



ICH Stability & Photostability

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

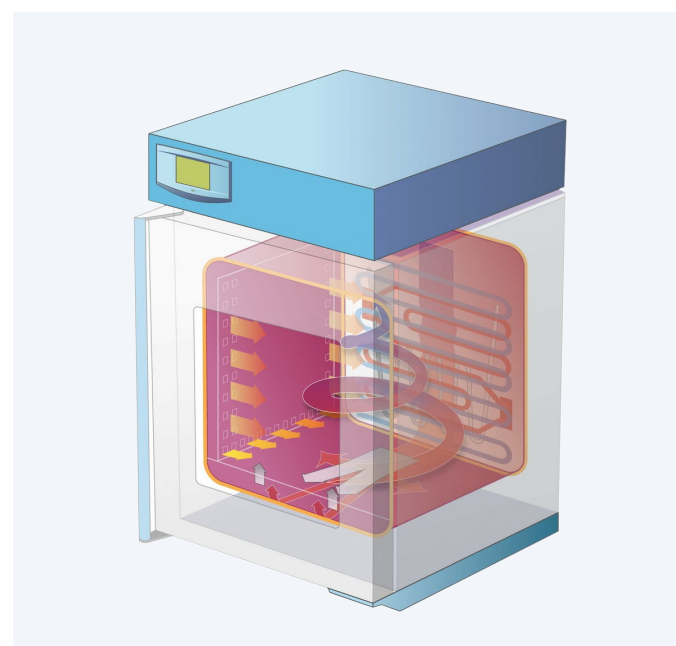


Engineered for Accurate Stability Testing

Precise control of temperature, humidity, and optional lighting for accurate test results and the assured quality of your products.

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 the pharmaceutical, cosmetic, and food and beverage industries. 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. BMT USA's patented forced air convection system circulates air both vertically and horizontally, delivering rapid heating and cooling times with exceptional temperature uniformity, ensuring accurate test results.



Patented Forced Air Convection System

Simulated natural airflow for rapid heating and cooling.

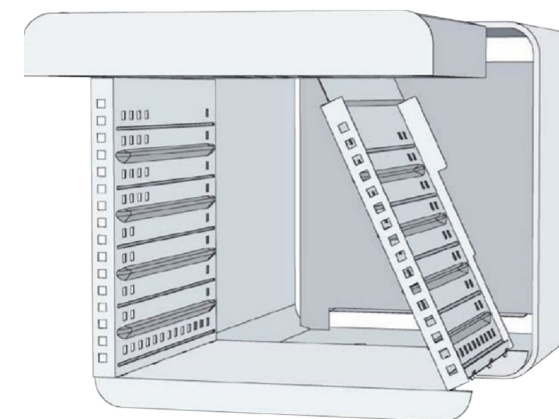
BMT's patented forced air convection system moves air both vertically and horizontally, creating precise temperature uniformity with rapid heating and cooling times. The process of heating from the bottom of the chamber to the top emulates natural airflow to accurately simulate climate conditions for reliable test results.

Chamber Design & Construction

Integrating pharmaceutical-grade materials with intelligent design characteristics for lasting durability, superior cleanliness, 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

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

Lighting options, including shelf or door lighting, UV or Vis light sources, and light intensity (controlled in 1% increments), enable Climacell and Friocell devices to meet the requirements for ICH Q1B Photostability studies:

- Combination LED Vis and fluorescent UV light shelves for exposure studies up to 13 lux and 1.8 W/m² (measured 12 cm below lights).
- Fluorescent UV or LED Vis light shelves for accelerated exposure studies.
- UV up to 2.99 W/m² and Vis up to 20,000 Klux (measured 12 cm below source).



ECO & EVO Digital Controllers

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

The ECO digital controller and advanced EVO digital controller utilizes a fuzzy logic algorithm to automatically assess process data, including operation temperature, chamber size, and other controlled elements. Based on the assessed data, the controller can make continuous adjustments to input values, such as heating intensity or cooling, to optimally regulate internal chamber conditions.

To minimize the time required to meet set process parameters, the controllers can quickly ramp up to the temperature set-point without overshooting. The result is reduced overall cycle times, power consumption, and recovery times. The controllers also provide 30-day data logging functionality and are FDA 21 CFR part 11 compliant when paired with optional Warmcomm 4.0F software.



ECO Digital Controller	EVO Digital Controller
<ul style="list-style-type: none"> 3" LCD display with wide-angle vision and adjustable contrast levels 	<ul style="list-style-type: none"> 5.7" full color touch screen display
Microprocessor controller with fuzzy logic	
<ul style="list-style-type: none"> 9 programs with 2 segments each for varying loads and parameters, up to 99 cycles Real time programming and cycling Large display of conditions, including temperature and humidity with LED indicator of device functions 	<ul style="list-style-type: none"> Up to 100 programs with up to 100 segments each, unlimited cycles Real-time programming and cycling with settings for temperature ramping and delayed start/stop Graphical display of parameters over the course of the cycle
Audible and visual alarms	
<ul style="list-style-type: none"> Keypad lock against unauthorized access 	<ul style="list-style-type: none"> Multi-level user password authentication with display lock against unauthorized use
Multi-language support including English and Spanish	
-	<ul style="list-style-type: none"> 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
<ul style="list-style-type: none"> Optional: USB, RS 232 and Ethernet ports Optional: 30-day USB data logger (standard in most 111, 222, 404, 707 and 1212 devices) 	<ul style="list-style-type: none"> SD memory card, USB drive and RS 232 port Integrated 30-day data logger with numerical and graphic display
Optional: BMS contacts (24V, 1A); 4-20mA contact	
<ul style="list-style-type: none"> Optional: ECO+, increase program segments from 2 up to a total of 8 segments (option is standard equipped on Climacell devices) 	<ul style="list-style-type: none"> 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 and Vis shelf and door lighting

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 / 4ft ³	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 / 8ft ³	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 / 14.3ft ³	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 / 25ft ³	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 / 43ft ³	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 and Vis shelf and door lighting

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 / 2ft ³	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 / 4ft ³	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
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1212 / 43ft ³	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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