

Alternative processes for rapid joining technologies

Tehnologii alternative pentru îmbinări rapide

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Abstract

Joining of two dissimilar materials is always an issue in diverse sectors. For instance, joining steel and aluminium is very problematic in automotive chassis. This is due to day-to-day more challenging requirements in several sectors, since steel can play the role of structure / frame supporting loads and avoiding large strains. In other applications, aluminium plays the role of the skin element.

In order to elaborate technological solutions for such joining purposes in the industry, the project by the title "A rapid joint by alternative processes", acronym J-FAST was proposed in the frame of the Manunet Program, by several partners of both the Basque Country and Romania. This project is currently on the run in both countries.

J-FAST project aims to develop new technologies mainly based on form processes to enhance the unions between dissimilar materials. These unions are very common in industrial sectors such as automotive, power generation or appliances. In the state of the art, form processes have become increasingly important because they reduce the need for further processing (joints without nuts). Besides, they are clean processes that do not need lubricants and do not generate chip. These solutions have been rather scientifically studied than implemented in practice. Within this project, the partners intend to expand these form processes to a number of materials and applications guarantying that the produced parts will be able to match and exceed the performance of conventional elements existing at present. So, the different work packages of the project should lead to new added products on different industrial areas (union of sheets in cars and appliances, plates in electric power generation, etc.)

Keywords

Friction drilling, form tapping, rotary broaching, friction stir welding (FSW), friction stir spot welding (FSSW), dissimilar joints, conventional processes, alternative processes, rapid joint