Die Cast Housings for Lightweight Steering Pinions using SoTA MMnCs

HIDRIA brought to the LightMe Ecosystem a highly industrialized and demanding test case based on production of aluminum die cast parts for lightweight steering pinions for modern automotive application.

As the test case with the most standardized production process, established mass production, as well as the highly demanding product safety and reliability aspects of the production, **HIDRIA's Lightweight Steering Pinions test case** were a big challenge for LightMe research partners.

The project's aim in **HIDRIA's** test case was to establish if implementation of **MMnCs-based Al-alloys** is feasible for use in contemporary European automotive industry. In addition to the need of addressing the lightweight aspect of the components test-manufactured in the new **LightMe Pilot Lines (PLs)**, HIDRIA brings to the LightMe test case family the unique product demands regarding mechanical properties of the housing as well as porosity criteria.

These were carefully considered by HIDRIA's main LightMe research partners, since the newly cast aluminum housings needed to meet the European automotive industry's product criteria on safety and reliability which is always a key obstacle for validation of new product designs in automotive supply chain.

For implementation of needed research activity for **HIDRIA's LightMe test case**, the company provided its key research partners, **University Brunel London** and **ÖGI Research Institute** with tool and product designs to simulate and cast steering pinions from **MMnCs-infused aluminum alloys** using **high-pressure die casting (HPDC)** and **gravity sand casting (GSC) processes**.

LightMe produced test housings using MMnCs have shown that the new technology could bring significant benefits for design of new lightweight steering pinions, especially in small-series and highly demanding prototypization production.

HIDRIA believes further research efforts on higher TRL levels would be needed to unlock the full potential of the technology, far beyond the project's boundaries, posing an opportunity for further EU research initiatives. Nevertheless, as the obtained results' analysis of the process has shown, the LightMe's Ecosystem opens up a wide field of industrial potential for European casting industry into which it could tap for advanced development of advanced casting processes for growth in the competitive global market.

For more information:
www.lightme-ecosystem.eu

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