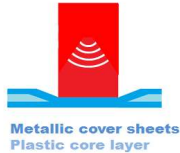


HybriSonic

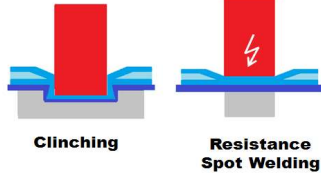
New processing strategies for hybrid materials with support of ultrasonic.

One Step:

Tool positioning supplying with ultrasonic waves ...

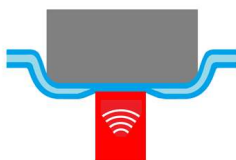


... further processing

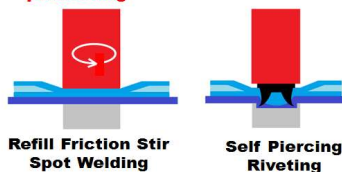


Two Steps:

Cold forming and supplying with ultrasonic waves ...



... further processing



- Processing of hybrid materials like monolithic metal sheets
- Nearly identical processing times compared to monolithic sheets
- Increased component quality

RESEARCH PERIOD

➤ project start: 1. calendar quarter 2019 ➤ project duration: 24 months

RESEARCH TOPIC AND OBJECTIVES

The polymer core layer in metal-plastic laminates (MPL) is a drawback for the use of most conventional joining processes like clinching, self-piercing riveting (SPR), resistance spot welding (RSP) or refill friction stir spot welding (RFSSW). To solve this problem the local suppressing of the polymer core layer in the joining area seems useful. In the planned project two different technical concepts for suppressing the core layer will be investigated. The first concept realizes the implementation of the ultrasonic equipment in the joining tool (clinching, RSP) and by this the displacement of the core layer during the forming process. As this approach is not suitable for some processes, like RFSSW or SPR, the displacement of the core layer in the future forming area will be done during the upstream part forming process.

In the international research project (26th CORNET-Call) a cooperation of four European partners is planned, who has experiences and scientific expertise in the field of mechanical joining (Fraunhofer IWU – GER), welding technologies (BWI – BEL, PWTR – PL) as well as ultrasonic supported processes (Fraunhofer IVV Dresden – GER). The goal of the research project is to enable the use of conventional joining processes for MPCs due to the ultrasonic assisted suppressing of the core layer. Therefore the process fundamentals for suppressing the core layer in metal-plastic laminates and the integration of ultrasonic equipment in specific tools will be investigated. Furthermore machine and tool components for the processes above will be developed in relation to the determined basic results.

RESEARCH ORGANISATIONS AND WORK DISTRIBUTION

The research is conducted interdisciplinary at four research centres in three European countries. As German partners the Fraunhofer Institute for Machine Tools and Forming Technology (IWU) and the Fraunhofer Institute for Process Engineering and Packaging (IVV), Branch Lab for Processing Machinery and Packaging Technology are involved. At the Fraunhofer IWU the process technologies forming and clinching will be examined. At IVV the behaviour of the polymer layer under the influence of ultrasonic overlapped tools will be investigated. The Belgian Welding Institute and the Wroclaw University of Technology/Department of Materials Science/Welding and Strength of Materials from Poland are responsible for welding technologies to be researched and the quality assessment of the joints.

BENEFITS AND TASKS OF THE USER COMMITTEE (UC)

The members of the UC have access to the research results in the form of presentations, interim and final reports.

With the help of the UC providing advice and undertaking a controlling function, it is also ensured that the interests of the industrial practice are taken into account. The members of the committee accompany the research centres from the planning stage over the project execution to the result processing. The majority of UC members should be SMEs.

In case of a membership in the UC, the company's own contributions must represent about a quarter of the total project sum. Contributions could be In-house services, the participation in public project meetings, consulting services, the provision of technology and / or material or the performance of services.

FURTHER ACTION

Please fill out the enclosed Letter of Intent (LOI) in consultation with your contact person and return it by fax or by email. The following contacts are ready to respond to any of your further queries or comments at any time.

Contact persons

RESEARCH CENTRE 1	RESEARCH CENTRE 2	RESEARCH CENTRE 3	RESEARCH CENTRE 4
Fraunhofer Institute for Machine Tools and Forming Technology (IWU) Department of Mechanical Joining	Fraunhofer Institute for Process Engineering and Packaging (IVV) Branch Lab for Processing Machinery and Packaging Technology	Belgian Welding Institute, npo	Wroclaw University of Technologie Mechanical Department Department of Materials Science, Welding and Strength of Materials
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