

BIOSAFE[®]-System

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



BIOSAFE®-System



Optimal Storage of Samples
Safety Needs a System



Systems Tailor-Made to Your Needs –
for Needs-Based Cryo-Technology.
A Complete System – Safety for Certain

BIOSAFE® MD ß –
BIOSAFE® SC ß – now with
-190 °C during gas phase
storage! Our product
range BIOSAFE® MD ß
and BIOSAFE® SC ß were
developed especially
for cryogenic long-term
storage of medical and
biological material in
laboratories

BIOSAFE® by Cryotherm has
been associated with quality
and safety for quite some time.
Experience, the technology
and our know-how make it an
easy decision for you to go with
BIOSAFE®.

Cryoconservation by means of
cryogenic liquid nitrogen has
become a proven and reliable
practice in science, research,
medicine, ecological research
and technology. Safe cold down
to -190°C in the gas phase and
the inert atmosphere enable
unproblematic freezing and
storage of valuable medical and
biological samples and material.

Our BIOSAFE® Range
consists of:

- CHRONOS® cryogenic stor-
age vessels for freezing and
storing
- BIOSAFE-CONTROL® ß the
level controller device and
vessel superordinate control
system for reliable supply of
cryogenic liquid nitrogen.

BIOSAFE® MD ß

is approved according to
directive 93/42/EEC on medical
product as medical products
class IIa. With this medical
product cell and tissue samples
stored long-term cryogenically
for return to the human body by
using cryogenic liquid nitrogen
as the cooling agent.



Convincing advantages:

- full storage capacity on gas phase storage
- the nitrogen reserve under the platform
is sufficient for up to two weeks
dependent on the size of vessel
- redundant hardware for software
independent monitoring of mini-
mum and maximum alarm
- low temperatures of -190 °C
whether in small or large vessels
and whether in wide-necked vessels
or vessels with a carousel system
- service for commissioning and
execution of qualification (IQ/OQ)
- remote diagnosis and remote
monitoring (optional)

BIOSAFE® SC ß

is the model for research, medi-
cine and the environment when
the samples stored are not to
be returned to the human body.

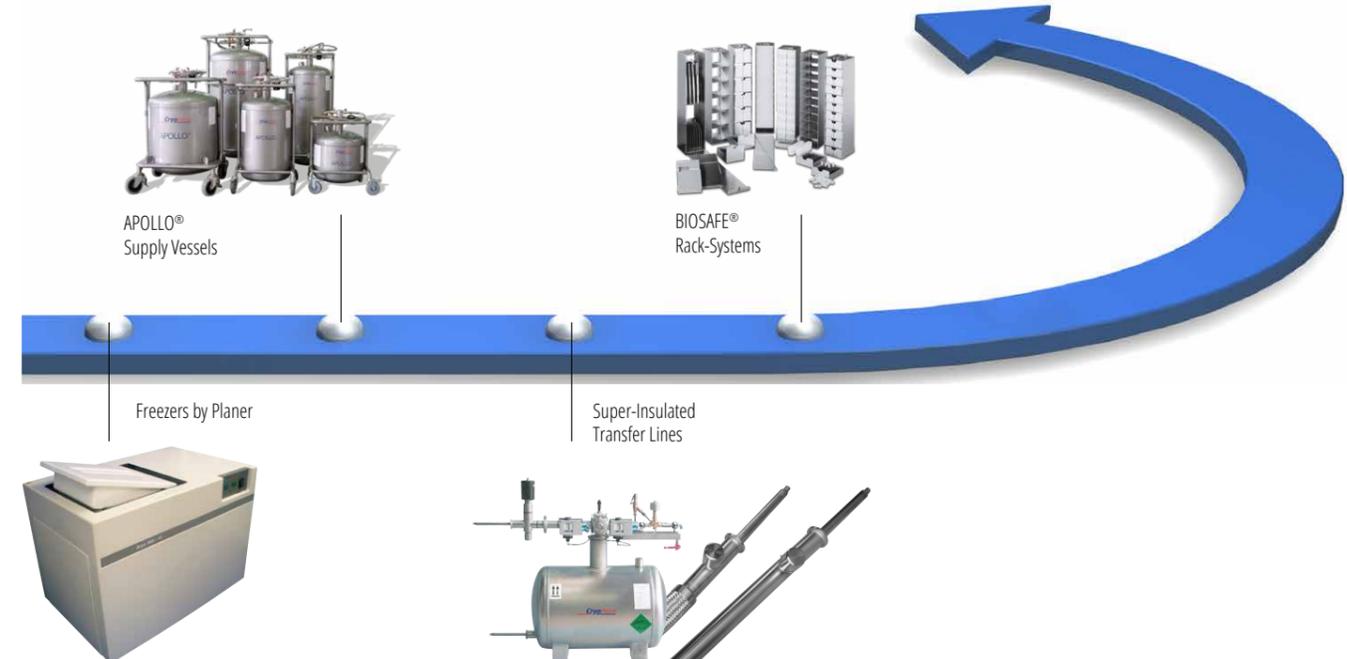


Cryotherm offers you a
complete solution for your cryo-
conservation requirements with
various sizes and models of
BIOSAFE®, supplemented with a
wide range of accessories:

- controlled and programmed
cooling down of your
samples in controlled rate
freezers
- administration and security
of your sample data by
means of the sample
management system
- a supply system optimised
for your requirements of
cryogenic liquid nitrogen via
the APOLLO® supply vessel

- or directly supplied via a
super-insulated transfer line
- the orderly, safe packing
and filing of samples by
means of the BIOSAFE® Rack
System

For you we will find the
optimum solution!
For you we will construct the
optimum Cryo-network!



From Cryo-Preservation in laboratory

to the complete Cryobank



BIOSAFE® 120/220/420 MD β
 BIOSAFE® 120/220/420 SC β

BIOSAFE® 500/600/1000/1400 MDβ
 BIOSAFE® 500/600/1000/1400 SCβ



Convincing advantages:

- high storage capacity
- low evaporation rate
- integrated level controller device and vessel superordinate control system BIOSAFE-CONTROL® β
- smooth surfaces – also on the lid – for easy disinfection
- low, easy to operate vessel height
- attractively designed vacuum insulated lid
- ergonomic lifting/swivel mechanism for the lid (220 / 420)
- lockable lid
- stainless steel model
- space saving positioning options

The BIOSAFE®-systems 120 to 420 are optimised to give you a maximum capacity at a minimum outer dimension. The large, thermodynamically optimised lid in appealing design gives you access in seconds to the material in store.

Loading with samples takes place via the wide neck opening to the freely-accessible storage space.

The sturdy construction of finely polished, corrosion-free stainless steel provides for a maximum lifelong duration and for an absolutely low evaporation rate. A combined vacuum seal-off and safety device for the vacuum area adds to the safety.

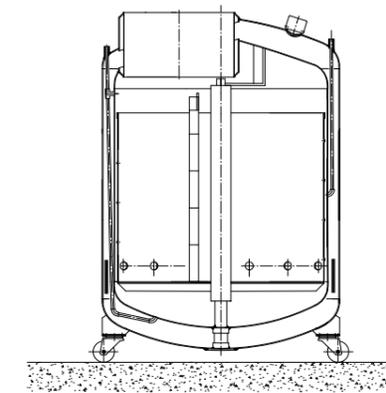


BIOSAFE® 500

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

For BIOSAFE® systems of 500 litres to 1400 litres, the vessels can be easily loaded via the vessel neck mounted at the side and the easily accessible carousel.

The four smooth running castors make BIOSAFE® storage vessels mobile and even more flexible.



Convincing advantages:

- extremely high storage capacity
- extremely low evaporation rate
- integrated level controller device and vessel superordinate control system BIOSAFE-CONTROL® β
- thermic insulated lid
- exocentric attached vessel neck
- smooth carousel for quick and easy access to samples
- four smooth-running castors, two of which can be locked
- measuring line for level control is duplicated (option: redundant level monitoring)
- stainless steel model

On request:

- forklift pockets
- other vessel sizes
- redundant level and vessel superordinate control system



BIOSAFE® 1400

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BIOSAFE® 2400 – on request – larger models are of course possible. Just contact us!

BIOSAFE-CONTROL® β

BIOSAFE® 40/60 SC β

Further features components are:

- insulated decanting hose (1.5 m)
- solenoid valve
- safety valve on T-piece
- device and instrument fitting

With the vessel types BIOSAFE® 40 SCβ and BIOSAFE® 60 SCβ Cryotherm offers small, highly efficient long term storage vessels for small sample quantities.

Both systems are equipped with the level controller and vessel monitoring system BIOSAFE-CONTROL® β.



Overview

Vessel Name		BIOSAFE® 40	BIOSAFE® 60	BIOSAFE® 120	BIOSAFE® 220	BIOSAFE® 420	BIOSAFE® 500	BIOSAFE® 600	BIOSAFE® 1000	BIOSAFE® 1400
geometrical capacity	[l]	121	175	151	251	420	490	690	960	1394
total geometric 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
diameter outer	[mm]	559	665	560	710	900	890	1,100	1,300	1,300
diameter inner	[mm]	no spec.	no spec.	514	664	854	795	970	1,155	1,155
neck diameter	[mm]	216	216	514	664	854	450	520	598	598
outer height	[mm]	965	959	1,140/1,045 *2	1,190/1,070 *2	1,190/1,070 *2	1,314/1,014 *2	1,370	1,440	1,820
inner height	[mm]	560	560	625	625	625	800	680	680	1,100
castor diameter	[mm]	-	-	-	80	80	80	125	150	150
stat. evaporation rate *1	[%/day]	1.19	1.19	2.3	2.0	1.5	1.2	1.3	0.7	0.6
article-no. SC β		78207829	78207803	78203758	78203757	78203756	78208610	78204183	78204185	78204187
article-no. MD β		-	-	78203753	78203754	78203755	78208611	78204182	78204184	78204186

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

Integrated Level Control and Vessel Monitoring for Safe Long-Term Storage

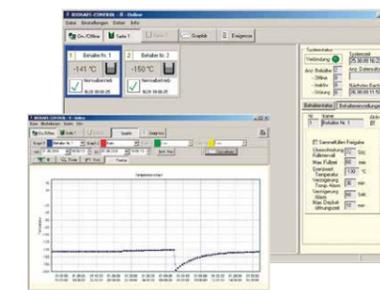
Technical Data

- display of the vessel status
- level control via height adjustable sensor with manipulation protection
- temperature measurement sensor, measurement range -200 +50 °C (accurate to +/- 2 °C)
- filling stop when lid open
- manual defogging
- alarm signal when:
 - nitrogen shortage and level exceeding
 - exceeding of vessel temperature
 - exceeding of maximum time for lid open
 - exceeding of maximum filling time sensor breakage or sensor short circuit
 - and lots more
- display of alarm signal in plain text
- software and processor independent redundant monitoring of minimum and maximum alarm with separate software alarm
- potential-free alarm outputs for your building technology (I/O box optional)
- analogue output of temperature measurement for your building technology (I/O box optional)
- connection via Ethernet (optional)



Central Functions (per network)

- I/O box (option) with relay for main valve, device error, collective alarm, over-temperature and 2 extra freely-assignable relays
- collection and buffering of all cryobank data for transfer to a PC
- connection of up to 32 systems to one network
- collective filling
- free selection of database, thus fully network capable
- interface RS 232 to PC
- parameter can be set on BIOSAFE® and PC
- MODBUS software as interface (RS485) to a superordinate control system



Convincing advantages:

- certified reliability with proven measuring principle
- clear presentation of vessel status
- liquid level adjustable from 0 (gas phase) – 100%
- easy operation at BIOSAFE-CONTROL® β and at PC
- flexible evaluation of logged temperatures and alarms
- central functions for control of main valve (I/O-box optional)
- central alarm administration and transfer to PC (by e-mail, SMS or Fax as option)
- including PC software for extensive documentation of the data of a cryobank
- modern matched design with the new BIOSAFE® generation
- parameter: response delay magnetic valve, reverse cooling function, alarm on/off switching adjustable

BIOSAFE-CONTROL® β Software

- in the German, English, French, Spanish and Italian languages
- setting of all vessel parameters in clear and password protected pop-up windows
- logging and evaluation of temperature curves of individual and all vessels
- logging and evaluation of alarm signals and events in individual and all vessels
- visualisation of vessel status on PC
- evaluation, lists and diagrams as protected PDF-files, CSV-files (EXCEL)

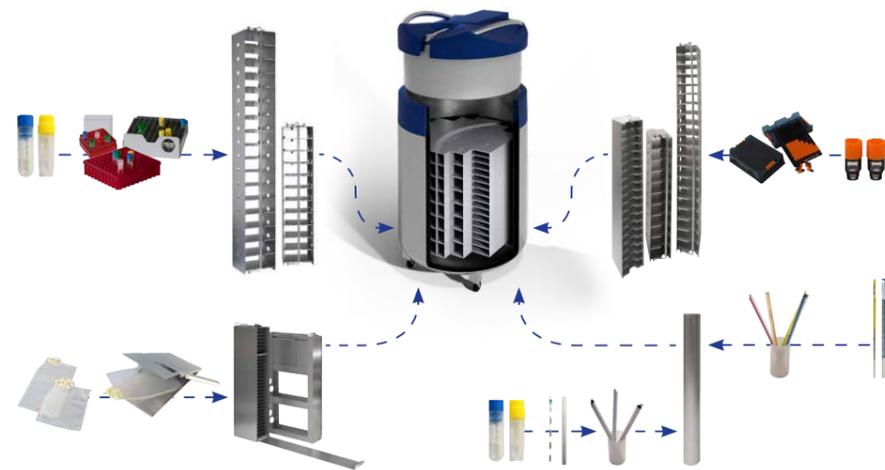
BIOSAFE® Rack-Systems

... the appropriate storage system for every biological sample

BIOSAFE® XXL



BIOSAFE® 8800



Convincing advantages:

- high storage capacity
- easy handling and high functionality
- safety due to various locking mechanisms
- even heat distribution within the racks by using aluminum
- low net weight due to stable aluminium light weight construction
- optimum height adjusted to BIOSAFE® systems
- ex warehouse: four standard heights (625, 680, 800 and 1100 mm)
- variable positioning plans for arrangement
- special designs for any desired sample

Our portfolio includes:

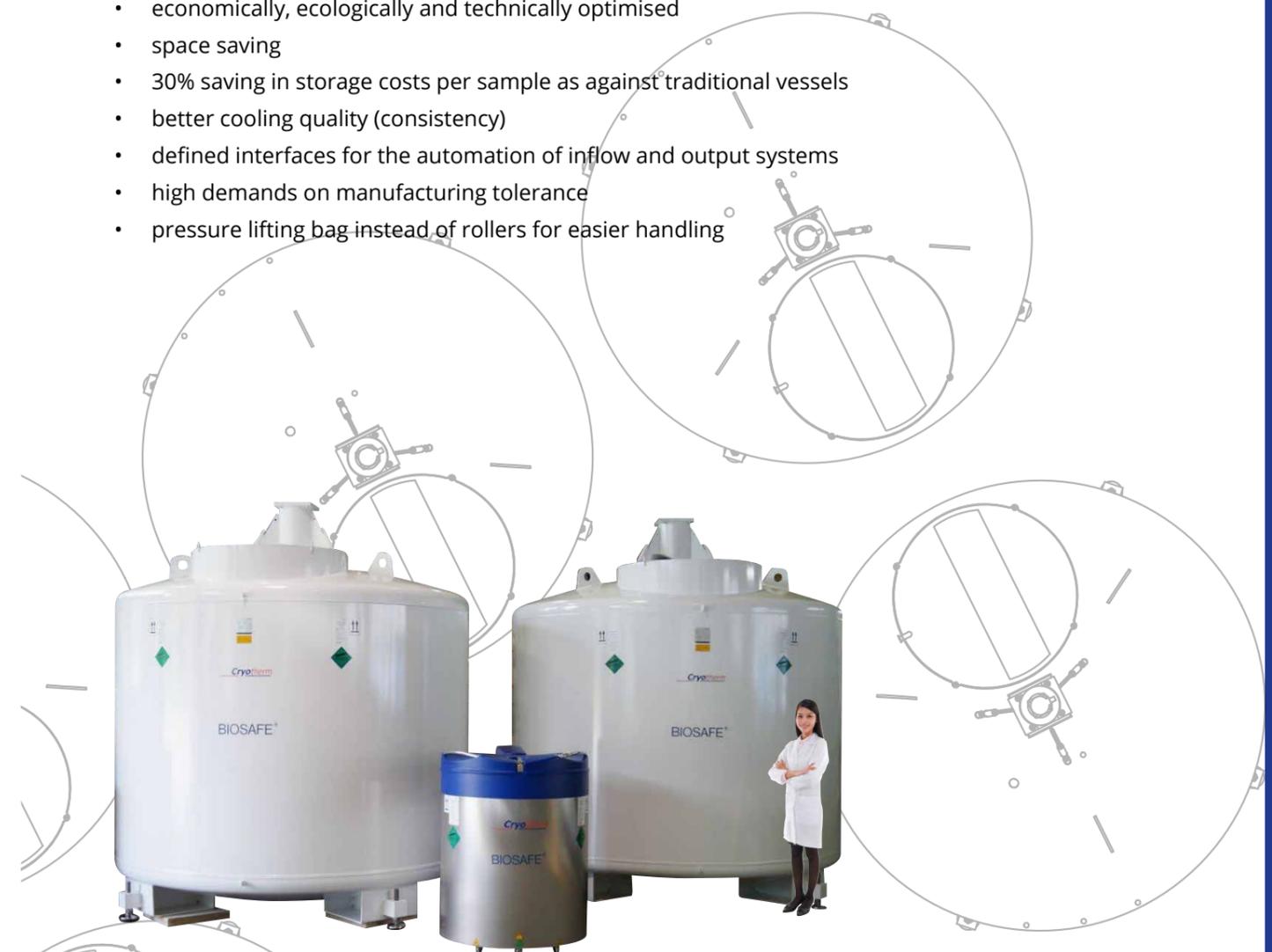
- racks for
 - vials in cryoboxes
 - vials in drawers
 - freezer bags in cassettes
 - SBS-Boxes (Microtiter)
- canisters for straws in goblets
- cryoboxes
- drawers
- cassettes for freezer bags
- and many more

Vials / Freezer Bags / Straws	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 drawer	-	-	6750	13000	23100	26260	35660	51160	77040
2 ml vials (Ø 12 mm) in cryoboxes	4000	6000	7000	13000	21750	22750	32100	46700	70200
5 ml vials (Ø 12 mm) in drawer	-	-	3375	6500	11550	14140	17880	28680	42800
freezer bags (50 ml)* Baxter 4R9951/Miltenyi AND 2 ml vials (Ø 12 mm) in drawer	-	-	288	512	832	1080	1440	2080	3120
freezer bag (500 ml)* Baxter 4R9955/Miltenyi AND 2 ml vials (Ø 12 mm) in drawer	-	-	144	240	480	480	576	864	1512
freezer bag (500 ml)* Hemofreeze/Gambro Z2003 AND 2 ml vials (Ø 12 mm) in drawer	-	-	75	150	270	288	432	612	918
straw 0.25 ml	-	-	85120	141120	246400	280000	268800	474880	831040
straw 0.5 ml	-	-	31920	52920	92400	105000	100800	178080	311640

*: other bag manufacturers and types on request

Areas of Use:

- worldwide largest Cryo-Biovessel, 8,800 l content per vessel
- number of samples: 1,200,000
- storage time; at least 30 years
- gas phase storage at -190 °C
- maximum operating safety
- economically, ecologically and technically optimised
- space saving
- 30% saving in storage costs per sample as against traditional vessels
- better cooling quality (consistency)
- defined interfaces for the automation of inflow and output systems
- high demands on manufacturing tolerance
- pressure lifting bag instead of rollers for easier handling



Always well supplied

Cryobanks

APOLLO® and Super-insulated Transfer Lines

APOLLO® Supply Vessels

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

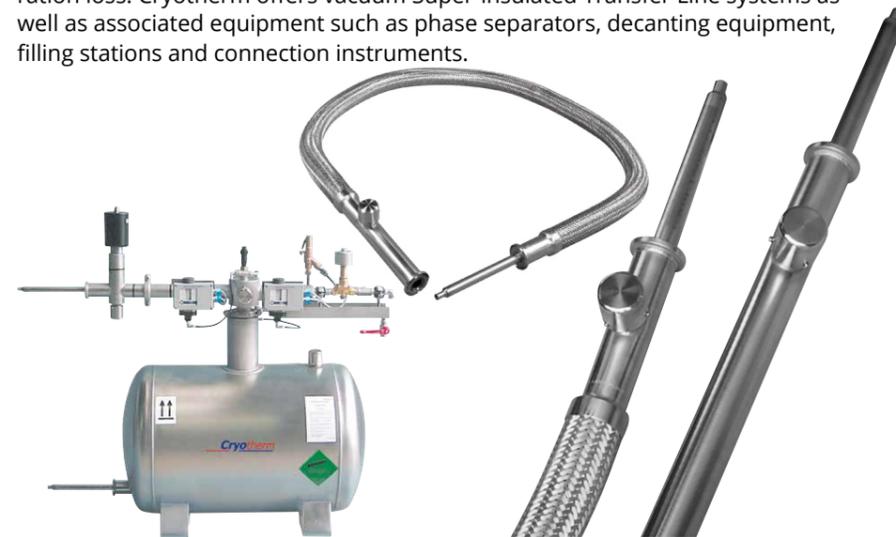
Optionally you can store 50-350 litres (larger systems on demand). The extensive basic configuration, as well as the proven reliability and the robust quality, comprise important elements of the BIOSAFE® system.

The vessel 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 castors on the protective transport frame. The vessels are manufactured from corrosion-free stainless steel.



Super-insulated Transfer Lines

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



Transfer Line advantages:

- available in rigid or flexible configurations
- made from 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 vacuum stability time due to the use of adsorption material and special getters
- consequently, reduced gas consumption, maintenance intervals and costs
- quality control in every phase of manufacture
- available with quick release plug-in connectors or welded connections as a fixed installation



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 many 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 visualization 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.

Turn-Key-Solutions

- planning
 - conceptual design and overall planning
 - planning of the pipe
 - spatial planning
 - electrics planning
 - building technology
 - MSR-planning
 - safety planning
- manufacture / Documentation
- commissioning / Installation
- service / Maintenance
- Certified Quality Management



Cryotherm Line Systems

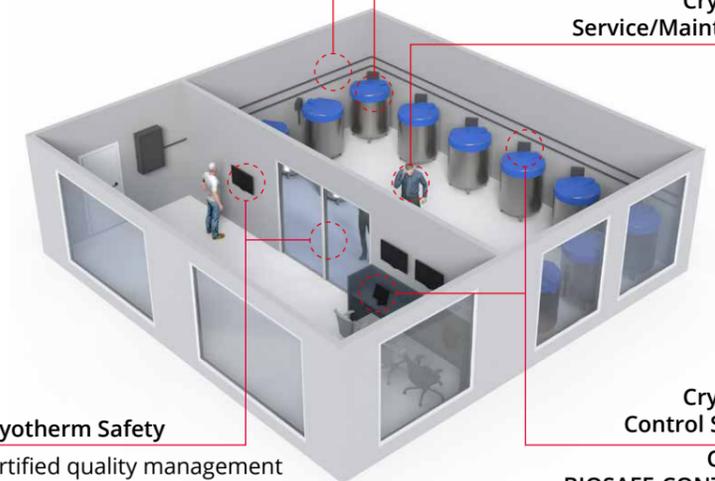
for the almost loss free transfer of cryogenic liquid gases Ø DN, 14 to 300 mm

Cryotherm Vessel Storage Systems

for the long-term storage of biological, medical and chemical material

Cryotherm Service/Maintenance

24/7



Cryotherm Safety

certified quality management system eg. access control, detection of the danger of asphyxiation and lots more

Cryotherm Control Systems

Cryo LC®
BIOSAFE-CONTROL® B



NITROGEN VESSELS

APOLLO® LIN Supply and Storage Vessel (50 - 350 l) · JUNO® LIN Supply and Storage Vessel (30 l)
SIRIUS® LIN Supply and Storage Vessel (1,000 - 2,000 l) · SATURN® LIN Transport Vessel (50 - 300 l)
MERKUR® LIN Transport Tank (500 - 3,000 l) · STELLA® Working Dewar (0.5 - 10,000 l) · LAB® Dewar Series (4 - 50 l)



BIOSAFE® SYSTEMS / LIFE SCIENCE

BIOSAFE® MD β Sample Storage System (Medical Product) (120 - 1,400 l) · BIOSAFE® SC β Sample Storage System (120 - 1,400 l)
BIOSAFE-CONTROL® β · CRYO-MESSENGER® Remote Monitoring System · BIOSAFE® X/S-Series · Vapor Shipper
STELLA® Working Dewar (0.5 - 10,000 l) · Controlled Rate Freezers (3.3 - 16 l)



BIOSAFE® RACK-SYSTEMS

Racks · Drawers and Cryoboxes for Vials · Canisters for Straws in Goblets · SBS Boxes (Microtiter)
Cassettes for Freezing Bags



HELIUM VESSELS

HELIOS® LHe Storage Vessel (100 - 15,000 l)
STRATOS® LHe Transport Vessel (100 - 1,000 l) · LHe Siphon



OTHER VESSELS

HYDROS® LH₂ Transport Vessel (1,000 - 15,000 l) · STRATOS® Transport Vessel (100-1,000 l)
APOLLO® Supply and Storage Vessel (50 - 350 l) · MERKUR® Transport Tank (500-3,000 l)



CRYO LINE SYSTEMS

Rigid Line Systems (DN 14-300) · Flexible Line Systems (DN 20-150) · Phase Separator Stations (50 - 200 l)
Gas Separator (5 l) · LHe Multiline



CONTROL AND MONITORING TECHNOLOGY FOR CRYOGENIC GASES

BIOSAFE-CONTROL® β · CRYO-MESSENGER® Remote Monitoring System · CRYO LC® Level Measurement and Control Device
LHe Level Measurement and Control Device · Capacitive Level Measurement · Oxygen Deficiency Warning System



TRANSPORT COOLING FOR VEHICLES

CRYOGEN® TRANS-SYSTEM



CUSTOMISING / TURNKEY SOLUTIONS / CRYO COOLER / COOLING BATHS

Do you have the right partner for your highly specific research tasks? Whether you work in microelectronics, analytics, environmental protection or one of the many other areas of research, we have the specialist staff who know your field and speak your language.



CRYO ACCESSORIES & AFTER-SALES SERVICE

Accessories · Installation/Assembly · Start Up · Function Qualification IQ / OQ · Repair/Maintenance
Spare Parts Service · Vessel Hire · Instruction/Training · Operating Manual · Service Hotline



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