ICH
Stability & Photostability

Climacell / Friocell Climate Chambers: Temperature, Humidity & Optional Lighting

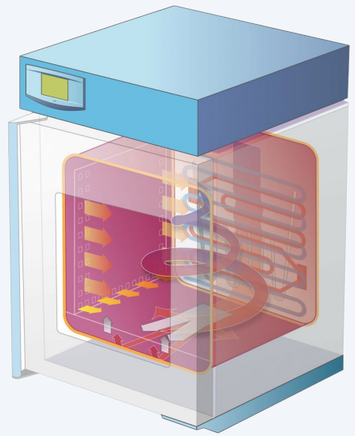
BMT USA. Pure Results.

Engineered for Accurate Stability Testing

Precise control of temperature, humidity, and optional lighting for accurate test results and product quality assurance.

BMT USA Climacell and Friocell climate chambers are designed to meet the exacting standards of ICH Q1A stability and Q1B photostability testing. These chambers provide precise control of temperature, humidity, and light conditions, ensuring accurate and reliable stability testing for pharmaceutical, cosmetic, and food and beverage applications. With a wide range of chamber volumes available, these versatile units can accommodate various loads to meet your specific testing requirements.

The addition of programmable UV/VIS shelf and door lighting enables ICH Q1B-compliant photostability testing, while the standard ECO or optional advanced EVO microprocessor control systems allows for real-time monitoring and adjustment of conditions. Our patented forced air convection system circulates air both vertically and horizontally, delivering rapid heating and cooling times with exceptional temperature uniformity for accurate test results.



Patented Forced Air Convection System

Simulated natural airflow for rapid heating and cooling.

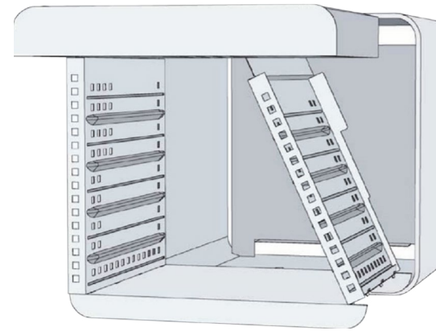
Our patented forced air convection system generates both vertical and horizontal airflow, moving in a spiral from the bottom of the chamber to the top, enabling rapid heating and cooling times with precise temperature uniformity. This process follows the same principals of natural airflow, ensuring an accurate simulation of climate conditions for consistent and reliable test results.

Chamber Design & Construction

Pharmaceutical-grade materials with intelligent design characteristics for lasting durability, improved hygiene, and efficient operation.

Climacell and Friocell devices are standard equipped with pharmaceutical-grade AISI 304 stainless steel chambers with five layers of insulation —including 2 inches of rock-wool—to help maintain internal conditions and improve efficiency. The main chamber walls are completely seamless with rounded corners. The inner chamber walls support the internal shelving system and are fully removable for easier cleaning and maintenance. A reinforced frame can also be added to support heavy loads.

The chamber doors feature a patented multi-point locking system that utilizes four locking posts, distributing force evenly across the entire door panel, rather than being concentrated at a single point. As a result, the door remains securely closed and sealed air-tight. Interior glass doors on Climacell and Friocell devices help mitigate the impact on internal conditions when there is a need to view into the chamber during an ongoing cycle.



Programmable ICH Q1B Lighting

Flexible lighting options for ICH Q1B photostability studies across diverse industries and applications.

UV/VIS Combination Shelf Lighting

- All data is valid for measurement 12 cm below the light shelf.
  - Model 111: up to VIS 12.2 klx, UV 1.05 mW/cm2
  - Models 222/404/1212: up to VIS 12.51 klx, UV 1.65 mW/cm2
  - Model 707: up to VIS 10.73 klx, UV – 1.44 mW/cm2

Single Wavelength UV and VIS Light Shelves

- VIS shelf, fluorescent light tubes:
  - Model 111: up to 16.5 klux
  - Models 222/404/1212: up to 18 klux
  - Model 707: up to 20 klux
- UV shelf, fluorescent light tubes:
  - up to 5 mW/cm2/s-1
  - mW/cm2/s-1 states how much UV light in mW is exposed to 1 square centimeter in 1 second.
- VIS LED shelves:
  - up to 30,000 lux

ECO & EVO Digital Controllers

Sophisticated digital control systems with fuzzy logic enabled microprocessor for precise control of process parameters.

The standard ECO digital controller and the advanced EVO digital controller employ a sophisticated fuzzy logic algorithm to analyze critical process parameters, including temperature, chamber volume, and other controlled variables. This continuous analysis enables precise real-time adjustments to input values, such as heating intensity and cooling levels, to efficiently maintain optimal chamber conditions.

To minimize the time required to achieve defined process parameters, each controller allows for fast temperature ramping without overshooting the setpoint—reducing the overall cycle time, power consumption, and recovery time. Each controller also provides 30-day data logging and FDA 21 CFR part 11 compliance when paired with optional Warmcomm 4.0F software.

ECO Digital Controller	EVO Digital Controller
• 3" LCD display with wide-angle vision and adjustable contrast levels	• 5.7" full color touch screen display
Microprocessor controller with fuzzy logic	
• 9 programs with 2 segments each for varying loads and parameters, up to 99 cycles	• Up to 100 programs with up to 100 segments each, unlimited cycles
• Real time programming and cycling	• Real-time programming and cycling with settings for temperature ramping and delayed start/stop
• Large display of conditions, including temperature and humidity with LED indicator of device functions	• Graphical display of parameters over the course of the cycle
Audible and visual alarms	
• Keypad lock against unauthorized access	• Multi-level user password authentication with display lock against unauthorized use
Multi-language support including English and Spanish	
-	• Fan adjustments in 1% increments
-	• Digital safety thermostat, Class 3
-	• Service programs for quick error diagnostics, includes remote access
-	• Online or offline data export
-	• Direct printing of protocols in PDF format
• Optional: USB, RS 232 and Ethernet ports	• SD memory card, USB drive and RS 232 port
• Optional: 30-day USB data logger *(standard in most 111, 222, 404, 707 and 1212 devices)*	• Integrated 30-day data logger with numerical and graphic display
Optional: BMS contacts (24V, 1A); 4-20mA contact	
• Optional: ECO+, increase program segments from 2 up to a total of 8 segments *(option is standard equipped on Climacell devices)*	• Optional: Communication+, USB and Ethernet connection with IP address for remote data transfer, control and diagnostics
Optional: FDA CFR 21 part 11 compliance with addition of Warmcomm 4.0F software	

Climacell ECO / EVO

Climate Chambers with Controlled Humidity, Optional Q1B Lighting

Working Temperature:

0°C up to 100°C *(10°C up to 90°C w/ humidity)*

- ECO -10°C / EVO -20°C min. temp. option available
- 160°C dry heat sterilization cycle (EVO)

Controlled Humidity (uniformity up to 2%):

ECO: 10% RH up to 95% RH
EVO: 10% RH up to 98% RH

- RH controlled in 1% increments (EVO)
- Equipped with active dehumidification

Heat Technology:

Patented forced air convection

Refrigerant:

R 134a / R449a -20°C min. temp. option

Lighting:

Optional UV/VIS shelf, door or combination lighting
[Refer to page 3 for options and data]

Model / Volume	Internal Dimensions (w x d x h)	External Dimensions (w x d x h)	Max # of shelves (spaced @ 2.8")	Usable Shelf Area (w x d)	Electrical
111 / 4ft³	ECO: 21.3" x 14.6" x 20.9" EVO: 21.3" x 15" x 21"	29.9" x 29.5" x 44.9" 30.7" x 29.7" x 47.8"	7	20.5" x 13.2"	230V 50/60Hz
222 / 8ft³	ECO: 21.3" x 20.5" x 29.9" EVO: 21.3" x 20.9" x 30.1"	29.9" x 35.4" x 53.9" 30.7" x 34.8" x 57.1"	10	20.5" x 19.1"	230V 50/60Hz
404 / 14.3ft³	ECO: 21.3" x 20.5" x 55.7" EVO: 21.3" x 20.9" x 55.7"	41.7" x 33.9" x 75" 43.1" x 34.8" x 74.4"	19	20.5" x 19.1"	230V 50/60Hz
707 / 25ft³	ECO: 37" x 20.5" x 55.7" EVO: 37" x 20.9" x 55.7"	57.5" x 33.9" x 75" 59.2" x 34.8" x 74.4"	19	36.3" x 19.1"	230V 50/60Hz
1212 / 43ft³	ECO: 3x21.3" x 20.5 " x 55.7" EVO: 3x21.3" x 20.9" x 55.7"	95.9" x 34.2" x 75" 99.6" x 35.4" x 75.6"	3x19	20.5" x (3x19.1")	230V 50/60Hz

All Climacell models are standard equipped with (2) stainless steel shelves.
All exterior height dimensions measured with legs. Measurements with casters may differ.

Friocell ECO / EVO

Temperature Controlled Chambers, Optional Q1B Lighting

Working Temperature:

0°C up to 100°C

- ECO -10°C / EVO -20°C min. temp. option available
- 160°C dry heat sterilization cycle (EVO)

Heat Technology:

Patented forced air convection

Refrigerant:

R 134a / R449a -20°C min. temp. option

Lighting:

Optional UV/VIS shelf, door or combination lighting
[Refer to page 3 for options and data]

Model / Volume	Internal Dimensions (w x d x h)	External Dimensions (w x d x h)	Max # of shelves (spaced @ 2.8")	Usable Shelf Area (w x d)	Electrical
55 / 2ft³	ECO: 15.7" x 14.6" x 13.8" EVO: 15.7" x 15" x 14"	24.4" x 25.2" x 34.4" 25.2" x 29.7" x 37"	4	15" x 13.2"	115V 50/60Hz
111 / 4ft³	ECO: 21.3" x 14.6" x 20.9" EVO: 21.3" x 15" x 21"	29.9" x 29.5" x 44.9" 30.7" x 29.7" x 47.8"	7	20.5" x 13.2"	115V 50/60Hz
222 / 8ft³	ECO: 21.3" x 20.5" x 29.9" EVO: 21.3" x 20.9" x 30.1"	29.9" x 35.4" x 50.2" 30.7" x 34.8" x 57.1"	10	20.5" x 19.1"	115V 50/60Hz
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1212 / 43ft³	ECO: 3x21.3" x 20.5 " x 55.7" EVO: 3x21.3" x 20.9" x 55.7"	95.9" x 34.2" x 75" 99.6" x 35.4" x 75.6"	3x19	20.5" x (3x19.1")	230V 50/60Hz

All Friocell models are standard equipped with (2) stainless steel shelves.
All exterior height dimensions measured with legs. Measurements with casters may differ.

BMT USA Equipment:

cGMP Steam & Terminal Sterilizers

Pure & Clean Steam Generators

Class 5 & 7 Depyrogenation Ovens

cGMP Washers

Laboratory Steam Sterilizers

Laboratory Washers

Laboratory Ovens

Laboratory Incubators

Climate & Stability Test Chambers

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