

Optimized Full Battery Pack Coolant Flow Analysis for an Electric Vehicle

About the Client

The client is one of the leading battery manufacturers with manufacturing and engineering units across the globe.

The Result

DEP MeshWorks aids in optimizing coolant channel design with DOE approach by performing battery pack coolant flow analysis. Diverse optimization techniques from the DEP team enabled them to perform coolant flow analysis for the battery pack at a rapid pace and provide accurate module outlet temperature readings. We cross-confirmed the measurements with the test data results.

The Objective

The client's requirement was to perform the battery pack flow analysis in the coolant channels, intake/outlet manifolds of a battery pack, which would be mass manufactured and used in EVs.

The Challenge

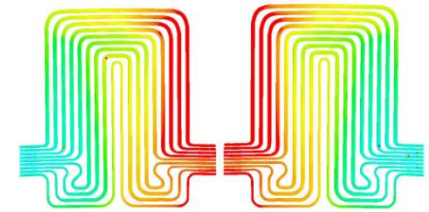
CAD cleanup and meshing for micro channels with the finest precision possible is required for accurate analysis & measurement. Even in curvature areas of micro channels, maximum possible accuracy needs to be ensured. Since minute disparities can lead to inaccuracies as high as 15-20% in the pressure drop scale, the clean-up and

meshing needs to be given utmost importance for exact and optimized results.

The Solution

The DEP team used its proprietary CAE platform, MeshWorks, which includes a set of unique tools for full battery pack examination. Using MeshWorks, we were able to understand the temperature and pressure drop across the bandolier, module and full battery pack. Using the features of MeshWorks' specialized electrification module, a set of analyses was performed. The DEP team also made design suggestions for the coolant channel as part of the process. An optimum channel solutions was proposed based on the study

conducted on the flow split in each section as well as the coolant channels of the battery pack, considering their application in specific electric vehicles.



Temperature profile in battery channels

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www.depusa.com

