As the key development strategy for Export, reliance on a large network of worldwide distributors.

Our partners market and service equipment all over the world; they are fully skilled in our technology and fully committed to a long-term relationship.

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Fax +33 (0)5 56 78 43 97

e-mail: sales@climats-tec.com
Climats’s entire expertise
in 8 EXCAL standard test volumes

Climats has been a specialist in environmental tests for almost 40 years, and designs and manufactures chambers that can simulate extreme and reproducible environments.

Present in sectors as diverse as automotive, aeronautics, space, defence and telecommunications, Climats helps guarantee the best level of performance, reliability and safety for your products. Our “Research and Development” department, focusing entirely on quality and innovation, works towards improving the efficiency, adaptability and ergonomics of the EXCAL range. Our environmental test chambers are continuously changing to meet the latest testing standards.

An entirely French design

Every year, over 700 environmental test chambers are designed, manufactured and assembled in our Bordeaux production unit. Today, we are pleased and proud to introduce a completely new generation of EXCAL environmental test chambers, which is the result of Climats’s experience and expertise.
YOU ARE RIGHT TO CHOOSE AN EXCAL!

A customised environmental test chamber

Your applications require specific functions and capacities, which is why Climats has a wide range of comprehensive standard machines. Our volumes have been designed and engineered so that you can add any of the options enabling you to customise your EXCAL to your needs.

High end technology

Spirale 3 is the reference software solution for controlling over 4,000 environmental test chambers and test benches worldwide. It was developed by Climats’s engineers for simple and efficient management of your machine. Spirale 3 is a reliable and accurate system, a complete software package, adapted to testing equipment and maintenance user requirements. Spirale 3 is also a completely open system that can be used for developing automatic functions and integrating data and additional data acquisition systems, to make your EXCAL a fully integrated test bench.

Energy saving

10 years of continuous research and development have culminated in the development of a revolutionary feature for protecting the environment.

Unique on the market, the Energy Saving control mode, in Spirale 3, scrupulously controls your energy consumption. A saving of at least 40% can be made on the electrical consumption of your typical cycles.

You can monitor the instant electrical consumption of the chamber during the test or check the total consumption for the whole test.

Reduced water consumption for the cooling system also constitutes a new environmental breakthrough.

Even more reliable

A new regulation system has been developed, incorporating feedback from our customers and our research on ecological advances. So, the Energy Saving mode helps to significantly reduce the load on the various components involved in refrigeration (solenoid valves, compressors and fans). Spirale 3 autonomously and optimally manages the production of cold and heat.

This standard test cycle clearly shows the energy saved with the ‘Energy saving’ cycle (dark grey curve) compared with a cycle without this mode (light grey curve). Electrical consumptions are displayed instantly.
Innovation

Enhance your test laboratory thanks to the modern design, and pure and elegant lines of the new EXCAL.

The most advanced technology

EXCAL is equipped with a 15 inch capacitive multitouch Panel PC, an SSD memory, Windows 7 and 2 USB ports. It therefore includes all of the latest technological advances.

Even greater connectivity: you have the possibility of networking your equipment, developing automatic functions, and having a completely upgradeable machine. Your connections are now completely centralised on the User Interface Panel (UIP).

A vast range: choose the foot print suitable for your work space.

Choose your cooling mode

Your chamber can be equipped with a water or air-cooled condenser.

Improved sound insulation and more stable performances, regardless of the ambient temperature of your test room.

Installing an EXCAL environmental test chamber equipped with an air-cooled condenser in your work space couldn’t be easier, all you need is an electrical connection.
Ergonomy

8 standard solutions:
140 l, 220 l, 400 l, 540 l, 770 l, 1000 l, 1400 l, 1800 l.

For ideal positioning of your products in the chamber, shelves are arranged throughout the entire height of the test volume. You can optimise your tests using several shelves for the same test.

Totally adaptable test spaces. Depending on your requirements, we can integrate fastener inserts, specific mechanical and electrical fittings or make specific penetrations (air extractor, gas injection, sampling).

The new design door can be opened fully and provides easy access for introducing your test products into the chamber. The door can be closed with one hand thanks to the solid and robust handle.

Keep in touch with your tested products using the Ø 80 mm portholes on each side, as standard. Depending on the connectors and positions indicated in the specification, optional diameter (Ø 100 mm, 150 mm, 200 mm) or any other shape portholes are available.

During testing, a large anti-condensation window offers maximum visibility of the materials being tested.

The materials constituting the test space (304L stainless steel) are resistant and scratch-proof. Treatment against chemical hazards (316L stainless steel) is offered as an option. The condensates flow directly on to the inclined base for rapid cleaning.

Performances

Homogeneity: +/- 0.5 °C to +/- 1.8 °C

Temperature regulation stability:
+/- 0.1 °C to +/- 0.3 °C

Humidity regulation stability:
+/- 1% to +/- 3%

Temperature range: -40 °C +180 °C / -90 °C +180 °C
Optional: Extension +200 °C and up to -100 °C

Transition speed: From 2 °C to 20 °C/min
18 refrigerating configurations

Humidity range: Stable and reproducible between 10% and 98%
Optional: Direct measurement/Saturation/Dry rate

Heat compensation: From 1000 W to over 10 kW
Useful technology

Ergonomic control panel

The new hardware system includes the latest industrial innovations with the 15 inch capacitive multitouch Panel PC with SSD memory and Windows 7.

This solid and robust Panel PC is conveniently positioned so you can incline it as required.

Connect your USB stick directly to the screen or use the network connection to archive your tests.

User Interface Panel (UIP): centralised connections

Ever attentive to user comfort and driven by our desire to continuously improve our products, we have created a space entirely dedicated to your connections. A panel positioned on the side of the chamber is provided for this purpose.

As standard, you have a safety socket, a thermal fuse, status indicators and 4 dry contacts that can be configured in Spirale 3.

Other innovations: 2 mobile sensors for closer regulation of your products, an RS232 connector, 4 logical inputs/outputs, 4 analogical inputs/outputs that can be configured in Spirale 3 and an Ethernet connection to control your chamber remotely.
Control system integrating the reference M.M.I. (Man-Machine Interface)

Your control panel and all of the components (test manager, program editor, etc.) benefit from remarkable ergonomics: a new user interface, instantaneous multilingual switch, ease of use, attention to detail and optimised design for use of the touch screen.

Control panel with 3 user levels
You choose the most suitable interface: production, laboratory, advanced tests.

Numerous configuration options
Access to these options and to the equipment commands can be controlled by nine password levels.

In this new version of Spirale 3, our program editor has a number of improvements, a modernised user interface and includes a touch screen: you can now draw your profiles with your finger or a stylus.

Spirale 3 includes a user-friendly and complete test manager for accurate and easy traceability. Editing statistics, exporting data and analysing information (rates, stability) is quick and easy.

User Script
This tool combines power and simplicity with its integrated help tool. You can create your own developments or submit them to us: automatic functions or specific safety functions, transform your EXCAL into a fully integrated test bench.

Network/Internet
A Spirale 3 exclusive feature, EXCAL remote control is as easy as creating a shortcut on Windows desktop and you don’t need to install any software on your desktop PC. A built-in web server checks your equipment’s status using any Internet browser. If the equipment alarm is activated or at the end of a test, Spirale automatically tells you by sending a message.

Supervision
This solution quite simply lets you manage all of your equipment, new and old, from a single workstation. Monitoring tools, profile creation, test report printing and email or SMS alarm setting functions are therefore available for all of your testing equipment.

Reliability
Simplified thanks to Spirale 3, our refrigerating circuits contain less parts subject to wear (solenoid valves), which is an excellent advantage for ensuring longer life span for your EXCAL equipment.

Preventive maintenance
Every component is individually monitored (solenoid valves, compressors) by action or duration counters. A global synthesis table helps you to plan preventive maintenance operations.
A perfectly dimensioned range

- **Extreme temperatures** (model T): from -90°C to +200°C
- **Humidity tests** (model H): RH from 10% to 98% (for temperatures from +10°C to +90°C)
- **An unparalleled high performance panel**: from 2°C/min to 20°C/min

### Aeraulics

Air circulation is optimised thanks to the double flow ventilation. This solution has a number of advantages:

- **Products are temperature treated simultaneously on all sides.**
- **Homogeneity on load is excellent regardless of the volume of your load.**
- **EXCAL chambers are equipped with adjustable air flow flaps.**

Circulated by a high-temperature fan, air is drawn in and conditioned in the technical compartment, then sent back into the entire test volume.

### Humidity production

Climats uses dew point bath humidity production, the system that is the most stable and closest to natural phenomena, which requires no maintenance. Easy to operate, it is completely reliable.

Spirale 3 provides accurate regulation to the 1/10% RH, with the standard humidity range from 10 to 98% for temperatures between +10 °C and +90 °C, limited by a minimum dew point of 4 to 8 °C.

### Temperature and humidity calibration

The Spirale 3 double entry calibration table can be filled in manually or automatically using a standard communicating with Spirale 3.

Measurement accuracy ensures a regulation stability between +/- 0.1°C and +/- 0.3°C.

Work space homogeneity, according to the standard IEC EN 60068-3-5, is between +/- 0.5°C and +/- 1.8°C.

Hygrometry: Produced by a maintenance-free water bath regulated at dew point temperature. Reliability, accuracy and regulation stability between +/- 1% and +/- 3%.

Relative humidity range between 10% and 98% and temperature range between +10°C and +90°C.

Nominal test conditions: Empty chamber without option. Water condensing type, clean cooling water supply at +18°C with a flow and pressure rate (2.5 bar minimum) matching the technical specifications of the chamber.

400 V three-phase 50 Hz/60 Hz mains power supply

Useful dimensions do not include the thickness of the rack for the shelves (25 mm on each side).

* Cabinet depth reduced by 10 mm
** Cabinet depth reduced by 20 mm
## EXCAL 140

**138 litres**

**Mobile**

<table>
<thead>
<tr>
<th>Type</th>
<th>Temp</th>
<th>Dimensions</th>
<th>Weight</th>
<th>Power Consumed</th>
<th>Net Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXCAL 1421-T/H</td>
<td>-70</td>
<td>W: 550 D: 500 H: 500</td>
<td>6.6</td>
<td>420</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>-45</td>
<td>W: 550 D: 1375 H: 1730</td>
<td>5.1</td>
<td>370</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>-45</td>
<td>W: 10 A/W: 9.5 D: 590</td>
<td>8.4</td>
<td>410</td>
<td>9</td>
</tr>
</tbody>
</table>

**Compact**

<table>
<thead>
<tr>
<th>Type</th>
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<th>Dimensions</th>
<th>Weight</th>
<th>Power Consumed</th>
<th>Net Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXCAL 220-T/H</td>
<td>-70</td>
<td>W: 550 D: 500 H: 750</td>
<td>6.6</td>
<td>470</td>
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<td></td>
<td>-45</td>
<td>W: 550 D: 1375 H: 1880</td>
<td>8.4</td>
<td>460</td>
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<tr>
<td></td>
<td>-45</td>
<td>W: 10 A/W: 17 D: 1260</td>
<td>8.4</td>
<td>410</td>
<td>9</td>
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**Optimum**

<table>
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<tr>
<th>Type</th>
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<th>Weight</th>
<th>Power Consumed</th>
<th>Net Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXCAL 400-T/H</td>
<td>-70</td>
<td>W: 660 D: 800 H: 750</td>
<td>9.5</td>
<td>540</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>-43</td>
<td>W: 930 D: 1790 H: 1880</td>
<td>8.4</td>
<td>520</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>-43</td>
<td>W: 10 A/W: 14 D: 1430</td>
<td>12.5</td>
<td>600</td>
<td>9</td>
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</table>

**Multipurpose**

<table>
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<th>Type</th>
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<th>Weight</th>
<th>Power Consumed</th>
<th>Net Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXCAL 540-T/H</td>
<td>-75</td>
<td>W: 750 D: 800 H: 900</td>
<td>10.4</td>
<td>640</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>-42</td>
<td>W: 1020 D: 1700 H: 2002</td>
<td>12.5</td>
<td>650</td>
<td>9</td>
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<tr>
<td></td>
<td>-42</td>
<td>W: 10 A/W: 18 D: 1480</td>
<td>14.9</td>
<td>790</td>
<td>9</td>
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</tbody>
</table>

## EXCAL 770

**770 litres**

**High Performance**

<table>
<thead>
<tr>
<th>Type</th>
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<th>Dimensions</th>
<th>Weight</th>
<th>Power Consumed</th>
<th>Net Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXCAL 7713-T/H</td>
<td>-70</td>
<td>W: 900 D: 950 H: 900</td>
<td>10.5</td>
<td>730</td>
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<tr>
<td></td>
<td>-40</td>
<td>W: 10 A/W: 16 D: 1310</td>
<td>11.9</td>
<td>870</td>
<td>9</td>
</tr>
</tbody>
</table>

## EXCAL 1000

**1000 litres**

**Universal**

<table>
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<tr>
<th>Type</th>
<th>Temp</th>
<th>Dimensions</th>
<th>Weight</th>
<th>Power Consumed</th>
<th>Net Weight</th>
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</thead>
<tbody>
<tr>
<td>EXCAL 1001-T/H</td>
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<td>W: 1000 D: 1000 H: 1000</td>
<td>16.4</td>
<td>1010</td>
<td>9</td>
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<tr>
<td></td>
<td>-45</td>
<td>W: 1270 D: 2140 H: 2095</td>
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<td>740</td>
<td>9</td>
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<tr>
<td></td>
<td>-45</td>
<td>W: 10 A/W: 18 D: 1490</td>
<td>14.9</td>
<td>830</td>
<td>9</td>
</tr>
</tbody>
</table>

## EXCAL 1400

**1416 litres**

**Powerful**

<table>
<thead>
<tr>
<th>Type</th>
<th>Temp</th>
<th>Dimensions</th>
<th>Weight</th>
<th>Power Consumed</th>
<th>Net Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXCAL 1401-T/H</td>
<td>-70</td>
<td>W: 1150 D: 1100 H: 1120</td>
<td>14.9</td>
<td>990</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>-45</td>
<td>W: 1470 D: 2220 H: 2200</td>
<td>11.9</td>
<td>990</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>-45</td>
<td>W: 10 A/W: 16 D: 1360</td>
<td>16.4</td>
<td>1120</td>
<td>9</td>
</tr>
</tbody>
</table>

## EXCAL 1800

**1932 litres**

**Industrial**

<table>
<thead>
<tr>
<th>Type</th>
<th>Temp</th>
<th>Dimensions</th>
<th>Weight</th>
<th>Power Consumed</th>
<th>Net Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXCAL 1801-T/H</td>
<td>-75</td>
<td>W: 1150 D: 1500 H: 1120</td>
<td>17.3</td>
<td>1060</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>-45</td>
<td>W: 1470 D: 2620 H: 2200</td>
<td>17.3</td>
<td>1350</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>-45</td>
<td>W: 10 A/W: 16 D: 1390</td>
<td>19.4</td>
<td>1410</td>
<td>9</td>
</tr>
</tbody>
</table>

**Rapid Temperature Change**

<table>
<thead>
<tr>
<th>Type</th>
<th>Temp</th>
<th>Dimensions</th>
<th>Weight</th>
<th>Power Consumed</th>
<th>Net Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXCAL 1802-T/H</td>
<td>-75</td>
<td>W: 1150 D: 1500 H: 1120</td>
<td>17.3</td>
<td>1060</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>-45</td>
<td>W: 1470 D: 2620 H: 2200</td>
<td>17.3</td>
<td>1350</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>-45</td>
<td>W: 10 A/W: 16 D: 1390</td>
<td>19.4</td>
<td>1410</td>
<td>9</td>
</tr>
</tbody>
</table>

**CONSUMED POWER**

<table>
<thead>
<tr>
<th>Type</th>
<th>Temp</th>
<th>Dimensions</th>
<th>Weight</th>
<th>Power Consumed</th>
<th>Net Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXCAL 1802-T/H</td>
<td>-75</td>
<td>W: 1150 D: 1500 H: 1120</td>
<td>17.3</td>
<td>1060</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>-45</td>
<td>W: 1470 D: 2620 H: 2200</td>
<td>17.3</td>
<td>1350</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>-45</td>
<td>W: 10 A/W: 16 D: 1390</td>
<td>19.4</td>
<td>1410</td>
<td>9</td>
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</table>

**NET WEIGHT**

<table>
<thead>
<tr>
<th>Type</th>
<th>Temp</th>
<th>Dimensions</th>
<th>Weight</th>
<th>Power Consumed</th>
<th>Net Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXCAL 1802-T/H</td>
<td>-75</td>
<td>W: 1150 D: 1500 H: 1120</td>
<td>17.3</td>
<td>1060</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>-45</td>
<td>W: 1470 D: 2620 H: 2200</td>
<td>17.3</td>
<td>1350</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>-45</td>
<td>W: 10 A/W: 16 D: 1390</td>
<td>19.4</td>
<td>1410</td>
<td>9</td>
</tr>
</tbody>
</table>
To organise the structure of your chamber

- Integration of additional portholes on the sides, ceiling, door and even in the window (diameters between 80 and 200 mm).
- Integration of RGB4 portholes.
- Integration of specific customer windows, connectors or sensors adapted to your requirements.
- Integration of notched cabinet portholes for connecting products before inserting them into the cabinet.
- RGB4 portholes.
- Increased loading capacity for each level using reinforced shelves.
- Increased loading capacity placed on the base of the test space.
- Reversible door opening.
- Integration of additional portholes on the sides, ceiling, door and even in the window (diameters between 80 and 200 mm).
- Integration of inserts for precise mechanical assemblies.
- 316L stainless steel cabinet and nickel-plated evaporator to protect the test volume from chemical hazards.
- Air extractor for renewing the air inside the test volume.
- Customisation of the colour of your chamber.

To make your tests safe

- Sensor-controlled door opening status indicator.
- MINI/MAX electronic temperature safety unit on separate PT100 sensor.
- Pre-installation of an emergency stop to be interfaced with your test benches.
- Integration of dedicated thermal fuses.
- Variator to select the fan speed.
- Air dryer for preventing the formation of humidity by sweeping with dry air or nitrogen.

To improve the chamber’s environment

- Integration of an audible warning device on event or alarm.
- 3-colour tower light.
- Pre-installation of an emergency stop to be interfaced with your test benches.
- Integration of a demineralised water tank for use during humidity tests.
- Reinforced machinery soundproofing.
- Installation of a demineralised water generator for long-term humidity tests.
- Bottles of demineralised water.
- Installation of water filter cartridges for short-term humidity tests.
- U2 cartridge.
- Replacement of the water cooling system with a remote air-cooled condenser solution.
- Remote air-cooled condenser.
- Installation of an additional chiller to ensure cooling of the installation.
- Chiller.
To develop your tests

You have a multitude of input and output units for your customised adaptations and applications.

- Relative humidity sensor for measuring or regulating.
- PT100 data acquisition card or thermocouple.
- Additional data acquisition units.
- Specific operating mode development: regulation on the average of several sensors, incoming regulation information on dry contact, START & STOP for regulation and ventilation when taking measurements.
- Specific digital communication such as IEEE 488, and 0/10v analogue control.
- Remote Panel PC for controlling your peripherals remotely.
- Supports MODBUS communication protocol accessories.
- Module with 6 relay outputs/6 logical inputs.

Please contact us, we are continuously enhancing these features!

The information provided in this brochure is not legally binding. It may be changed by Climats without prior notice or justification.
As the key development strategy for Export relies on a large network of worldwide distributors. Our partners market and service Climats equipment all over the world; they are fully skilled in our technology and fully committed to a long-term relationship.