

**„Anwendungsorientierte Untersuchung eines  
in einer Wohnungslüftungsanlage integrierten  
Messsystems zur Diagnose  
der Luftdichtheit von Gebäuden“**

**-englischer Kurzbericht-**

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Die Verantwortung für den Inhalt des Berichtes liegt beim Autor“.

The objective of the present research work named "Applied study of a modified ventilation and measurement system to record leakproofness of buildings" is to perform a leakproofness test in accordance with DIN EN 13829 by means of a ventilation system installed inside a house.

At the beginning of this research work, different procedures and processes have been prepared to determine the extent to which a built-in ventilation system has to be modified in order to perform a leakproofness test. The course of this project can be divided into the following sections: analytics, sensors, developing the proper software, practical application of a modified, built-in ventilation system, leakproofness test, comparison with an official BlowerDoor-test in two different houses.

In the analytical part of this project, structures have been prepared which provide an easy and safe handling of the procedures required for a leakproofness test, even for inexperienced persons. Additionally, a certain number of inspection procedures were developed to test if the pressure sensors can meet the measuring demands of this project. In order to make comprehensive statements about the building's leakproofness, different pressures and volumetric flow rates have to be measured. While doing so, it soon became clear that direct methods of measuring the volumetric flow rate in pipes are expensive and do not meet the claimed accuracy of the momentary volumetric flow rate. It was then decided to continue with a more practical and affordable alternative: a differential pressure sensor with a combined measure-cross which was able to record the volumetric flow rate in a satisfying way.

Furthermore, a software program was developed which provides a safe and simple performance of the leakproofness analysis, even at the end-user's house. After having finished the leakproofness test of his house with his modified, built-in ventilation system, the end-user will be handed out a report in accordance with DIN EN 13828. The decisive factor of this report is a value named  $n_{50}$  which allows a direct indication of the house's air change rate at a pressure difference of 50Pa.

The practical application showed the capability of the developed procedure to perform an adequate leakproofness test in a house, with the results being comparable to the one of a BlowerDoor-test. To gain these insights, the ventilation systems of two houses were modified according to the developed enhancements of this research work. The results received by the two ventilation systems were validated through the results of the BlowerDoor-tests, which have been executed directly afterwards with the same ventilation systems.