전도식 수문의 유압회로 설계에 대한 연구

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Study for the Hydraulic Circuit Design of a Turning-Type Sluice Gate

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Key Words: Turning-Type(전도식), Sluice Gate(수문), Hydraulic Circuit(유압회로)

Abstract : The hydraulic cylinders are used for actuating the sluice gate which controls the volume of water in the reservoir. The turning-type sluice gate is better to control the height of water than the sliding-type sluice gate. The reaction force to the rod end of cylinder is varying upon the angle of sluice gate and the installation location of cylinder. The hydraulic supply pressure is dependent on the supply flow rate, the flow coefficients of valves, the size of cylinder, and the reaction force to the rod end of cylinder. The hydraulic circuit is designed to minimize the hydraulic supply energy required to open and close the turning type sluice gate.

BGA 패키징에서 종방향 열초음파 진동을 이용한 무연 솔더의 저온 무플럭스 솔더링

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Low Tempearture Fluxless Soldering of Lead Free Solder Using Longitudinal Thermosonic Vibration in BGA packaging

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Key Words: Lead free solder(무연솔더), Thermosonic soldering(열초음파 솔더링), BGA, Viscoelasticity(점탄성)

Abstract : Recently extensive researches on the lead-free solder and fluxless soldering have been conducted. Thermosonic BGA bonding using the longitudinal ultrasonic is investigated in this study for its application to low temperature fluxless flip chip bonding with the lead-free solder(Sn-3%Ag-0.5%Cu). Solder temperature increase by viscoelastic heating of solder was calculated by numerical analysis and compared with experiment results. Effects of process variables on bond quality were analyzed through the microstructrues of bond interfaces and shear test. Joint shear strength under the optimal bonding condition satisfied the industrial requirement. Since the multiple flux-free solder joints can be formed with short bonding time,