Aalborg Universitet

AALBORG UNIVERSITY

CFD-Benchmarks

Nielsen, Peter V.

Published in:
Euroacademy on Ventilation and Indoor Climate

Publication date:
2008

Document Version
Publisher's PDF, also known as Version of record

[Link to publication from Aalborg University](#)

CFD-Benchmarks

Peter V. Nielsen, Aalborg University, Denmark

Two-dimensional benchmark test
The two-dimensional benchmark test, also called the "IEA 2D test case" was defined in 1990 to be used in the IEA Annex 20 work, but there have been a very large number of papers that use this geometry in other CFD work.

We believe that it is attractive to a new user to stick to a geometry used by a number of other researchers. It is possible to compare the results with other authors' results (other turbulence models, other numerical schemes, etc.). The basic knowledge behind the benchmark test has thus expanded during the years and made the test case more useful.
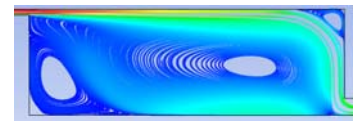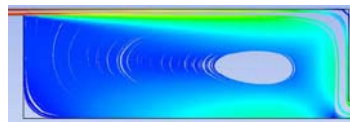
Benchmark tests of flow around manikins
Research centres around the world have developed many different configurations to represent a computer simulated person. The manikins are very different with respect to size, form, heat emission details, turbulence models, etc. The variation may reflect the various possibilities in software and different standards for persons from country to country as shown in the following examples:
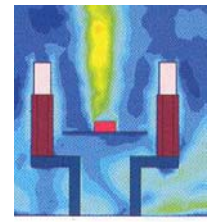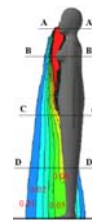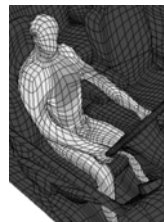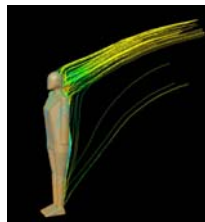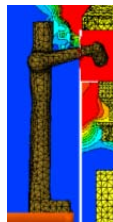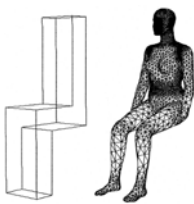
To support the development of a CFD Manikin, we have introduced three benchmark tests for the boundary conditions around a CFD manikin. One test is for mixing ventilation and one is for displacement ventilation, and the last one is for thermal comfort.

The idea behind a benchmark test, which define the boundary conditions around a CFD manikin, is the following: When you have tested your **own idea** of a CFD manikin under the **same** boundary conditions as a number of other researchers, you can make comparisons, and perhaps make some new decisions on geometrical details of your design, turbulence model, type of grid etc. This may hopefully lead to simplifications of a CFD manikin.

Two grids for CFD manikins are also given on the home page.

A number of seminars, forums and workshops have taken place during the years as shown in the home page.