



# **SPECIALTY REACTOR FUELS AND COMPONENTS**

Generation IV Development



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Since 1987, BWXT Nuclear Operations Group, Inc.'s (BWXT) Specialty Fuel Facility in Lynchburg, Virginia, has been perfecting the fabrication techniques required to support the vision of developing passively safe, compact nuclear reactors capable of economically generating electricity and hydrogen. These next generation reactors are commonly referred to throughout the nuclear industry as Generation IV Advanced Gas Reactors.

The gelation process, developed in Europe in the 1950s, and significantly refined by BWXT, is aptly suited to produce large quantities of high quality TRISO-coated particles for this unique application. Capabilities exist to fabricate either uranium dioxide (UO<sub>2</sub>) or uranium oxycarbide (UCO) kernels continuously coated with a low-density graphite buffer layer, high-density pyrolytic graphite, and either silicon carbide or zirconium carbide coatings.

BWXT's pilot-scale facility is fully capable of producing, analyzing and certifying several hundred kilograms of coated fuel per year for Generation IV reactor applications. In addition, the highly skilled staff can tailor the process to meet the customer's specific needs. BWXT has developed and implemented several state-of-the-art quality assurance and control methods to support Generation IV fuel manufacturing.

BWXT's fabrication process is suitable to produce Generation IV fuel at any enrichment utilizing a multitude of starting materials to provide the utmost flexibility in locating and procuring uranium feedstock.

Under the leadership of the Idaho National Laboratory (INL), where BWXT manages the nuclear operations, the Specialty Reactor Fuel group utilizes its capabilities and proficiencies in the deployment of the Next Generation Nuclear Plant (NGNP). An NGNP has been authorized to be built at the INL site. This plant, when completed, will demonstrate the capability of gas-cooled reactor, cost-effectively generating electricity and very high temperature process heat for such applications as hydrogen production.



## Unique Capabilities

- Research and development up to full-scale production
- Demonstrated capability in producing a variety of uranium components
- Proven leader in space nuclear power design and fabrication

# NUCLEAR POWER FOR SPACE APPLICATIONS

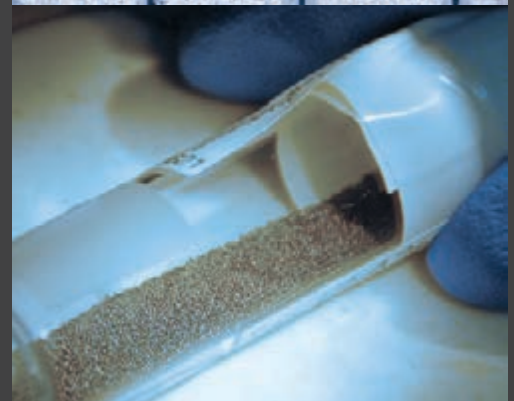
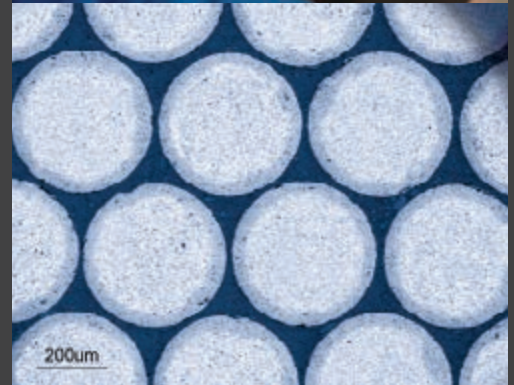
For nearly four decades, BWXT has supported the design and development of advanced power systems for space applications. From general concept layouts for potential missions to detailed engineering designs, BWXT is a proven leader in space nuclear power design applications.

Its Nuclear Regulatory Commission (NRC)-licensed, high-enriched uranium fuel fabrication facility is capable of performing basic research and detailed process development in support of mission-specific needs.

BWXT's experience in processing advanced materials along with its extensive capabilities in nuclear component fabrication and assembly provide its customers with a turnkey design-develop-deploy option unparalleled in the U.S. nuclear industry.

## Current Processing Capabilities of Fuel Forms

- Uranium dioxide (UO<sub>2</sub>)
- Uranium carbide (UC<sub>x</sub>)
- Uranium nitride (UN)





**BWXT IS A PROVEN LEADER IN THE HANDLING AND  
PROCESSING OF URANIUM-BEARING MATERIAL  
FOR ADVANCED NUCLEAR POWER APPLICATIONS.**

NUCLEAR ENERGY    GOVERNMENT SERVICES    **ADVANCED TECHNOLOGIES**

Headquartered in Lynchburg, Va., BWX Technologies, Inc. (BWXT) is a leading supplier of nuclear components and fuel to the U.S. government; provides technical, management and site services to support governments in the operation of complex facilities and environmental remediation activities; and supplies precision manufactured components and services for the commercial nuclear power industry. BWXT has more than 5100 employees and significant operations in Lynchburg, Va.; Erwin, Tenn.; Mount Vernon, Ind.; Euclid, Ohio; Barberton, Ohio; and Cambridge, Ontario, as well as more than a dozen U.S. Department of Energy sites around the country. Follow us on Twitter @ BWXTech and learn more at [www.bwxt.com](http://www.bwxt.com).

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