



## Novel technologies for dissimilar materials joining

During the last months of the project, the Ybridio Consortium has defined representative workpieces in order to validate both the novel joining technologies and the quality control systems developed along the project runtime



Fig 1: Components Pre-Assembly

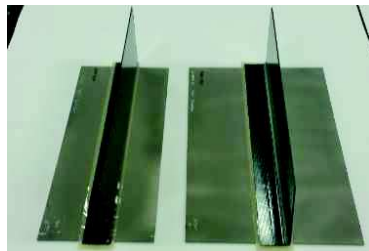


Fig 2: Bonded Test Articles

### ÉIRE Composites

ÉireComposites have begun the welding of final test articles. The first of these are the L-Pull specimens which are to be used to test the out of plane strength of the joint.

The specimens consist of a composite L section made from Carbon Fibre/PEEK and a Titanium skin. An additional layer of PEEK is inserted at the bondline. The induction welding system developed at ÉireComposites was used to assemble all test articles.

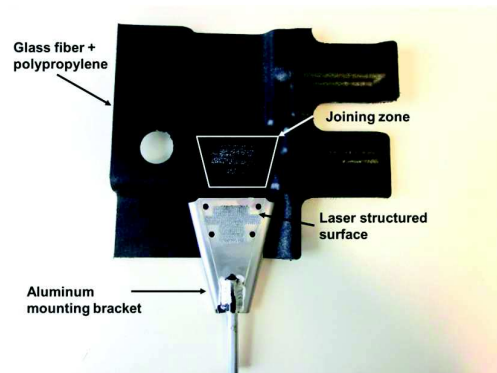


Fig 3: HBW-Gübesch Automotive test case

### IVW

At IVW, the induction joining system has been prepared for demonstrator manufacturing. Coils, stamps and tools have been custom-made in order to be able to join the different demonstrator parts.

During the last weeks, the parameters of the joining process were further optimized to meet the requirement of the demonstrator parts and guarantee a high-quality joint. Up to now, first parts were joined successfully and delivered to the respective project partner.



Figure 4: LEISTER dissimilar materials joining machine at Laser World of Photonics trade fair

### LEISTER Technologies

LEISTER Technologies presented the hybrid joining technique at the LASER World of Photonics trade show in Munich in June 2015. Aside from a presentation given within the collocated Lasers in Manufacturing conference, a live demo attracted a broad audience to the LEISTER booth at the show. Potential customers were impressed by the reliable joining of ConiPerf steel plates with PP and ABS polymer plates.

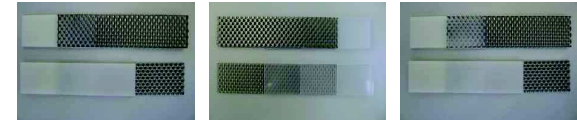


Figure 5: Bonded Test Articles at LEISTER

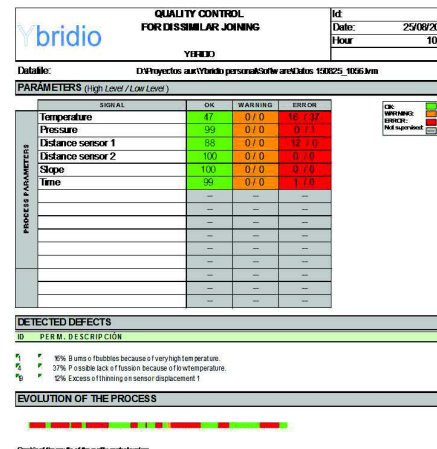


Figure 6: Quality control system GUI developed by Tecnalía



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### TECNALIA

During Ybridio project a control and supervision system has been developed for the quality assurance of laser joining. The system is able to monitor the most relevant parameters affecting the quality of the joint (temperature, pressure, thickness reduction, etc.) and control them to ensure the process window is maintained. It also generates a report about the quality of the joint and informs the operator about specific defects that may have occurred during the joining process.

The system has been evaluated and validated by artificially producing defects in the different material combinations. It has been proven that it provides relevant information to the operator and reliable results about the quality of the joint.

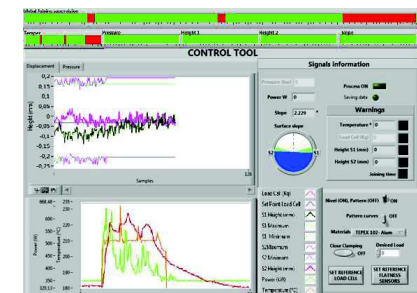


Figure 7: Measurement of parameters for quality control

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