

Dynamic indentation and low velocity impact of siliconized graphite

Uvarov S V^{1,®}, Bannikova I A¹, Naimark O B¹ and Gareev A R²

¹ Institute of Continuous Media Mechanics of the Ural Branch of the Russian Academy of Sciences, Academician Korolev Street 1, Perm 614013, Russia

² Joint Stock Company “Scientific Research Institute of Graphite-based Construction Materials”, Elektrodnyaya 2 Bldg 1, Moscow 111524, Russia

® usv@icmm.ru

Siliconized graphite SG-P0.5 (NIIgrafit, Moscow) samples were subjected to dynamic indentation using a modified split Hopkinson bar setup with hemispherical indenter and low-velocity (100 m/s) impact by steel spheres. Specimen structure was investigated by x-ray tomography before and after tests. Fragment distribution can be approximated with power law for low mass fragments (less than 0.02 g) and exponential for large fragments. We suppose that small fragments were created due to crack propagation and their distribution can be related to the damage evolution at the crack tip zone [1]. The distribution of the large fragments is well described by Mott’s distribution.

The present research was supported by the Russian Science Foundation (project No. 21-79-30041, <https://rscf.ru/en/project/21-79-30041/>).

[1] Bannikova I A, Saveleva N V, Uvarov S V, Bannikov M V, Panfilov P E and Naimark O B 2023 *Russ. Phys. J.* **66** 990–997