# 유전자 알고리즘을 이용한 머플러 구멍 위상최적설계

## Topology Optimization of Muffler Hole using Genetic Algorithm

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**ABSTRACT**

Rotary compressors are one of the most important parts of air-conditioners in the industry. This device usually has noise problems during the circulation process of the refrigerant and muffler is used for the noise reduction. The acoustic performance of the muffler depends on its shape and its hole locations on the upper surface. Therefore finding the optimum location of the muffler holes is a topic of increasing importance in the compressor industry. In this research the optimization of the muffler hole locations and the importance of the resonator cavity on the lower surface of the muffler in acoustic point of view is studied. At first, the topology optimization for the 2 hole muffler is performed based on a model without resonator cavity by using genetic algorithm. The 2 hole muffler's acoustic analysis  and experiment results are matching, however, the optimized model's results are not. By adding the resonator cavity and also by changing the cavity shape, the acoustic analysis and experiment result comparison is performed for different cavity shapes. The topology optimization of the revised model with cavity is carried out for noise reduction. Finally, the optimized design is produced and tested for validation.

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