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Qualified disposal of obsolete powders based on water-dispersion technology

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Abstract

A modern strategy in the field of gunpowder production is presented, directed at the qualified recycling of the outdated military powders into powders for civil purpose as commercially efficient processing into state-of-the art materials. Seven major directions for a modification of the aqueous-dispersing technology are presented:

- a plasticization and dissolution of powder elements in ethyl acetate;
- a deformation of partially plasticized powder elements of fine-grained pyroxylin powders (PP) and spherical powders (SG) in the hydrodynamic flow of the dispersion medium;
- a plasticization of a polymer base by ethyl acetate with a formation of a lacquer dispersion, omitting a stage of formation of a lacquer macrophase;
- a partial plasticization of a rigid highly molecular framework of powder elements with a low- active plasticizer;
- an emulsion phlegmatization of pyroxylin powders;
- a generation of a pore space in dense fine-grained pyroxylin powder marks (an activation technology);
- a rolling of elements of small-size PP and BP under a forced highly elastic strain;
- an adaptation of SG and PP for a new designated purpose.

There are separately marked variants for powder processing by adapting the alternative civil small arms for propelling charges and by prolonging the warranty storage lives as the simplest and more economical methods of utilization. At present, the chemical recycling of the outdated powders according to the aqueous-dispersing technology dominates in the industry, which makes it possible to remove unnecessary components from the mass, to introduce new compounds for an adjustment of a formulation and a chemical stability reserve and to provide powder elements with the required structure, shape and geometrical dimensions by special techniques.

The range of manufactured civil products for rifle systems is presented as an example: hunting and sporting powders for smoothbore gun cartridges of 12, 16 calibres, 7.62 mm and 5.6x39 mm rifle cartridges, 9 mm pistol cartridges, 5.56x45 cartridges for NATO rifle-based carbine.

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