Sheet metal forming testing hub

Results in Brief

Zero-defect manufacturing of sheet metal products

The EU-funded FormPlanet offers an Open Innovation Test Bed for advanced sheet metal characterisation, helping to cut waste and increase productivity.





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What do cars, aircraft, beer cans, washing machines, surgical tables and kitchen utensils all have in common?

They depend on sheet metal.

One of the fundamental forms used in metalworking, sheet metal is a thin, flat piece of metal <u>formed by an industrial process</u>. "Because sheet metal is an essential material in such a wide variety of products, reliable sheet metal forming is a critical manufacturing

process," says Eduard Piqueras Jover, collaborative research and innovation project coordinator at Eurecat

Sheet metal forming is an industrial process used to create a metal part. Instead of cutting and removing the part from the sheet, the forming process applies force to the sheet, causing it to form into the desired shape. However, this is far from straightforward.

"The challenge is that today's high-performance sheet metals are subject to cracking

and have limited formability," explains Jover. "Even more challenging is that it is incredibly hard to predict how a specific sheet metal will react to forming."

Solving common problems in sheet metal forming

Answering this challenge is FormPlanet [2] (Sheet metal forming testing hub). Developed with the support of EU funding, FormPlanet is an Open Innovation Test Bed offering advanced sheet metal characterisation methodologies, non-destructive in-process measurements, and a range of modelling approaches.

The innovative methods developed in the project provide solutions to common industrial problems in sheet metal forming. These include edge cracking, hydrogen embrittlement, formability-related cracks, and non-expected part performance, all of which can cause productivity losses or inaccurate quality assessments.

"FormPlanet offers techniques for optimising the development and forming processes of high-strength sheet metals, thus improving the manufacturing process of complex and lightweight parts," notes Jover.

The platform's advanced characterisation and modelling methods have proved to be effective at improving sheet metal performance prediction and reducing production losses. Based on testing, demonstrations and case studies, the project showed that companies adopting the FormPlanet platform into their workflow improved their manufacturing and forming processes.

"Participating companies found solutions to manufacturing problems in high-strength sheet metals or complex parts for lightweighting solutions and high-performance requirements," says Begoña Casas, FormPlanet technical coordinator at Eurecat.

Furthermore, by shortening both the R&D and industrialisation stages, the platform's testing methodologies also help reduce the time it takes to bring new lightweight materials to market. In addition, the new methods reduce testing time, complexity, and the number of specimens required, resulting in significantly more cost-effective characterisation methods.

A one-stop shop for sheet metal characterisation

According to Daniel Casellas, scientific director at Eurecat, the FormPlanet platform will help manufacturers predict part performance and ensure a zero-defect production process. "Our test bed offers the most innovative sheet metal characterisation, modelling, and quality testing services available in Europe," explains Casellas. "For the sheet metal forming industries, this tool is nothing short of a game changer."

FormPlanet and its innovative methods will soon be made available to the European sheet metal forming industry via an independent entity. Eurecat, along with its partners Letomec 2 and COMTES FHT 2, are currently in the process of establishing the entity, which they hope to launch by early 2023.

"Through this new entity, we will be able to offer a one-stop shop for sheet metal characterisation, modelling and quality control, along with such complementary services as technical and business consulting," adds Casas.

In parallel to launching the new entity, the project team continues to improve and demonstrate the innovative characterisation and modelling services already available via the FormPlanet platform.

Keywords

FormPlanet, sheet metal, sheet metal forming, open innovation, test bed, metalworking, manufacturing, industrial process, metal part

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FormPlanet

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