



FOAM DECONTAMINATION OF METALS

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The foam decontamination is a promising way for purifying radioactive contaminated surfaces. Foam decontamination solutions allow creating the necessary volume of decontaminating medium and forming a relatively small amount of secondary liquid waste so that this method may be applicable to bulky objects. Also it should be noted that foam can be effective for items with a complex geometry. Despite the numerous advantages, the well known foam decontamination methods are unpopular today due to their low efficiency and difficulties of secondary waste management. The modern foam compositions primarily permits to remove only dust and non-fixed contaminants.

We have made some attempts to improve the attractiveness of foam decontamination process. Currently two chemically-active compositions (acidic and alkaline) for the foam decontamination have been designed and tested. The main advantage of both tested compositions is that they are based on easily degradable surfactants. At the same time the acidic composition has a very low salt content.

Composition of the solutions for the foam generation	pH	Expansion rate of the foam	Na ⁺ content in the solution, mg/l
Water, nitric acid, surfactants, wetting agent, complexing agents, thickener	1-2	20-35	10
Water, alkaline, wetting agent, surfactants, complexing agents, thickener	12-14	20-35	3000

Laboratory testing results



Cover of the tank (stainless steel) with liquid radioactive wastes
Contaminations: organics, rust, main radionuclides – U, Pu, Am, Cs, Sr
Initial radioactivity: α - 120 counts/min-cm²; β + γ - 1700 counts/min-cm²
Mode: two treatment cycles by acidic foam and two treatment cycles by alkaline foam. Duration – 60 min; Solution rate – up to 1,2 l/m²
Decontamination factor: α - 80; β , γ -120



Lead block

Contaminations: main radionuclides – U, Pu, Am, Cs, Sr
Initial radioactivity: α - 900 counts/min-cm²; β + γ - 500 counts/min-cm²
Mode: two treatment cycles by acidic foam and two treatment cycles by alkaline-based foam. Duration – 60 min; Solution rate about 1,2 l/m²
Decontamination factor: α - 2500; β , γ -100

The foam testing in real industrial conditions

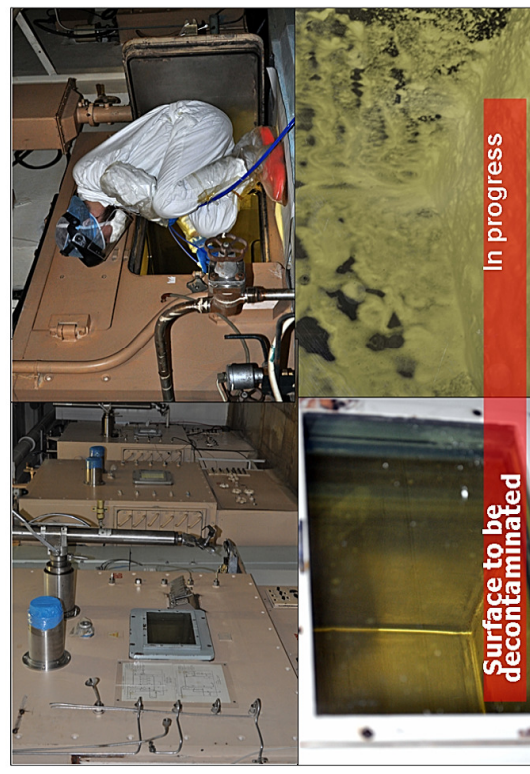
Test was performed on the research hot cell

Initial radioactivity: α - 150-50000 counts/min-cm² (Pu)

Mode: two treatment cycles by acid-based foam and two treatment cycles by alkaline-based foam.
Duration – 4 hours; Solution rate ~ 1 l/m².

Decontamination factor up to 15000

Condensed foams after use were removed from the surface into anti-foam agent solutions



This moment we are developing a method for management with condensed foam. Then the technology will be tested for decommissioning at the facility of the “Rosatom” (Russia).