

Universal bench for testing streng of the composite thin-walled constructions to radiation and impact

Ostrik A V, Nikolaev D N and Bugay I V[®]

Institute of Problems of Chemical Physics of the Russian Academy of Sciences, Academician Semenov Avenue 1, Chernogolovka, Moscow Region 142432, Russia

[®] irinbug@yandex.ru

Providing modern technical requirements for missile and space technics is impossible without providing the protection of their constructions from the complex action of radiation [1] and the impact of compact solids. Mechanical radiation action and low-speed impact cause non-stationary deformations of constructions and their subsequent destruction. In the case when the construction is protected by a multi-layer porous package, the wave stage of deformation is generally not dangerous and destruction occurs at the shell stage. Then, the features of the mechanical action of radiation and the impact of bodies are leveled, and as a result, everything is reduced to the effect of one-sided non-stationary pressure on the surface of the protected construction. Thermal action of radiation leads to heating of the construction and reduction of its thickness.

The work proposes new explosive devices and a universal bench, which allows you to model low-pulse mechanical action together with the thermal RPF action and low-speed impact. Thermal action is reproduced by contact conductive plates, high-power EHF emitters and pyrotechnic sheet charges. The pneumatic gun is used to accelerate the striker.

The design of the universal bench takes into account previous developments [2], but a principal change has been made.

This work was supported by the RFBR (project 19-08-00606-a).

- [1] Bakulin V and Ostrik A 2015 *Complex action of radiations and particles on the thin-walled constructions having heterogeneous coverings* (Moscow: Fizmatlit)
- [2] Ostrik A, Romadinova E, Cheprunov A and et al 2008 *Mechanical X-ray action on thin-walled composite constructions* (Moscow: FIZMATLIT)