

Cryogenics for Synchrotrons

The way to cool down cavities
and cryostats

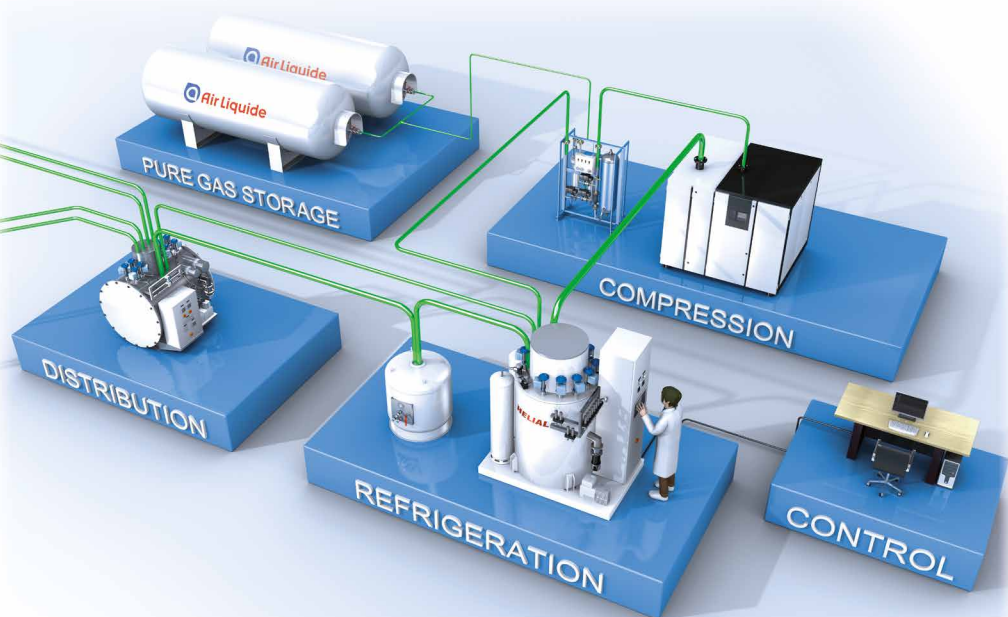


Air Liquide, world leader in gases, technologies and services for Industry and Health, supplies customized solutions in mechanical cold production, liquefaction, storage and distribution of cryogenic fluids at very low temperatures.

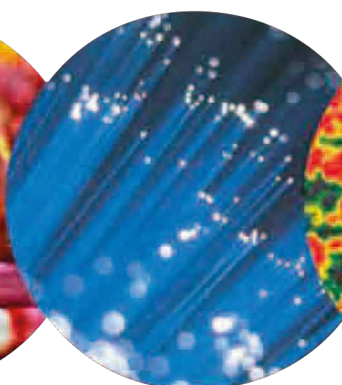
Air Liquide provides tailor sized cryogenic solutions dedicated to synchrotrons.

Last generations synchrotrons make use of superconducting cavities. Some scientific users study samples at cryogenic temperatures. Air Liquide designs and manufactures the refrigeration systems necessary to cool down the cavities and tailor-made cryostats.

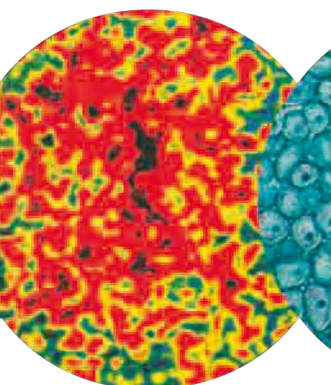
A turnkey refrigeration system dedicated to synchrotrons



Chemistry



Materials science



Magnetism

Air Liquide team supports you in all the stages of your project, from drawing up the specifications to implementing the solution.

Our cryogenic products are specifically designed according to your needs.

Air Liquide expertise

- Highly reliable systems
- Supply of components:
 - Helium refrigeration systems with high stability pressure control
 - Auxiliary circuits
 - High vacuum pumping units
 - Gas purification systems
 - Cryostats
- Know-how and support of an international group



Air Liquide support

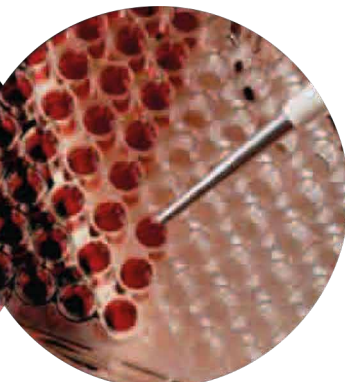
- Preliminary analysis and assistance in the definition of your specifications
- Selection of the most appropriate technologies
- Turnkey solutions
- Operation and maintenance
- Training



Life sciences



Macromolecular crystallography



Industry

Our recent references

Shanghai Synchrotron Radiation Facility (China)

- One helium refrigerator 650 W at 4.5 K following SELO regulation
- One compressor station (cycle compressor, oil removal & gas management system and recovery compressor)
- One 2,000 L dewar
- One cryogenic distribution line
- One multi-component analyser

National Synchrotron Research Center (Thailand)

- One helium liquefier 20.7 L/h
- One compressor station (cycle compressor 26 g/s, oil removal & gas management system and recovery compressor)
- One 450 L dewar
- One cryogenic distribution line
- One gasbag
- One atmospheric heater

National Synchrotron Radiation Research Center (Taiwan) - I & II

- Two helium refrigerators 450 W at 4.5 K
- Two compressor stations (cycle compressor 85g/s, oil removal & gas management system and one common recovery compressor 11 g/s)
- 2,000 L dewar
- Two systems of cryogenic distribution lines
- Two multi-component analysers

Soleil National Synchrotron (France)

- One helium refrigerator 450 W at 4.5 K
- One complete compressor station (cycle compressor, oil removal system & gas management system)
- One recovery compressor for the cavities stand by mode helium recovery
- One 2,000 L dewar
- One cryogenic distribution line
- One distribution box to the cavities
- One cavities flows control panel
- One multi-component analyser

Diamond Light Source (U.K.)

- One helium refrigerator 500 W at 4.5 K
- Two compressor stations in redundancy (cycle compressor, oil removal & gas management system)
- Three ambient 30 m³ gas buffers
- One recovery compressor
- One 2,000 L dewar
- One cryogenic distribution line
- One multi-component analyser
- Manufacture and installation supervision of warm helium circuits between modules

Variable Energy Cyclotron Center (India)

- One helium refrigerator (refrigeration: 415 W at 4.5 K, liquefaction: 85 L/h / mixed mode: 360 W @ 4,5 K and 12 L/h)
- One compressor station (cycle compressor, oil removal & gas management system)
- One 2,000 L dewar
- One valve box with a phase separator
- Manufacture and installation supervision of cryogenic transfer lines

Pohang Accelerator Laboratory (South Korea)

- One helium refrigerator: 700 W & 27L /h at 4.5 K
- One compressor station (cycle compressor, oil removal & gas management system & recovery compressor)
- One 2,000 L dewar
- Manufacture and installation supervision of cryogenic transfer lines to customer cryomodules

TAC (Turkish Accelerator Center)

- One helium refrigerator: 210 W @ 1.8 K
- One auxilliary cold box
- One compressor station
- A 5,000 L dewar
- A transfert line
- Manufacturing and installation of the above equipment

GSI (Darmstadt Centre for Heavy Ion Research)

- One helium liquefier (20 L/h)
- One compression station
- One dryer
- A 3,000L dewar
- One gas management system
- Manufacturing and installation of the above equipment

Contact us

gcom.alat@airliquide.com

www.advancedtech.airliquide.com

