ABOUT US

The Radiological Characterisation and Radioactive Waste Management Laboratory is a key national player in the field of radiological characterisation, operating for years in the development of innovative techniques and providing technical-scientific and operational support to Public Administrations and private individuals who request it.

WHAT WE DO

- Analysis for radiological characterisation using both destructive and non-destructive methods, in the laboratory and on the customer's premises;
- Modelling and simulation;
- Consultancy and process design;
- Applied research in the context of ENEA's strategic programmes, participation in national and international funded projects;
- Activities involved in the decommissioning of nuclear installations;
- Supervisor of ENEA's Integrated Service, pursuant to Article 74 of Italian Legislative Decree 101/2020;
- Education for thesis students, PhD students and trainees;
- Scientific dissemination.

WHERE WE ARE

We do most of our work in the laboratory located at the ENEA Casaccia Research Centre, but we can perform analyses throughout Italy thanks to our Mobile Lab.

Contact

For information on analysis, radiological characterisation, modelling, consultancy and training services

caratterizzazione.radiologica@enea.it

For information on the activities of the Integrated Service and on radioactive waste disposal in general

servizio.integrato@enea.it

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RADIOLOGICAL CHARACTERISATION AND RADIOACTIVE WASTE MANAGEMENT LABORATORY

Radiological characterisation

We perform characterisation using destructive and non-destructive methods. The former involve dissolving the sample with various procedures, and they have higher sensitivity than non-destructive methods. The latter allow for an analysis of the sample as is, without any special preliminary manipulation. The nature of the sample, the type of study required, and our experience determine the technique that will be carried out.




Characterised samples

As an applied scientific research laboratory, we work on samples of the most diverse matrices and origins, and for which a standard analysis procedure is not always available. For example, in the recent past we have analysed:

- Environmental matrices (asphalts, soils);
- Industrial matrices (cements, sands, paints, oils);
- Samples from nuclear plant decommissioning, experimental installations, including those resulting from research nuclear fusion installations;
- Activated materials;
- Radioactive waste, including those contaminated with transuranic isotopes;
- Samples from radiopharmacy processes;
- Unknown samples from unexpected finds.

Method of analysis

For non-destructive characterisation

- Tomographic Gamma Scanner Spectrometry (TGS);
- Multi-Group Analysis Gamma Spectrometry (MGA);
- Low-background Gamma Spectrometry (LabSOCS);
- In Situ Object Counting System Spectrometry (ISOCS);
- Small Samples Neutron Counting (SSNC);
- Raman Spectrometry.

For destructive characterisation

- Glove boxes for handling radioactive materials;
- Alpha spectrometry;
- Beta counting with Liquid Scintillation Counting (LSC);
- Alpha and beta counting with proportional counter;
- Mass spectrometry (ICP-MS);
- Gas chromatography with mass spectrometry (GC-MS);
- UV-Visible spectrophotometry;
- Fourier-transform infrared spectroscopy (FTIR).


Modelling, consulting and design

Our skills and expertise in the field of radiological characterisation also allow us to offer the following services:

- Research and development of innovative analysis methods;
- Design and optimisation of experimental tests and measurement systems;
- Engineering problem solving;
- Simulations for radiation protection in complex facilities, such as calculation of shielding for radioactive waste repositories;
- Evaluation of the possible activation of materials;
- Drafting of procedures and consulting through simulations with calculation codes.

Integrated Service for the management of radioactive waste of non-electronuclear origin

The Characterisation Laboratory has long carried out the activities of the Integrated Service. Italian Legislative Decree 101/2020 establishes that ENEA shall provide guidance, coordination, supervision and planning activities for the management of disused sources and radioactive waste.






Training and information

Thanks to the framework agreements that ENEA stipulates with universities and centres of higher education, it is possible to participate in internships at our laboratory for training and preparation of undergraduate or doctoral theses on topics related to the activities of our lab. We participate in information and dissemination events related to our activities.