

BIOSAFE®-System

An Optimum in Sample Storage
... for safety, security and reliability



BIOSAFE® MDB – BIOSAFE® SCB...



...now at - 180°C in gas phase storage!
Our product series BIOSAFE® MDB and BIOSAFE® SCB has been developed especially for cryogenic long-term storage of medicinal and biological material in laboratories and cryobanks.

BIOSAFE® by Cryotherm has been a synonym for quality and safety for a long time. Experience, the technology and our know-how make it easy for you to decide on BIOSAFE®.

Cryoconservation by means of deep cold liquid nitrogen is an established practice in science, research, medicine, environmental research and technology.

Safe cold down to -180°C in the gas phase and inert atmosphere enables unproblematic freezing and storage of valuable medicinal and biological samples and materials.

Our BIOSAFE® consists of:

- CHRONOS®-deep temperature storage containers for freezing and storing
- BIOSAFE® CONTROL β, the level controller and vessel monitoring system for a reliable supply of deep cold liquefied nitrogen.



BIOSAFE® MDB ...

... is approved as a medical product, class IIa, according to the Medical Device Directive 93/42/Emedicine.

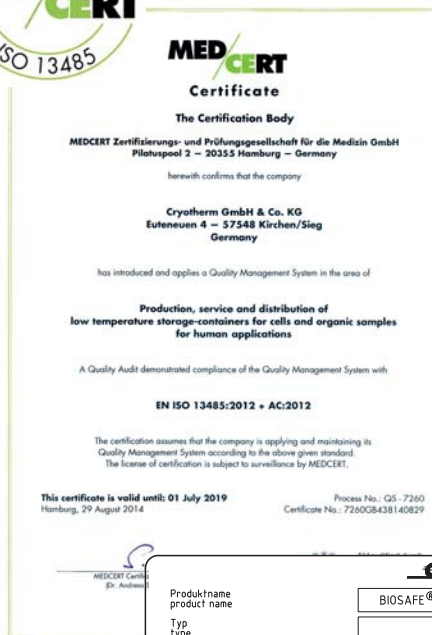
With this medical produkt cell and tissue samples are stored cryogenically long term for reintroduction to humans by using deeply cold liquefied nitrogen as a cooling agent.

BIOSAFE® SCB ...

... is the version for research, medicine and the environment when the samples to be stored are not to be reintroduced to humans.

Advantages that are convincing:

- full storage capacity in gas phase storage
- nitrogen reserve under the platform is sufficient – depending on the size of container – for up to 2 weeks
- redundant hardware for software independent monitoring of minimum-alarm and maximum-alarm
- deep temperatures of -180°C whether small or large containers and whether wide-neck containers or carousel system
- service (comission only) for start ups and carrying out qualification (IQ/OQ)
- remote monitoring (optional) and remote diagnosis
- 24 hour hotline



Produktname product name	BIOSAFE® MDB
Typ type	
System-Nr. system-no.	
Baujahr year of construction	
Artikelnummer article-no.	
0482 Klasse / class IIa 93/42/EWG Cryotherm GmbH & Co. KG Eufeneuen 4, 57548 Kirchen (Sieg) Made in Germany, RLP www.cryotherm.de	

BIOSAFE[®] with system



Systems customized to your requirements – meeting the demands of cryotechnology
A complete system – it's safe for sure!

With the various sizes and versions of BIOSAFE[®] augmented with an extensive range of accessories CRYO-THERM offers the complete solution for your cryoconservation tasks:

- controlled and programmed freezing of your samples in [controlled rate freezers](#)
- administration and security of your sample data by the sample management system
- supply system for deeply cold liquefied nitrogen by APOLLO[®] supply and storage containers optimized for your demands
- or directly supplied via a [super-insulated transfer line](#)

- orderly, safe packing and classification of the samples by means of the BIOSAFE[®] [organization system](#)
- remote monitoring of your samples by our remote monitoring system [CRYO-MESSENGER](#)

For you we will find the optimum solution!

For you we will construct the optimum Cryo-network!



Freezers
by Planer

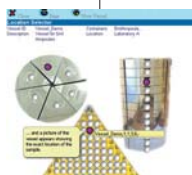


APOLLO[®]-
Supply Containers



BIOSAFE[®]-
sample organization system

Sample-Administration and
Sample-Management System



Super-Insulated
Transfer Lines



CRYO-MESSENGER[®]
remote monitoring system



From Cryopreservation in laboratory ...

BIOSAFE® 120/220/420 MDB

BIOSAFE® 120/220/420 SCB



BIOSAFE® 120, 220, 420 MDB
BIOSAFE® 120, 220, 420 SCB
for larger numbers of samples offer
the following advantages at a glance:

- high storage capacity
- low evaporation rate
- integrated level controller and vessel monitoring system BIOSAFE® CONTROL B
- smooth surfaces – also on the lid – for easy disinfection
- low, easy to operate container height
- vacuum insulated lid in attractive design
- ergonomic lifting/swivel mechanism for the lid
- lid can be locked
- stainless steel finish
- space saving positioning options

BIOSAFE® systems 120 to 420 are optimized for a maximum in capacity at a minimum in dimensions.

The large, thermodynamically optimized, vacuum insulated lid in attractive design allows access to the materials stored in a second.

Loading of samples is executed via the wide-neck opening in the freely accessible storage space.

Its robust construction of polished, corrosion-free stainless steel ensures a long service life and an absolutely low evaporation rate. Further security is provided by a combined evacuation and safety valve.



... to the complete Cryobank



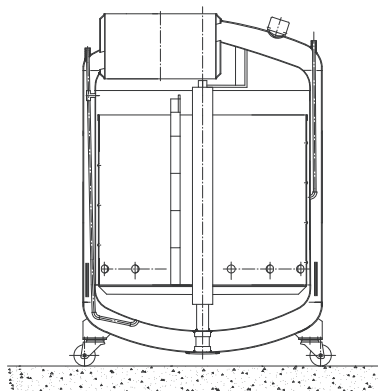
BIOSAFE® 500/600/1000/1400 MDB
BIOSAFE® 500/600/1000/1400 SCB



The BIOSAFE® systems 500 to 1400 are optimized for a maximum in capacity at a minimum in consumption.

In the realms of 500 litres to 1400 litres and more the containers can be easily loaded via the container neck mounted at the side and the easily accessible carousel.

The four smooth running rollers make BIOSAFE® storage containers mobile and even more flexible.



BIOSAFE® 500, 600, 1000, 1400 MDB
BIOSAFE® 500, 600, 1000, 1400 SCB
for the really large quantities of samples

- extremely high storage capacity
- extremely low evaporation rate
- level controller and vessel monitoring system BIOSAFE® CONTROL B
- thermally insulated lid
- eccentrically mounted container neck
- easily accessible carousel for quick and easy access to samples
- 4 smooth running rollers, 2 can be locked
- control line for level regulation implemented in duplicate (option: redundant level monitoring system)
- stainless steel finish

On demand:

- fork lift pockets
- other container sizes
- redundant level and container monitoring system



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BIOSAFE® 2000 - on request larger models are of course possible. Just contact us!

BIOSAFE® - Overview

With the container types BIOSAFE® 40 SCB and BIOSAFE® 60 SCB Cryotherm offers small, highly efficient long term storage containers for small sample quantities. Both systems are fitted with the level controller and vessel monitoring system BIOSAFE-CONTROL® β



Further equipment components are:

- insulated filling hose, 1.5m
- solenoid valve
- safety valve
- holder for controller and instruments

BIOSAFE® 40 SCB and BIOSAFE® 60 SCB can be integrated into a network with all other types of container from the BIOSAFE® system by means of BIOSAFE-CONTROL® β.



Description	BIOSAFE® 40	BIOSAFE® 60	BIOSAFE® 120	BIOSAFE® 220	BIOSAFE® 420	BIOSAFE® 500	BIOSAFE® 600	BIOSAFE® 1000	BIOSAFE® 1400
Geometrical content total [l]	121	175	151	251	420	490	690	960	1.394
Geometrical content under platform (LIN-Reserve) [l]	approx.10	approx.10	21	35	57	50	84	100	100
Weight empty [kg]	43	53	100	175	225	320	340	520	660
Outer diameter [mm]	559	665	560	710	900	890	1.100	1.300	1.300
Inner diameter [mm]	n/a	n/a	514	664	854	795	970	1.155	1.155
Neck diameter [mm]	216	216	514	664	854	450	520	598	598
Total height [mm]	965	959	1.045*	1.180* ²	1.190*	1.314/1.014* ²	1.370	1.440	1.810
Height [mm]	560	560	625	625	625	800	680	680	1.100
Roller diameter [mm]	-	-	-	80	80	80	125	150	150
Static evaporation rate* ¹ [%/day]	1,19	1,19	2,3	2,0	1,5	1,2	1,3	0,7	0,6

*¹: measured on gas phase storage, *²: operational height = upper limit of container with lid open

Description	BIOSAFE® 40	BIOSAFE® 60	BIOSAFE® 120	BIOSAFE® 220	BIOSAFE® 420	BIOSAFE® 500	BIOSAFE® 600	BIOSAFE® 1000	BIOSAFE® 1400
2 ml-vials (Ø 12 mm) in drawers	-	-	6.750	13.000	23.100	26.260	32.680	46.880	72.760
2 ml-vials (Ø 12 mm) in cryoboxes	4.000	6.000	7.000	13.000	21.750	22.750	26.400	41.800	64.600
5 ml-vials (Ø 12 mm) in drawers	-	-	3.375	6.500	11.550	12.120	17.780	25.480	38.250
Freezer bags (50ml)* ¹ Baxter 4R9951/Miltenyi AND 2 ml-vials (Ø 12 mm) in drawers	-	-	288	512	832	on request	768	1.664	3.120
Freezer bags (500ml)* ¹ Baxter 4R9955/Miltenyi AND 2 ml-vials (Ø 12 mm) in drawers	-	-	144	240	480	480	528	864	1.512
Freezer bags (500ml)* ¹ Hemphreeze/Gambro Z2003 AND 2 ml-vials (Ø 12 mm) in drawers	-	-	75	150	270	on request	345	450	900
			750	500	500	-	-	-	-

*¹: other bag manufactures and types on request

BIOSAFE-CONTROL® β...

... integrated level controller and vessel monitoring system for safe long term storage.

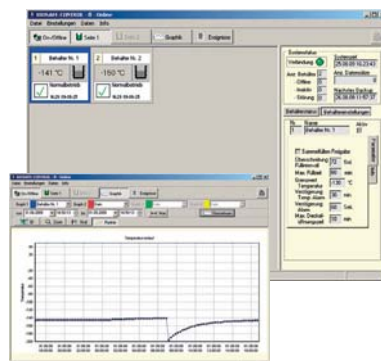


Technical Data

- display of container status
- level control via height-adjustable sensor with protection against manipulation
- temperature measurement sensor, range -200...+50°C (+/-2°C exact)
- overflow protection with open lid/ manual defogging possible
- alarm message when:
 - nitrogen shortage and level exceeded
 - container temperature exceeded
 - lid maximum opening time exceeded
 - maximum filling time exceeded
 - sensor failure or sensor short circuit
 - and many more
- display of alarm message in plain text
- software and processor independent, redundant monitoring of minimum and maximum alarms with separate software alarm
- potential-free alarm outputs for your building services
- analogue output of temperature measurement for your building services
- ethernet connection (optional)

Central Functions (per network)

- I/O box (option) with relay for main valve, appliance failure, combined alarm, to high temperature and 2 extra freely configurable reserve relays too
- collection and buffering of all Cryobank data for transfer to a PC
- connection of up to 32 systems to one network
- combined filling
- free selection of database, thus fully network capable
- interface RS 232 to PC
- parameters can be set at Biosafe and at PC



Advantages:

- certified reliability with proven measurement principle
- clear display of container status
- liquid level can be set from 0 (gas phase) – 100% (liquid phase)
- easy operation at BIOSAFE-CONTROL® β and at the PC
- flexible evaluation of logged temperatures and alarms
- central functions for controlling main valve (I/O box, optional)
- central alarm administration and transfer to the PC (E-Mail, SMS as option)
- including PC-software for wide-ranging documentation of data of a Cryobank
- modern design coordinated with the new BIOSAFE® generation
- parameters: response delay of the solenoid valve, re-cooling function, Alarm ON/OFF adjustable

BIOSAFE-CONTROL® β-Software

- in German and English language
- setting of all container parameters in clear and password protected pop-up windows
- logging and evaluation of all temperature graphs of individual and all containers
- logging and evaluation of the alarm messages and events of all containers
- visualisation of the container status on the PC
- evaluations, lists and diagrams as protected pdf-files, csv-files (EXCEL)

BIOSAFE® -Sample-Storage-Systems ...



... the suitable storage system
for every biological sample

Racks for Vials and Freezer Bags

The new modular structure brings a systematic nature to the BIOSAFE® system and makes safe storage easy and even more clear. In this way you have the organization of your samples under control and at all times you can be sure that you can access your samples quickly and directly.

All storage racks for a BIOSAFE® system have the same size, no matter what is to be stored – that guarantees universal application.

The storage rack variations for vials or bags are almost unlimited. Even the standard version of BIOSAFE® offers you a number of opportunities. And if that should not be sufficient then take a look at the wide range of BIOSAFE® accessories. Here you will surely find everything for what you are looking.

Of course, customized solutions are possible – contact us!



- racks for vials in drawers
- racks for freezer bags in cassettes
- racks for SBS-Boxes (Microtiter)
- canisters for straws in goblets
- cryoboxes
- drawers
- cassettes for freezer bags
- and much more



Advantages that are convincing:

- high storage capacity
- safety due to various locking mechanisms
- optimum height adjusted to BIOSAFE® systems
- ex warehouse: four standard heights (625, 680, 800 and 1100 mm)
- low net weight due to stable aluminium light weight construction
- special designs for any desired sample



CRYO-MESSENGER® a Sample-Management

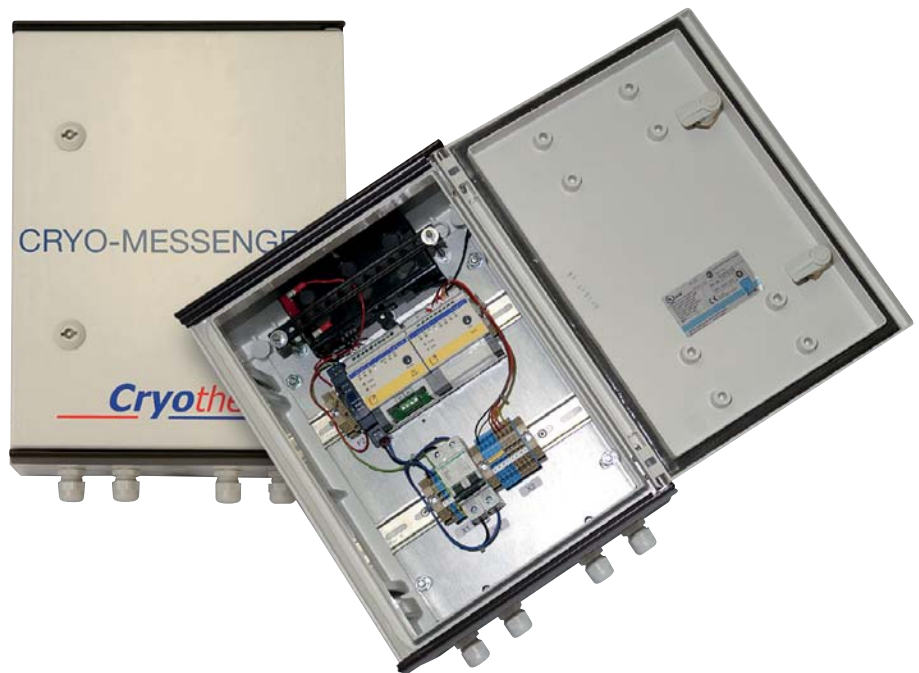
... safety – also when on the road and from home
... all sample data safely under control!

CRYO-MESSENGER Remote monitoring via SMS, E-Mail and Co. – a little more safety!

The remote monitoring system CRYO-MESSENGER® has your Cryocontainers and Cryobanks on site under permanent control: round the clock, 365 days per year.

CRYO-MESSENGER® transfers created data to the Global Data Center (www.cryomessenger.de) which in turn will transfer any messages to you: irrespective of whether as an SMS, E-Mail or Fax. Of course, you can also call up data on your containers at any time.

It is your choice!

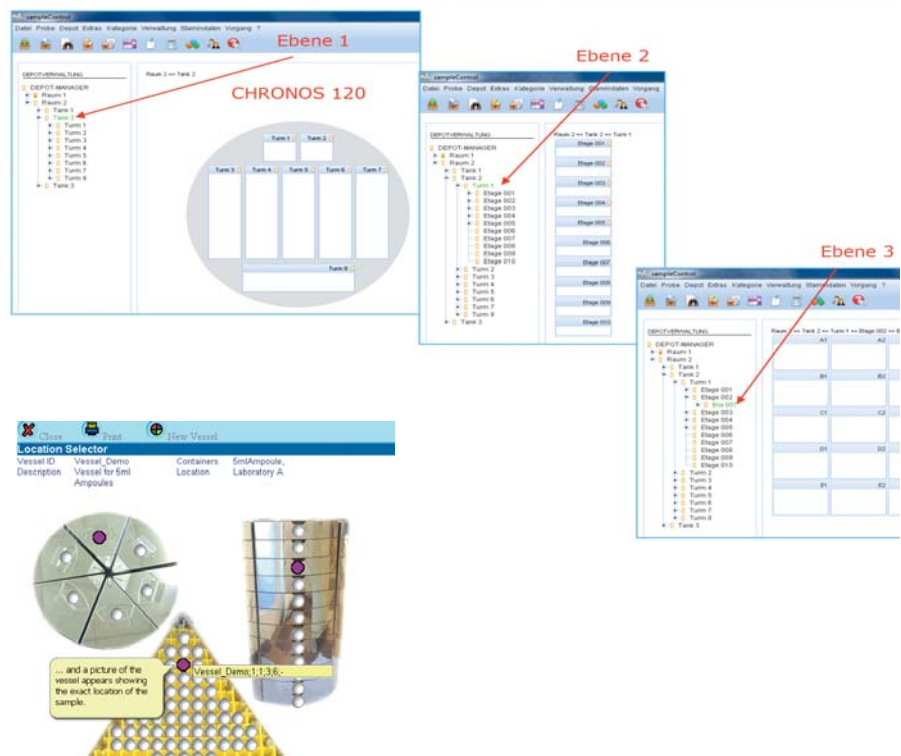


Sample Administration: easy, flexible, systematic

Safe and efficient sample management is of essential significance in cryogenic long term storage. Cryotherm offers a graphic database for a computer controlled storage strategy of biological samples. With the hardware and software we offer you a system that

- provides a clear graphic layout to locate and identify samples
- is easy and intuitively operated
- guarantees a wide ranging protocol

Sample management made easy!



Always well supplied ...

... APOLLO® and Super-insulated Transfer Lines

APOLLO® Supply Containers

The super-insulated APOLLO® storage containers with a low evaporation rate ensure safe replenishment of deeply cold liquefied nitrogen.

Optionally, you can store 50-350l (on demand even larger). Not least the extensive basic configuration as well as the proven reliability and the robust quality comprise important elements of the BIOSAFE® system.

The container is equipped with a transfer siphon with transfer hose, level indicator, manual pressure build-up, pressure gauge and valves. Easy, safe handling due to smooth running, large rollers on the protective transport frame. The containers are manufactured from corrosion-free stainless steel.



Super-insulated Transfer Lines

In order that the gases get from the containers to the "point of use" with a low loss due to evaporation, Cryotherm offers vacuum Super-insulated Transfer Line systems as well as associated equipment such as phase separators, decanting equipment, filling stations and connection-instruments.



Advantages:

- in rigid or flexible quality
- of anti-magnetic, highly corrosion-free stainless steel, thus also for use in sterile rooms and in the food industry
- easily expandable and combinable by means of plug-in connectors
- long stability time of the vacuum due to the use of adsorption material and special getters
- Consequently, you reduce your gas consumption and your maintenance intervals
- quality control in every phase of manufacture
- available with quick release plug-in connectors or welded connections as a fixed installation

Cryobanks ...



... everything from a single source

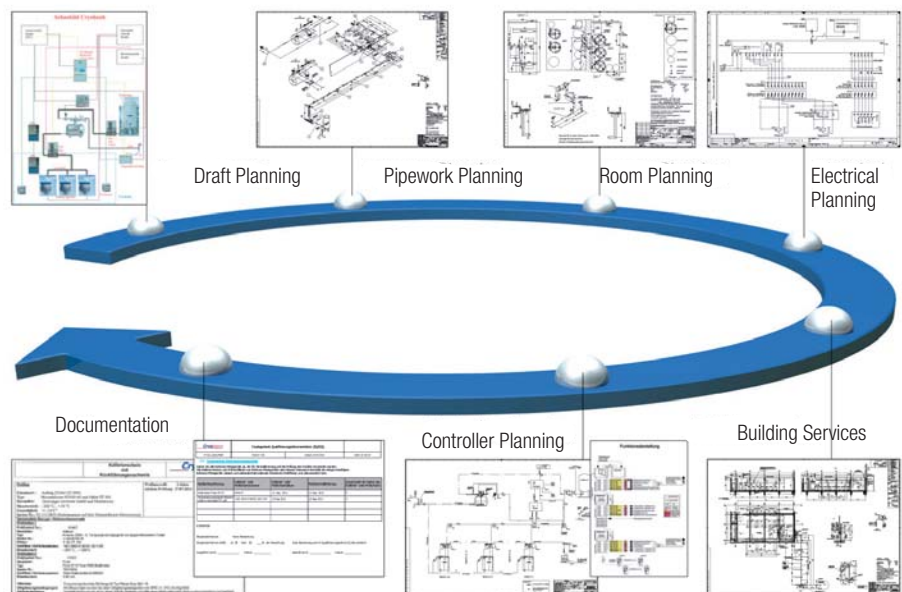
The set up of a complete Cryobank is possible and unproblematic with the BIOSAFE® system.

For this purpose we will gladly create a suitable concept for your assignments consisting of:

- **Nitrogen Supply Concepts** (liquid nitrogen storage tank, super-insulated transfer lines, phase separator, gas phase separator, exhaust pipes and much more)
- **Safety Concepts** (oxygen deficiency monitoring, redundant systems, automatic central switching units and instruments, alarm detection and transfer, remote supervision)
- **Measuring and Control Concepts** (Data creation and management system, system visualisation by means of control technology, data and alarm detection, data transmission, network creation, interfaces to other disciplines)
- **GMP Concepts** (Creation of design studies, execution of qualification measures (IQ/OQ))

- **Service Concepts** (Installation/assembly, start up, spare parts service, repair/maintenance, maintenance agreements, instruction/introduction, 24 hour hotline)

On request our specialist engineers will gladly advise you on matters of supply and use of liquid nitrogen.



Cryo-Supply Systems

The vacuum super-insulated containers by Cryotherm serve to store and transport the deeply cold fluid gases. We deliver for you the ideal supply containers for all uses in research, development, medicine and industry – completely equipped and immediately operational.

JUNO® LIN-Supply container (25 - 100 l) · APOLLO® LIN-Supply Container (50 - 350 l)
SATURN® LIN-Transport Container (100 - 300 l) · MERKUR® Transport Tank (500 - 2,000 l)
SIRIUS® LIN-Supply Container (1,000 - 2,000 l) · HELIOS® LHe-Storage Container (100 - 10,000 l)
STRATOS® LHe-Transport Container (100 - 1,000 l)

Cryo-Piping Systems

In order to transport deeply cold fluid gases from A to B almost without any loss we have developed special vacuum super-insulated transfer piping. These transfer piping systems are distinguished by high thermal quality. For LIN/LOx/LAr/LHe/LH₂ rigid transfer piping (DN 14 - 100) · flexible transfer piping (DN 20 - 32) plug-in coupling – weld coupling · gas phase separator (10 l) · phase separator (50 - 200 l)

Cryo-Customizing/Cryo-Engineering

If you have completely individual research tasks to perform. Do you have the right partner for the job? Whether you work in micro-electronics or one of the many other areas of research we have the specialist staff who know your field and speak your language.

Cryo-Storage Systems

Today storage periods of many years are in demand. Make use of our Cryo-Storage Systems for long-term storage of biological, medicinal and chemical materials in laboratories and Cryobanks. BIOSAFE® MD-sample storage system (medical product) (120 - 1,400 l)
BIOSAFE® SC-sample storage system (120 - 1,400 l) · CHRONOS®-sample container (120 - 1,400 l)
STELLA®-work container (0.5 - 63 l) · Freezing apparatus (3.3 - 16 l) · dryo shipper

Cooling of Transport Systems

Deep frozen foods cover an ever larger part of our daily requirements. For an optimal cooling quality we equip your cold storage vehicles, trailers, semi-trailers, swap bodies and containers with transportable Cryo-Systems.

CRYOGEN®-Trans-System

After-Sales-Service

Installation/Assembly, Start Up, Spare Parts Service, Repair/Maintenance, Instruction/Training, Technical Hotline +49 (0)2741 958575



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