

CHT-15: A NEW DESIGN OF HEAT SUPPLY PIPELINE STRUCTURE

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ABSTRACT A new design of heat supply pipeline structure is proposed. Learned from the vessel structure in penguins' legs, the cooled fluid pipe is used as a "protection" for the hot fluid. A three layer pipeline is used: The hot fluid flows in the inner pipe and the cooled fluid flows with the annular space between the intermediate pipe and outside pipe, with certain insulation within the intermediate pipe and inner pipe. This design avoids that both the hot fluid pipe and cooled fluid pipe emit heat into environment separately. The temperature difference between the hot fluid and the cooled fluid is smaller than that between hot fluid and air. Therefore, the heat loss for the hot fluid is smaller than the heat loss of conventional design, which reduces the energy loss and improves the heat quality. On the other hand, The heat loss by the hot fluid is brought back by the cooled fluid. Comparisons have been made between the new design and conventional one under different parameters. The new structure can also avoid the need to settle two pipelines in conventional design, saving space effectively. The new designed pipeline structure has good energy-saving potential and can be widely used in many aspects of industrial and residential applications.

KEYWORDS: Heat supply; Pipeline; Heat loss