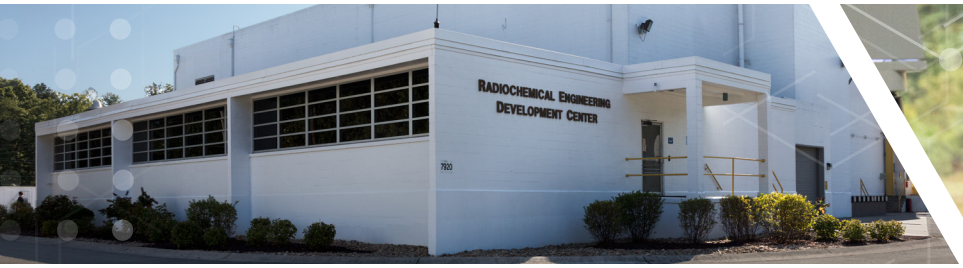
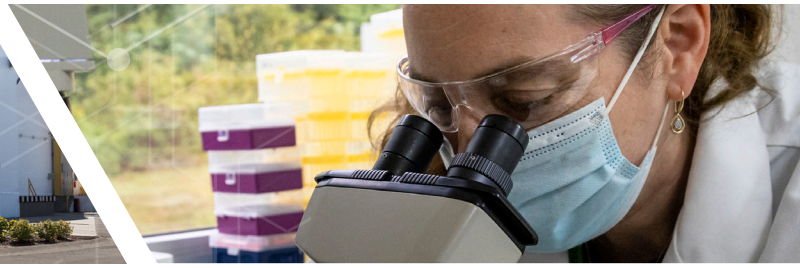
Multipurpose Radiochemical Processing and Research Facility

Radiochemical Engineering Development Center





At the Radiochemical Engineering Development Center (REDC), experts in radiochemical processing use specialized equipment and systems to produce unique radioisotopes for applications in research, national security, medicine, space exploration, and industry.

The multi-buiding REDC complex, built in 1966 and in 1968, are designated as Hazard Category 2 nuclear facilities and include hot and cold laboratories, heavily shielded hot cells, gloveboxes, and high bay space. There, experts safely handle alpha and neutron emitters and work with some of the most exotic and rare materials on the planet.

Isotope R&D and Production

REDC provides world-class capabilities in isotope production, research and development, source fabrication, and the distribution of various unique isotopes. REDC is a key resource for the DOE Isotope Program and other US Department of Energy and National Nuclear Security Administration programs advancing materials science, nuclear science and technology, energy innovation, chemistry, nuclear security, and neutron science.

REDC pioneered many radiochemical separation processes and continues to drive innovation for the production, recovery, and purification of radioisotopes for shipment worldwide. Current primary mission areas include producing plutonium-238 for NASA's radioisotope power systems; isotopes for targeted alpha therapy cancer treatments; transcurium elements (californium, berkelium, einsteinium, fermium) for industrial and research applications; and isotopes such as californium-252, selenium-75, and nickel-63 for industry, national security, and nuclear nonproliferation. Uses include detecting explosive residues at airport security checkpoints; radiology; monitoring coal, cement, and other materials; and analyzing fissile and transuranic material waste.

REDC has contributed to major scientific impacts: supplying heavy actinide isotopes for the discovery of new super-heavy element and isotopes, including tennessine, the second-heaviest and most recently discovered element; research on the physics of heavy elements, electron behavior in orbitals, nuclear properties, and nuclear reactions; and research on the chemistry of heavy actinides, chemically stable compounds, the crystal structure of salts, solution chemistry, and spectroscopy.

Details

9 hot cells with associated tanks and process equipment in first building

7 hot cells in second building

Windows of lead glass and mineral oil, or lead glass with zinc bromide

High-density concrete used for front, rear, sides, and top shielding of hot cells

All primary and secondary confinement systems exhaust streams; offgas systems enable safe and compliant radiochemical processing

Fiberoptic access for online spectroscopic monitoring of chemical processes; capable of expanding in-cell and near-cell instrumentation

Pneumatic transfer system between facilities

Pneumatic motor-driven intercell conveyer systems

Pneumatic transfer tube system

In-cell remote manipulators and gloveboxes; 50-ton bridge crane in high bay for remote transfer of materials

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