

A. Szalay, A.G. Mamalis and I. Zádor

Explosive metalworking technologies: A modern advanced industrial technology

ABSTRACT. High energy rate forming (HERF) technologies meet the principles of Industry 4.0. These versatile technologies represent a new paradigm in the knowledge-based production of components. In the manufacturing of special component parts, processing of the materials is carried out directly, by high speed, high energy shock waves, without using energy-transforming equipment such as hydraulic presses. The energy source of HERF is the chemical energy stored in high explosives, which can be used for many metalworking operations. The three main types of explosive metalworking practised by us are: explosive welding and cladding; explosive tube forming; and explosive compaction of powders and granules. This paper briefly introduces the principles, practices and application possibilities of these types.

Keywords: explosive cladding, explosive powder compaction, explosive tube forming, materials, multicomponent

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