Abstract Submitted
for the SHOCK05 Meeting of
The American Physical Society

Explosive forming of aerospace components ERIK CARTON, MARIANNE STUIVINGA, CYRIL WENTZEL, TNO, DUTCH SPACE COLLABORATION — TNO is involved in development of the explosive forming technology for the fabrication of metal sheets and plates. This technology is labor intensive, but requires only single-sided tooling. Therefore, it can be used economically for small series of hard to deform metals, like nickel, titanium and aluminum alloys that are generally used in aerospace applications. As the alloys can be explosively formed in their hardened (tempered) condition, these formed components do not need a heat-treatment after forming, preventing unwanted deformations to occur. At TNO this forming process is under development both experimentally and theoretically. Results of computer simulations and in-situ measurements of strain, strain rate and forces will be presented, compared and discussed. Examples are given of aerospace components of aluminum, nickel and titanium alloys made at TNO for reasons of process development and the generation of demonstrators.

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Date submitted: 08 Apr 2005 Electronic form version 1.4