

ABSTRACT

The number density of suspended particles can be quantified by using laser attenuation method. There are two types of suspended particles: solid particles and liquid droplets. Laser attenuation is a phenomenon where a portion of laser beam is reflected by the lenses and absorbed by the particles introduced in its path and the remainder portion of the beam is transmitted to the receiver. Currently, there are many measurement systems using the application laser for the quantification of suspended particles. Those systems are limited for certain settings and experiments only. The objective of this project is to develop a measurement system for the quantification of number density of the suspended particles by using laser attenuation method which incorporating the features of high flexibility, movability, reliability, stability, safety and lightness. The scope of study for this project includes research on the principle of laser and laser attenuation, design of the measurement system, selection of the components and finally experiments to test its functionality. Initially, there are four sketches made by using AutoCAD 2006. Then, only two sketches are selected for the design stage and the final design of measurement system is chosen by considering how well the designs meet the requirements of flexibility, stability, movability, safety and lightness. The fabrication of this system involves the milling, lathing, drilling and assembly processes. Three experiments are conducted throughout the project period. From the result of experiments, this measurement system has shown its functionality as expected to quantify the number density of suspended particles. Finally, this system is now ready for the measurement in various experiments dealing with the quantification of suspended particles.