

# **NOISE REDUCTION OF CENTRIFUGAL FAN BY USE OF RESONATOR AND ACTIVE NOISE CONTROL TECHNIQUE**

**PATIL T. B<sup>1</sup>, BOROLE K. R<sup>2</sup> & SANAP S. B<sup>3</sup>**

<sup>1</sup>Research Scholar, Sinhgad College of Engineering, University of Pune, Maharashtra, India

<sup>2</sup>Professor, Smt. Kashibai Navale College of Engineering, University of Pune, Maharashtra, India

<sup>3</sup>Associate Professor, Sinhgad College of Engineering, University of Pune, Maharashtra, India

## **ABSTRACT**

Centrifugal fans are extensively used in industrial applications and there is a continual and increasing demand for higher flow rate machines with the attendant restriction of the smallest possible dimensions. This increase in flow rate is normally achieved by the use of higher speeds and which leads to increase in the noise generation mechanism within the fan unit, resulting in the radiation of extremely objectionable high frequency discrete tones. Noise causes nuisance and hazard to hearing. The noise generated by centrifugal fan contains tonal as well as random components. Blade tones are generally the most annoying components and need to be reduced. The production of the tone is known to originate from within a concentrated region around the cut-off of the fan casing. The tone is produced by the interaction of the mean air flow leaving the impeller with the asymmetric part of the casing comprising the cut off. At present little attention is given towards the noise generated by the centrifugal fans. The conventional method of treatment is to use passive damping techniques or to redesign the fan. Redesign is often costly and ineffective. In the last decade, resonators and active noise control technique have emerged as a viable technology to reduce the noise levels of centrifugal fans. The level of blade passing frequency component can be reduced substantially by mounting acoustic quarter-wavelength resonators into the cut off which is made of perforated sheet metal to permit communication of the resonator cavities with the interior of the fan casing.

**KEYWORDS:** Centrifugal Fan, Cut-Off, Noise, Quarter - Wavelength Resonator