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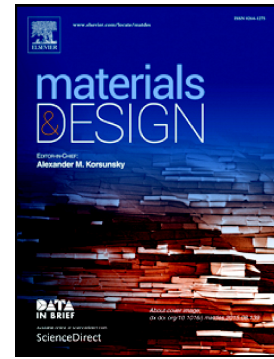
A new concept of universal substitutive explosive welding

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A New Concept of Universal Substitutive Explosive WeldingC. Choi^{1*}, P. Tan¹, D. Ruan² and B. Dixon¹¹Defence Science and Technology Group,

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ABSTRACT

This paper presents an innovative explosive welding technology, namely Universal Substitutive Explosive Welding technique, which was recently developed by Australian Defence Science and Technology Group to improve the survivability and mobility of military vehicles. The new technique is superior to the existing industrial explosive welding ones in terms of integrity, quality and stability. It is able to significantly upgrade the hardness upper limit of target material and ensure the perfect welding bond between the flyer (soft) and target (hard) panels without size limitation of target panel. Experimental results show that using the new technique raised the ballistic velocity limit (V_{50}) of the explosively welded panel by up to 20% and reduced the bulge depth (related to dynamic plasticity) significantly without any rupture or fragmentation issues. Charpy impact test on the sample fabricated by the new technique showed strong recovery effects with time with no transition temperature.

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