

Simulation of Air Flow Through Ventilation Ducts

E. Dalsryd¹

¹KTH Royal Institute of Technology, Stockholm, Sweden

Abstract

In this report I study the airflow through ventilation ducts. By numerical simulation, the so-called k-factor has been estimated. The k-factor is the quotient of the airflow volume and the square root of the pressure drop over the duct.

A two dimensional axial symmetric model has been used to simulate an iris damper connected to a straight pipe. A three dimensional model has been used to simulate a pipe with a 180-degree-bend.

The simulations have been compared to practical measurements and also to other simulations.

The conclusion is that the result of a simulation of this 180-degree-bend have errors that are too large (locally around 20 %, but usually less than 10 %) to be useful in a context of "obligatorisk ventilationskontroll" (OVK). The result of the simulation of the iris damper with a straight pipe gives a maximum error between 3 % and 10 %. After further investigations, it may be possible that this method will be useful.