

Project 346-051

ABSTRACT

The project has aimed to overcome usual stereotype thinking in laboratories and show that high user safety can be achieved with low airflow and subsequently low energy consumption. The project results demonstrate that if overall assessments for laboratory ventilation is used instead of assessments for the individual components it is possible achieve the same level of security with lower energy consumption.

For future support to users of the project results a series of simple assessment tools have been developed that in most cases can provide an indication of the present security level and whether it is possible to reduce the air flow. The developed tools can also be used when designing new laboratories to ensure the lowest possible air flow and energy consumption.

The project has developed the following:

1. Guideline for laboratory design including guidelines for fume cupboard positions, fume cupboard environment, walkways etc. and laboratory ventilation design
2. Guideline for design of energy efficient fume cupboards with high personal safety
3. Guideline for requirement specifications and tools for self-monitoring of fume cupboard safety level
4. Tool for calculation of present and future energy consumption in a laboratory based on the present design and possible changes into an energy efficient laboratory.

Full-scale measurements where performed at a test facility at Technological Institute which states that energy consumption can be reduced significantly without essential safety aspects are affected if fume cupboards and the laboratory as a whole is optimized. It is expected that the additional costs for optimized laboratories can be covered by the energy savings. In addition, it is expected that the necessary initiatives at a holistic-oriented approach will be easy to implement.

It is expected that the solutions and tools developed in the project will be used in connection with the massive public investments in the hospital and university sectors is happening in these years in Denmark. Furthermore, the results will be of interest to laboratories in chemical industry, the pharmaceutical industry and other businesses which use fume cupboards to large extent.

The project was funded by the ELFORSK program and performed during the period of 1.th April 2014 to 1.th August 2016.