

Abstract Submitted
for the SHOCK07 Meeting of
The American Physical Society

Crack-resistance and spall strength of cerium under dynamic loading. VICTOR PUSHKOV, VLADIMIR OGORODNIKOV, SERGEY ERUNOV, Russian Federal Nuclear Center-VNIIEF — There is poor knowledge on cerium characteristics under dynamic loading, such as dynamic crack-resistance and spall strength, which are important for some applications. For example, material crack-resistance is one of parameters of the model, which is used for numerical description of the dispersion process [1]. Tests were performed for determination of dynamic crack-resistance by the split Hopkinson pressure bar method. However, significant plasticity of cerium caused failure of crack-resistance determination. Therefore crack-resistance evaluation was performed by study of material spall strength σ_0 . Considering value σ_0 , it is possible to determine specific work for material break λ [2], and, basing on it, then it is possible to determine crack-resistance value by the Irvine-Griffiths criterion.

[1] A.K.Zhiembetov, G.S.Smirnov, A.L.Mikhaylov et al. Cavitation method for determination of parameters of melting of shock-compressed substances at volume expansion. Chemical Physics, 2005, v.24, #10, p.57-65.

[2] Fracture of different-scale objects. Edited by A.G.Ivanov, RFNC-VNIIEF, Sarov, 2001.

Victor Pushkov
Russian Federal Nuclear Center-VNIIEF

Date submitted: 23 Mar 2007

Electronic form version 1.4