

In-Situ Crack Growth Measurement in GH2 (Gaseous Hydrogen)

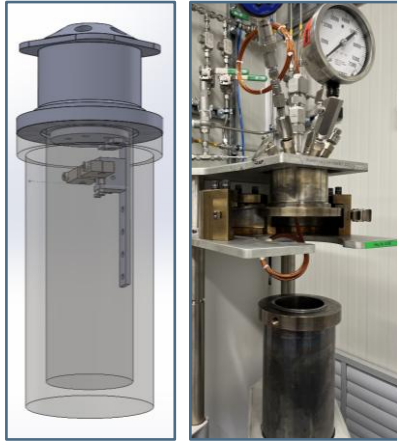


Fig. 400bar GH¹ autoclave with specimen fixture

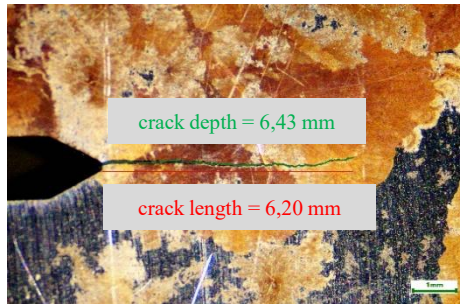


Fig. 2: Metallic CT-Specimen with crack

Description

According to ADR*, the methods outlined in ISO 11114-4 are the only recognized procedures for demonstrating material compatibility with hydrogen and corrosive gases. For mobile steel storage systems, mandatory proof of compatibility is required. A standard test duration for this compatibility is 1000 hours per test run. However, there is a need to accelerate the testing process for material certification and approval, depending on the understanding of crack growth behavior and its influencing factors in gaseous hydrogen (GH2).

This master thesis aims to **explore in-situ crack growth measurement techniques in GH2**, with a focus on accelerating the material certification process. The work will investigate **key factors influencing crack growth** and develop methods to assess material compatibility efficiently.

Content / Time table:

- Crack Growth Measurement: Optimize and implement in-situ techniques to measure crack growth in GH2 under controlled conditions.
- Test Acceleration: Explore methods to accelerate the standard test procedure for faster material certification, considering factors influencing crack growth.
- Data Analysis: Analyze the test results to identify correlations between material properties and crack growth in GH2.

Start: as of now

Duration: approximately 6 months

Paid Master Thesis

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