

KEY ACTIVITIES AT JRC HOT CELLS

Nuclear waste management

Evaluating the long-term behaviour and stability of nuclear waste materials to ensure their safe containment and management.

Safety of novel nuclear technologies

Conducting independent research on novel nuclear technologies such as Accident Tolerant Fuel and Small Modular Reactors to promote innovation, safety and efficiency of nuclear energy.

Characterisation of highly irradiated materials

Assessing the safety of highly irradiated materials using state of the art non-destructive and destructive techniques.

Support to Member States

Providing independent scientific evidence to Stakeholders and Member States. In addition JRC offers access to its nuclear facilities to researchers and scientists through the Open Access programme.

Training and education

Providing specialised training programs to researchers and students involved in nuclear research and safety.

Support to research at JRC Karlsruhe

Preparing samples to ensure the necessary support for other research activities within JRC Karlsruhe.

WANT TO KNOW MORE?



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European
Commission

JRC HOT CELLS

Key Infrastructure for Research in Nuclear Safety

Science for policy

The Joint Research Centre (JRC) provides independent, evidence-based knowledge and science, supporting EU policies to positively impact society

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WHAT ARE HOT CELLS?

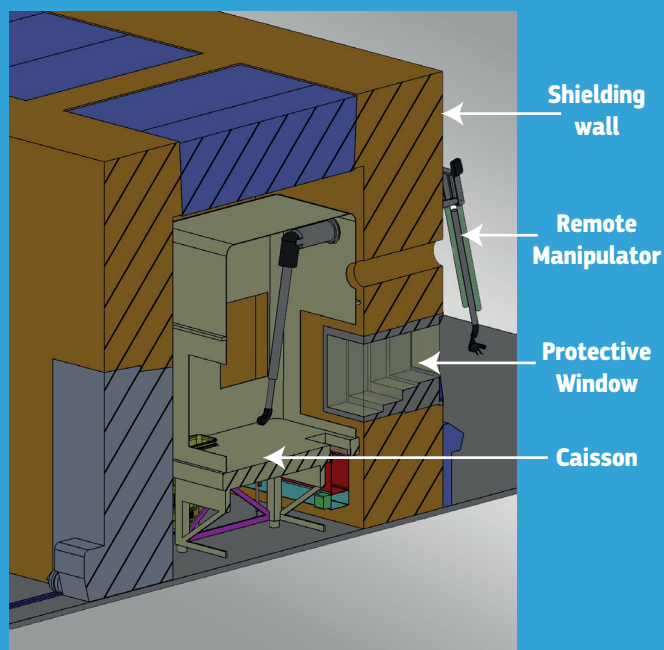
Hot cells consist of heavily shielded, sealed chambers designed to allow operators to safely manipulate highly radioactive materials. They are an essential tool in nuclear research providing a confined working space where radiation exposure is minimised for both workers and the environment.

- Protection from radiation exposure

- Operated through remote manipulators

- Allow handling of highly radioactive material

Hot Cell Overview



HOW DO THEY WORK?



Shielding walls

Shielding walls ensure a safe environment for both operators and the whole laboratory area. These very thick walls, built with high-density materials, effectively absorb or block ionising radiation.



Telemanipulators

Telemanipulators are essential tools. These devices consist of mechanical arms controlled remotely by operators. They are designed to offer precise three-dimensional movements, which is essential for conducting meticulous scientific experiments through thick shielding.



Ventilation system

The advanced ventilation system maintains continuous, controlled airflow, creating lower pressure within the cells to protect personnel and the environment. The use of absolute filters provides further external protection by capturing even the smallest radioactive particles.



Always monitored

The hot cells are constantly monitored 24/7 for fire, water leakage, radioactivity, pressure changes, and ventilation variations, ensuring a safe environment.

WHAT IS THEIR ROLE?

The JRC Karlsruhe hot cells are among few facilities capable of conducting experimental studies on irradiated fuel. Their unique value lies in their independence from specific interests and their state of the art capabilities dedicated to safety of both current and future nuclear systems of relevance to the European Union.



Expert Support for Safe Operations



A team of specialised technicians provides technical support for the operation and cyclic renovation of the Hot Cells ensuring that all systems and equipment are functioning optimally. Additionally, they are responsible for internal transfers of radioactive samples and materials, carefully handling and transporting these substances to prevent contamination and exposure.