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FSW – TIG Welding of Cu 99 Copper

Sudarea FSW-WIG a cuprului Cu99

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Abstract

TIG-assisted FSW welding is a development of the FSW process, causing the emergence of a hybrid welding process, in solid state, which integrates the pre-heating of plates by the TIG welding process.

This paper presents considerations on welding Cu99 copper, by the hybrid FSW-TIG process, compared to the classical FSW process.

Related to the FSW welding technique that was available and used in the experiments, by the classical FSW process of joining Cu99 copper, because of the high forces developed during the welding process, it was necessary to limit the welding speed to below 120 mm / min, to protect both the machine and welding tools.

Due to the additional heat contribution of the TIG process, the experiments have shown that by applying the FSW-TIG process to welding Cu99 copper of thickness s = 5 mm, in comparison with the classical FSW process, the following advantages can be obtained with certainty: increasing the welding speed up to approximately 200%, depending on the material, obtaining welded joints with comparable characteristics to the classical FSW welding; obtaining a more stable welding regime (without vibration), which provides a better protection of the machine and welding tools. The welding tool life could be increase two times.

Keywords

Friction stir welding, TIG assisted FSW, cooper