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## DEVELOPMENT AND STUDY OF SMALL-ARMS SILENCERS

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This paper presents the results of the research into the design and development of firearm silencers conducted at the Institute of Technical Mechanics of the National Academy of Sciences of Ukraine and the State Space Agency of Ukraine in 2013 – 2018. As a result, high-efficiency silencers were developed and made owing to new design solutions and modern production technologies. Theoretical studies made it possible to refine a physical model and the gas-dynamic pattern of supersonic gas flows in the silencer chambers and at the silencer exit. Among the designs developed for small arms and classified by purpose, caliber, and cartridge type, namely, for 5.45 mm, 5.56 mm, 7.62 mm, and 9.0 mm arms, the most efficient ones were unified. A technology was developed for the production of silencers made of stainless steel and titanium and aluminum allows, which made possible silencers competitive in performance characteristics with their best foreign counterparts.

The shape and location of baffles that form expansion chambers and govern the thermogasdynamic processes inside the silencer were chosen, and their choice was substantiated.

Efficient silencers with spherical baffles were developed for 5.45 mm – 9.0 mm small arms. The most promising silencers of this type are those with:

- peripheral labyrinth vortex gas withdrawal circuit;
- additional expansion chamber that embraces the outside part of the barrel and is connected gas-dynamically to a traditional muzzle silencer, which extends beyond the muzzle end.

Silencers with deformable elastic structural components made by the traditional scheme – movable flat baffles loaded by coil compression springs – were developed and tried out too.

**Keywords:** *silencer, baffle elements, shot sound intensity reduction.*

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