

# 해양온도차 발전을 위한 심층수 파이프 직경에 따른 에너지 손실량 검토

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## Feasibility Study on Cold Water Pipe Diameter by Friction Loss and Energy Conversion on OTEC

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The energy conversion from the temperature difference between hot and cold source like ocean thermal energy conversion (OTEC), requires a long and large-diameter pipe (about 1000 to 10,000 meters long) to reach the deep water. The pipe diameter ranges from 2.8 meter for proposed early test systems, to 5 meter for large, commercial power generation systems. The pipe must be designed to resist collapsing pressures produced by water temperature and density differences, and the reduced pressure required to induce flow up the pipe. Other design considerations include the external-drag effect on the pipe due to ocean currents, and the wave-induced motions of the platform to which the pipe is attached. Various approaches to the pipe construction have been proposed, including aluminum, steel, concrete, and fiberglass. More recently, a flexible pipe construction involving the use of fiberglass reinforced plastic has been proposed. This report presents the results of a scaled fixed cold water pipe (CWP) model test program performed by EES(Engineering Equation Solver) to demonstrate the feasibility of this pipe approach.

**Key words** : OTEC(해양온도차발전), Pipe Friction Loss(파이프 마찰손실), Condenser(복수기), Heat Recovery(열 회수), Working Fluid(작동유체, 냉매), Energy Balance(에너지 평형)

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