MMM Group

FRIOCELL® EVO

Incubator with Forced Air Circulation and Active Cooling

NEW



Innovative Heat Technology





protecting human health

Tradition, Quality, Innovation

Since its establishment in 1921, BMT Medical Technology s.r.o., the traditional manufacturer of medical and laboratory technology, has been gradually transformed from a small regional company to an international corporation.

In 1992, it became a member of the European MMM Group which has been operating on the world markets since 1954 as an important supplier of systems for the health care industry, science and research. With its comprehensive offer of products and services, sterilization and disinfection devices for hospitals, scientific institutes, laboratories and pharmaceutical industry, MMM Group has established itself as an outstanding quality and innovations producer on the global markets.

The knowledge and experience gained during the implementations of individual supplies for our customers all over the world, and the technical innovations have been permanently and positively influencing the development, construction and production of our devices. High level of our work has also been confirmed by the number of patents and industrial designs as well as an easy implementation of individual device adjustments.

MMM Group – excellence in medical and laboratory technology.

Basic Characteristics

Volume: 55, 111, 222, 404, 707, 1212 l
Working temperature:
0.0°C up to 100°C
(options of –20°C and +160°C decontamination)
Refrigerant:
R449a (down to –20°C),
R134a (down to 0°C)
Inner glass door
Interior: stainless steel,
mat. No. 1.4301 (AISI 304)

FRIOCELL® EVO

Precise and Energy-Saving Incubator with Active Cooling

The device FRIOCELL® provides time and space-precision tempering of materials in the field of bio-technologies, botany, zoology, food processing, cosmetics, chemistry, etc. A unique cooling system offers exact and economic simulation of selected natural processes; it reduces evaporation of samples and allows extremely low temperature conditions regeneration times.
In case of optional equipment buying, the device offers regulation of CO_2 respectively other gases concentration or space-homogenous lighting in the field of visible or UV light with adjustable intensity and possibility of intensity measuring using special probes. Thanks to the unique combination, the device offers a wide range of possible applications to users.

Meeting the requirements of regulations
2014/35/EU, 2014/30/EU, ICH 279/95 Option 2, FDA 21 Part 11, 2011/65/EU, 517/2014/EU.



Applications



Pharmaceutical Industry

Tests of photo stability according to ICH 279/95 Option 2, quality tests of pharmaceutical raw materials



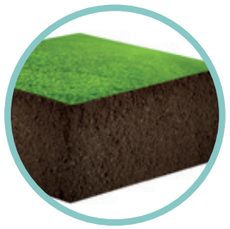
Water Management

Testing of water quality in municipal water preparing plants (BSK5 at 5°C)



Cosmetic Industry

Durability testing, testing of cosmetic products or primary materials stability



Agriculture

Enzymatic reactions and microbiologic activities in soils



Plastics Industry

Temperature stabilisation of reference samples



Zoology

Simulation of conditions for living organisms research – cultivation of fish eggs, cultivation of insects development stages



General and Applied Industry (research field)

E.g. cultivation of tissue cultures – human or animal ones



Botany

Studies of germination, green plants growing for further research



Food Industry

Tests of food products expiration date



Paper Industry

Long-term testing of paper quality



Beverage Industry

Rapid beer quality test (12h/5°C+12h/40°C)



Paints and Varnishes Industry

Paints stability testing – resistance to UV radiation



The New Control System Offers

- 5.7 inch (14.5 cm) touch screen display
- Microprocessor Fuzzy logic process control
- Intuitive control via colour icons
- Graphic configuration of a new program
- Transparent displaying of data course at the cycle
- Protective thermostat class 3
- Acoustic and visual alarm
- Multi-level users administration (corresponding to FDA 21 Part 11)
- Keyboard lock against unauthorised handling
- Data encryption and non-manipulability (corresponding to FDA 21 Part 11)
- Up to 100 programs and up to 100 segments for each program
- Yearly data logger in graphic and numeric form
- On-line or off-line data export
- Prepared service programs for fast diagnostics of faults
- Easy service diagnostics including remote access
- Multi-language communication
- Direct printing of protocols in PDF format via Warmcomm 4.0
- Easy user configuration of the device
- SD memory card, USB Host and RS 232 standardly included
- WIFI connection, USB device or Ethernet interface with own IP address for remote data transfer, control and diagnostics (optional equipment)
- Programming of ramps, real time and cycling
- Fan setting 0–100%
- Main ON/OFF switch for security reasons
- Device state LED indicator

Connectivity



- SD card
- RS 232
- USB Device
- Ethernet / Internet (optional equipment)
- WIFI (optional equipment)
- USB Host (optional equipment)
- BMS remote alarm (optional equipment)

Integrated data logger, SD card



Compatible thermo-printer via RS 232



Specified desk-top printer (USB/WiFi)



Connection of software WarmComm 4.0

- Smartphones CLC monitor



- local



- remote (internet)

Data Outputs

Thanks to the most up-to-date components of electronic, the device FRIOCELL® EVO does not have any data peripherals connection limit. The basic configuration contains traditional and reliable RS 232, USB Device and the SD card as the data carrier. The device can be easily extended with the Wifi 802.11b/g module with up to 100 meters reach, there is also available the USB Host for bi-directional USB communication and for remote connection there is the Ethernet (RJ 45) connection. Proper IP address allows easy connection to PC or selected printer, respectively other usual data periphery (Smartphone, Netbook, etc.). Thanks to the open platform and adjusted data format it is also possible to configure remote connection and to work with on-line data in remote mode (internet).

WarmComm 4.0

Universal Data Administration with Devices of the MMM Group





messages

- internet
- GSM

- connectible to all the devices of the MMM Group
- stable platform of the SQL library
- user-friendly environment
- Connection via the Ethernet to unlimited number of devices via RS 232,USB, then limited by the number of PC ports
- bilateral communication – data monitoring and device control
- compatibility with older lines of heat technology devices
- Client-Server architecture
- service module for local and remote diagnostics
- three levels depending on client´s requirements (B-P-F)
- compliance with FDA CFR 21 Part 11 (version F)
- web support, on-line updates
- protected licence policy
- unpretentious to HW requirements, compatible with MS Windows
- validation documentation IQ/OQ



FRIOCELL® EVO

Comfort Machine with Superior Parameters

MMM Group offers traditionally **fully ranged size** of the cabinet, from personal size 55 litres, up to new size 1 212 litres, with the best ratio cost/performance. Patented **vertical air flow** with preheating chamber and asymmetrically perforated panels ensure the well proven vertical spiralled air flow with the best spatial homogeneity.

Deep experience of the factory engineers and many years of careful development help with sophisticated **Fuzzy logic** control system. By means of the Fuzzy logic are continually evaluated the current process conditions as size of chamber, set parameters, quantity of the samples inside and herewith optimizing heating, cooling and steaming performance.

Practical large and popular door handle, robust wheels with brakes and 220° (with exception of size 707, 1212) openable main door(s) contributes to high user friendly character of the device. Light grey with light blue device colours highlighted by dark blue smiley control panel cause a pleasant feeling of harmony in the user every morning



New smart design
with user-friendly control panel

Wifi connection
for wireless connection to PC / SMARTPHONE (optional equipment)

Fuzzy logic microprocessor control
for start time minimisation

Improved fixation of the upper construction for easy service access

Effective LED diods
(up to 30 000 lx) low-temperature programmable exposition lighting (optional equipment)

Rigid, but airy trays for efficient air flow in the chamber

Stainless Steel Chamber (AISI 304)
facilitating regular device cleaning

Easily removable inner panels
for easy chamber cleaning

Heating and cooling elements placed in the pre-chamber with maximal transfer surface for efficient heat exchange

Inner fully insulated glass door
made of safety glass Security Izolas according to EN 12150-2:2004

More intense bed slope
for easier condensate drain

SD memory card
for data transfer

Remote service diagnostics
using proper IP address

Touch screen
with graphic interface

Main switch ON/OFF
safe device stopping

Increased maximal temperature up to 160°C for the chamber decontamination (optional equipment)

Automatic defrosting system
(optional equipment)

Vertical construction of the case
means space savings in your lab

Efficient chamber insulation for long-term stability of parameters in the chamber

Improved cooling system
for shorter recovery times

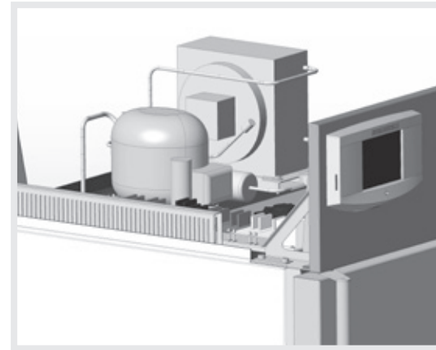
Unique vertical programmable system of air flow in the chamber
for precise conditions of the process and short recovery times

Four-point adjustable door fixation
for perfect door sealing

Caster with a break for easy and safe device handling
(for sizes 404, 707, 1212)

Door closing and securing mechanism for easy and safe door closing (Patent protected)







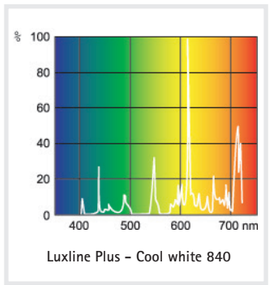


Programmable Exposition Lighting

New generation of the FRIOCELL® EVO device offers wide possibilities of selected lighting use. The variability of placement, selection of light sources, user friendliness and possibility of fluent intensity control meet even the most demanding requirements towards applications with exposition lighting.

Fluorescent Tubes in Doors





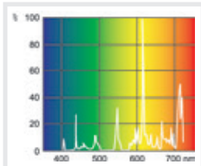
Luxline Plus - Cool white 840

Traditional placement of the light case with new design and increased intensity of lighting (up to 36 000 LUX). Exposure of the whole cross-section of the chamber with the lowest purchase costs and minimal influence on conditions in the chamber. Program-controlled switching on and off of the lighting (ZAP-VYP) for FRIOCELL® ECO. Program-controlled regulation of intensity within the range of 10-100% in increments of 1%, which can be completed with intensity measuring for FRIOCELL® EVO. Suitable for industrial simulation of materials ageing or undemanding processes of growth simulations. Simulation of day and night conditions. Available for FRIOCELL® ECO + FRIOCELL® EVO.

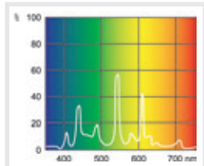
Fluorescent Tubes in Shelves



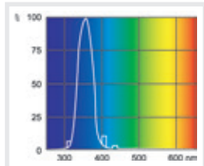
A vertical source of up to three light cases with direct lighting and variable height of lighting. Even lighting of the whole shelf and optimal use of the chamber volume for the area size lighting. Efficient balancing of temperature emissions thanks to perforation of cases and precise regulation of conditions in the chamber even under full lighting. Maximal intensity 23 000 LUX (12 cm below the source). Program-controlled switching on and off of the lighting (ZAP-VYP) for FRIOCELL® ECO. Program-controlled regulation of intensity within the range of 10-100% in increments of 1%, which can be completed with intensity measuring for FRIOCELL® EVO. Typical for tests of photo-stability or basic growth simulations in botany. Simulation of day and night conditions.
Available for FRIOCELL® ECO + FRIOCELL® EVO.
Different colours of the light source.



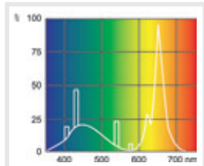
Luxline Plus
- Cool white 840



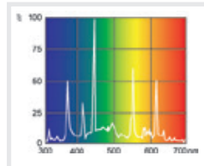
Luxline Plus
- Day light - 860



Black light blue



Gro-Lux: increased blue and red share - support of photobiological plants processes



Full spectrum light source: Activa (Not suitable for photostability testing)

LED Lighting in the Door



Economic solution of white exposition LED lighting with higher intensity (up to 21 000 LUX).
Exposure of the whole cross-section of the chamber with low temperature emissions. Program-controlled switching on and off of the lighting (ZAP-VYP) for FRIOCELL® ECO. Program-controlled regulation of intensity within the range of 10-100% in increments of 1%, which can be completed with intensity measuring for FRIOCELL® EVO. Suitable for industrial testing with high demands towards intensity. Simulation of day and night conditions. May be completed with intensity measuring.
Available for FRIOCELL® ECO + FRIOCELL® EVO.

White LED Lighting in Shelves



Precise horizontal lighting with white or colour LED lighting with maximal intensity (up to 30 000 LUX), low temperature emissions of the light source, variability of enlightened cases placement. Program-controlled switching on and off of the lighting (ZAP-VYP) for FRIOCELL® ECO. Program-controlled regulation of intensity within the range of 10-100% in increments of 1%, which can be completed with intensity measuring for FRIOCELL® EVO. It is suitable for industrial use or use in botany. Maximal use of enlightened surface of shelves in relation to the chamber volume. Simulation of day and night conditions. May be completed with intensity measuring.
Available for FRIOCELL® ECO + FRIOCELL® EVO.

Configuration for typical applications

Based on our experience we offer optimal configurations for selected applications, typical for FRIOCELL®.



Botany

Studies of germination, green plants growing for further research



Pharmaceutical Industry

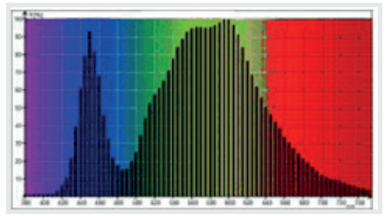
Tests of photo stability according to ICH 279/95 Option 2, quality tests of pharmaceutical raw materials

Growth Chamber - White



Exact growth chamber with variable growth height and full-spectrum fluently controllable LED lighting.

- Base used FRIOCELL® EVO
- Chamber sizes 111, 222, 404, 707, 1212
- Up to four floors with LED lighting
- Up to 3,4m² of lighted surface
- Full-spectrum stable white LED lighting with fluent intensity regulation (step 1%)
- Maximal intensity up to 330 µmol/m²/s*
- Maximal growth height up to 1300 mm
- Automatic defrosting
- CO_2 regulation (option)



*) measured 12 cm below the Shelf

Growth Chamber - Spectral



Growth chamber optimising high lighting intensity with optimal colour spectrum of LED source for photosynthesis and low power consumption.

- Base used FRIOCELL® EVO
- Chamber sizes 111, 222, 404, 707, 1212
- Up to four floors with LED lighting
- Up to 3,4m² of lighted surface
- Diversified blue-red-fared (2:2:1) LED source optimised for photosynthesis with fluent regulation of individual light components
- Maximal intensity up to 311 µmol/m²/s*
- Maximal growth height up to 1300 mm
- Automatic defrosting
- CO_2 regulation (option)

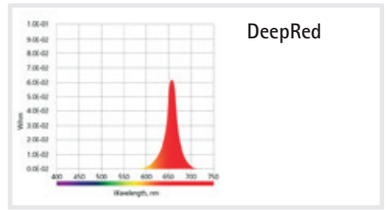
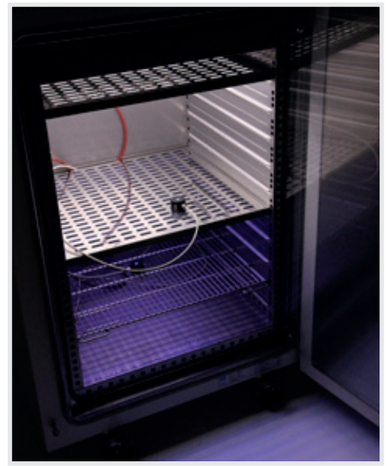


Photo-stable Chamber



Chamber with combined or separated VIS-UV source of light with independent control and automatic assessment of photo stability test.

- Base used FRIOCELL® EVO
- Chamber sizes 111, 222, 404, 707, 1212
- Three combinable VIS-UV lighted shelves or two VIS + one UV lighted Shelf
- Automatic control of process duration
- Automatic assessment of exposure dose (with option VIS and UV measuring)
- High intensity of lighting – up to 20,000 LUX and 3,0 mW/cm²/s-1*
- Short exposition times
- High light homogeneousness for equal lighting of all the samples
- Printing of protocols for individual exposition doses with confirmation
- Automatic defrosting



Accessories Included

Each FRIOCELL® EVO is supplied with standard equipment which does not have to be additionally ordered and it makes a standard part of delivery:



Touch screen



Communication ports RS 232 and USB host



SD card



Multi-conductor temperature sensor



Sealing inner glass door



2 stainless steel trays

Optional Equipment

Thanks to modular construction of our devices even FRIOCELL® EVO may be additionally equipped according to your preferences with many additional options. FRIOCELL® EVO may then serve as a chamber for testing of photo-stability, light simulation of day and night, processes with CO_2 control, hot-air decontamination, etc.

1. Hot-air decontamination 160°C
2. Additional cooling –20°C
3. Flexible temperature sensors
4. LED light shelves
5. Exposition lighting in doors
6. Light sensors of exposition
7. Defrosting system
8. CO_2 control
9. Software WarmComm 4,0
10. Data module USB device, Ethernet, wi-fi
11. Mechanic door lock
12. Electromagnetic door lock
13. Trays or shelves
14. Access port Ø 25, 50, 100 mm
15. Programmable inner socket
16. External printer
17. Multi-point temp. / humidity measuring
18. IQ/OQ protocols







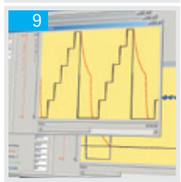






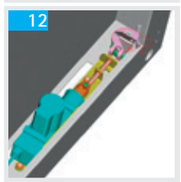


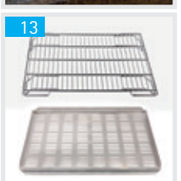


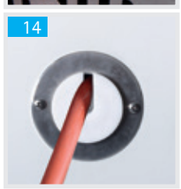


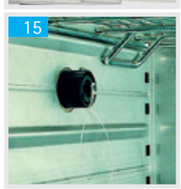


















Technical Parameters

FRIOCELL® EVO (FC EVO)			55	111	222	404	707	1212
Technical data Internal space - chamber, stainless steel DIN 1.4301 (AISI 304)	volume	Approx. l	54	110	219	404	704	1408
	width	mm	400	540	540	540	940	3×540 (1905)
	height	mm	355	535	765	1415	1415	1415
	depth	mm	380	380	530	530	530	530
Volume of the steam space		Approx. l	91	167	305	530	878	1753
External dimensions (including door, Handle H and caster C)	width	mm	640	780	780	1100	1500	2530
	height	mm	940H	1187H	1450H	1890C	1890C	1921C
	depth	mm	755	755	885	885	885	898
Package – dimensions (three-layers carton)	width	Approx. mm	990	992	1120	1332	1682	2742
	height (incl. palette)	Approx. mm	1300	1650	1746	2200	2190	2240
	depth	Approx. mm	830	954	952	1062	1064	1137
Weight	nett	kg	95/105**	110/120**	143/153**	240/250**	280/290**	519/545**
	brutt (carton)	kg	180/190**	220/230**	263/273**	390/400**	500/510**	839/865**
Shelves of stainless steel *)	shelves	max. No.	5	7	10	19	19	3×19
	standard equipment	pcs. included	2	2	2	2	2	6
	min. distance between shelves	mm	70	70	70	70	70	70
	Storage area (w × d)	mm	380×335	520×335	520×485	520×485	920×485	520×485
Maximal load *)	per 1 tray	kg/screen	20	20	30	30	50	30
	for a shelf	kg/shelf	20	20	30	30	20	30
	total inside of device	kg/case	50	50	70	100	130	300
Number of outer metal doors		psc.	1	1	1	1	2	3
Number of inner glass doors		psc.	1	1	1	1	2	3
Electrical data	max. power requirement	W	700/850**	1000/1150**	1150/1300**	1700/1700**	2000/2050** ***	2500/3300**
	mains 50/60 Hz	V	115/230	115/230	115/230	115/230	115/230	115/230
IP Code			IP20	IP20	IP20	IP20	IP20	IP20
Temperature data Working temperature	from 0.0°C from –20.0°C	to °C to °C	100 (decontamination 160°C) 100 (decontamination 160°C)					70 70
Temperature accuracy	in space at 10°C	Approx. (±) °C	<0,5	<0,5	<0,5	<1	<1	<0,6
	in space at 37°C	Approx. (±) °C	<0,5	<0,5	<0,5	<1	<1	<0,5
	in time	Approx. (±) °C	<0,2	<0,2	<0,2	<0,3	<0,4	<0,2
Heating/up time to 37°C from the ambient temperature		min	<11	<11	<11	<22	<13	<30
Cooling/down time from 22°C to 10°C		min	<21/<11**	<21/<11**	<17/<14**	<19/<11**	<21/<22**	<21
Recovery time after 30 s of door opening according to DIN 12 880	at 37°C	min	<5	<5	<2	<10	6	10
	at 50°C	min	<6	<6	<3	<13	6	10
Heat emission	at 37°C	Approx. W	55	70	63	123	148	200
Complete device noise level		dB	45/50**	46/52**	50/56**	56/58**	58/65**	60
CO_2 concentration		%	0,1-20				-	0,1-20
Required pressure CO_2		bar/psi	0,3-0,7/5-10**				-	0,3-0,7/5-10**

Note: All technical data are related to 22°C ambient temperature and ± 10% voltage swing (if not specified).
For other parameters see section Electric connections.

*) Approx. 50% of the tray area can be filled in a way a uniform air circulation is enabled inside the chamber.

**) Value at cooling up to -20°C.

***) max. power requirement with decontamination 2500 W

The values may differ depending on specific charge and media parameters.

Change in the design and make reserved.

Make Acquaintance With Our Further Offers ...

Unique Line... Cell

CE

Designation	Type marking	Laboratory case type	ECO line / EVO line	Linie Standard / Linie Comfort	Natural air circulation	Forced air circulation	Temperature range in °C (Optional equipment)	Volume 22 (l)	Volume 50 (l)	Volume 55 (l)	Volume 111 (l)	Volume 190 (l)	Volume 222 (l)	Volume 404 (l)	Volume 707 (l)	Volume 1,212 (l)
drying, tempering, sterilization	ECOCELL®	drying oven	●		●		5*–250/300	●		●	●		●	●	●	
	DUROCELL	drying oven with protective layer of inner space EPOLON	●		●		5*–125	●		●	●		●			
	VENTICELL®	drying oven	● / ●			●	10*–250/300	●		●	●		●	●	●	
	STERICELL® ***	hot-air sterilizer		●		●	10*–250	●		●	●		●	●		
	VACUCELL®	drying oven with vacuum	● / ●				5*–250/300	● / ●		● / ●	● / ●					
incubation	INCUCELL®	incubator / biological thermostat	●		●		5–100	●		●	●		●	●	●	
	INCUCELL® V	incubator / biological thermostat	●			●	10–100	●		●	●		●	●	●	
	FRIOCELL®	incubator with cooling	● / ●			●	0-100 (-20)			● / ●	● / ●		● / ●	● / ●	● / ●	● / ●
	CLIMACELL®	incubator with cooling and controlled humidity	● / ●			●	0-100 (-20)				● / ●		● / ●	● / ●	● / ●	● / ●
	CO2CELL**	incubator with CO_2 atmosphere		● / ●	●		5*–50		● / ●			● / ●				

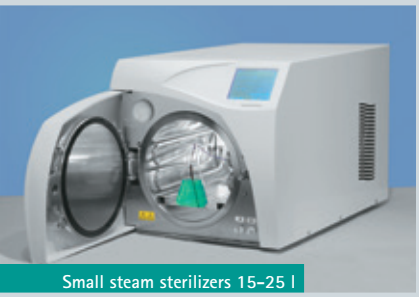
The above stated technical data apply and they are valid at the temperature of 22°C and voltage oscillation ±10%.

* above the exterior temperature

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*** the STERICELL® line also meets the Directive No. 93/42/EEC, the product is presented in a separate leaflet CE 0123

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