

Cryogenics for optronics

Gas storage, supply and regulation systems
for cryogenic circuits and cryo-coolers



Solutions for complete cryogenic cooling
function, in association with Joule-Thomson
cryo-coolers.



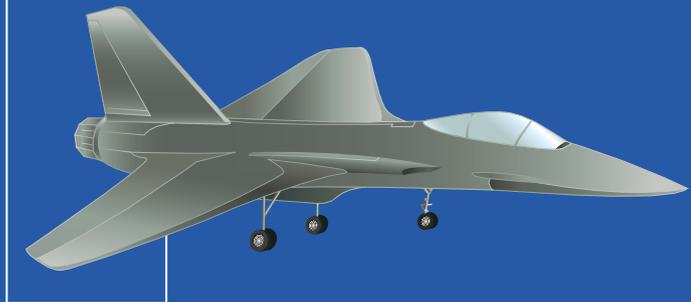


Our gas storage, supply and regulation systems can be associated with Joule-Thomson cryo-coolers to perform a complete cryogenic cooling function.

Our teams master the entire cold production chain for optronics, from components for cryogenic circuits to Joule-Thomson cryo-coolers.

Applications

- Missile direction control system
- Other optronics equipment



A wide range of different components to answer your specific needs

- Pure gas storage (at high pressure), to supply the cryo-coolers
- Valves for pressure regulation: low absolute and relative pressure exhaust valves, non return valves
- High pressure circuits for gas supply: flexible pipework, connectors, filters

Key benefits

- ✓ Longtime storage capacity
- ✓ No electronic components
- ✓ Customizable design for tailor-made solutions
- ✓ Long operating lifetime
- ✓ Ease of integration
- ✓ ITAR free

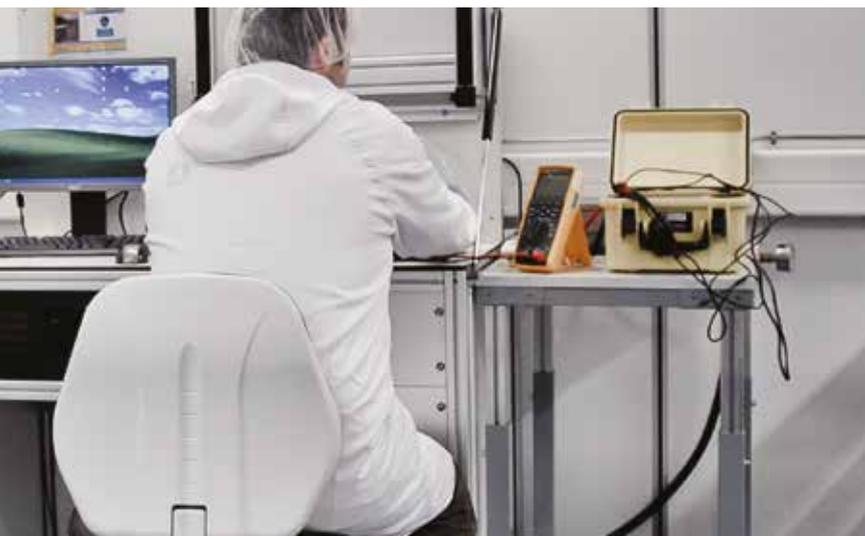
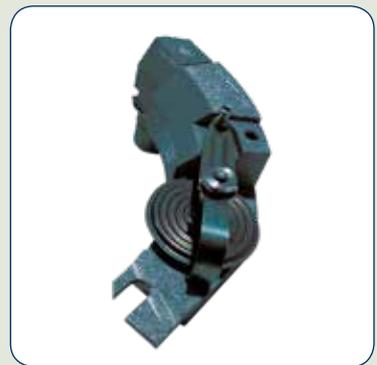


Air Liquide is the world leader in gases, technologies and services for Industry and Health with more than fifty years of technical, industrial and commercial experience in mechanical cold production, liquefaction, storage and distribution of cryogenic fluids at very low temperatures: a benchmark in expertise.

Our teams address the specific needs of each customer using a global approach that combines consulting, design and commissioning, to offer the most fitting solution.

Air Liquide advantages

- Specialist in very low temperature technologies for more than 50 years: **production of Joule-Thomson cryo-coolers**, pulse-tube cryo-coolers, dilution systems, liquefaction, refrigeration, etc.
- Welding qualification, characterization of materials and high pressure and regulation mastery
- Products in compliance with gas purity norms DEF STAN 58-96 issue 4
- Involved in many aeronautical programs, space activities and Scientific Research
- Know-how and support of an international group
- High production rate capabilities



Standard equipment features

Storage capacities

Sealed containers at a pressure of 700 bars

Tightness	Maximum pressure drop: 5% in 15 years
Design pressure	1,400 bars
Bursting pressure	> 2,700 bars

Absolute valves

Maximum full flow pressure	1.6 bars absolute
Minimum closing pressure	1.04 bars absolute
Maximum flow	40 NI/min

Cooling operations based on different types of gas: argon, nitrogen, air and mixtures.

Equipment capacities and technical features can be tailored to your specific needs.

Contacts

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A world leader in gases, technologies and services for Industry and Health, Air Liquide is present in 80 countries with approximately 66,000 employees and serves more than 3.6 million customers and patients.