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## An Investigation on the Vortex Tube

Kenziro ENOMOTO\*

The behaviour as well as the characteristics of the vortex tube were examined both experimentally and theoretically. To the end, the present author employed two experimental set arrangements. One set was devoted to the investigations of the performance characteristics of vortex tube. With this apparatus, the number of nozzles, the lengths as well as the divergence or convergence of tube were varied, and the effect of the configurations of vortex tube upon characteristics was examined. The other set was employed for the observation of the flow patterns of the air within the tube. Futhermore, the author conducted theoretical analysis concerning the flow within the tube.

Following conclusions were obtained.

(a) The number of nozzles were varied 1, 3 and 5, and it was found 3 nozzles corresponded optimum.

(b) Optimum performance characteristics were obtained when the vortex tube having divergence 3/100 and length diameter ratio of around 15 was employed.

(c) The static pressure distributions within the tube were estimated approximately by means of the energy balance of rotating fluid masses with centrifugal force.

(d) The optimum figures of merits for cold air and hot air amounted to 19 % and 17 % respectively.

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