



The Importance of Air Flow during cleaning.

The particles we are required to control, by the ISO 14644 specification, are very small. None of these sizes, reflect enough light for humans to see them. These small particles are suspended in air. We can tell these particles are suspended in the air by using an air particulate reader, or as I often note during my site visits, my mouth go's dry, as the particles I breathed in absorbed the saliva in my mouth. Whilst these small particles are suspended in air, many forces act upon them, including Van Der Waals force, electromagnetic force, Brownian motion, convection, air movement, static electricity and finally gravity. I say finally gravity, as the mass of some of these particles is very light, we calculate gravity $Mass \times 9.8m/s^2$, therefore, the acceleration of these low mass particles due to gravity (falling to earth) is minuscule, and other forces will have a much stronger/dominate influence on them, as they fall.

The rationale behind requiring the CRAH units, and air scrubbers running is as follows: By having the CRAH units working, we are creating a lot of air movement, and making this the dominant force working on the suspended airborne particles. The $0.3\mu m$ air scrubbers then filter $2500m^3$ of air each per hour. This process should soon remove the particles, down to $0.3\mu m$, from the air, stopping them coming out of suspension and re-contaminating surfaces, which would then require to be recleaned. If we turn this air movement and filtration off, the air will soon become still again, thus allowing other forces to become the dominant force, working on the suspended airborne particulate. Any suspended particles could then re-contaminate surfaces, which would then need recleaning.

Air movement will also help stop particulate entering the data hall via doors, either under them or as they are opened. As a positive pressure should be achieved in the data hall.