

Development of a Measurement Lance for Measuring the Temperature Distribution During Hydrogen Filling

Description

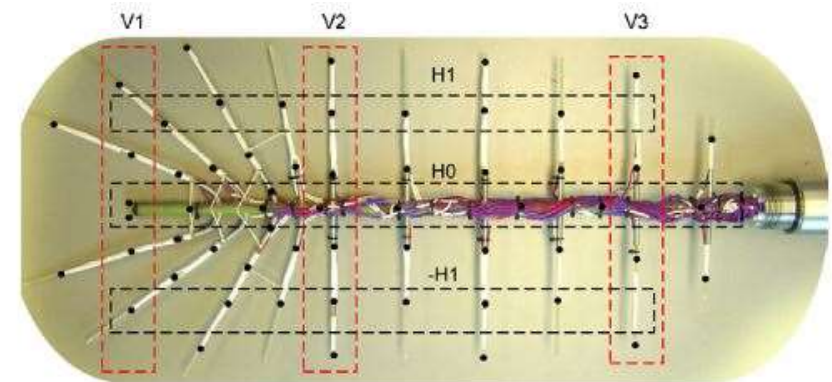
To facilitate the use of hydrogen in the mobility sector, faster filling times are essential. However, faster filling rates lead to higher temperatures. Local temperatures above 85 °C can lead to loss of structural integrity of the pressure vessel, and thus pose a significant safety hazard.

The magnitude and spatial distribution of the temperature over the course of the filling process depend on various geometric, operating and environmental parameters. Currently there are no standardized methods for experimental assessment of the temperature distribution, with measurements typically limited to one sensor integrated into the inlet valve.

The aim of this thesis is develop a lance with spatially distributed temperature sensors to measure the hydrogen tank temperature field.

Work Packages

- Literature research on temperature measurement in high-pressure storage tanks (2 Weeks)
- Development of sensor and measurement concepts (2 Weeks)
- Preparation of CAD drawings and list of materials (4 Weeks)
- Construction of the lance (2 Weeks)
- Written thesis (2 Weeks)



Sources: Dicken et al., Measured effects of filling time and initial mass on the temperature distribution within a hydrogen cylinder during refuelling, Journal of Power Sources, vol. 165, no. 1, 2007.

- **Start:** immediately
- **Duration:** approx. 3 months
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