

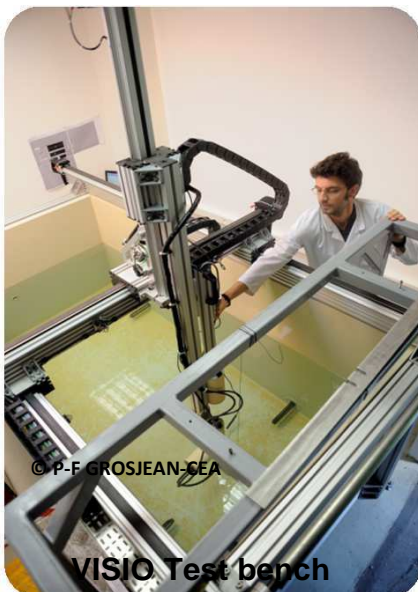


SURFACE CHARACTERIZATION - CND

Challenges & Markets

Quality assurance, extended lifetime, guaranteed performances for the purpose of improving the availability and safety of big systems such as nuclear reactors—these are the major challenges facing surface characterization.

So offering measurement instruments and techniques that can guarantee the state of the components or the structures is of prime importance, particularly in the nuclear industry, in steelmaking and during inspections in an opaque medium.



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VISIO Test bench
(water container for acoustic and ultrasonic experimentation)

Value added offer

The DEN offers industrialists:

- its competence in the field of ultrasonic and magnetic instrumentation, particularly and more generally the implementation of experimentations allowing them to study/develop/qualify instruments in a complex or hostile environment (high temperatures, melted liquid metals, high pressure),
- simulation tools
- and its competence in signal treatment

The objective of the CEA/DEN is to meet the needs expressed by industrialists whether it is in terms of:

- use of its platform test means and of the DEN's competence especially in Cadarache,
- licensing a specific technology (Patent & Know-how)
- creation of new collaborations
- advice and expertise
- network sharing
- development of instrumentation or of instrumental techniques

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Patents

CEA – Cadarache has 7 families of transferable patents in this particular area of research:

- EP1234166B1 (expires in 2019)
 - EP1516177B1 (expires in 2022)
 - FR2887664B1 (expires in 2025)
 - FR2920537B1 (expires in 2027)
 - FR2977377A1 (possible protection until 2031)
- as well as 2 patents pending since the end of 2011

Technical Offers

Development of ultrasonic translators
Analytical tools, of instrument development and qualification, of measurement chains and of instrumental techniques in this field and in various mediums

- Liquid metals at high temperatures (550°C-600°C), sodium in particular
- Gas at high temperatures (up to 1300°C)

The use of instrumental techniques for non-destructive inspections

Expertise

General Instrumentation (temperature, flow and pressure measurements...)

Acoustics and ultrasounds

Implementation of tests conducted in severe conditions (500-1100°C, 1-100 bars)

Equipment

CEA/DEN has extensive test and development means at its disposal:

- Water containers of varying dimensions (ranging in capacity from a few dozen to hundreds of liters)
- Automated system of displacement and movement (5 degree arms of freedom)
- Multi-element systems
- Electronics and analyzer of specific CND signals
- The Schlieren photography test bench
- Furnaces
- High temperature He circuit (900°C)
- Liquid metal test means (Na 600°C max), PbBi, PbLi, NaK, ...

Our strong points:

The DEN has the resources of its well-recognized expertise and know-how in the field of surface characterization and non-destructive inspection that enable us to meet your needs.

Key figures:

- Manpower
 - 12 research engineers / technicians involved in R&D instrumentation,
 - 4 PHD students,
 - 3 apprentices
- Accreditations
 - Certification ISO 9001
 - Certification ISO 14001
 - OHSAS

Those who have entrusted us with their work:

AREVA, EDF