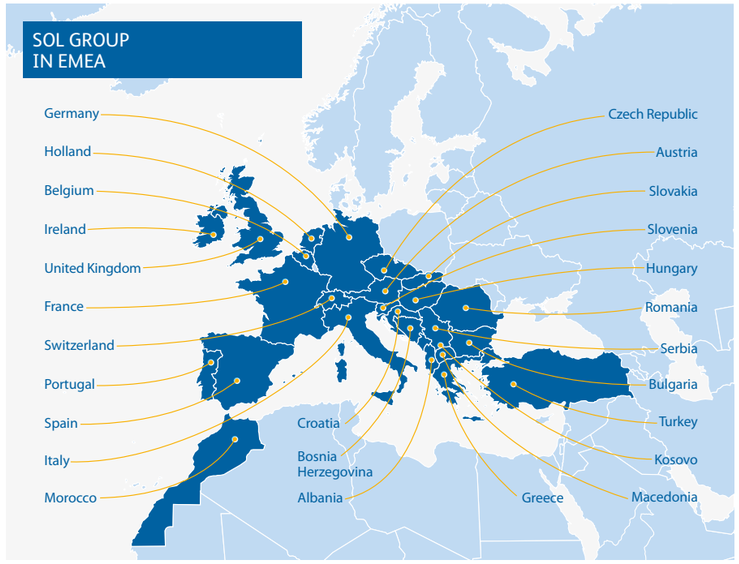
Established in 1927 in Italy, **SOL Group** is active in the production, applied research and sale of technical, pure and medical gases and home care service, in biotechnology and the production of renewable energy.

Worldwide offices in 28 countries with more than 3,500 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 opportunity to offer highly qualified and customized solutions and services.

SmartFreezer®

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



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CryoManagement
SmartFreezer®

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

SmartFreezer® is the innovative solution in cryobiology.

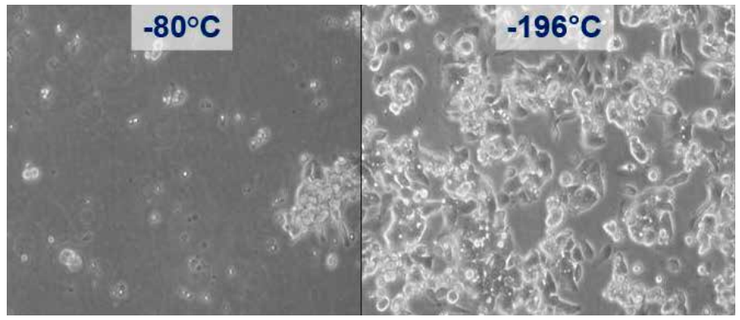
It is a fully automated robotic system for preservation of biological samples (liquid nitrogen vapour phase) at cryogenic temperatures (-180° C).

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

SmartFreezer® application software

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® 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[1,2] compared to -80°C.

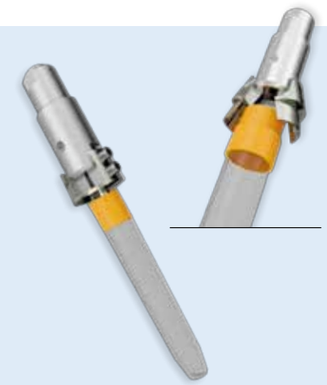


Growing behaviour of LoVo-cells 10 years after storing in -80°C and -196°C. Colony formation and growing as a monolayer is significantly better after -196°C [2].

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 LN_2.
- Avoid samples freezing and thawing processes.
- Thermal rack to be precooled as to prevent samples thawing.
- Loading/unloading up to five 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 LN_2.
- Separation between storage volume and automation cabinet.
- Icefree protection on cryotubes. 5 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_2 tank

Technical specifications

Model		SmartFreezer®					
		Standard				PRO (available in 2019)	
Storage capacity (n°)		1 ml: 14470	2 ml: 8410	3 ml: 6006	4.5 ml: 5046	1 ml: 22000	2 ml: 12000
Cryotube identification		Barcode/Dotcode					
Load/unload speed (sec/cryotube)		Max 20					
Dimensions (mm)	Before installation	1400x890x1960					
	After installation	1400x890x2610					
Dry system		Yes, produces dry air with a very low dew point					
Freezing agent		Liquid Nitrogen (LN_2)					
LN_2 consumption (lt/day)		Average 15 -18					
Temperature backup		Auto backup. Temperature kept for 48 hours without nitrogen supply					
UPS		Yes					
Pneumatic backup system		Yes					
Remote alarm		Yes (ON/OFF)					
Ports		Ethernet					