

## QUO VADIS – Nature and Technology

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In the Republic of Moldova, large-scale work to protect agricultural crops from hail has been carried out on a systematic basis since 1967, with thousands of anti-hail missiles being used annually. Moldova currently uses Alazan-6 and Loza-2 missile systems, equipped with pyrotechnic ice-forming compositions based on silver iodide (AgI).

The influence of the temporary factor on reducing the ice-forming activity of ShAD anti-hail missiles under the conditions of their practical operation was noted in studies [2], therefore, it is relevant not only to control the effectiveness of anti-hail missiles at the manufacturing stage, but also during their practical use.

Based on [3], as well as the experience of other research centers, at the Institute of Engineering Electronics and Nanotechnologies named after. D. Ghitsu (now the Technical University of Moldova) developed and manufactured a stand for the study of ice-forming compositions used in anti-hail rockets in static conditions, as well as an aerodynamic stand that allows testing full-size generators of ice-forming aerosols (rockets, squibs, etc.).

An aerosol cube is used to generate (sublimate) small samples of ice-forming substances. The active substance is ignited and burned in the cube.

Next, an air sample containing active particles is taken from the cube using a syringe and supplied to the “cloud” chamber (mixing chamber), where the active particles are mixed with water mist at low temperatures. The chamber has the ability to change temperature and humidity, thereby simulating similar conditions in the clouds. Active particles, interacting with water droplets in the fog, cause their crystallization. At the bottom of the mixing chamber there are thermostats, which are metal cylinders with glued glass with a mirror surface.

The resulting ice crystals, settling to the bottom of the chamber within a few minutes, fall on the mirror surfaces of the thermostats, which makes it possible to subsequently count them in a certain field of view of the microscope and determine with high accuracy the number of active particles per unit weight of the substance.

To test rockets of the Loza and Alazan types, a horizontal wind tunnel is used, in which the movement of a rocket in a cloud is simulated and air samples with combustion products are taken for mixing with water mist in the mixing chamber and further analysis of the amount of ice-forming particles.

### References:

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