

## 2. SUPERCONDUCTING MAGNETS LAB

Name of the infrastructure	Superconducting magnets lab
Location of infrastructure (town, country)	Madrid, Spain
Web site address	<a href="http://www.ciemat.es">http://www.ciemat.es</a>
Legal name of organization operating the infrastructure	CIEMAT, Centro de Investigaciones Energéticas Mediambientales y Tecnológicas
Location of organization (town, country)	Madrid, Spain
Key Accelerator Research Area(s)	Cryogenic tests of SC magnets. NC magnets testing. Magnetic measurements of NC & SC magnets. Fabrication of SC magnets. Especial magnet design & Fabrication
General description of the infrastructure	<p>This facility is composed by the following infrastructures and / or activities:</p> <ol style="list-style-type: none"> <li><b>1. Test stations for superconducting magnets:</b> Superconductivity laboratory for testing magnets up to 2000 A and other superconducting devices. It includes power supplies, 3 helium cryostats, instrumentation, and a dry cryostat cooled with cryocooler.</li> <li><b>2. Magnetic measurement facilities:</b> <ul style="list-style-type: none"> <li>- Magnetic measurements instrumentation.</li> <li>- High precision mechanical 3D system with a Hall sensor for measurement of large magnetic devices.</li> <li>- Rotating coil system for the measurement of dipole, quadrupole and sextupole field quality.</li> </ul> </li> <li><b>3. Test stations for thermal and electrical testing (at cryogenic temperatures):</b> <ul style="list-style-type: none"> <li>- Sumitomo RDK 415D Cryocooler. Leybold cryocooler. Autonomous liquefactor for liquid helium production, Cryogenic Supply System, CSS</li> </ul> </li> <li><b>4. Platforms for manufacturing treatments and test of magnet components for accelerator:</b> <ul style="list-style-type: none"> <li>- Assembly Hall for the fabrication and mounting of accelerators components. It includes 3 winding tables, mechanical measurements instrumentation, etc...</li> </ul> </li> </ol>
Already existing or planned	Facility in user operation since 2007
Unique features	Ideal facility for testing small superconducting magnets. Many of the LHC small prototypes have been tested here.
Present situation/future changes/expected lifetime	In operation for several years. An additional Cryocooler will be added
Accelerator infrastructure or component test infrastructure	Component test infrastructure
Shared facility/infrastructure	Infrastructure dedicated to R&D and projects
Main user community	SC magnets NC magnets, including current leads and other components
Number of users	Large accelerator-based facilities like XFEL, LHC, HL-LHC, IFMIF, ILC, FCC projects and R&D
Open for external users	Yes
If open to external users: Modality of access to the infrastructure (access unit)	There are different modalities to access the facility like a "Service Contract" or a "Collaboration Agreement" among others
Number of access units available for external users	Depending on the availability of the part of the installation needed
If open to external users: Support offered by the organization operating the infrastructure	Support will be provided by CIEMAT, at a cost: manpower for preparing the tests, assembly, running of the installation, fluids and electricity... In any case, the presence of some users will be requested at some points
Review procedure for requested access	Either after discussion with CIEMAT, or in the frame of an international contract, European or else
How to apply	By contacting the Accelerator Unit leader at CIEMAT
Can the infrastructure be made available?	Yes
If YES, fraction of time that could be made available (%)	Depending on the internal projects going on, and on the facility needed, a priori around 30 %
Number of FTEs operating the infrastructure	3
Contact details (name, Institute, email,)	<p>Fernando Toral Head of Accelerator Unit Avenida Complutense, 40 28040, Madrid <a href="mailto:Fernando.toral@ciemat.es">Fernando.toral@ciemat.es</a> Tel.: +34 91 496 2557</p>

**if available: costing model (how is the annual operating cost calculated)**

If service is delivered to internal CIEMAT clients, costs are calculated on a basis of an all-in fee package. Special conditions may be applicable for tests performed in the frame of approved official cooperation agreements.

## Pictures



Fig. 2 Testing Cryostat



Fig. 3. Winding of MCBX Prototype for the HL-LHC



Fig. 1. Test of Autonomous cryogenic supply system of AMIT Cyclotron