

# Friocell EVO

## Freeze Thaw Chambers

Patented Forced Air Convection with Cooling



### Temperature:

-20°C up to 100°C

### Sterilization Cycle Option:

160°C dry heat

### Refrigerant:

R 449a

### Chamber:

AISI 304 stainless steel (AISI 316 option available).  
Double wall, seamless main chamber with removable inner chamber.

### Optional Lighting (EVO):

- Programmable UV & VIS ICH Q1B lighting for photostability studies.
- VIS LED shelf and door lighting.
- Light intensity controlled in 1% increments.

### Electrical:

115V 50/60Hz: 55, 111, 222, 404, 1212  
230V 50/60Hz: 707

### Optional Equipment:

- Stainless steel exterior: AISI 304 or 316.
- AISI 316 stainless steel chamber.
- Stacking frame for 111 devices.
- 160°C sterilization cycle on EVO models.
- 1" (25mm) / 2" (50mm) / 4" (100mm) access port.
- Flexible PT 100 temperature sensor.
- Ethernet communication port
- Automatic key and door lock.
- Door sensor and alarm.
- Waterproof interior electrical socket: 230V.
- Rolling cart for 111 and 222 models.
- 4-20mA and BMS contacts (24V, 1A).
- IQ/OQ protocols with 9pt. or 27pt. temperature mapping.
- Warmcomm software:
  - 4.0B - data monitoring.
  - 4.0P - data monitoring and control.
  - 4.0F - FDA 21 CFR part 11 compliance.

Friocell EVO freeze thaw chambers produce temperatures as low as -20°C up to 100°C, creating the optimal conditions for conducting freeze thaw studies of materials, including asphalt, concrete, adhesives, and coatings. The chambers are also ideal for testing food and beverage, pharmaceutical, and cosmetic products and packaging.

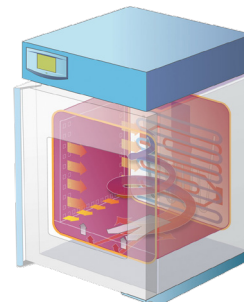
### Key Benefits:

- Pharmaceutical-grade stainless steel chamber for easier cleaning and sterilization.
- Patented refrigeration system offer accurate and fast simulation of natural processes and reduces the risk of sample drying.
- Temperature ramping and cycling.



### EVO Controller:

- 5.7" LCD touch display.
- Fuzzy Logic algorithm constantly monitors chamber conditions and continuously optimizes parameters.
- (100) programs with (100) segments each for varying loads and parameters.
- Real-time programming and cycling with settings for temperature ramping.
- Fan adjustments in 1% increments.
- Programmable audible & visual alarms - temperature, time & humidity.
- Service programs for quick error diagnostics.
- USB device, RS232 & optional Ethernet port.
- Integrated SD card 30-day data logger & multi-level secure user authentication.
- Optional FDA CFR 21 part 11 compliance.



### Patented Forced Air Convection System:

Our patented force air convection system provides simultaneous vertical and horizontal airflow for precise temperature uniformity and fast heating and cooling times. The process of heating from the bottom of the chamber to the top mimics natural airflow, allowing for a more accurate simulation of climate conditions.

Friocell EVO Freeze Thaw Technical Data		Model	55	111	222	404	707	1212
<b>Interior Dimensions</b>  <b>Chamber:</b> AISI 304 stainless steel (AISI 316 stainless steel option available)	Volume	ft <sup>3</sup>	1.9	3.9	7.8	14.3	25	43
		liters	55	111	222	404	707	1212
	Width	inches	15.7	21.25	21.25	21.25	37	3 x 21.25
		mm	400	540	540	540	940	3 x 540
	Depth	inches	15	15	20.9	20.9	20.9	20.9
		mm	380	380	530	530	530	530
	Height	inches	14	21	30.1	55.7	55.7	55.7
		mm	355	535	765	1415	1415	1415
<b>Exterior Dimensions</b>	Width	inches	25.2	30.7	30.7	43.3	59	92.9
		mm	640	780	780	1100	1500	2360
	Depth	inches	29.7	29.7	34.8	34.8	34.8	35.4
		mm	755	755	885	885	885	898
	Height (Legs L, Casters C)	inches	34.4L/37C	41.1L/46.7C	50.2L/57.1C	75L/35C	75L/35C	75L/75.6C
		mm	875L/940C	1045L/1187C	1275L/1450C	1905L/1890C	1905L/1890C	1905L/1921C
<b>Shelves: Stainless Steel</b>	Capacity: # of shelf guides in chamber side walls	maximum #	4	7	10	19	19	3 x 19
		standard #	2	2	2	2	2	6
<b>Shelf Distance</b>	Min. distance between trays	inches	2.8	2.8	2.8	2.8	2.8	2.8
		mm	70	70	70	70	70	70
<b>Useable Shelf Area</b>	Width x Depth	inches	15x13.2	20.5x13.2	20.5x19.1	20.5x19.1	36.3x19.1	20.5x19.1x3
		mm	380x335	520x335	520x485	520x485	920x485	520x485x3
<b>Maximum Shelf Load</b>	One Shelf	lbs	44.1	44.1	66.1	66.1	110.2	66.1
		kg	20	20	30	30	50	30
	Total Per Unit	lbs	110.2	110.2	154.3	220.5	286.6	661
		kg	50	50	70	100	130	300
<b># Outer Metal Doors</b>			1	1	1	1	2	3
<b># Inner Glass Doors</b>			1	1	1	1	2	3
<b>Volume of Steam Space</b>		ft <sup>3</sup>	3.2	5.9	10.8	18.7	31	61.9
		liters	91	167	305	530	878	1753
<b>Operation Temperature</b>	From -20°C	up to °C	100	100	100	100	100	100
<b>Temperature Accuracy</b>	Distribution @ 10°C	± °C	<0.5	<0.5	<0.5	<1	<1	<0.6
	Distribution @ 37°C	± °C	<0.5	<0.5	<0.5	<1	<1	<0.5
	Uniformity	± °C	<0.2	<0.2	<0.2	<0.3	<0.4	<0.2
<b>Heating Time to 37°C From the Ambient Temperature</b>		minutes	<11	<11	<11	<13	<13	<30
<b>Cooling Down Time From 22°C to 10°C</b>		minutes	<21	<21	<17	<19	<21	<21
<b>Recovery time after door opened for 30 s according to DIN 12880</b>	@ 37°C	minutes	<5	<5	<2	<2	<6	<10
	@ 50°C	minutes	<6	<6	<3	<4	<6	<10
<b>Heat Emission</b>	@ 37°C	W	55	70	63	123	148	200
<b>CO<sup>2</sup> Concentration</b>		%	0.1 - 20		-		0.1 - 20	
<b>CO<sup>2</sup> Required Pressure</b>		Bar/PSI	0.3-0.7/5--10		-		0.3-0.7/5--10	
<b>Noise Level of Complete Device</b>		dB	45	46	50	56	58	60
<b>Electrical Data</b>	Max Consumption 50/60Hz	W	700/850**	1000/1150**	1150/1300**	1700	2000/2050**	2500/3300**
		A	7.6	7.7/10	9.2/11.2	16	17.9	11.6
		V	115	115	115	115	230	115
<b>IP Code</b>			IP20	IP20	IP20	IP20	IP20	IP20
<b>Weight</b>	Net	lbs	209.4	242.5	315.3	507.1	565.2	1201.5
		kg	95	110	143	230	270	545
	Gross	lbs	396.8	485	579.8	859.8	1102.3	1907
		kg	180	220	263	390	500	865
<b>Weight -20°C</b>	Net	lbs	231.5	44.1	337.3	551.2	639.3	1201.5
		kg	105	120	153	250	290	545
	Gross	lbs	419	507.1	601.9	881.8	1124.4	1907
		kg	190	230	273	400	510	865

\*\*Value at cooling down to -20°C