

The integration of ANSA into the Climate Control systems engineering CFD process at Ford

¹Konstantinos Haliskos*, ²Igor Golberg

¹BETA CAE Systems,

²FORD WERKE GmbH

KEYWORDS -

CFD model process, Climate control, Automotive, ANSA, kinetics

ABSTRACT

From CAD to CFD simulation model, the requirements of CCSE group at FORD are demanding both in volume of designs and number of process tasks that cause additional workflow to users. Frequently groups follow different approaches on common problems and use a variety of tools for the same tasks increasing overall complexity. The time required to extract the appropriate CAD assemblies and prepare a watertight mesh model for each process is considerable and every effort to automate this is of paramount importance. Standardization through the use of common model or common process and tools is fundamental to the success of the group in this field.

This study provides a methodology used to handle the multidisciplinary tasks of CCSE groups at geometry and mesh level with the aim to create high quality surface and volume mesh with elements of model parameterization while establishing an efficient common environment for users. The included CFD models are looking at duct pressure drop / air vents control in cabin, defrost / demist and air extraction. The data provided as input includes an assembly of cabin with ducts which is used for preliminary studies as well as for full vehicle model of sign-off CAD. From the generation of the separate model sub-assemblies within ANSA, to the use of batch mesh and advanced meshing tools the process has been simplified and standardized. Additional tools like kinetics have been employed to handle model shape modifications under operation and automation has been implemented as per requirement.

During this study a diversity of model meshing techniques and tools have been exploited and included in the verification process with the scope to increase efficiency and improve meshing turnaround time. Overall, the ability of ANSA to handle all tasks and provide solutions per subcase has been a critical aspect in the decision to implement it in the process at FORD CCSE.