Abstract

The simple counter-flow vortex tube consists of a long hollow cylinder with tangential nozzle at one end for injecting compressed air. Compressed air supplied to the vortex tube is separated into low pressure hot and cold air from its two ends. The exact mechanism of this temperature separation is not known today. Most of the investigators have studied the various operating
characteristics of vortex tube based on the cold air fraction. Vortex tubes of different geometrical configurations give optimum performance at different cold fractions.

This paper presents experimental results of the energy separation in vortex tubes for different nozzle diameters keeping all other geometrical parameters constant. It is experimentally evidenced that the nozzle diameter greatly influences the separation performance and cooling efficiency. The most important point revealed in this paper is that there is an optimum nozzle diameter that gives the best performance of vortex tube.

References

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