



**DATABASE**  
RFID



**KLS**  
Storage systems from  
-40°C down to -180°C



**TRANSPORTATION  
SYSTEM**  
at low energies



**KLF**  
controls rate freezing from  
-40°C down to -180°C

## ① QUALITY IS OUR MAIN FOCUS

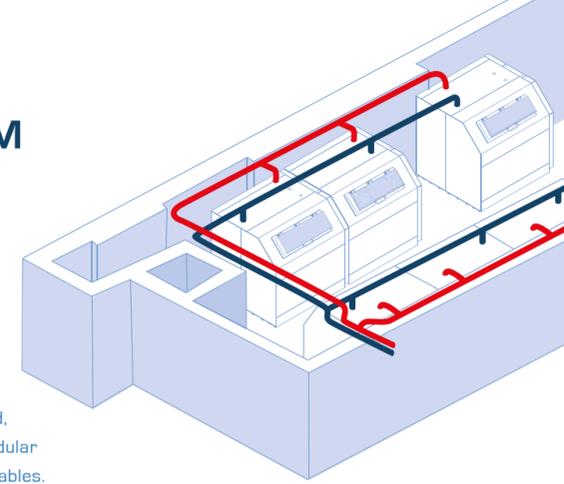
ALL SYSTEMS OF CLST/MABAG WILL PROVIDE:

- Administration of samples
- Monitoring of the vital parameters
- Documentation of the whole process
- Constant temperature

## ② KLS/PATERNOSTER SYSTEM

THE KLS IS AN AUTOMATED SYSTEM FOR STORAGE OF MEDICAL AND BIOLOGICAL ITEMS INCLUDING COMPUTERIZED INVENTORY SYSTEM.

The main features of our storage systems are high economic efficiency and optimization of the overall workflow. Compared to conventional storage systems the KLS itself controls the whole process. The system keeps the samples in the necessary conditions which guarantee the vitality needed, even if there is a power interruption. We offer customized, modular turn-key solutions matched to your needs and the used expandables.

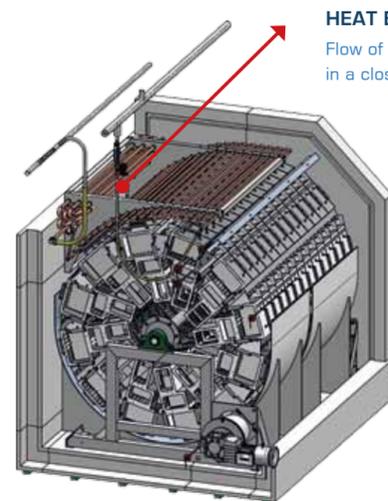


**CAD ROOM-PLANNING**  
to gain workflow optimization

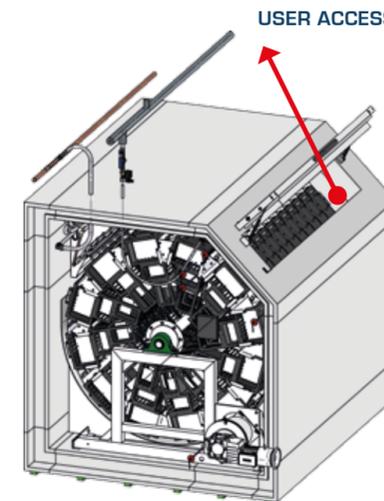


## ③ CLOSED LIQUID NITROGEN (LN2) COOLING SYSTEM

- No cross contamination of samples
- No additional air-condition necessary
- No de-icing needed
- No significant loss of temperature when loading/unloading
- Maintains temperature up to 24 hours in the event of power failure



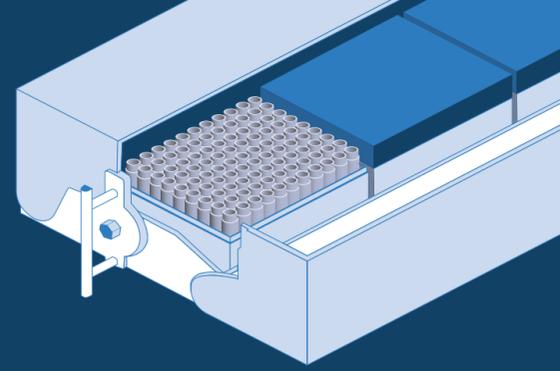
**HEAT EXCHANGER**  
Flow of liquid nitrogen in a closed circuit.



**USER ACCESS**

## ④ CUSTOMIZED & MUDULAR

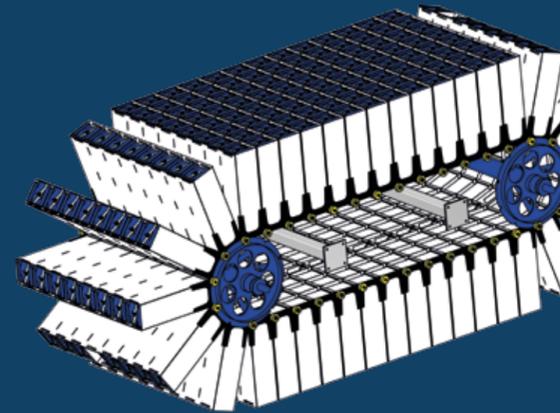
A KLS can store plasma bags in cassettes as well as smallest tissue samples. The KLS can be adapted to the size of the goods. Only the matrix boxes in the cassettes and the robot retrieval grab function have to be altered. All other components of the KLS remain the same and are modularly expandable.



RACKING EXAMPLE FOR 2ML TUBES

### SPECIFIC CASE OF KLS PATERNOSTER SYSTEM

- KLS Paternoster system (10m length)
- Capacity: 7.000 blood plasma-bags or 600.000 2ml vials or 1.000.000 1ml vials
- Consumption at -80°C: approx. 500 litres liquid nitrogen (€ 0,25/liter)
- No costs for ice or snow removal



2AXIS KLS PATERNOSTER SYSTEM

## ⑤ ROBOTIC SYSTEM FOR AUTOMATED LOADING AND UNLOADING PROCEDURE



- Frozen samples are transferred into boxes which are labeled with barcode/RFID
- Log in to the system, scan the sample and place box in specific cart
- Put the cart and place in access window
- Robot will pick up the box and place in system. Action will be confirmed to user when completed.
- Retrieval: - Log In - Identify sample of interest and robotic will retrieve ...

## ADVANTAGES OF OUR KLS/ PATERNOSTER SYSTEM

- All in one solution for storage, inventory system, quality control including documentation
- GLP or MDD certification optional
- Fully computer based inventory management, password protected access
- Control and date processing via W-LAN or remote access
- Easy to integrate into LIS/HIS systems
- Space efficient
- Closed liquid Nitrogen (LN2) cooling system
- Manual access even in case of power interruption
- Installation without structural alterations, parts fit through normal doors
- Alarm signal via in-house surveillance system
- Remote diagnosis and maintenance possible
- Ultra low maintenance requirement by almost any technician
- No loss of samples due to stable storage conditions
- Reduction of running cost by simplified operation



### CUSTOMERS

BLOOD BANKS  
STEM CELL FACILITIES  
TISSUE BANKS  
TUMOR BANKS  
ORGAN BANKS  
DNA PROBES BANKS  
IVF, VETERINARY BANKS  
GREEN BIOTECHNOLOGIES: SEEDS AND CELLS  
TISSUE FOR DRUG PRODUCTION IN THE PHARMACEUTICAL INDUSTRY

## COMPANY PROFILE

CLST GmbH is a customer oriented provider of equipment for controlled rate freezing, storage and transport of medical and biological materials. With our sister company **MABAG** we developed the most modern storage device (KLS) for storage of blood plasma, cells and tissue samples at temperatures below +4°C, -80°C and down to -180°C.

Our cryo logistic line consists of the following major products:

- ❄️ **FB:** Full service tissue banks
- ❄️ **KLS:** Flexible, modular storage systems for 20.000 up to 1,5 Mio samples with permanent documentation of vital storage parameters
- ❄️ **ROBOTICS:** Automated retrieval systems for stored samples
- ❄️ **INVENTORY SOFTWARE:** chaotic storage ability, access control and GLP documentation
- ❄️ **KLF:** Plasma Shock Freezer (KLF) for controlled rate freezing (-40° in 30min.)
- ❄️ **TRANSPORTATION SYSTEMS**

CLST GmbH received ISO 13485 certification by notified body NR. 0636. Necessary GLP documentation available on request.



**CLST GmbH**  
Cryo Life Science Technologies GmbH

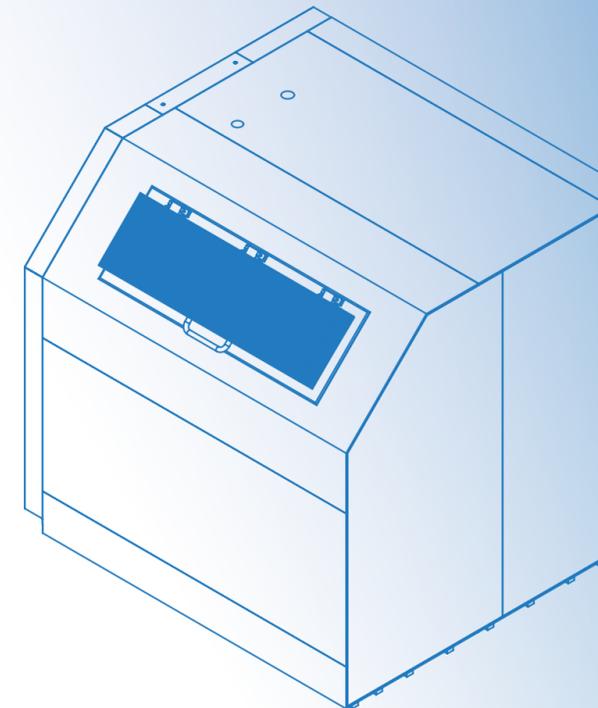
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## CRYO PRESERVATION SOLUTIONS

+ 4°C  
down to  
- 180°C



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