

The CEA-Saclay technical platforms are clustered in a building complex covering an area of 25 000 m² called 'Synergium' as it hosts a large number of technical activities profiting from common skills, personnel and services with complementary themes of development.

Test beam facilities



High Intensity Proton Injector (IPHI)
3 MeV proton beam ($I \leq 100$ mA) in pulsed or CW mode.



Ion Source Test Bench (BETSI)
Generation of light ion beams in pulsed or continuous mode, ($I \leq 30$ mA, $V \leq 50$ kV).

Test stations under high magnetic field



Eight Tesla Test Station (SEHT)
Test of large components ($\varnothing \leq 0.58$ m, $T \geq 1.8$ K, $I < 1000$ A) under magnetic field ($B \leq 8$ T).



Test Cryostats at Variable Temperature and High Magnetic Field (CETACEs)

Critical current measurement on superconducting samples:
CETACE 1: $\varnothing \leq 49$ mm, $B \leq 17$ T, 1.8 K $\leq T \leq 200$ K,
CETACE 2: $\varnothing \leq 93$ mm, $B \leq 13$ T, $T = 1.8$ K or 4.2 K depending on the magnetic field value.



HO
Test facility for characterizing superconductor wire in a background field $B=3$ T with a homogeneity of 350 ppm in a sphere of 300 mm (350 mm warm bore, $T = 4.2$ K).

Test stations for RF devices and superconducting cavities



Vertical test cryostats
Accelerating field and quality factor measurements of superconducting radiofrequency cavities
CV1: $\varnothing \leq 0.7$ m, $h \leq 2.9$ m,
CV2: $\varnothing \leq 0.45$ m, $h \leq 1.7$ m.



Horizontal test Cryostat
Tests of superconducting cavities in the same conditions as in an accelerator
CryHoLab: $\varnothing \leq 0.7$ m, $h \leq 1.5$ m.



352 MHz RF platform
Pulsed klystron ($f = 352$ MHz, $P_{peak} = 2.8$ MW, duty cycle $c = 5$ %).

Characterization and measurement laboratories



Mechanical tests laboratory
Mechanical tests : traction, compression, bending and slippage ($T = 4.2$ K or 77 K or 300 K).



Surface characterization laboratory
Preparation and surface characterization of samples.



Low temperature characterization laboratory
Characterization of superconducting samples by measurements of the Residual Resistivity Ratio ($\varnothing \leq 0.15$ m, $h \leq 1$ m, 4.5 K $\leq T \leq 300$ K), the first critical field HC_1 ($\varnothing \leq 0.3$ m, $h \leq 1.33$ m, 2 K $\leq T \leq 40$ K), ...



Diagnostics, Vacuum and Assembly (DIVA)
Mechanical assembly, vacuum leak tests, pumping speed measurements, hydraulic tests.

Test stations for superconducting magnets and large size cryogenic components



W7-X station
Test cryostats of large magnets ($\varnothing \leq 5$ m, $h \leq 4.1$ m, 4.2 K $\leq T \leq 7.6$ K, $I < 25$ kA) on intensity, insulation voltage, mechanical stress, pressure drop and temperature.



Horizontal Cryogenic Station for Magnetic Tests (SCHEMA)
Tests of superconducting magnets ($T \geq 1.8$ K, $I < 20$ kA).



Vertical station
Tests of large components ($\varnothing \leq 0.88$ m, $h \leq 7.9$ m, $T \geq 1.8$ K, $I < 20$ kA) in LHe, LN₂ or under vacuum.



Japanese Tokamak station (JT-60SA)
Test cryostat of large magnets (oblong shape: $l \leq 10$ m, $w \leq 6.5$ m, $h \leq 2$ m, 5 K $\leq T \leq 7.5$ K, $I < 26$ kA) on intensity, insulation voltage, pressure drop and temperature.

Characterization stations at cryogenic temperature



Pressurized superfluid helium cryostat
Measurements in pressurized superfluid helium ($\varnothing \leq 0.25$ m, $h \leq 0.2$ m, 1.6 K $\leq T \leq 2.15$ K, $P \leq 2$ bar).

Measurement of the thermal conductivity of insulators and conductors (MECTIC)

Specifications: $\varnothing \leq 0.5$ m, 3.8 K $\leq T \leq 300$ K.



Thermosiphon test bench
Characterization of single phase and two phase flows by measurements of the mass flow rate, volume ratio, pressure drop and wall temperature (test sections: $\varnothing = 0.4$ m, $h = 1.2$ m).

Thermautonome

Characterization of single phase and two phase flows by measurements of the pressure drop and wall temperature (vertical test section: $h = 0.3$ m, 3 K $\leq T \leq 30$ K, $P \leq 3$ bar).



Chemistry, clean room and assembly complex for superconducting cavities and cryomodules



Integrated chemistry cabinets
Chemical treatment of elliptical cavities ($h \leq 1.5$ m).

Vertical electropolishing cabinet
Chemical and electrochemical treatment of elliptical cavities ($h \leq 1.8$ m, $m \leq 200$ Kg).



ISO4, ISO5 clean rooms
Assembly of cavities, and cavity strings ($l < 14$ m), high pressure rinsing.

Module assembly halls
1500 m² assembly halls with cranes ($m \leq 20$ t).



Superconducting magnet winding and insulation laboratories



Insulation laboratory
Technical support in the insulation, impregnation and winding of small magnets ($L \leq 0.75$ m, $\varnothing \leq 0.4$ m).



Winding workshop
Technical support in the winding of large magnets ($\varnothing \leq 2$ m, $L \leq 3$ m).