BACKGROUND

One drawback associated to UHSS coated components is the risk of hydrogen embrittlement (HE) and delayed hydrogen fracture of the part. This problem has been tackled by developing LHE (Low HE) processes and by applying a degassing stage. The standard degassing process is applied equally to the components regardless UHSS or coating composition. However, it is known that the nature and structure of both the base material and the coating have a great influence in the hydrogen intake and degassing efficiency.

Consortium

cidetec surface engineering

hereon

AZTERLAN
MEMBER OF BASQUE RESEARCH & TECHNOLOGY ALLIANCE

elsyca

MAX-PLANCK-INSTITUT FÜR EISENFORSCHUNG GmbH

elhco
electroless hard coat, s.a.

Topic Manager

LIEBHERR

INDUSTRIAL CHALLENGES

- Understanding of HE phenomena
- Tool to predict HE probability in complex coated parts
- Minimizing industrial rework and scrap
- Cd replacement

EXPECTED RESULTS

- 4 different UHSS will be studied during the project to be classified according their facility to degas.
- 3 coating layer microstructures / morphologies will be studied.
- Permeation parameters of all heterogeneities and Hydrogen thresholds (retained H vs. HE) will be determined for all the materials.
- A model able to predict retained H and degassing time of a part will be developed,
- Determination of all undesirables morphologies/structures/zones and the possibility to local rework undesirable structures detected instead of full reprocessing.
- Reduction of average degassing time.
- Energy consumption (in the heating process) reduction for different plated UHSS compared to current procedure (AMS2759/9 standard).

H2Free

INVESTIGATION AND MODELLING OF HYDROGEN EFFUSION IN ELECTROCHEMICALLY PLATED ULTRA-HIGH-STRENGTH-STEELS USED FOR LANDING GEAR STRUCTURES

ID: 101007712

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FIND OUT MORE!

https://www.cidetec.es/en/projects/surface-engineering-6/h2free-3

Clean Sky 2
JOINT UNDERTAKING

H2Free project has received funding from the Clean Sky 2 Joint Undertaking (JU) under grant agreement No 101007712. The JU receives support from the European Union's Horizon 2020 research and innovation programme and the Clean Sky 2 JU members other than the Union.
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CLEAN SKY2

OBJECTIVE

TO DEVELOP A PRACTICAL GUIDELINE FOR HYDROGEN DEGASSING OF UHS-STEELS PLATED WITH LHE-ZN-NI AND LHE-CD, WITH THE AIM OF SAVING PRODUCTION COSTS AND MINIMISE ENVIRONMENTAL IMPACT.

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