

# Advantages

The **FREMES system** is an innovative, safe and cost-effective solution for the decommissioning of nuclear and radiation hazardous facilities and radioactive waste management.

- Characterization of most types of crushed building materials — soil, sand, slag and building materials (concrete, bricks);
- Reduction of RW volumes subject to storage and disposal.

## 1 Adaptability

Ability to adapt the system for different sites and types of contaminants (various nuclide vectors and process parameters (soil, crushed building materials, etc.).

## 2 Automation

Fully automatic operation, consistent material flow and containers handling.

## 3 Safety

Remote access for operating personnel.

## 4 Modularity

Possibility of retrofitting with various measuring modules. Standardized spare parts.

## 5 Mobility

The system is easy to transport and install at the customer site.

# About the Company

TVEL JSC is the Integrator of the State Corporation Rosatom in the field of "Nuclear decommissioning and radioactive waste management".

58

organizations  
Of Rosatom -  
business participants

>50

years of technological  
experience

100+

projects implemented  
in 20 countries  
around the world

## Advanced technologies at all stages of decommissioning:

- preparation for decommissioning;
- creation of infrastructure;
- dismantling and fragmentation of equipment and building structures;
- decontamination;
- radioactive waste management;
- environmental remediation;
- radioactive waste disposal.

## With care for future generations!

Address: Kashirskoe shosse, 49,  
Moscow, 115409  
Tel.: +7 (495) 988 82 82 ext. 7202  
E-mail: [decommissioning@tvel.ru](mailto:decommissioning@tvel.ru)  
[www.tvel.ru](http://www.tvel.ru)



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## NUCLEAR DECOMMISSIONING AND RADIOACTIVE WASTE MANAGEMENT

### SOLUTIONS FOR RW CHARACTERIZATION AND SORTING

- **FREMES System** for radiological measurements and sorting of radioactively contaminated bulk materials

## FREE RELEASE MEASUREMENT SYSTEM



# FREMES System for radiological measurements and sorting of radioactively contaminated bulk materials

## Purpose

The **FREMES system** makes it possible to separate clean bulk material from contaminated material, and classify contaminated bulk material as radioactive waste of one class or another for further conditioning and transfer for further storage or disposal.



## Application

### Nuclear industry

- Decommissioning of nuclear and and radiation hazardous facilities.
- Radioactive Waste Management.

<b>Materials</b>	Soil, sand, slag, crushed concrete, bricks
<b>Nuclide vector</b>	From 50 keV to 1,5 MeV
<b>Detected isotopes</b>	From low-energy gamma emitters (U-234) to high-energy emitters (Co-60)
<b>Installation performance</b>	Up to 10 tons per hour

## Technology

### Separation of radiation-contaminated bulk materials

- In-line gamma spectrometry measurements on.
- Automatic sorting by given values based on the radionuclide vector.

### Analysis of the contamination level and Separation into three material flows (or other thresholds set by the regulator, if applicable otherwise):

- clean (<1 Bq/g);
- VLLW (1...10 Bq/g);
- LLW - ILW (>10 Bq/g).



The clean material is removed from the control of the regulatory body, the rest of the material is sent for conditioning and storage or final isolation

## References

### Implemented project

Rehabilitation of the territory as part of the decommissioning of Dessel Nuclear Fuel Fabrication Plant (FBFC International).

### Result

- 45.000 tons of material processed in 2 years.
- About 90% of the material is free release.
- In 2022, the FBFC International was removed from the control of the regulatory body.



### Current project

Decommissioning of former diffusion uranium enrichment facility at the Angarsk electrolysis chemical plant (AECF, Angarsk, Russia).

### Volumes to be processed

- About 85.000 tons of radioactively contaminated soils.