

Thesis Title : The Study of Dust Fall Jar and High  
Volume Sampler's Suitability for  
Measuring Dust Concentration from Cement  
Plant

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#### Abstract

In this study, dust fall jar and high volume sampler are used to monitor the cement dust at Tumbon Tub Kwang, Amphoe Kangkhai, Saraburi Province. Dust fall Jar which is recommended by ASTM ( American Society for Testing and Materials ) for collecting dust in month period, whereas high Volume Sampler which is recommended by (US EPA) United State Environmental Protection Agency and National Environment Board is normally used for 24-hour sampling period. The goal of research is to study the trend of data collected by high volume sampler and dust fall jar and relation of dust and calcium which is the major component in cement powder collected by these two apparatus with distance and direction in Southwest monsoon and Northeast monsoon. Monthly sampling by dust fall jar was done for one year while short period of 24-hour

sampling by high volume sampler was done in February and March during Southwest monsoon and in December during Northeast monsoon.

It was found that by using high volume sampler, concentration of particulate decreased when distance between point source and station increased but calcium did not show the same result. By dust fall jar, the concentration of both dust and calcium decreased when distance from point source increased. From regression analysis of dust collected by the two instrument, it was found that  $R^2$  value of dust during Southwest monsoon was 0.43 in February and 0.02 in April. During Northeast monsoon, the  $R^2$  value of dust was 0.91 in December. The  $R^2$  value of calcium were 0.47, 0.38, and 0.97 in February, April and December, respectively. The  $R^2$  value of dust in April were lower than in February because wind direction varied in April so that three-day sampling data of high volume sampler was not good representative. On the other hand,  $R^2$  value of calcium in these two months was not different because the major source of calcium still came from cement plant. The  $R^2$  value in Northeast monsoon was higher than in Southwest monsoon because there were more stations downwind from cement plant in Northeast monsoon season. It may be concluded that particulate and calcium collected by high volume sampler and dust fall jar from cement plant have the same trend.