1272_2024-angelantoni_cat_aerospace_0924-1

ACS | Angelantoni TECHNOLOGY FOR LIFE

Aerospace test solutions

Since 1952, Angelantoni has been producing and marketing worldwide, under the ACS brand, environmental test chambers for all types of tests on materials, components, and finished products. The ACS brand has always been associated with a vast experience and flexibility in customized solutions, and with undisputed expertise in technologies, gained in part through close cooperation with research institutions, universities, and industrial partners.

ACS “World leader in Environmental Space Simulation”

The ACS brand has acquired a strong leadership position in the aerospace sector, the most challenging environment for simulation: after the first Thermal Vacuum Chamber (TVC) in 1988, Angelantoni became one of the few leading international manufacturers at international level, and a supplier for the most important space research centers testing satellites, subsystems, and components.

Angelantoni Test Technologies
stay ahead to meet the needs
of the Industry of the Future, where

Internet Technology,
Remote Connections,
Communication & Networking

are the keywords for success.

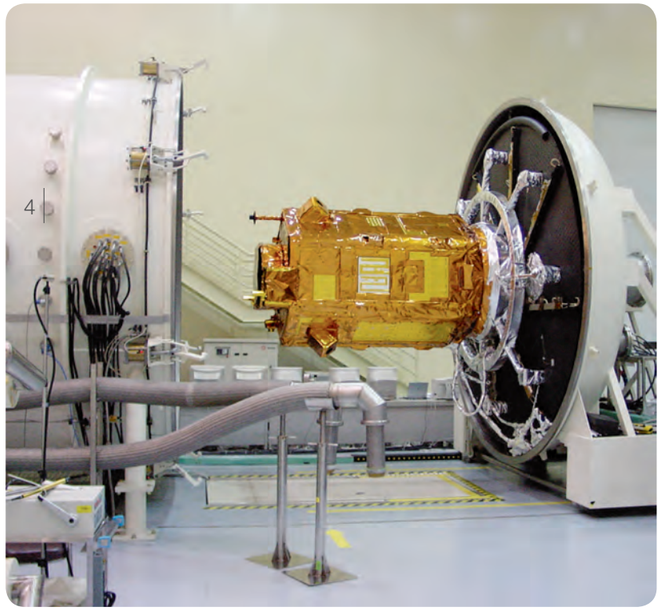
ACS Features and benefits

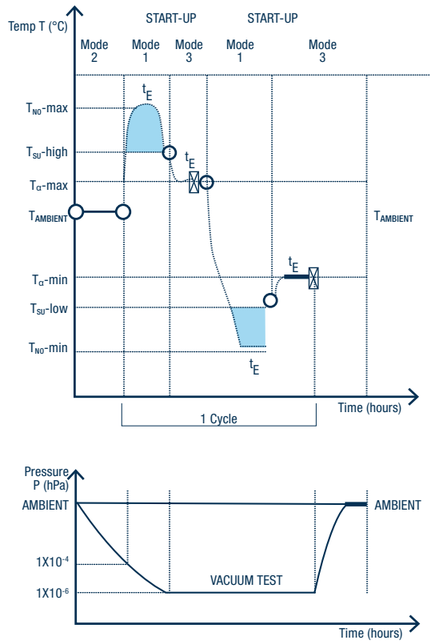
- Wide range of TVC sizes, with diameters ranging from under 1m up to 10m
- High quality and vast experience in vacuum pumping systems
- High quality of black shroud paint with a solution for low outgassing at maximum temperatures (>+150°C) according to ESA standard ECSS-Q-ST-70-02C
- Special shroud design to withstand the highest heat dissipations (>5 kW/m2)
- Special attention to minimizing consumption through hardware solutions and software management of the plant
- Integrated control and monitoring system totally developed by ACS
- Special attention to and experience in redundancy aspects
- Full capability for supplying turnkey systems

Satellite Testing

Thermal cycling: used to subject the DUT (Device Under Test) to the alternation of high and low temperatures within a temperature range that is typically -100°C to +100°C, while the pressure is maintained at values below 10^{-6} mbar (high vacuum). While the satellite is subjected to thermal cycling, it is possible for RF (radiofrequency) signals to be exchanged across the chamber through dedicated wave guides. These tests may take up to a month.

Thermal balance: made for the validation of the thermal-mathematical model of the satellite. Tests are performed by creating an environment with a temperature range similar to that which the satellite will encounter while in orbit (below -180°C). Some parts of the satellite are also subjected to heating from hot sources (lamps or IR emitters) to simulate the effect of sun rays which can cause temperatures to locally reach +150°C. The satellite is kept at a constant pressure of 10^{-6} mbar during these tests.





ECSS-E-10-03A cycle

A wide range of thermal systems is available based on different test needs, economy, and flexibility, such as:

- Liquid nitrogen flooding (boiling mode)
- Liquid nitrogen flooding (boiling mode) with heating elements (lamps or IR emitters)
- Liquid nitrogen partial flooding (boiling mode) with heating elements (lamps or IR emitters)
- Liquid nitrogen pressurized circuit with heating elements (lamps or IR emitters)
- Pressurized gaseous nitrogen circuit
- Combined liquid and gaseous nitrogen modes
- Mechanical cooling with intermediate fluids

TVC construction

The external body

The external body of the testing volume (vessel) is produced from high-quality stainless steel and its design is supported by the FEM (Finite Element Method) analysis in order to optimise the steel thickness withstanding the pressure differences between the internal and external environments. Welding and surface finishing are treated to minimise leak rates and outgassing, making it possible to reach deep vacuum.

The thermal field

The test volume of the TVC is a thermoregulated stainless steel cylinder, known as the shroud, which transfers the heat to the DUT by its inner surface irradiation. Two disc-shaped heat shields close the two ends of the cylinder completely, in order to achieve a uniform temperature field around the device under test (DUT). The shroud consists of two laminated sheets with a space of a few millimetres between them. This space is used for the passage of the thermal fluid from the thermal power generation system. A special black paint is applied on this surface producing a layer with high emissivity (> 0.9) and with low RML (residual mass loss <1% at 150°C), which maximises the thermal exchanges in high vacuum conditions. Sometimes in the test volume there is a “thermal plate” on which some specimens are placed to carry out thermal cycles with heat transfer by conduction.

Different types of Temperature Regulation systems are available, depending on the application type:

Temp. range from -70°C up to + 150°C Mechanical Cooling with Intermediate Fluid
The fluid, typically a diathermic oil, cooled by refrigerant gas or heated electrically, is circulated by a magnetic coupling pump through the shroud in a closed loop. A benefit of this system is the low cost of ownership.

Temperature range from -180°C up to + 150°C Pressurised Gaseous Nitrogen
By means of a special fan, pressurised gaseous nitrogen circulates in the shroud maintaining a density that favours heat exchange and ensure a good temperature uniformity over the entire radiating surface. The heating takes place by means of electrical heaters, while the cooling by spraying of liquid nitrogen in the circuit. This system allows an excellent regulation of the temperature in the whole range.

Temperature range from -196°C up to + 150°C Liquid Nitrogen + Irradiators
In this case, the shroud is filled - wholly or partially - with liquid nitrogen, thus reaching a temperature <90K (between -196°C and -185°C depending on the pressure in the circuit). This creates a radiant cryogenic environment around the object to be tested. The circulation of the LN2 in the shroud may be of natural type or forced by means of a pump. The heating of the object under test or the control of intermediate temperatures, takes place by means of heating elements (infrared lamps or emitters) placed on special structures in the test volume.

1272 2024-angelantoni cat aerospace 0924-2

Satellite Testing

TVC construction

The vacuum generation plant

The vacuum generation plant consists of a set of high quality and widely known brand of vacuum pumps. The first vacuum stage (primary or rough pumping) is performed by dry pumps, eliminating the risk of oil back streaming and characterized by very low maintenance. It allows the transition from ambient pressure to values of around 10^{-2} mbar in a short time. The second stage, consisting of more sophisticated pumps (cryogenic pumps), allows the achievement of a high vacuum with elevated reliability on the performances. Typical levels of final pressure inside the chamber are around $1x10^{-6}$ mbar, but it can drop to values in the range of 10^{-8} mbar depending on the time.

The control and management system

The control and management system of the TVC consists of a fully automated combination of hardware and software components.
Sequencing, safety interlocks and operator interfaces are implemented through the PLC, the core of the control system. In case of failure of utilities like power, pneumatic supply, cooling water circulation etc… the PLC provides built-in inter subsystem level interlocks to ensure the safety of operating personnel, test object and facility equipment.
HMI devices are provided for local (on-board panel) and remote (PC dedicated software) control connected to the PLC.

Standard Thermal Vacuum Chambers

Thanks to its recognised know how and experience ACS has been able to develop a range of standardised thermal vacuum chambers built with high quality components by first class suppliers. They are mainly used for testing nanosatellites and components.

Flexible and integrated turnkey solutions, ready for Testing Laboratories and Research Centers!

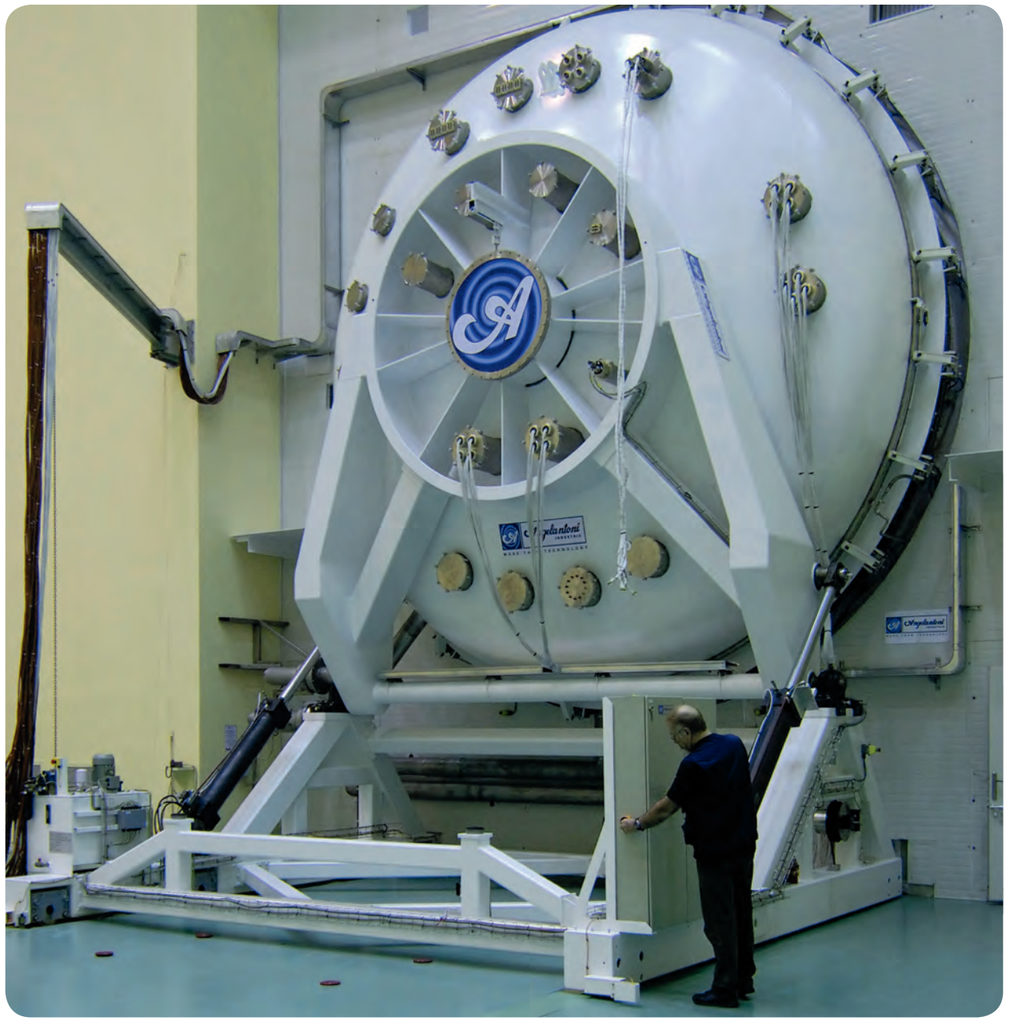
		HVT400	HVT1000	HVT2700
USEFUL CAPACITY (l)		400	940	2650
SHROUD INTERNAL DIMENSIONS approx. (mm)	diameter	800	1000	1500
	length	800	1200	1500
THERMAL PLATE DIMENSIONS (mm)	width	500	600	800
	depth	700	900	1100
TEMPERATURE RANGE ON THE SHROUD AND THERMAL PLATE	(-70°C... +125°C*)	BY MECHANICAL COOLING		
	(-150°C...+125°C*)	BY PRESSURIZED GN2 RECIRCULATION		
TEMPERATURE RANGE ON THE SPECIMEN	(-180°C...+125°C)	BY SHROUD LN2 FLOODING AND INFRARED LAMPS		
HIGH VACUUM LIMIT $1x10^{-6}$ mbar in 4 hours from ambient pressure at ambient temperature		BY TURBOMOLECULAR PUMP		
HIGH VACUUM LIMIT $5x10^{-7}$ mbar in 3 hours from ambient pressure at ambient temperature		BY CRYOGENIC PUMP		
PRIMARY VACUUM LIMIT $5x10^{-2}$ mbar in 30 minutes from ambient pressure		BY DRY SCREW PUMP		

* temperature extension on the shroud and thermal plate to 150°C available as option

Customized Test Solutions for Aerospace Applications

Thermal Vacuum Chamber
HVT240MC -190130 GN2/LN2

- **Tests: high vacuum, temperature**
- External dimensions (chamber only):
  7200x16000x9000 mm (WxDxH)
- Internal useful dimensions: 5500x10000 mm (ØxL)
- Internal useful volume: 240 m^3
- Temperature range: -190°C/+130°C
- Temperature variation rate:
  - 1°C/min from -100°C up to +100°C
  - 1°C/min from +100°C down to -100°C
- Vacuum limit: $1x10^{-6}$ mbar
- Special features:
  - Door with tilting system for spacecraft loading
  - Special trolley for Spacecraft loading on rails
  - Internal monorail crane
  - Spacecraft horizontality control system



Thermal Vacuum Chamber
HVT460K-180127 GN2

- **Tests: high vacuum, temperature**
- External Dimensions:
  19000x15000x10500 mm (WxDxH
- Internal useful dimensions:
  7000x12000 mm (øxL)
- Temperature range:
  -180°C to +127°C in GN2 mode
- Working pressure:
  <1x10-6mbar
- Purpose:
  test on spacecrafts and satellites

Thermal Vacuum Chamber
HVT200000 -190100 LN2

- **Tests: high vacuum, temperature**
- External dimensions:
  6800x14000x8000 mm (WxDxH)
- Internal useful dimension:
  6200x7000 mm (ØxL)
- Vacuum limit: $1x10^{-7}$ mbar
- Temperature Range:
  -190°C/+100°C
- Special features:
  satellite horizontal control system

Customized Test Solutions for Aerospace Applications

Thermal Vacuum Chamber
HVT8000 -80100 MC

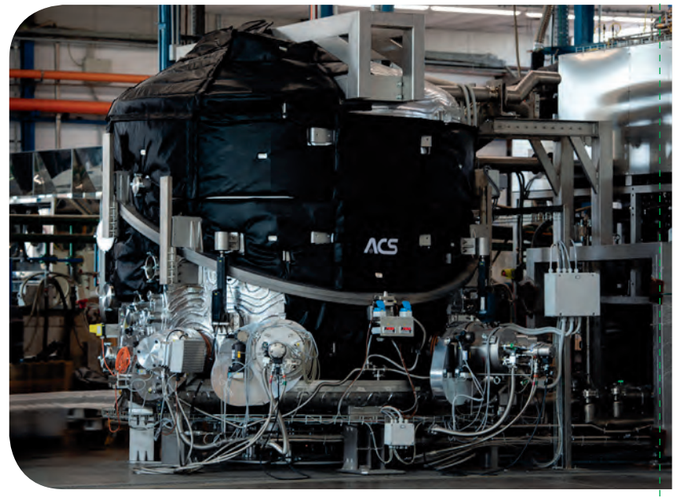
- **Tests: high vacuum, temperature**
- External dimensions (chamber only): 4800x5600x2700 mm (WxDxH)
- Internal useful dimensions: 2000x2500 mm (ØxL)
- Internal useful volume: 8 m^3
- Temperature range: -80°C /+100°C
- Temperature variation rate:
  - 1°C/min from -70°C up to +100°C
  - 1°C/min from +100°C down to -70°C
- Vacuum limit: $1x10^{-6}$ mbar
- Special features:
  - Door with tilting system for spacecraft loading
  - Removable thermal plate

High Vacuum Chamber
HV19000

- **Tests: high vacuum**
- External dimensions: 4600x5800x4000 mm (WxDxH)
- Internal useful dimensions: 2400x4500 mm (ØxL)
- Internal useful Volume: 19 m^3
- Vacuum limit: $2x10^{-7}$ mbar in 12 hours
- Vacuum limit with 5 mg/s Xenon flow: $2x10^{-5}$ mbar
- Xenon pumping speed: 70.000 l/s at $2x10^{-5}$ mbar Xe partial pressure
- Special features: tests on spacecraft electric propulsion trusters

Thermal Vacuum Chamber
HVT7300-8080 GN2

- **Tests: high vacuum, temperature**
- External Dimensions: 3600x5500x3500 mm (WxDxH)
- Internal useful dimensions: 2400x1800 mm (øxH)
- Temperature range: -80°C to +80°C in GN2 mode
- Working pressure: 1x10-7mbar
- Purpose: calibration of Earth Observation optical instruments



Transparent Thermal Chamber
ATS10000 -6060

- **Tests: Temperature, RF tests**
- External dimensions: 1800x2700x6000 mm (WxDxH)
- Internal useful dimensions: 1820x1350x4650 mm (WxDxH)
- Internal useful Volume: 11 m^3
- Temperature range: -60°C/+60°C
- Temperature variation rate:
  - 2°C/min from -60°C up to +60°C
  - 2°C/min from +60°C up to -60°C
- Special features: combination of thermal tests and Radio Frequency measurements on antennas

Aeronautics test solutions

ACS “World leader in Environmental Testing of Aeronautics Components and Systems”

Environmental chambers in which it is possible to control pressure in order to simulate the altitude above sea level are a fundamental instrument in the aeronautics industry, both civil and military. Over the years, the tests necessary for the development and qualification of new equipment have become increasingly more complex and integrated. The need to have numerous parameters under control at the same time and to simulate extreme conditions has made the classic “altitude test chamber” a necessary instrument, but one that is not always sufficient for achieving the quality and reliability standards required.

ACS has gained valuable experience down through the years, enabling it not only to offer altitude test chambers for testing in compliance with the most common international standards of the sector, but above all to meet the most selective demands from the market.

ACS Features and benefits

- Combined control of humidity and altitude
- Integrated solutions including vibrations at high altitude
- Simulation of altitude at fast rates of change
- Simulation of “explosive decompression”
- Fast rates of temperature change
- Multi-shaker interfaces
- High load-bearing capability
- Flexible design to allow the testing of large physical dimensions
- DUT air conditioning at controlled temperature

Standard Altitude Test Chambers

Since 1953 ACS has been designing and developing a complete series of standard chambers for vacuum tests up to 1 mbar (equivalent to 150,000 feet altitude). These chambers are available in standard 150, 500 and 1000 liter capacities with a parallelepiped shape. A special wall thermoregulation system (optional) guarantees the best functioning below 300 mbar, thermoregulating the test environment by radiation. This range of altitude chambers is available in both thermostatic (temperature and pressure control) and climatic (temperature, pressure and humidity control) versions.
A new version has been designed for Environmental Stress and is ideal for reliability growth processes where temperature rates of change of 5°C/min are pre requisite. Other technical details in the Altitude Test Chambers brochure available at www.acstestchambers.com.

Features and advantages

- Top-of-sector performance, in terms of both the breadth of the regulation field and the speed of the temperature and pressure variations
- Optimized system for the thermoregulation of the walls of the test chamber in both the heating and cooling phase, even for pressures close to minimum values (optional)
- MyKratos™ software: the new embedded control system makes it possible to control, monitor and assist the chamber in any place at any time in multiple ways (WiFi, Ethernet, mobile network) via the on board panel and desktop/ mobile devices (MyAngel24™ interactive assistance system is optional).
- Industrialization of the control, cooling, humidification, and pumping devices in order to guarantee maximum quality and reliability as well as ease of access to the various maintenance points.

Main standards

DEF STAN 0035 3-11 (High Temperatures, Low Pressures)
DEF STAN 0035 3-12 (High Temperatures, Low Pressures)
DEF STAN 0035 3-13 (Low Temp. and Pressures, High Humidity)
MIL-STD-810G METHOD 500.5 PROCEDURE I
MIL-STD-810G METHOD 500.5 PROCEDURE II
MIL-STD-810G METHOD 500.5 PROCEDURE III*
RTCA/DO-160C

* chamber equipped with special options.

Customized Test Solutions for Aeronautics Applications

Altitude Chamber
UD16000 - for testing airborne large components

- **Tests: Temperature, Humidity, Altitude, Rapid decompression, Explosive decompression**
- External dimensions: 10000x6300x3500 mm (WxDxH)
- Internal useful dimensions: 2100x4000x2100 mm (WxDxH)
- Internal useful Volume: 16 m³
- Temperature range: -70°C/+160°C
- Temperature variation rate:
  - 1°C/min from -70°C up to +160°C
  - 1°C/min from +160°C up to -70°C
- Relative Humidity range: from 5% to 98% (dew point range -5°C/+84°C)
- Altitude limit: 150.000 feet
- Special features:
  - MIL-STD-810G METHOD 500.5
  - Procedure III - Rapid Decompression
  - Procedure IV - Explosive Decompression

Altitude Chamber
UD24000 C VT LN2

- **Tests: temperature, humidity, vacuum**
- External dimensions (chamber only): 2600x7800x3050 mm (WxDxH)
- Internal useful dimensions: 2000x6000x2000 mm (WxDxH)
- Temperature range: -75°C / +150°C
- Temperature variation rate (with 1600 kg internal load):
  - 5°C/min from -65°C up to +120°C
  - 5°C/min from +120°C down to -65°C
- Relative Humidity range: from 10% to 95% (dew point range +2°C/+79°C)
- Pressure range: from ambient down to 10 mbar
- Special features: fast depressurization from ambient down to 45 mbar in 1 min.

Defense
test solutions

ACS "World leader in Environmental Testing of Defense Systems and Components"

One of the priorities for homeland security is the prevention of incidents (i.e. terrorist actions, destructive natural events) with a view to reducing the impacts they may have on national security.
The strategic environments are usually divided into three main focus areas: surveillance of the territory through satellites, deterrence by airborne vehicles or navy, action by land forces. The high reliability and the perfect functioning of the tools included in this chain are therefore indispensable prerequisites. Preventive inspection and testing of these materials is highly recommended to ensure the security of the system. Over many years various test specifications have been developed in support of these activities, with particular focus on the wide range of environments in which the equipment may be used, for example MIL-STD, ECSS, NASA, DEF STAN, STANAG, RTCA-DO, ITOP, etc.

ACS, through the experience and knowledge acquired over five decades, is able to offer customers in this market area a wide range of testing solutions suitable for any method of the main standards, thus enabling our customers to be fully confident that the equipment they purchase to perform these crucial tests is supported by a supplier with an in-depth knowledge of industry specifications and test procedures.

ACS Features and benefits

- Over 40 years' experience in designing and producing chambers for military applications
- Explosion-proof solutions
- Integrated mobile environmental test solutions
- Design and production of large testing facilities for full-scale military vehicles

Customized Test Solutions for Defense Applications

Vibration Test Chamber
CH22000 C VT LN2

- **Tests: temperature, humidity, vibrations**
- External dimensions (chamber only): 5800x3000x(3540÷3940) mm (WxDxH)
- Internal useful dimensions: 5500x1850x2000 mm (WxDxH)
- Temperature range: -60°C/+90°C
- Temperature variation rate:
  - 10°C/min from -60°C up to +90°C
  - 10°C/min from +90°C down to -60°C
- Relative Humidity range: from 10% to 95% (dew point range +4°C/+59°C)
- Special features:
  - floor interfacing with external shakers
  - hydraulic lifting system
- Standard requested: BS 2011-IEC 68-2-32/50, MIL-STD-810G

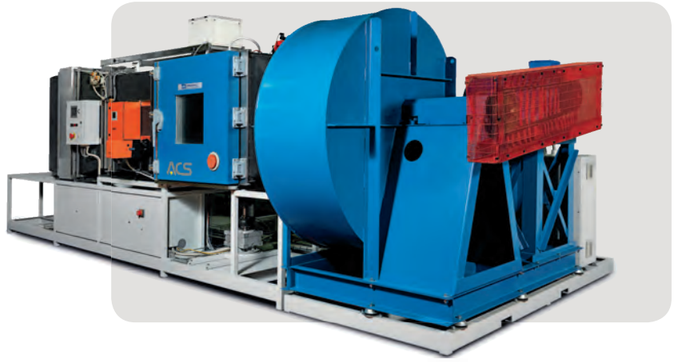
Solar Simulation Plant

- **Test: solar simulation**
- External dimensions: 8600x16500x10000 mm (WxDxH)
- Internal useful dimensions: 8000x16000x7600 mm (WxDxH)
- Temperature range: +32°C/+49°C
- Temperature variation rate:
  - 0.05°C/min from +32°C up to +49°C
  - 0.05°C/min from +49°C down to +32°C
- Special features:
  - wide solar radiation area 6000x13000 mm (WxD)
  - hydraulic lifting system for lamps structure
- Standard requested: MIL-STD-810E method 505.3

Customized Test Solutions for Defense Applications

Sand and Dust Chamber
SD1000 MIL

- **Tests: sand and dust**
- External dimensions (chamber only): 6500x3300x2300 mm (WxDxH)
- Internal useful dimensions: 1000x1000x1000 mm (WxDxH)
- Temperature range: ambient/+66°C
- Relative Humidity: below 22%
- Air speed: up to 29m/s
- Standard requested: MIL-STD-810G Method 510.5

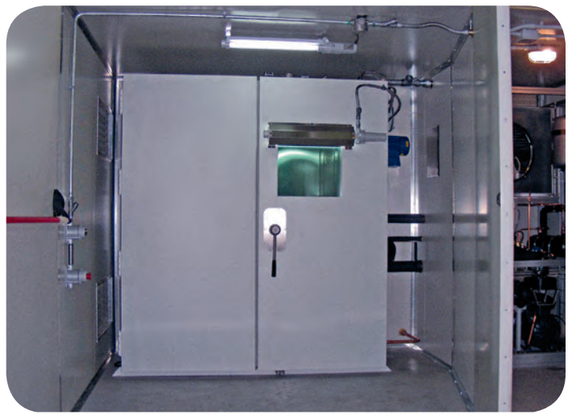


Vibration Test Chamber

- External dimensions (Typically): 2000x3476x2280 mm (WxDxH)
- Internal dimensions (Typically): 1000x1130x1080 mm (WxDxH)
- Temperature range: -75°C up to +180°C
- Relative Humidity range: from 10% to 95%
- Standard requested: MIL-STD-810F Method 520.2

Explosion Proof Chamber
CH22000 TC EX

- **Tests: Combined Temperature-Humidity**
- Temperature range: -55°C/+85°C
- Relative Humidity range: from 10% to 95%
- Standard requested: MIL-STD-810F, ITOP4-2-602



Thermal Shock Chamber
UC50 -60130 CST

- **Tests: the chamber consists of two testing rooms which can work independently or together to perform thermal shock tests and/or test profiles**
- Useful dimensions:
  CHAMBER (1): 3000x4000x2000 mm (WxDxH)
  CHAMBER (2): 000x4000x2000 mm (WxDxH)
- Temperature range: -60°C/+130°C
- Temperature rate (average value, with 300 kg of compact Aluminium load, in the testing range -54°C/+120°C):
  - ROOM (1): 3°C/min heating, 2°C/min cooling
  - ROOM (2): 3°C/min heating, 2°C/min cooling
  - LARGE ROOM (1 + 2): 3°C/min heating, 2°C/min cooling
- Thermal shock resetting time: 5 minutes in the range -40°C/+60°C, with 300 kg of compact aluminium load
- Humidity range: from 10% to 95% R.H. in the temperature range +20°C/+80°C
- Standard requested: MIL-STD-810G

Walk-in Chamber
UC507 -5575

- **Tests on heavy vehicles**
- Internal useful capacity: 507 m^3 approx.
- Internal useful dimensions: 6500x13000x6000 mm (WxDxH).
- Door useful dimensions: 5600 x 5600 H mm
- Floor capacity: 65 tons (in the full area)
- Temperature range: -55°C/+75°C (adjustable)
- Temperature accuracy (at steady conditions): ±1...±2°C
- Average temperature rate (without internal load):
  - heating up from -55°C to +75°C -> 0.5°C/min
  - cooling down from +75°C to -55°C -> 0.5°C/min
- Climatic range (without any heat load): +10°C/+75°C
- Humidity range: from 10% to 95% R.H. (adjustable)
- Air velocity (around the specimen): 0.25 m/sec< V <1.5 m/sec
- Standard requested: MIL-STD-810F Meth. 501.4 Proc. I & II, Meth. 502.4 Proc. I, II & III, MIL-STD-810F Meth. 507.4

ACS | Angelantoni TECHNOLOGY FOR LIFE

Angelantoni Group Innovation to excel

Angelantoni Group has always been a hub of innovation thanks to its collaboration with research institutes and universities, which has led to the design, manufacture, and marketing of state-of-the-art products in diverse application fields and the registration of a significant number of patents.

Since its beginning in 1932, numerous challenges have been met and won, with a focus on offering innovative solutions, providing customers with ingenious products and tailored services, and assisting them in the best possible way.

www.angelantoni.com

ENVIRONMENTAL TESTING

Since its launch on the market in 1952, the ACS brand has had a mission: to be at the forefront of environmental testing technology.

Flower®: the ecological environmental test chamber.
Energy savings of up to 70% without affecting performance.
An energy consumption reduction of around 70% is possible during the stabilization phases thanks to a unique patented system consisting of an inverter, which controls the compressor speed and allows the adaptation of the compressor power to different working needs, and a “cold sink” that increases the cooling efficiency.

MyKratos™ Control System
ACS was the first to launch on the market an environmental test chamber capable of meeting the new demands of the Industrial Internet of Things and Industry 4.0 for integrated, interconnected, and communicating machines.
Also worthy of note are a number of other innovative ACS products of outstanding technological complexity, such as:

- calorimeters for testing the energy efficiency of air conditioners in the household appliance and automobile sectors;
- high-vacuum chambers for tests on satellites and satellite parts;
- HALT/HASS test chambers for the accelerated stress test to verify component reliability.

PVD GREEN COATING

Kenosistec produces sputtering, PVD and evaporation machines for thin film coating. PVD is a totally green technology substituting the galvanic process which uses chemical solvents and hexavalent chromium dangerous for cancer generation. These coating machines are used for R&D and industrial processes in the decorative field, electronics, automotive, fashion, small house appliances and Perovskite for PV cells.

BIOMEDICAL FIELD

Angelantoni Life Science (ALS) research has led to the development of unique, high-tech biomedical equipment such as:

- Hemosafe®, a computerized and patented refrigerated blood bank for storing and distributing bags of packed red blood cells
- Smartfreezer®, the first robotized biorepository in the world for biological materials (stem cells, etc…) with storage in liquid nitrogen vapour at -180°C
- Waster®, to transform contaminated and hazardous hospital waste into standard waste.

ENERGY EFFICIENCY

Turboalgor developed a patented and technologically advanced system whose aim is to improve the efficiency of old and new commercial and industrial refrigeration systems for frozen food, ice-cream and pharma. Turboalgor consists of an energy recovery heat exchanger and a turbocharger, derived from the automotive industry, installed into a conventional refrigeration plant. Turboalgor produces energy savings up to 23% in comparison with existing systems and cooling power increase up to more than 50%, depending on the operating conditions of the plant. Turboalgor has also developed a free piston expander to save energy in the transcritical CO_2 refrigeration plants, mainly used in the supermarket large retailers field.

RENEWABLE ENERGIES

Archimede Solar Energy (ASE) was the first producer of patented molten salt solar receiver tubes, developed in collaboration with ENEA (Italy’s National Research Center for Renewable Energies) after 6 years of joint R&D. ASE produced also solar receiver tubes for oil and saturated or overheated steam.

Angelantoni Test Technologies, owned by the **Angelantoni Group**, is the only company capable of offering a comprehensive range of environmental test chambers - **ACS** branded - for a great variety of applications, thanks to the expertise and technical know-how of its teams of experts. Innovation, flexibility and organization have always been the keys to success for ACS, world-famous since 1952 also for its high-tech test equipment such as Thermal High Vacuum Chambers for Aerospace applications and Calorimeters.

ENVIROMENTAL SYSTEM CERTIFICATION DNV·GL ISO 14001

QUALITY SYSTEM CERTIFICATION DNV·GL ISO 9001

Angelantoni Test Technologies
Località Cimacolle, 464
06056 Massa Martana (Pg) - Italy
Tel. +39 075.89551 (a.r.)
Fax +39 075 8955200
info@acstestchambers.it

ACS | Angelantoni TECHNOLOGY FOR LIFE

EN

Angelantoni
TECHNOLOGY FOR LIFE

Subsidiaries

Ofterdingen, GERMANY
info@att-umweltsimulation.de

Canéjan, FRANCE
info@angelantoni.fr

Beijing, P.R. CHINA
info@attasiapacific.com

Noida, INDIA
info@attindia.in

ACS

Angelantoni Test Technologies
Loc. Cimacolle, 464 - 06056 Massa Martana (Pg) - Italy
Tel. +39 075.89551 (a.r.) - Fax +39 075 8955200
info@acstestchambers.it

www.acstestchambers.com