

## **ABSTRACT**

The de-icing process of the windscreen is a demanding problem in car climatization. In the first stages of the development procedure of air ducts, the numerical simulation plays an important role due to economy of time and money. Unfortunately, the available numerical methods for the generation of the computational grid and the simulation of the de-icing process are very time consuming and are complicated in handling. Therefore normally the quality of the de-icing process is evaluated with simplified simulation procedures or even with measurements late in the design process and necessary modifications are again time and cost consuming. The aim of this paper is to describe new methods for the de-icing simulation that will reduce meshing and calculation time by showing accurate results. It can be shown that a simulation of the entire de-icing process, including heat transfer through the windscreen and ice melting, is necessary to check the status of ice thickness in the relevant areas of the windscreen at a certain time, defined by U.S and European standards. These methods need to be applied to check if the standards for de-icing process are reached. A comprehensive simulation programme was performed to identify the best way to achieve accurate results in time which fit in the development processes. Simulations of test cases are presented in this paper and it can be shown that the new strategies enable the optimization of components, relevant for de-icing, in an acceptable time, which reduce the use of prototypes saving money and time.