

# DEVELOPMENT OF FUEL CELL ASSEMBLY SYSTEMS

## Developing Adaptive and Future Assembly Systems for Fuel Cell Assembly along with Battery Pack Assembly

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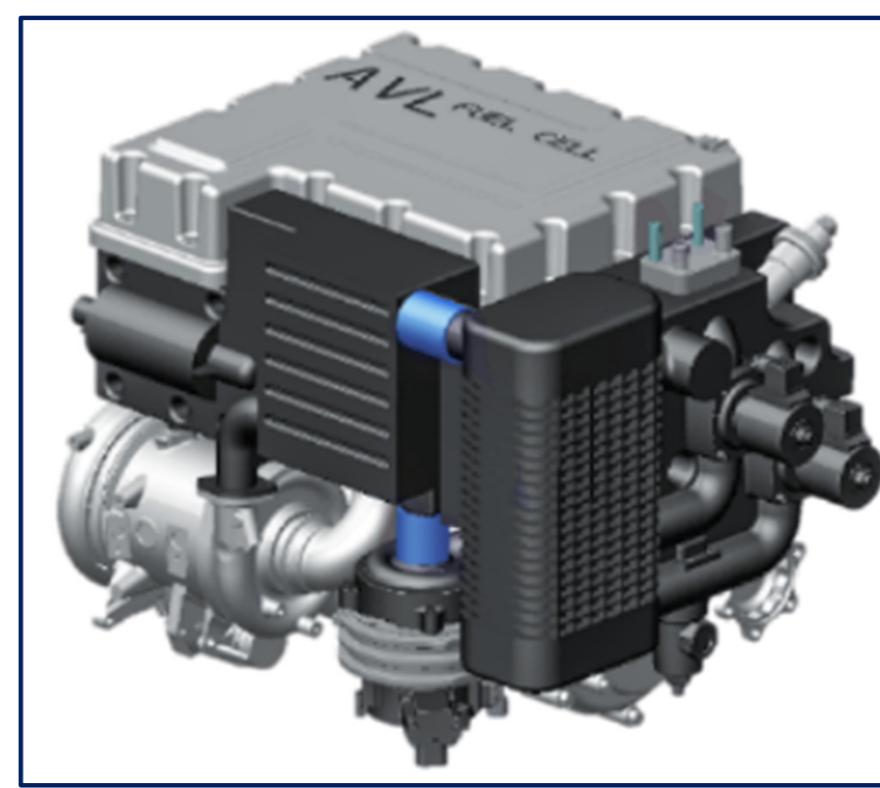
Pro<sup>2</sup>Future



## MOTIVATION & GOALS

E-mobility is perceived to be the future of mobility. But with low demand, high product variability, and mass customization, new **innovative and modular assembly techniques** must be researched upon. In ASP2, we focus on:

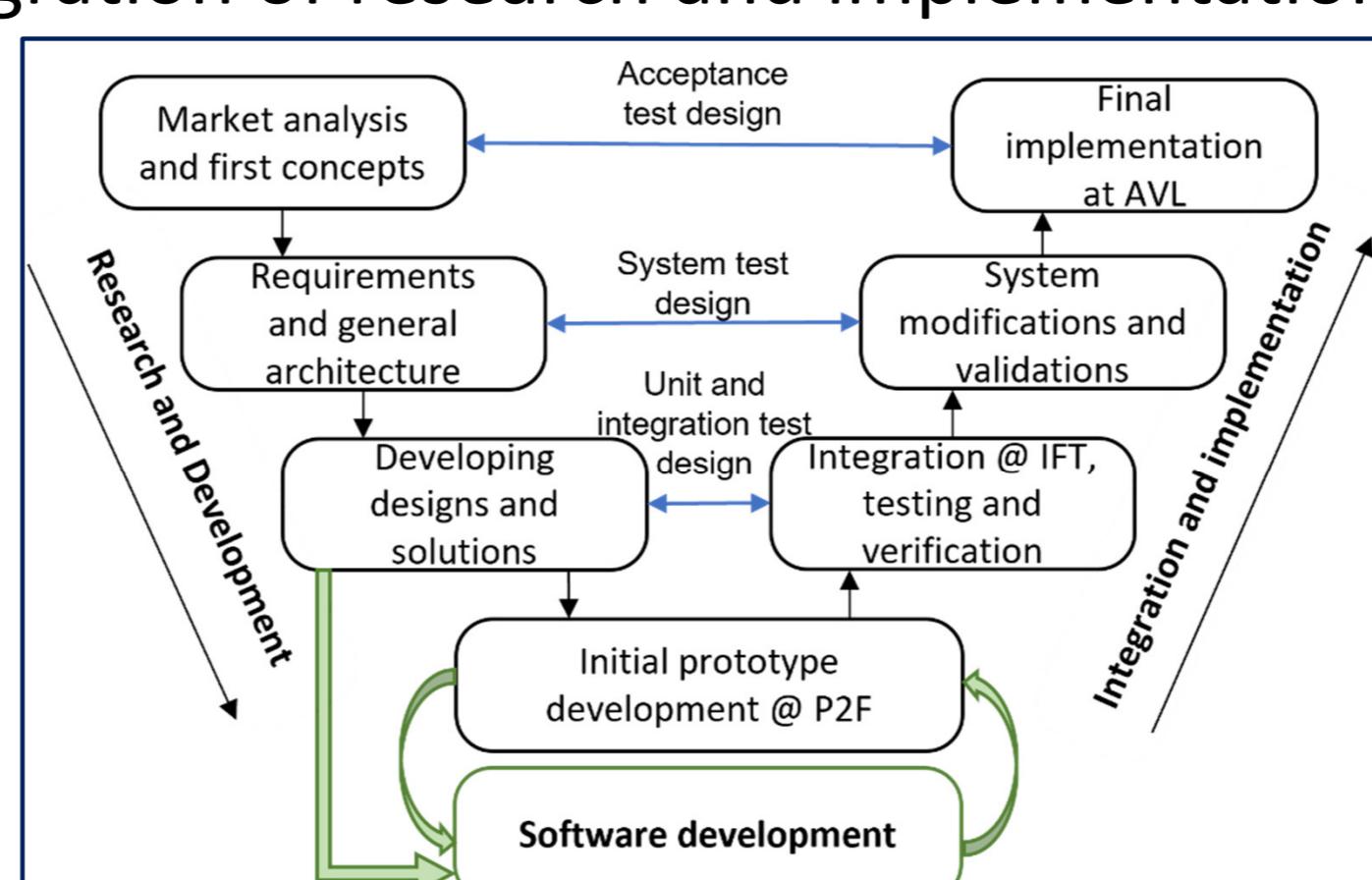
- Development of an **adaptive assembly layout** for fuel cell assembly, which is adaptable for battery pack assembly
- Developing, thereby, a **flexible handling technology**, i.e., grippers for the assembly process of cells
- Addressing the **need for a clean environment** for the stacking process in both, fuel cell as well as battery packs
- Thus, development of **modular cleanroom** concept for individual specific assembly station



## APPROACH of STUDY

The depicted **V-model** describes the integration of research and implementation for grippers and cleanroom.

- **3D-printed end-effectors** with varying design are experimented.
- **Sensory system** with the help of **HEPA filter** (High Efficiency Particulate Air) is used to develop a modular cleanroom approach.



## CONTRIBUTION

### Scientific contribution

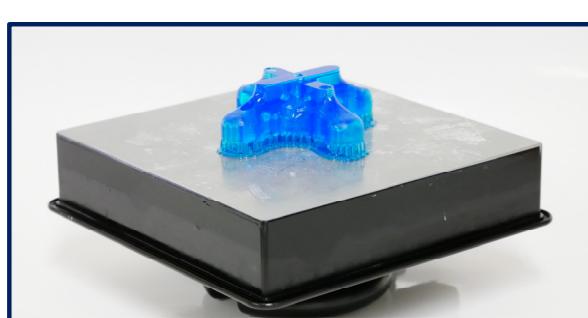
The provision of resource-efficient cleanroom technology (to ensure the longevity of fuel cells) and the adaptation of current handling technology (to ensure the greatest possible flexibility for new product designs).

### Economic contribution

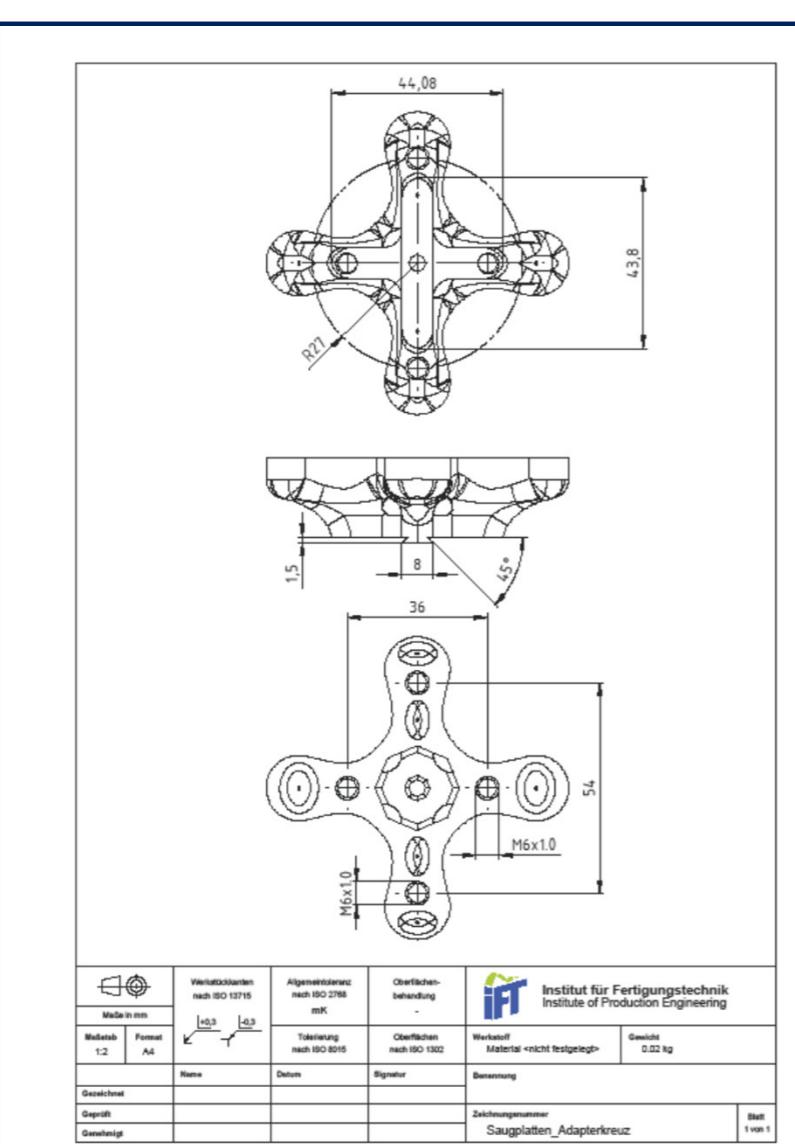
Cleanrooms are energy consuming spaces. Developing station-specific cleanroom could save over 70% of the energy costs.

## OUTCOME

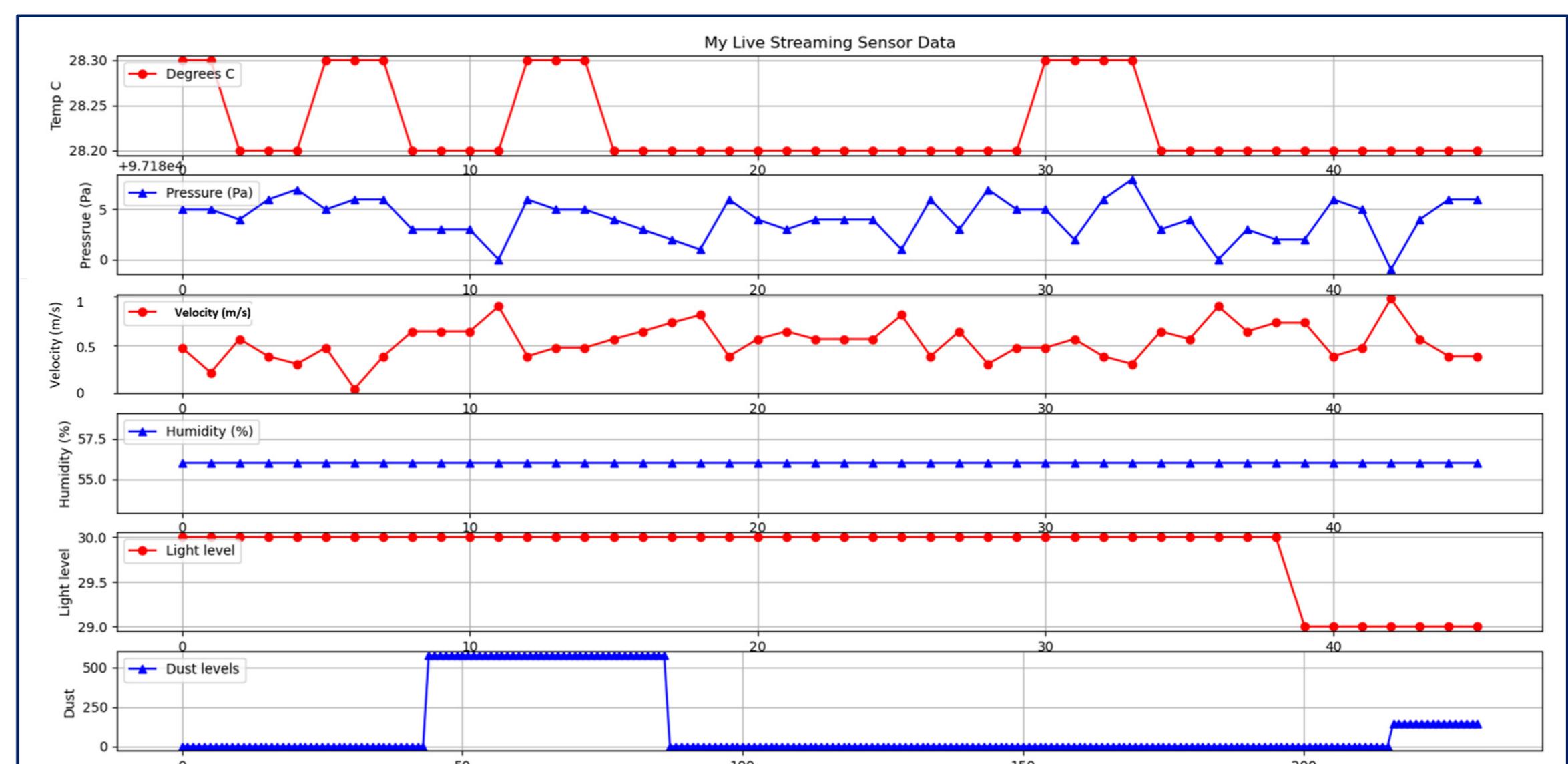
Innovative design and development of **vacuum end-effector** for gripping technology



3D-printed end-effector models



**Real-time monitored cleanroom** concept for effective optimization and usage



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Acknowledgement: This work was supported by Pro<sup>2</sup>Future (FFG, 881844) and AVL List GmbH.

