

ICH/FDA Stability Testing Chambers

BioCold environmental chambers combine the modern technology and innovation today's applications require with the old-fashioned customer service and value customers deserve.

Our microprocessor-based controls, together with thermoelectric cooling and ultrasonic humidification, allow for confident temperature mapping and validation, easily exceeding ICH/FDA guidelines for stability testing. BioCold chambers control temperature within $\pm 0.3^{\circ}\text{C}$ or better, and humidity within $\pm 2\% \text{RH}$ or better. With a temperature range of 20°C to 60°C , and humidity up to $85\% \text{RH}$, our ICH chambers are suitable for a wide range of long-term, intermediate, and accelerated testing applications.

Thank you for your interest in BioCold Environmental chambers. Please review the information below to see if we can assist with your stability testing and storage needs. In addition to our ICH chamber series, we also offer chambers for cold storage, incubation, and insect rearing, as well as a complete line of prefab walk-in environmental rooms. If your application requires features not listed below, please call to learn about our other product lines.

John Herdlein
President



Model BC5600-ICH

BioCold ICH Chamber Series

Model	Doors (Solid)	Shelves	Exterior Dimensions L x D x H	Interior Dimensions L x D x H	Electrical
BC3100-ICH	1	3	27½" x 33¾" x 77¾"	22½" x 27" x 58¾"	115/1/60 hz, 15amp
BC5600-ICH	2	6	52¾" x 33¾" x 77¾"	47½" x 27" x 58¾"	115/1/60 hz, 15amp
BC8500-ICH	3	9	76½" x 34¾" x 78¼"	73¼" x 29" x 60¾"	115/1/60 hz, 15amp

Standard Features

- **Superior, Straightline Temperature and Humidity Control** Capable of achieving temperatures of 20° to 60°C ($\pm 0.3^\circ\text{C}$ or better) and relative humidity of 50% to 85% RH ($\pm 2\%$ RH or better).
- **Microprocessor-Based Controls** BioCold ICH series chambers come standard with two microprocessor-based controls with dual digital displays (actual value and set value). Features PID with Fuzzy Logic and Autotune to ensure straight -line temperature and humidity control.
- **Ultrasonic Humidification** Ultrasonic humidification permits precise humidity control without adding heat to the system. No steam boilers. BioCold's self-powered vapor generator fan runs only when the system calls for humidity, isolating the vapor supply from the chamber and eliminating the moisture climb which can occur with continuous fan operation. A vapor distribution plenum ensures uniform distribution throughout the chamber.
- **1" Thermocouple Instrument Port**
- **8' Power Cord** For 115/1/60hz connections on a 15-amp dedicated circuit.
- **Thermoelectric Cooling** Thermoelectric cooling allows for quiet and energy-efficient chamber operation in a lab environment. Balanced with resistive heaters, our thermoelectric units allow for precise temperature control even at below-ambient conditions.
- **Rear Wall Plenum** Assures positive airflow throughout chamber for superior temperature and humidity control and uniformity.
- **Coated Wire Shelving Racks** Each unit comes standard with white coated wire shelves per door. Single door models have 3 shelves; two-door models have 6 shelves; and three-door models come standard with 9 shelves. Additional shelving or stainless steel upgrade available upon request.
- **Solid Stainless Steel Self-Closing Door**
- **Stainless Steel or White Aluminum Interior** Depending on model chosen. All models have stainless steel floor.
- **300 Series Stainless Steel Exterior**
- **5" Casters**

Additional Options

- Double-pane tempered glass doors
- Interior GFI duplex or quadruplex outlets
- Honeywell 7-day, 10", 2-pen chart recorder for charting temperature and %RH
- Paperless data logging system
- NIST certification (recorder temperature only)
- NIST certification (control temperature only)
- 1½" access ports
- Additional shelving
- Stainless steel wire shelving
- Hot gas bypass refrigeration system for operation at temperatures below 20°C

Principles of Operation

Thermoelectric Cooling

Thermoelectric cooling allows for quiet and energy-efficient chamber operation in a lab environment. Balanced with resistive heaters, our thermoelectric units allow for precise temperature control even at below-ambient conditions.

Ultrasonic Humidification

Generating water vapor ultrasonically offers many benefits over electric steam generators or boilers, including electrode steam generators. Those who work with humidity controlled chambers know the problems associated with steam. Vapor generated ultrasonically is adiabatically changed from the liquid state to the gas state without any change of energy and without adding any heat to the system. Ultrasonic humidification also avoids the challenges of corrosion, high power consumption, and expensive burnt out heaters, float switches, and electrodes.

BioCold's Ultrasonic Vapor Generator is self-powered and self-contained. Why is self-powered important? Other companies using ultrasonics require the air pressure inside the chamber to continuously move air across the water reservoir. This means that even when the ultrasonic humidifier is off, these systems will continue to draw moisture from the reservoir and add it to the system. Humidifiers powered by chamber air pressure have no way of interrupting the air flow.

BioCold uses a self-powered fan generator that delivers vapor to the chamber only when vapor is called for and only when the ultrasonic transducers are energized. Vapor is instantly switched on and off by the microprocessor-based humidity controller, giving BioCold the ability to add moisture finitely. With its self-powered ultrasonic vapor generator, BioCold chambers provide superior humidity control, even at below-ambient conditions.

Thermoelectric Dehumidification

As new ICH standards are developed, the temperature and humidity guidelines may require chamber dehumidification to achieve the appropriate humidity levels. Thermoelectric cooling gives us the ability to strip water vapor out of the air regardless of ambient humidity conditions. We then add ultrasonic humidity back into the system, bringing the humidity level back, as described above, to specified %RH levels.

Vapor Distribution Plenum

Once vapor is generated, it must be distributed throughout the chamber. While ultrasonic humidification does not add heat to the system, it has been found that if vapor is introduced into the chamber in only one area there will be an "evaporative cooling" effect as the water vapor continues to expand at the bottom of the plenum. This effect may be as great as -3°C, and can upset temperature mapping. At BioCold, we use a vapor distribution plenum that evenly distributes vapor throughout the chamber.

The results of our **self-powered Ultrasonic Vapor Generator with vapor distribution plenum** are powerful and dynamic.