PRESS RELEASE

Developing a 4.0 solution for aeronautical manufacturing and assemblage processes based on state-of-the-art materials

- *Tekniker is leading the European INNOTOOL project for the purpose of developing smart 4.0 tools to improve the manufacture of thermoplastic parts and assembly of aeronautical products (CS2 – LPA "Advanced Rear End" demonstrator)*

[Eibar, 11 September 2020] – Sensors installed on production resources in operation at industrial plants in sectors such as the aeronautical business are making it possible to learn more about processes to monitor them, detect any deviations and establish corrective or preventive actions. Thanks to improved controlling and monitoring, it is easier to remove any faulty parts affecting manufacturing and assembly and helps to foster production practices geared towards zero defects.

It is in this context that **Tekniker**, member of the Basque Research and Technology Alliance (BRTA) is coordinating the European INNOTOOL project (INNOvative TOOling design) to obtain and validate a technological demonstrator for manufacture and assembly processes involving state-of-the-art materials.

This initiative meets the requirements of the high-accuracy smart assembly process (SMART) defined by **Aernnova**, a top-level supplier of high-added value aeronautical structures. This organisation has proposed, in coordination with Airbus, CS2 JU (Clean Sky 2 Joint Undertaking), a technological development topic for an "Advanced Rear End" demonstrator. Subsequent to a selection process open to all European companies, the "CS2 Call for Proposals CFP", it was the proposal submitted by Tekniker and its partners that was eventually chosen.

The project began in May 2020 and combines 4.0 solutions that sensor, model, simulate and optimise industrial tools used to lessen the amount of time required to develop new products,

improve process control, increase production rates and ensure the quality of end products. In this regard, the differential value of the project lies in the manufacturing and assembly methodologies that are based on functionalities incorporated to tools themselves allowing them to perform smart operations.

In addition to leading the project itself, Tekniker is also responsible for developing the smart assembly tool as well as for the use procedure that combines several technologies (process control, forecasts, collisions, assembly assisted by automatic measurements). The technology centre will also collaborate with the tool's (mould) thermal control and thermoforming process that a Zaragoza-based organisation called **AITIIP** will design, manufacture and validate with the support of Aernnova in its role of project "topic manager" under the CFP formula of CS2. This tool will be used by AITIIP to showcase the validation of new advanced manufacturing and circular economy concepts that include the novel high-deposition 3D printing option to implement innovations that will not only speed up manufacturing processes in the aeronautical sector but also reduce energy consumption levels.

On the other hand, and thanks to a solid track record in terms of designing, manufacturing and assembling components, the Basque technology centre will also be in charge of designing, manufacturing and validating automatic smart assembly tools as well as integrated measuring and sensoring technologies to assist assembly processes in which components are involved.

Solutions developed within the framework of the INNOTOOL project will have a major impact on the production of innovative components for the aeronautical sector that will also apply to other sectors such as shipbuilding, automotive, railways or areas of work connected to large structures.

Dimensional metrology and sensoring to control assembly processes

Right until the project finishes in 2022, Tekniker will provide its extensive expertise in terms of dimensional metrology, manufacturing, and assembly process control by managing all the technical and administrative elements.

In this regard, the aim of the technology centre is to learn more about factors influencing thermoforming and assembly processes carried out for aeronautical products to achieve a higher degree of control and eliminate faulty parts to implement zero-defect manufacturing.

To this end, digital models for thermoforming processes and product assembly structures will be defined. Gorka Kortaberria, project coordinator at Tekniker, explains that “during the assembly process we intend to maintain the current accuracy levels for materials that are more flexible than those used nowadays such a carbon fibre or thermoplastic materials by integrating a collaborative assembly solution assisted by external measuring devices and real-time process data”.

Another determining factor is related to fine-tuning of virtual models to guarantee that combined manufacturing systems do meet process or product requirements beforehand.

In this manner, innovative solutions such as sensors shall be incorporated and used as a function of requirements specified in advance (power, temperature, position, etc.), together with external measuring systems for component positioning, processes such as additive manufacturing for components used on thermoforming moulds or a smart assembly assistant to monitor components in real time and prevent collisions. The simulation will also make it possible to analyse and optimise the design stage of tools by shortening and optimising implementation at later stages.

The INNOTOOL project funded by the European Commission, is a European Clean Sky 2 project and will end in 2022. The initiative will help to improve the products and processes of companies such as Aernnova and Airbus.

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Concerning Tekniker

With nearly 40 years of experience in the field of applied research and knowledge transfer, Tekniker has achieved a high degree of specialisation in four major areas (Advanced

manufacturing, surface engineering, product engineering and ICTs) and can now make available its cutting-edge technology to customers to meet their needs. The technology centre is a member of the Basque Research and Technology Alliance (BRTA).

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