원심팬의 기하학적 특성에 따른 송풍 성능에 관한 연구

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A Study on Fluid Dynamic Performances according to the Geometric Characteristics of Centrifugal Blowers

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Key Words: Centrifugal Blower(원심송풍기), Wind Tunnel(풍동), PIV(입자영상유속계)

Abstract : Comprehensive experimental works are carried out for the optimal design of a centrifugal blower adopted in an indoor unit of an air-conditioner. The models for consideration are typical multi-blade turbo blower and limit loaded one, respectively. The main interest lies on the fluid dynamics performance when the blower is installed in the practical system. The methodologies are an experimental estimations with a wind tunnel for blower performance and PIV measurement for the detail flow information. A centrifugal blower with limit loaded fan shows pronounced performances in terms of the flow rate and static pressure rise and the reason is explained by the precise measurement of the flows between blades using PIV. Consequently, it is found that the blower is proper for the flows with a resistance in down stream such as a heat exchanger.

이차목을 갖는 환형 분사 초음속 이젝터 작동압력 이론해석

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Theoretical Analysis of the Starting Pressure of an Annular Injection Supersonic Ejector Equipped with a Second-Throat

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Key Words: Starting Pressure(작동압력), Annular Injection Supersonic Ejector(환형 분사 초음속 이젝터), Mixing Model(혼합 모델), Overexpanded Flow(과도팽창 유동)

Abstract : Starting pressure of an annular injection supersonic ejector equipped with a second-throat was investigated theoretically. We assumed that the ejector starts when the supersonic primary flow reaches the second-throat inlet. To determine that, for a given geometry and primary flow inlet condition, the secondary flow pressure was calculated by a mixing model and applied as the back pressure condition for an overexpanded flow calculation after the primary nozzle exit. An empirical factor was employed and multiplied by the first diamond shock wave pattern length in order to simulate the distance that the supersonic primary flow travels. In result, for the three cases of primary nozzle area ratio, we could get accurate model of predicting the starting pressure by selecting a suitable empirical factor around 2.95.