



# RESEARCH TEST REACTORS AND MEDICAL ISOTOPE TARGETS

**BWXT**<sup>®</sup>  
BWX Technologies, Inc.



# RESEARCH TEST REACTORS AND TARGETS

BWX Technologies, Inc. (BWXT) Research Test Reactors and Targets (RTRT) facility in Lynchburg, Virginia, is a premier supplier of high- and low-enriched uranium, aluminum-clad, plate-type reactor fuel for U.S. universities and national laboratories. The site has also fabricated plate-type reactor fuel and targets for nuclear reactor test sites throughout the world.

The RTRT facility was constructed in 1981 to produce fuel elements for the U.S. Department of Energy's (DOE) laboratory program. Since then, it has successfully fabricated over 33 different fuel element designs and delivered more than 8,000 fuel elements.

In supplying nuclear fueled products, BWXT's top priority is the quality and reliability of our work and meeting customer delivery requirements. Our capabilities and experience are proof of our commitment:

- U.S. Nuclear Regulatory Commission (NRC) license to process uranium-bearing materials with enrichments up to fully enriched.
- Recognized for a well-defined and rigorous Quality Program compliant with ASME NQA-1, ISO-9000 and 10CFR50, Appendix B.

## Fabrication Capability

Our strength in the research test reactor and targets business is manufacturing a high-quality, high-consequence, build-to-print product. We have a commitment to excellence in manufacturing, quality and on-time delivery.

- BWXT's RTRT facility supplies the DOE laboratory program with oxide fuel elements for the High Flux Isotope Reactor (HFIR) at Oak Ridge National Laboratory and the National Institute of Standards and Technology (NIST).
- We provide aluminide fuel elements for the University of Missouri, Massachusetts Institute of Technology (MIT) and the Advanced Test Reactor (ATR) at Idaho National Laboratory and BR-2 for SCK•CEN.





- The site has supplied many low-enriched, uranium-silicide fuel elements to universities such as Purdue University, University of Florida, University of Massachusetts (Lowell) and Georgia Institute of Technology.
- We have also supplied elements containing low-enriched uranium-silicide fuel to the Japan Materials Testing Reactor and to the Japan Research Reactor 3 and 4, as well as elements containing silicide fuel to several reactors in various European countries.

## New High-Density LEU Fuel

BWXT's RTRT facility works closely with the DOE-directed non-proliferation program. In support of the material, management and minimization directive, BWXT is assisting the Pacific Northwest National Laboratory and Idaho National Laboratory in the development and commercial demonstration of low-enriched uranium (LEU), high density uranium-molybdenum fuel required for the conversion of existing high-enriched uranium (HEU) reactors.

## Fuel Powder

BWXT manufactures fuel powder with uranium enrichments from 19 to 93 weight percent U-235 in aluminide and silicide forms. Fuel powder in oxide form was fabricated for previous contracts.

## Fuel Plates and Targets

In addition to standard uranium-aluminum matrix fuel plates, the RTRT facility routinely incorporates the neutron poisons boron and gadolinium into the fuel plates. Poisons can be homogeneously distributed or they can be selectively located in the plate. We have also produced LEU-molybdenum dispersion plates. Fuel plate production includes flat plates of the type used in the MIT research reactor; curved plates of the type for use in ATR, NIST and Missouri-type elements; and involute-shaped plates for use in the HFIR. BWXT has also manufactured various targets (plates and annular design) for use in the production of molybdenum-99.



## Element Assemblies

BWXT has extensive experience with special element assembly processes, including welding, swaging (crimping), pinning or a combination of joining methods as specified by the customer. A variety of fuel element configurations are currently fabricated in the RTRT facility, including unique box-type elements and cylindrical-element assemblies. We also have experience with fabricating complex fuel elements containing cadmium wire.

## Other Components

In addition to producing research and test reactor fuel, BWXT has experience with manufacturing other reactor components, including graphite reflectors and control rods, as a service to the reactor community.

People Strong

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At BWX Technologies, Inc. (NYSE: BWXT), we are People Strong, *Innovation Driven*. Headquartered in Lynchburg, Va., BWXT provides safe and effective nuclear solutions for national security, clean energy, environmental remediation, nuclear medicine and space exploration. With approximately 6,600 employees, BWXT has 12 major operating sites in the U.S. and Canada. In addition, BWXT joint ventures provide management and operations at more than a dozen U.S. Department of Energy and NASA facilities. Follow us on Twitter at @BWXTech and learn more at [www.bwxt.com](http://www.bwxt.com).

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