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WORALUK KUNATHIMAPUN: A PERFORMANCE STUDY OF CYCLONE DUST COLLECTOR FOR FOUNDRY OPERATION. THESIS ADVISORS: WITAYA YOOSUK Dr.ENGINEERING., VICHAI PRUKTHARATHIKUL M.Sc.(INDUSTRIAL H & S)., VAJIRA SINGHAKAJEN M.A.(DEMOGRAPHY).,105 P. ISBN 974-662-066-5

This thesis covered design and performance analysis of cyclone dust collector (CDC). The tool (CDC) was 17 inches in diameter. It was applied to test its ability to collect dust from a foundry operation. The CDC model was the tangential inlet and axial discharge or the conventional type. Shapes and dimensions were calculated and designed based on the hypothesis of Koch and Licht. The performance analysis was estimated by Stairmand's hypothesis. The study was divided into 2 parts. Firstly, dust was separated based on size distribution using sieve No.200 to retain particles large than 75 microns. These large particles were classified using Sieve Analysis. Particles smaller than 75 microns or passing through sieve No.200 were classified using Anderson Sampler. Secondly, the CDC was used to collect mixed dust particles obtained from the same site. The CDC performance data consisted of measuring the gas velocity in conveyance dusts and the pressure drops across cyclone and determining of concentration the particles suspended in gas stream by using the Stack Sampler method. This was carried out by two sets of experiments consisting of 156-162 cfm flow-rate in one set and 320-332 cfm in another set. Each set applied 3 dust concentrations: 45-53 mg/m³, 109-114 mg/m³ and 217-230 mg/m³.

It was found that the performance of the designed CDC was similar to that of Stairmand. The CDC performance in elimination of dust was related to dust concentrations ; i.e. the performance increased in accordance with the dust concentrations. However, the CDC showed no significant differences in its performance when tested against two flow-rates, 156-162 cfm and 320-332 cfm. This might be explained by to use of a narrow flow-rate with in the range of CDC performance.