

### **S3.2.2 HOT GAS CLEAN UP IN FUEL GAS USING SPRAY NOZZLES**

Bhuvanewari G, Sarat Chandra Babu Jakka  
National Institute of Technology Tiruchirappalli

Hot gas is mostly generated by the combustion process with a high concentration of particulate matter, though it possesses high thermal energy. Hence, it is recommended to remove the particulate matter before introducing it to other processes or vented to atmosphere. The objective of this study is to develop an efficient mechanism to cool and to remove the particulate matter from hot flue gases of combustion. The experimental facilities include an ejector, spray chamber, distributor, spray nozzles, filter and thermocouples. The distributed spray nozzle equipped in the ejector generates the mist which cools the hot gases containing post-combustion particulate matter of diameter around 10 $\mu$ m and less from 750 deg C to nearly 200 deg C. The exit mixture of mist and flue gas from ejector then passes through the spray chamber. Flange type full cone spray nozzles are employed in the spray chamber. The uniform spray distribution provides effective condensation of the particulate matter and enhances removal of non-condensable gases. The results of this study indicate efficient design of spray distribution nozzles will be attractive in hot gas clean up. The focus is crucial in analyzing the system and developing an efficient design of spray nozzles to be applied in the industrial environment of hot gas cleanup. The results are expected to serve as the basis for future research.