

# The Effect of Tube Length, Cold Exit Diameter and High Temperature of Working Gas on The Cold Flow Temperature of Vortex Tube

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**Abstract.** Vortex tube has been using widely in industry for cooling process. It is working as a refrigerator which split compressed gas into hot and cold stream without using any electrical or chemical process. In term of application, the effect of geometrical parameters on the cold flow temperature of vortex tube by using high temperature compressed gas is obscure, and effect of certain working gas has yet to be vigorously researched. Thus, the objective of this analysis is to determine the effect of length of the vortex tube, cold exit diameter and different high temperature working gas. 3 different tube length, 3 different cold diameter, and 7 different types of gas are used. Simflow, which is free software, is selected to analyse the effect numerically. From the results, it is clear that the optimum tube length, cold exit diameter, and working gas are  $L = 175$  mm,  $d = 4$  mm and helium, respectively.