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Failure of Metallic-Intermetallic Laminate Composites under Dynamic Loading SERGEY ZELEPUGIN, Tomsk Science Center, Tomsk, Russia, VYACHESLAV MALI, Lavrentiev Institute of Hydrodynamics, Novosibirsk, Russia, ALEKSEJ ZELEPUGIN, ELENA ILINA, Tomsk State University, Tomsk, Russia — New approach to manufacture the metallic-intermetallic laminate (MIL) composites is realized: explosion welding of a package of titanium and aluminum sheets with the subsequent sintering without a hydraulic press. Sheets of the titanium (thickness of 0.5 and 0.6 mm), aluminum (thickness of 1.0 mm) are used. Packages with 11, 13 and 21 alternating Ti-Al layers in the sizes 50-120 and 120-300 mm are received. The processes of high-velocity interaction of a projectile with the MIL composite target were numerically investigated in axisymmetrical statement using modified finite element method. Results of computations demonstrate that a uniform target entirely from both Al₃Ti and Ti-6-4, has less ballistic resistance in comparison with the composite one. Optimum construction of the composite target should include metal layer of sufficient thickness, which should provide the termination of propagation of brittle cracks.

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