the globe valve. A globe valve is made of acrylamide so that we can see the inside of the globe valve. The flow visualization test is carried out to analyze the inner flow of the valve. The test system is composed of the acrylic valve, a stripe laser and a high speed camera. The velocity distribution of the flow is analyzed by the flow analysis program with images captured by the high speed camera.