

Pittaya Hongsamat 2007: An Analytical Study of Local Exhaust Ventilation for Six-Spindles Turning Machine. Master of Engineering (Safety Engineering), Major Field: Safety Engineering, Interdisciplinary Graduate Program. Thesis Advisor: Associate Professor Chawalit Kittichaikarn, Ph.D. 75 pages.

The purpose of this research was to analyze the local exhaust ventilation of six-spindles turning machine. The study focused on correlation between the spindle speed and the oil mist concentration. The filter and gravimetric method was used to measure the oil mist concentration that were generated from the 3 maker's turning machine named ACME, MITSUBISHI and TORNOS.

Research result revealed that the spindle speed had an effect on oil mist concentration. This correlation was statistically significant, at 5% significance level or at 95% confidence intervals. The type of machine had no influence on oil mist concentration. In this research, the equation was drawn from statistical theories to conclude that the oil mist concentration increases as the spindle speed increases. For ACME's machine, the spindle speed range was 1000 to 2000 RPM., the coefficient of determination (R^2) were found to be 53.4%. For MITSUBISHI's machine, the spindle speed range was 1500 to 2400 RPM., the coefficient of determination (R^2) were found to be 55.7%. For TORNOS's machine, the spindle speed range was 2400 to 4700 RPM., the coefficient of determination (R^2) were found to be 85.4%.

Finally, it was found that the face velocity of local exhaust ventilation was insufficient. The results simulated by using fire dynamic simulation and program Pyrosim gave the same agreement.



Student's signature



Thesis Advisor's signature

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