



MEDICAL

# SmartFreezer EVO<sup>®</sup>

Fully automated robotic system for cryopreservation ensuring the best protection of high value sample quality at -180°C



# CryoManagement SmartFreezer EVO®



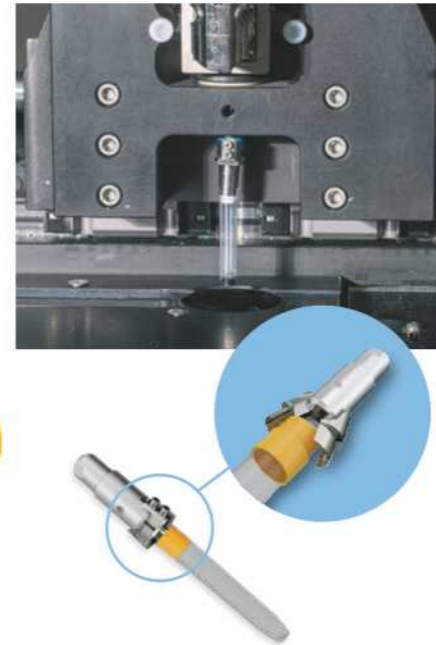
Fully automated robotic system for cryopreservation ensuring the best protection of high value sample quality at -180°C

SmartFreezer EVO® is the innovative solution in cryobiology.

It is a fully automated robotic system for preservation of biological samples (liquid nitrogen vapour phase) at cryogenic temperatures (-180° C).

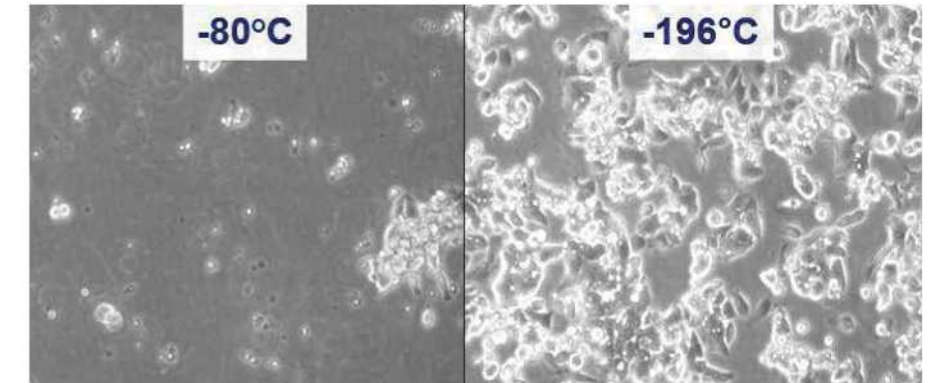
Entirely developed and built in Italy, it is the best choice for biobanks, hospitals, as well as pharmaceutical market for highest biomaterial sample requirements.

- Certificated as Medical Device according to EU Directive 93/42/EEC
- Cherry picking
- Connection with LIMS and supervision software
- Capacity increase up to 45 %
- Ideal for the cryopreservation of Covid-19 samples



The system is powered with a connection to the nitrogen pipeline with a vacuum line made by SOL.

The outcome of pathological studies clearly demonstrate that biomaterial specimens should be stored at -180°C in liquid nitrogen (vapour phase). SmartFreezer EVO® fulfills these requirements while sample storage in -180°C to exhibit a better cell vitality and to guarantee the highest level of specimens quality after thawing<sup>1,2</sup> compared to -80°C.



Growing behaviour of LoVo-cells 10 years after storing in -80°C and -196°C. Colony formation and growing as a monolayer is significantly better after -196°C<sup>2</sup>.

1. Hubel et al (2011), State of the Art in Preservation of Fluid Biospecimens, BIOPRESERVATION AND BIOBANKING, 9.3: 237-244

2. Winther, H. B., C. Brochhausen, M. Brochhausen, U. Topaloglu, and C.J. Kirkpatrick (2014) "A New Biobank Concept to Optimize the Quality of Data-Rich Specimens." Virchows Archiv 465, Supplement: 295

## Technical features

### Fully automated storage and retrieval

- The cherry picking concept guarantees no exposure of other specimens than the appropriate one.
- Pneumatic gripper (grip inside/outside cryotube cap).
- Storage/retrieval in less than 20 sec/cryotube of the desired sample.

### Temperature control

- Sample storage in the vapour phase of LN2
- Avoid samples freezing and thawing processes.
- Thermal rack to be precooled as to prevent samples thawing.

- Loading/unloading up to eight cryotubes in one batch.

### Software

- Touch screen interface.
- Easy integration of external LIMS systems.
- Open access to Ontology systems.
- Automatic sample tracking of historical data.
- Connection with external PC possible.

### Safety

- No operator exposure to LN2.
- Separation between storage volume and automation cabinet.

- Icefree protection on cryotubes. 8 additional operations to complete the load/unload process.
- Access control: only authorized user are allowed to manage the system.
- Full traceability of complete sample history.



Detail of a disc to store cryotubes inside LN<sub>2</sub> tank

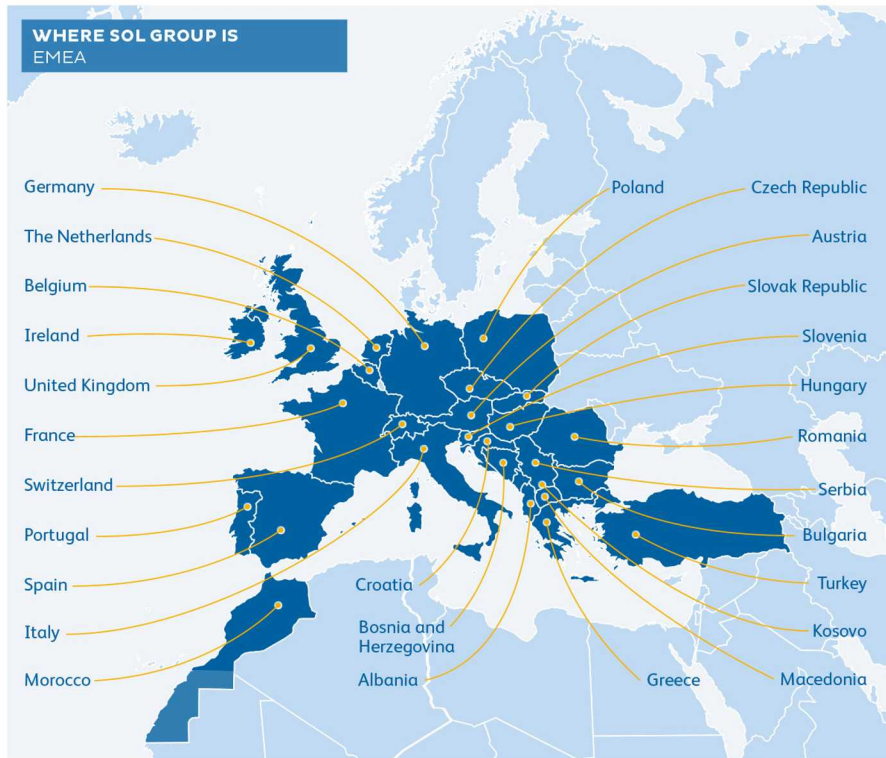
## Technical specifications

SmartFreezer EVO	EVO LAB			EVO MD		
	V180.05	V180.10	V180.20	V180.05	V180.10	V180.20
Product Number	V180.05	V180.10	V180.20	V180.05	V180.10	V180.20
Storage capacity (n° vials)	0.5 ml: 21300	1 ml: 21300	2 ml: 12700	0.5 ml: 19371	1 ml: 19371	2 ml: 11631
Cryotube identification	Barcode/dotcode			Barcode/dotcode		
Load/Unload speed (sec/cryotube)	<20			<20		
Dimension before installation LxWxH (mm)	1460x890x1980			1460x890x1980		
Dimension after installation LxWxH (mm)	1460x890x2650			1460x890x2650		
Freezing agent	Liquid nitrogen			Liquid nitrogen		
LN <sub>2</sub> consumption (lt/day)	Average 15-20			Average 15-20		
LN <sub>2</sub> pressure(bar)	0.7/2			0.7/2		
Absorbed power (VA)	500			500		
Temperature backup	Auto backup. Temperature kept for 48 hours without nitrogen supply			Auto backup. Temperature kept for 48 hours without nitrogen supply		
UPS + Pneumatic backup system	Yes			Yes		
Remote alarm	Yes			Yes		
Ports	Ethernet+RS485			Ethernet+RS485		

Established in 1927 in Italy, **SOL Group** is active in the production, applied research and sale of technical, pure and medical gases and home care service, in cryobiology and in biotechnology and the production of renewable energy.

Worldwide offices in 29 countries with more than 4,000 employees and more than 50,000 industrial and civil clients, 500 Medical Centers and 400,000 patients, cared for every day.

Its knowledge and strength gained over decades of experience give to SOL Group the Automated systems for a safe liquid nitrogen supply opportunity to offer highly qualified and customized solutions and services.



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