

計畫名稱：排放管道粒狀污染物檢測比測執行計畫（I）

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計畫執行單位：台灣大學環境工程學研究所

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中文摘要

模擬煙道是為內徑約60 cm，高約14 m之垂直管道，一具十五匹馬力的風車，以及前後進氣孔與出氣孔的過濾設備所組成。本計畫邀請32家代檢業者參與煙道採樣，每家廠商在3種風速和3種粉塵輸出量，產生共計9種組合編號下，進行2種組合編號的盲測。

研究的主要目的包括維護排放管道氣、粒狀污染物檢測比測系統(模擬煙函)正常運轉操作。進行(空氣檢測類)檢測機構之盲測業務，針對32家領有排放管道粒狀污染物檢測業者進行比測，利用歷年累積排放管道粒狀污染物檢測比測數據，建立更佳之粒狀物質量濃度統計模式，探討煙道內微粒成份（含光學特性）、粒徑分佈、數目濃度、表面積濃度、重量濃度等對煙道內不透光度量測的影響，最後，利用此計畫結果編寫空氣污染專責人員或檢測機構採樣人員訓練班之教材，並檢討設置「排放管道粒狀污染物檢測」訓練班之可行性。

結果顯示2003年煙道粒狀污染物統計模式其迴歸模型的 $R^2=0.54$ ，也就是說模型解釋的程度將近達到百分之五十四左右，相較於歷年的資料今年的粒狀污染物統計模式解釋力降低，這暗示著代檢業對於煙道粒狀物的檢測能力下降，需要加強訓練和教育。此外，在相同微粒質量濃度下，微粒的粒徑大小會產生不同的不透光度，因此，空污費依此不透光度標準進行徵收，必須考量製成產生微粒的粒徑分佈。

英文摘要

The testing system simulating a stack is composed of an inlet filtration unit, a 15 HP blower, a 13.4 m height, 60 cm diameter stainless steel duct, and an outlet filtration (bag house collector). Three levels of velocity and three levels of dust feeding rate were chosen for operational conditions in this project year. Thirty-Two private certified laboratories were invited and randomly assigned to 2 out of 9 conditions.

The main objective of the present study is to operate a pilot stack system to keep on establishing a database of measurements of stationary sources. This database was subject to

further statistical analysis for performance proficiency. Other objective is to improve, operate and maintain a device (simulating a stack) for validating the measurement of particulate from stationary sources. To Produce unknown dust concentrations for evaluate the sampling performance of the private certified laboratories by the statistical analysis model of the 2001 and 2002 year. Generating different kinds and aerosol concentrations in the laboratory to evaluate number, surface, volume and mass concentrations how to affect opacity in the stack. Finally, utilizing the result to make a trained class or course for sampling from dusts and stack.

The results showed that a statistical model of aerosol was derived and found to be able to explain over 54% of the variation in this year, this indicated that the ability of stack particulate measurements in this year may be lower than last year for private certified laboratories. Certified laboratories need to make a strengthen training and education about stack sampling. Furthermore, aerosol particles of the same mass concentration may have different opacity readings primarily due to the difference in size distribution. Therefore, aerosol size distribution of emitted particulate matter needs to be considered if opacity meter is to be used as the continuous emission monitor.

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