

framatome

Fast prototyping
for advanced fuels
supporting all reactor types



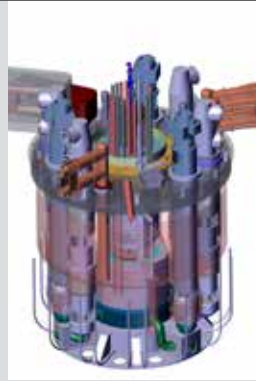
A gateway to net zero



The **climate change** crisis



Is driving a need for **carbon-free energy**



New and **Advanced reactors** will be contributing



Requiring a new and **advanced fuel supply chain**

> Now is the time to prepare for the transition to advanced fuels.

New and advanced fuels: A diverse landscape



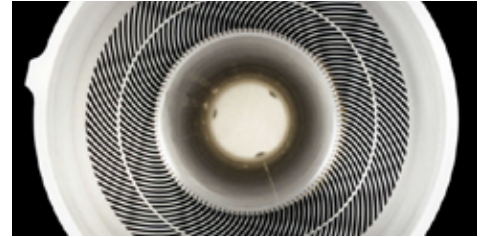
Fissile materials

- U-Pu
- U-Pu-MA
- HALEU/LEU
- Thorium



Fuel Forms

- Oxides
- Nitrides
- Salts
- Metallic alloys
- Silicides
- Carbides and Oxycarbides
- Doped fuel

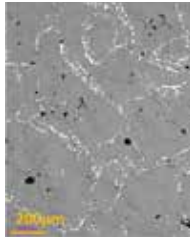
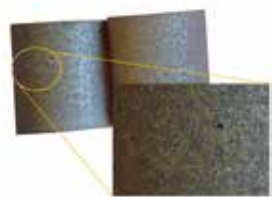


Fuel Types

- Ceramic fuels
- TRISO fuels
- Metallic fuels
- Molten salt fuels

> Framatome is ready with materials, expertise, engineering and manufacturing capabilities to support diverse advanced reactor projects.

Our experience with a **wide array of fuel types**

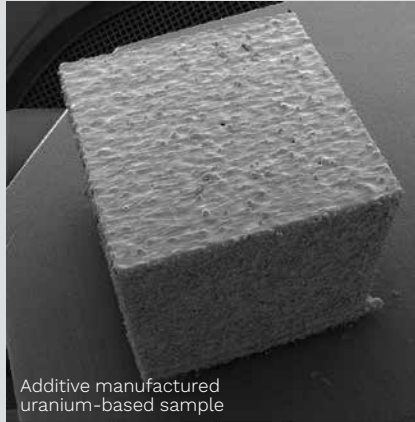


Microcell-doped fuel



> Our proven experience fabricating different fuel types makes us the perfect choice for **fast prototyping your project.**

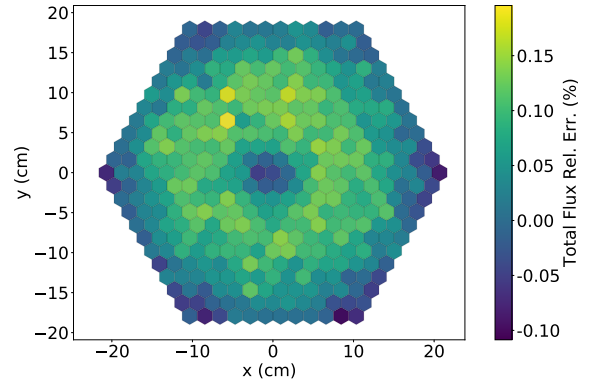
Advanced equipment and laboratories



- Opportunity to work with depleted, natural or enriched uranium
- R&D lab complete with a set of manufacturing equipment
- Melting furnaces and hot and cold rolling mills
- Nuclear environment (glove boxes)
- Ability to perform all necessary characterizations
- Academic partnerships

 We have the facilities and equipment to **handle any development need.**

Experts in **prototyping and fuel development**



A neutronic modeling of the HTR compact double heterogeneity inside a hexagonal block with Apollo2-A.



We've taken on the biggest challenges in advanced reactor fuel designs, and bring decades of **experience to accelerate your design and manufacturing.**

More fuel design and manufacturing **than anyone**

Fuel centers of excellence

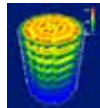


Global R&D Network

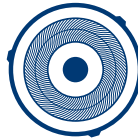
with state-of-the-art test infrastructure

- Innovation labs CRIL and CERCA in Romans
- CRC Zirconium research center in UGINE
- Hot lab in Erlangen
- Test facilities in Lingen, Erlangen and Richland
- Kathy Loop in Karlstein
- Technical centers in Karlstein and Le Creusot

Expert Analysis in



- Neutronics
- Materials
- Mechanics
- Safety
- Thermal-Hydraulics



Leader in fuel manufacturing for **research reactors**



Our solutions for **developers**



Single source for components

- Neutron sources supplier
- Control rod assemblies supplier
- Zirconium and stainless cladding tubes
- High precision mechanical components



Engineering centers of excellence

- Fuel engineering centers in France, Germany and U.S.
- Advanced codes & methods and licensing expertise
- Light water/fast-neutron reactor MOX fuel IP and expertise
- TRISO fuel expertise

 Whether you need knowledge, facilities or components, we have **everything you need for fast prototyping.**

Our facilities for **developers**



Fast Prototyping Labs

- R&D facilities: CRIL for HALEU and CRC for Zr alloys
- CERCA HALEU licensed site for manufacturing advanced fuels for research reactors (UAL, UMo, U3Si2, UZrH)
- Hot cells lab in Erlangen



Locations available for industrial pilots

- Richland Industrial Park: Best-in-class licensed site in the U.S.
- Romans: Best-in-class licensed site in France, and the only site licensed for Enriched Reprocessed Uranium (ERU) globally

> A comprehensive portfolio of technology bricks from
a single-source trusted supplier.

The preferred partner for advanced
reactor fuel deployment



> Get the benefit of highly skilled professionals with a wealth of experience and
get your project on the fast track today.



Framatome is an international leader in nuclear energy recognized for its innovative, digital and value added solutions for the global nuclear fleet. With worldwide expertise and a proven track record for reliability and performance, the company designs, services and installs components, fuel, and instrumentation and control systems for nuclear power plants. Its approximately 18,000 employees work every day to help Framatome's customers supply ever cleaner, safer and more economical low-carbon energy. Visit us at www.framatome.com, and follow us on Twitter and LinkedIn.

Framatome is owned by the EDF Group (75.5%), Mitsubishi Heavy Industries (MHI – 19.5%) and Assystem (5%).



Learn more about our
portfolio of advanced
fuel capabilities.

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