

3D-CFD Battery cooling plate optimization

➤ Supporting companies: **GammaTech Engineering** (GTE) and **Cornaglia**

- ❑ Start date: February/March 2025
- ❑ Project duration: 6÷8 months
- ❑ Site:

- GTE's offices in Turin

- ❑ Compensations: Meals

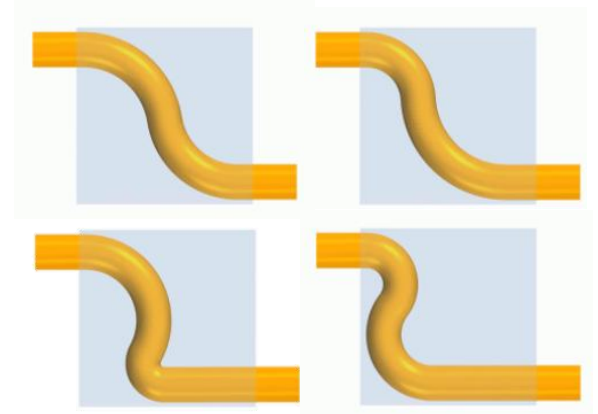
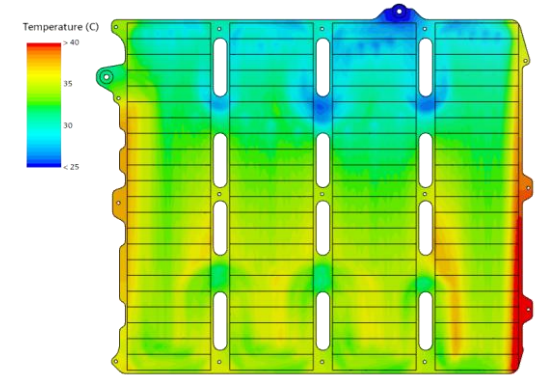
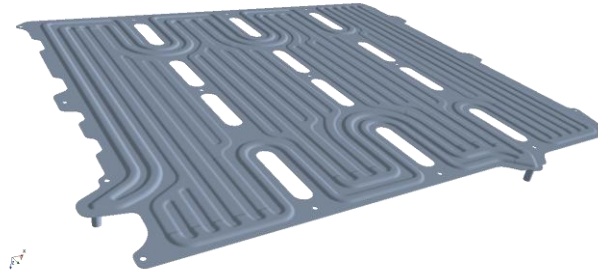
- ❑ Motivations and Project Scope

- Growing electrification trend in automotive industry calls for the design of efficient battery cooling systems to keep up with the increasing power density of the batteries
 - Design optimization of cooling plates requires time-consuming loops Parametric optimization can significantly speed-up the identification of battery cooling plate designs matching desired performance within geometry and technology constraints

- ❑ Thesis proposal:

The student will develop of a methodology for the optimization of battery cooling plates in the 3D-CFD simulation software Star-CCM+, including:

- Parametric CAD in Start-CCM+/external parametric CAD interfaced w/ Star-CCM+
 - DoE on selected key geometric parameters, on a suitable number of levels, first at module level, then for the complete cooling plate
 - Possible use of Adjoint Surface Sensitivity or Mesh Morphing for further local design optimization



Example of parametric optimization