



Aalborg Universitet

AALBORG UNIVERSITY
DENMARK

Single-sided Natural Ventilation Driven by a Combination of Wind Pressure and Temperature Difference

Larsen, Tine Steen; Heiselberg, Per Kvols

Published in:

Abstracts The 6th international Conference on Indoor Air Quality, Ventilation & Energy Conservation in Buildings

Publication date:

2007

Document Version

Publisher's PDF, also known as Version of record

[Link to publication from Aalborg University](#)

Citation for published version (APA):

Larsen, T. S., & Heiselberg, P. (2007). Single-sided Natural Ventilation Driven by a Combination of Wind Pressure and Temperature Difference: . In Abstracts The 6th international Conference on Indoor Air Quality, Ventilation & Energy Conservation in Buildings: Sustainable Built Environment : okt. 28-31, 2007 : Sendai International Centre, Sendai, Japan (pp. 292). Sendai International Centre, Graduate School of Engineering, Tohoku University.

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- ? Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- ? You may not further distribute the material or use it for any profit-making activity or commercial gain
- ? You may freely distribute the URL identifying the publication in the public portal ?

Take down policy

If you believe that this document breaches copyright please contact us at vbn@aub.aau.dk providing details, and we will remove access to the work immediately and investigate your claim.

SINGLE-SIDED NATURAL VENTILATION DRIVEN BY A COMBINATION OF WIND PRESSURE AND TEMPERATURE DIFFERENCE

Tine S. Larsen^{*1}, Per Heiselberg¹

¹*Department of Civil Engineering, Aalborg University, Denmark*

ABSTRACT

Natural ventilation is a commonly used principle when ventilation systems for buildings are designed. The ventilation can either be obtained by automatically controlled openings in the building envelope, or it can just be the simple action of opening a door or a window to let the fresh air in. In both situations the aim is to obtain a good indoor environment but to control the amount of air, some basic knowledge of the flow through an opening is necessary.

The amount of air going through the window opening in single-sided ventilation will depend on the wind speed near the building, the temperatures inside and outside the room, the wind direction, the turbulence characteristics in the wind and the pressure variations caused by e.g. wind gusts. Finally it also depends on the size, type and location of the opening. Therefore, expressions for this prediction mainly depend on unsteady parameters, which make the prediction difficult.

From earlier work, a few design expressions for single-sided ventilation already exist, but none of these include the wind direction, which here is an important parameter. Therefore several wind tunnel experiments are made in this work to find a new design expression which includes all of the above parameters.

KEYWORDS

Single-sided natural ventilation, wind tunnel, measurements, air change rates

* Corresponding Author: *Tel: + 45 9635 8557, Fax: + 45 9814 2555*
E-mail address: tsl@civil.aau.dk