

Climats

a schunk company

Expert in
environmental simulation

CREATOR
OF EXTREME

TEMPERATURE & HUMIDITY CHAMBER
ENVIRONMENTAL STRESS SCREENING
THERMAL SHOCK
COMBINED VIBRATION - TEMPERATURE
LARGE VOLUME CHAMBER

-
- ▶ AEROSPACE
 - ▶ AUTOMOTIVE
 - ▶ ELECTRONICS
 - ▶ TEST LABORATORIES
 - ▶ RENEWABLE ENERGIES
 - ▶ DEFENCE





CREATOR OF EXTREME



To launch additional videos, download the **Climats** mobile app from your usual *app store*.



CLIMATS, EXPERT IN ENVIRONMENTAL SIMULATION

As specialists in climate testing for over 45 years, Climats designs and manufactures chambers that can simulate extreme environments to help you ensure the highest levels of performance, reliability and safety for your products, while ensuring compliance with all European and global standards.

Our climate chambers are constantly evolving to meet the latest test standards.

Our research and development department, entirely focused on quality and innovation, works hard to improve the efficiency, adaptability and ergonomics of all our product ranges.

Meeting your needs is in our DNA. Climats also offers you products that are entirely made to measure in order to continually adapt to your core business and your requirements.

100% French design

Climats is a French company located near Bordeaux which designs, manufactures and assembles all of its production at its production unit.

Historically attached to the know-how and innovation of Climats, our customers come from fields as varied as the automotive sector, aerospace, defence, electronics and test laboratories.



NFC)))

Puce

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As a subsidiary of the world leader in environmental simulation, Climats is part of the Schunk group. Schunk is a global industrial group made up of autonomous companies with a presence in 30 countries and more than 8,000 employees. Its turnover exceeds one billion Euros.

Schunk's activities are currently focused on the following markets:

- ▶ Carbon and ceramics techniques
 - ▶ Climate and environmental simulation techniques
 - ▶ Sintered metal techniques
 - ▶ Ultrasonic welding techniques
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Climats

a schunk company

250

Standardised Excats

7

thermal shock configurations

1

customer delivery made each day

72

employees

45 YEARS

of experience

5000 M²

of factory space

11,000

environmental chambers in operation around the world

17

product lines



CLIMATS,
EXPERT IN ENVIRONMENTAL
SIMULATION

FOR OVER
45 YEARS



AREAS OF APPLICATION

Initially focused on aeronautical testing, Climats has expanded its areas of expertise and adapted itself to multiple areas of application.



AEROSPACE

All components and structures used in the aerospace industry are subject to extreme temperatures and altitudes. These extreme variations in temperature due to rapid changes in aircraft altitudes are simulated using very high levels of accuracy and reproducibility in environmental stress screening chambers (ESS), offering performance levels up to 25°C/min and over!

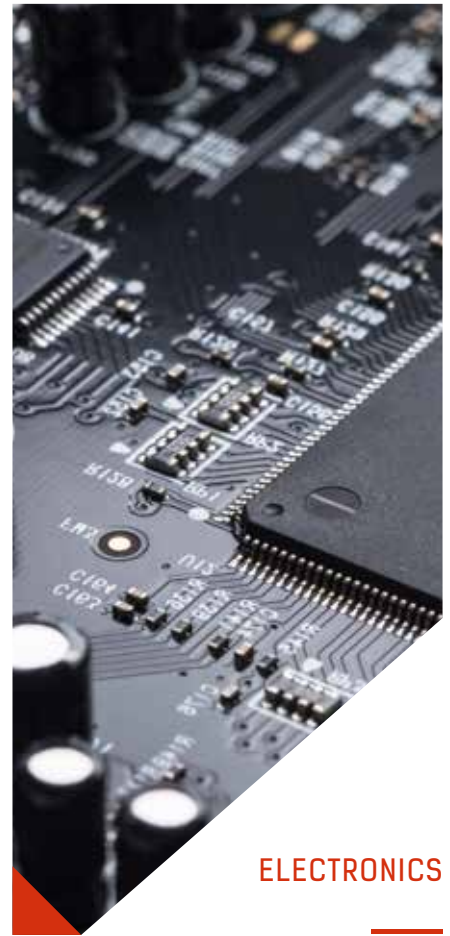
Altitude chambers and space simulators are able to simulate atmospheric and space flight conditions, both in terms of vacuum levels and temperature, in order to achieve the specifications required for the development and qualification of sensitive components.

More than anything else, automotive products are subject to extreme and changing environmental conditions when in use.

As part of the ongoing search for technological development and improvements in the quality and reliability of its components, the automotive industry uses environmental testing to reproduce the most extreme environmental conditions.



AUTOMOTIVE



ELECTRONICS

Electronic components, semiconductors and electronic boards must be subjected to a wide range of particularly severe climatic tests.

Temperature and moisture saturation tests are created to penetrate the cores of products. Combined with your industrial process, thermal shock tests (very fast temperature change tests) will enable you to identify defective specimens.

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*Climats' expertise extends to
all sectors of the industry.*
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To meet your requirements in terms of temperature and humidity stability tests, Climats offers a range of reliable and robust chambers that enable you to optimise your products while meeting the requirements and traceability levels required in cutting-edge industries.

DEFENCE



TEST LABORATORIES

Whatever the type of test required by your customers, all our equipment uses the same basic technology to facilitate inspections, management and maintenance of your machinery. Spirale Vision control and regulation software is embedded in our entire range to ensure accurate traceability of your test campaigns and to accelerate the creation of test reports.

The industrial challenges associated with clean energies require special testing methods. Photovoltaic panels and batteries are subjected to severe conditions in equipment specifically designed to test the materials that comprise them in complete safety.

RENEWABLE ENERGIES



RANGES DESIGNED TO MEET ALL NEEDS

EXCAL² Temperature and humidity chambers

- ▶ From 140l to 1800l
- ▶ Extreme temperatures (-90°C to + 250°C)
- ▶ Relative humidity with a minimum dew point of -5°C
- ▶ Unmatched volume/power ratio

SPEEDCAL Environmental stress screening chambers (ESS)

- ▶ Volumes suitable for your needs
- ▶ Extreme temperatures (-90°C to + 250°C)
- ▶ Relative humidity with a minimum dew point of -5°C
- ▶ Versatility of tests supporting speeds up to 28°C

SCAL thermal shock

- ▶ 2 or 3 zones to double your test capabilities
- ▶ Vertical or horizontal
- ▶ From 70l to 1500l
- ▶ ESS mode

WINCAL large volume chambers

- ▶ Rigid construction
- ▶ Standard range from 2 to 16 m³
- ▶ From -80°C to +200°C
- ▶ Extended climatogram

Modular large volume chambers

- ▶ Construction up to 100m³
- ▶ From -70°C to +80°C
- ▶ Structure made from modular panels

VIBCAL Climate chambers combined with a vibration system

- ▶ Vibration and temperature
- ▶ Vibration, temperature and humidity
- ▶ On a vertical vibrator and horizontal table



RANGES DESIGNED
TO BE ADAPTABLE

TO ALL YOUR
NEEDS





Spirale *Vision* lets you control all your equipment from an extra large 15-inch multi-touch screen.

- ▶ Choose the level of use that suits you:
 - Production level: simple, clear and functional. One-touch to start and archive the test.
 - Standard Level: a versatile level in which you follow the progress of your test with the CycleWin recorder.
 - Laboratory Level: manages advanced tests.
- ▶ You can always use recorder mode, program editor and remotely control your equipment via the Internet.
- ▶ The supervision function manages all your equipment from a single station.

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Codified options including...

- ▶ *A camera for fault-free traceability. Image proofing by recording photo sequences showing the impact of the test on your product.*
- ▶ *A bar code reader. Your test products are identified by reading the barcode and the QR-Code, enabling fast and foolproof follow-up.*



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ENVIRONMENTALLY FRIENDLY

Our products are **eco-friendly** thanks to the combination of the **Energy Saving** mode and the use of a next-generation gas, **F-Gas Ready**.

F-Gas Ready

We comply with the new **F-Gas** regulations and respect the environment. The use of **R449A gas** combined with a new refrigerant circuit reduces the ecological footprint (the R449A GWP is 65% lower than the R404A GWP) with equivalent performance. This new coolant circuit can only be leak tested once a year.

Energy Saving

Unique on the market, this control mode is included in the **Spirale Vision** software and provides savings of at least 40% in your typical cycles. This regulation mode significantly reduces the number of components involved in the cooling process (solenoid valves, compressors, fans).

Energy Saving automatically manages the **START & STOP** function.

Thanks to these technologies you consume less energy and the operating times of the solicited organs are reduced, guaranteeing an increased lifespan.

Input and output water temperature measurements combined with a flow rate sensor, provide real-time water consumption values.

The associated reduction in water consumption by the cooling system is also an environmental benefit.



STANDARD RANGES



EXCAL² Temperature and humidity chamber

- ▶ Temperature range: from -90°C to +250°C
Regulation stability: less than $\pm 0.3^{\circ}\text{C}$
- ▶ Humidity range: 5% to 98% (for temperatures from +10°C to +95°C) with a minimum dew point of -5°C. Regulatory stability below $\pm 3\%$
- ▶ Speed of variation: up to 28°C/min
- ▶ 8 test volumes: 140, 220, 400, 540, 770, 1000, 1400 and 1800 litres

SPIRALE Vision as standard



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SCAL

Thermal shock



- ▶ Temperature range:
from -90°C to $+220^{\circ}\text{C}$
- ▶ Transfer time between both zones:
less than 10 seconds
- ▶ ESS mode possible in cold cabinet with a maximum load of 100 kg (e.g. for SCAL CTH2)
- ▶ Volumes: from 70 litres to 1500 litres
- ▶ 7 configurations available:
vertical or horizontal shock,
2 or 3 test tanks

SPIRALE Vision as standard



SPEEDCAL

Environmental Stress Screening (ESS)



- ▶ Temperature range:
from -90°C to $+250^{\circ}\text{C}$
- ▶ Humidity range: 5% to 98%
(for temperatures from $+10^{\circ}\text{C}$
to $+90^{\circ}\text{C}$) with a minimum dew
point of -5°C
- ▶ Speed of variation:
up to $30^{\circ}\text{C}/\text{min}$
- ▶ Volumes: depending
on needs

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EXAMPLES OF TEST STANDARDS

COLD

- ▶ NF EN 60068-2-1
- ▶ GAM EG 13 fasc 01
- ▶ MIL STD 810/502-2
- ▶ ISO 16750-4, low temperature
- ▶ JESD 22-A119

DRY HEAT

- ▶ NF EN 60068-2-2
- ▶ GAM EG 13 fasc 02
- ▶ MIL STD 810/502-2
- ▶ ISO 16750-4, High temperature test
- ▶ MIL STD-202 G/108A
- ▶ MIL STD-883 D/1008.2
- ▶ JESD22-A103D

TEMPERATURE VARIATION

- ▶ NF EN 60068-2-14
- ▶ GAM EG 13
- ▶ RTCA DO160 SEC5
- ▶ ISO 16750-4, temp. steps
- ▶ ISO 16750-4, temp. cycling
- ▶ MIL-STD-331C, Test C6
- ▶ JESD22-A105C

DAMP HEAT

- ▶ IEC 60068-2-30
- ▶ IEC EN 60068-2-38
- ▶ IEC EN 60068-2-78
- ▶ GAM EG 13 fasc 03
- ▶ MIL STD 810/507
- ▶ RTCA DO160 SEC6
- ▶ NF C 20-703
- ▶ ISO 16750-4, Damp heat steady
- ▶ MIL STD-2026/103B
- ▶ JESD 22-A 101C

ENVIRONMENTAL CYCLES

- ▶ GAM EG13 fasc 08
- ▶ IEC 60068-2-30
- ▶ IEC 60068-2-38
- ▶ ISO 16750-4, Damp heat cyclic
- ▶ ISO 16750-4, Temp/Humid cyclic
- ▶ MIL STD-202 G/106D
- ▶ MIL STD-331 C/C1
- ▶ MIL STD-750-1/change 3
- ▶ MIL STD-810 G/507.5
- ▶ MIL STD-883 J/1004.7
- ▶ JESD22-A100D
- ▶ JFJ 1101

FROST

- ▶ FREEZING/DEFROSTING



MEETS ALL EUROPEAN AND
GLOBAL STANDARDS:

YOUR REQUIREMENTS ARE
OUR
PRIORITY





TROPICAL
Damp heat testing



WINCAL
Large volume chambers / Rigid structures



- ▶ Temperature range: from -10°C to +180°C
- ▶ Humidity range: from 10% to 98% (for temperatures from +10°C to +90°C) with a minimum dew point of -5°C
- ▶ 6 test volumes: 140, 220, 400, 540, 770 and 1000 litres

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- ▶ Temperature range: from -80°C to +200°C
- ▶ Humidity range: from 10% to 98% (for temperatures from +10°C to +90°C) with a dew point of +4°C to +94°C. Regulatory stability less than ± 3%
- ▶ 5 test volumes: 2,000, 4,000, 8,000, 12,000, 16,000 litres
Other volumes on request

SPIRALE Vision as standard



CM
Large volume chambers / Modular structures



- ▶ Temperature range: from -70°C to +125°C
- ▶ Humidity range: from 20% to 90% (for temperatures from +15°C to +60°C) with dew point of +7°C
- ▶ Test volumes: up to 100,000 litres

SPIRALE Vision as standard



VIBCAL

Environmental chamber combined with a vibration system



- ▶ Temperature range: from -70°C to +200°C
- ▶ Humidity range: from 10% to 98% (for temperatures from +10°C to +90°C) with a minimum dew point of -5°C
- ▶ Speed of variation: up to 20°C/min
- ▶ Volumes: on request
- ▶ 2 types of chamber: vertical vibration (VibA) vertical & horizontal vibration (VibT)



SPIRALE Vision as standard



TM

Thermal chamber: benchtop



- ▶ Temperature range: from -65°C to +200°C
- ▶ Speed of variation: 3°C/min over the entire temperature range
- ▶ Volumes: 55 litres & 80 litres

Eurotherm regulator
or SPIRALE mini supervisor



ALTITUDE CHAMBER

- ▶ Temperature range: from -70°C to +180°C
- ▶ Humidity fonction is available
- ▶ Speed of variation: 2°C/min on average for a temperature range of +150°C to -55°C without load
- ▶ Volumes: 220, 500, 1000 and 1500 litres

Vacuum level: atmospheric pressure
up to 5 mbar

CUSTOMIZED SOLUTIONS



AIR GENERATOR

- ▶ Temperature range: from -70°C to +180°C
- ▶ High airflow
- ▶ Production of temperature and humidity conditioned air



GT-FC Airflow

- ▶ Temperature range: from -70°C to +200°C
- ▶ Air flow rate: up to 32 Nm³/h
- ▶ Average temperature variation >120°C/min



SPIRALE Vision as standard



BATTERY TEST

Climate chamber for thermal battery tests

- ▶ Temperature range: +60°C to -60°C
- ▶ Speed variation: upon request
- ▶ Volumes upon request
- ▶ Secure chamber



SPIRALE Vision as standard



PV MODULE TESTING

Environmental chamber for photovoltaic modules test standard

- ▶ Temperature range: +150°C to -70°C
- ▶ Volumes upon request
- ▶ Specific carts for photovoltaic panels



SPIRALE Vision as standard

CALM ATMOSPHERE

Monobloc environmental chamber

- ▶ Temperature range: from +20°C to +60°C
- ▶ Air velocity: between 0.3 and 0.5m/s
- ▶ Speed of variation: 1.5°C/min
- ▶ Volumes upon request



SPIRALE Vision as standard



SIMULATION OF SOLAR RADIATION

Precision solar climate chamber

- ▶ Temperature range:
 - 20°C to + 100°C with radiation
 - 40°C to + 120°C without radiation
- ▶ Humidity performance:
 - with radiation: 10% RH / 80% RH in the range +15°C to +80°C
 - without radiation: 10% RH / 90% RH in the range +10°C to +90°C
- ▶ test volume: 1000 litres



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RAIN TEST Rain spray chamber

- ▶ 3 test volumes: "nozzle", "ramp" and "hoop"
- ▶ Flow rate from 0 to 5l/min (depending on the mode used)
- ▶ Pressure from 0 to 10 bar
- ▶ Volumes upon request



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MATERIAL TESTING

- ▶ Temperature range: -40°C to +180°C
- ▶ Humidity range: 10% to 98% (for temperatures from +20°C to +90°C)
- ▶ Speed of variation: 15°C/min from +80°C to -40°C
- ▶ Volumes upon request



SPIRALE Vision as standard

HYDROCARBON TEST Secure environmental chamber

- ▶ Temperature range: from -70°C to +180°C
- ▶ Speed of variation: 10°C/min on average
- ▶ Volumes after study



SPIRALE Vision as standard



BURN-IN
Modular-design thermal chamber

- ▶ Temperature range:
from 0°C to +70°C
- ▶ Speed of variation: Average 3°C/
min with 300 kg of electronics
bays and heat dissipation of 6 kW
- ▶ Volumes after study



SPIRAL Vision or Eurotherm
regulator as standard

BS 17@
Combined saline mist and humidity test

- ▶ Temperature range:
from +30°C to +60°C
- ▶ Saline mist: + 35°C
to + 50°C
- ▶ Humidity: maximum 98%,
min. 5 to 20% depending on
the dew point of dry air
- ▶ Volumes upon request



SPIRALE Vision as standard



AFTER SALES SERVICE

Climats as one of the worldwide leading climatic chamber supplier has its own service department in order to enable you to enjoy the best of our climatic chamber.

Today, thanks to our service department and our representative network, Climats has the capacity to offer you a whole range of technical services all around the world in perfect conformity with local rules and legislation.

The unique technology of our control and regulation software SPIRALE VISION allows a very fast diagnostic of your equipment by our team located in the factory in France. Indeed, one of the numerous features of SPIRALE VISION is to generate a back up file containing all the technical information detailing the status of your equipment, level of performance, presence of failures etc. This back up file can be sent via email, then investigated by our team less than one hour later after the generation.

Main activities

- ▶ Installation & set-up of your chamber
- ▶ Training
- ▶ Preventive maintenance
- ▶ Repairing
- ▶ Metrology (characterization, calibration)

Complementary activities

- ▶ Expertise
- ▶ Tightness control
- ▶ Parts supply

Europe
Asia
America
Africa



An international presence

At the heart of Climats' development strategy, we export through an intercontinental network of distributors. Trained in our technologies and committed to lasting relationships, our partners handle sales and technical support for our environmental equipment around the world.

Climats

a schunk company

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