

Summary

Airtightness measurements in laboratory areas to the securing of small loads of particulate matter

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1 Introduction

Manufacturing and development processes in the electrical industry (microchips), the technology for smallest elements with high precision, the medical research and the food technology as well as operating theatres require laboratories and/or areas with particularly „unsoiled“ air. The clean-room technology dedicates itself to the protection of these work areas. A field of application is the avoidance of undesirable high concentrations of suspended matters and fine types of dust in air, which can lead to disturbances in the operating procedure and to falsified test results. For this reason it is necessary to limit the particle load of the room air.

In the following two measuring examples one describes, which experiences were made with airtightness measurements in pure areas and why defined airtightness requirements to the space covering and their early examination with the BlowerDoor measuring system is a relevant test criterium to the securing of small dust loads.

2.3 Summary and outlook

The tested laboratory areas exhibited a large number of leakages, by which suspended matters and fine types of dust can arrive into the inspection rooms and disturb the operating procedure crucially. Air speeds at the leakages and the leakage sizes varied. Among the typical leakages were sealed cable- and pipe pass-throughs as well as cables, which pierce through the walls in a bundle, missing seals at construction unit joints and element butts of the clean-room system (research lab) and/or interruptions in the airtightness level (missing interior plaster within the range of the floor pavement - laboratory for surface analytics). The reduction and/or targeted elimination of these leakages is the premise for the avoidance of unwanted particle entries into the laboratory areas from the outside.

The experiences show that the airtightness measurement is very well suitable to improve the quality of the laboratory covering essentially and to clearly reduce thus the entry of unintentional air pollutions. The accomplished measurements point out an enormous improvement potential concerning the airtightness of these areas, which can be planned and realized by following procedure:

Already during the building design the airtightness layer is defined in detail and marked adequately in the plans. During the execution of construction appropriate measures can be converted for the improvement of the airtightness (sealing sleeves for cable penetrations, sealing tapes etc.). The airtightness measurement here serves primarily for the quality assurance and is accomplished in a phase, in which still improvement work can be made.

Further it is desirable to formulate concrete requirements to the airtightness of these areas as well as to define a yardstick for the appraisal of the located leakages.