

Die BOS Linie für biologische Materialien

“Kälte bewahrt leben, kann es aber auch zerstören,,

– NNC 2018

Wichtig sind die Methode, das Equipment
sowie das Einhalten von gesetzlichen Vorschriften und physikalischen Grundsätzen

Information's

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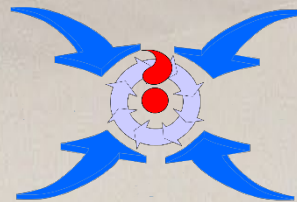
F&E und Sales

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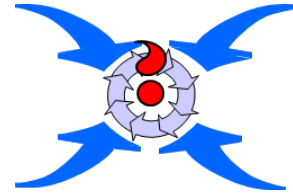
+49- (0) 481 817 894 96 F&E / Sales

<http://www.nn-lin.com>



- Human Anwendungen, Medizin/Forensik..
- Pharmazie
- Tiermedizin
- Naturproben
- Food Bereich
- sonstige technische Lösungen, Analysen und Konzepte

Biological Organization System



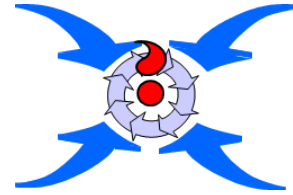
Systemline



Presenting the Product Range of **NNC-LIN MS** GmbH / **Germany**

BOS-S- S=Storage, F= Freese, T= Transport, M= Management

NNC-LIN MS GmbH



History

NNC-Group, based near Hamburg/Germany, was founded in late 2003. The founder picked up a business idea for the health care product, which was on the market since a couple of years but was not yet implemented successfully. Due to the increasing demand for blood storage products, they expected new business of providing a safe, organized and cost-effective solution for the storage of biological material. In close cooperation with German hospitals, they developed the **BOS-S/040** storage system, the first device in a family of products improving the services of transfusion medicine centers of hospitals.



Uwe Nehrmann

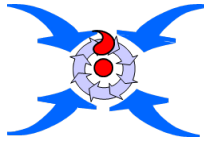
Mission

The objective of NNC is to develop, manufacture, and market systems and components which enable users to freeze biological material up to minus 150° Celsius, store it at a constant temperature, and manage its input/output/warehousing, using state-of-the-art technology which controls the product from its origin to final usage.

Vision

The vision of the company is to help all organizations, which need 'deep freezing' storage capacity for their products to

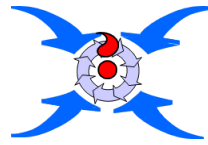
- reduce the overall expense
- improve product quality
- improve the handling and logistics
- ensure reliable documentation



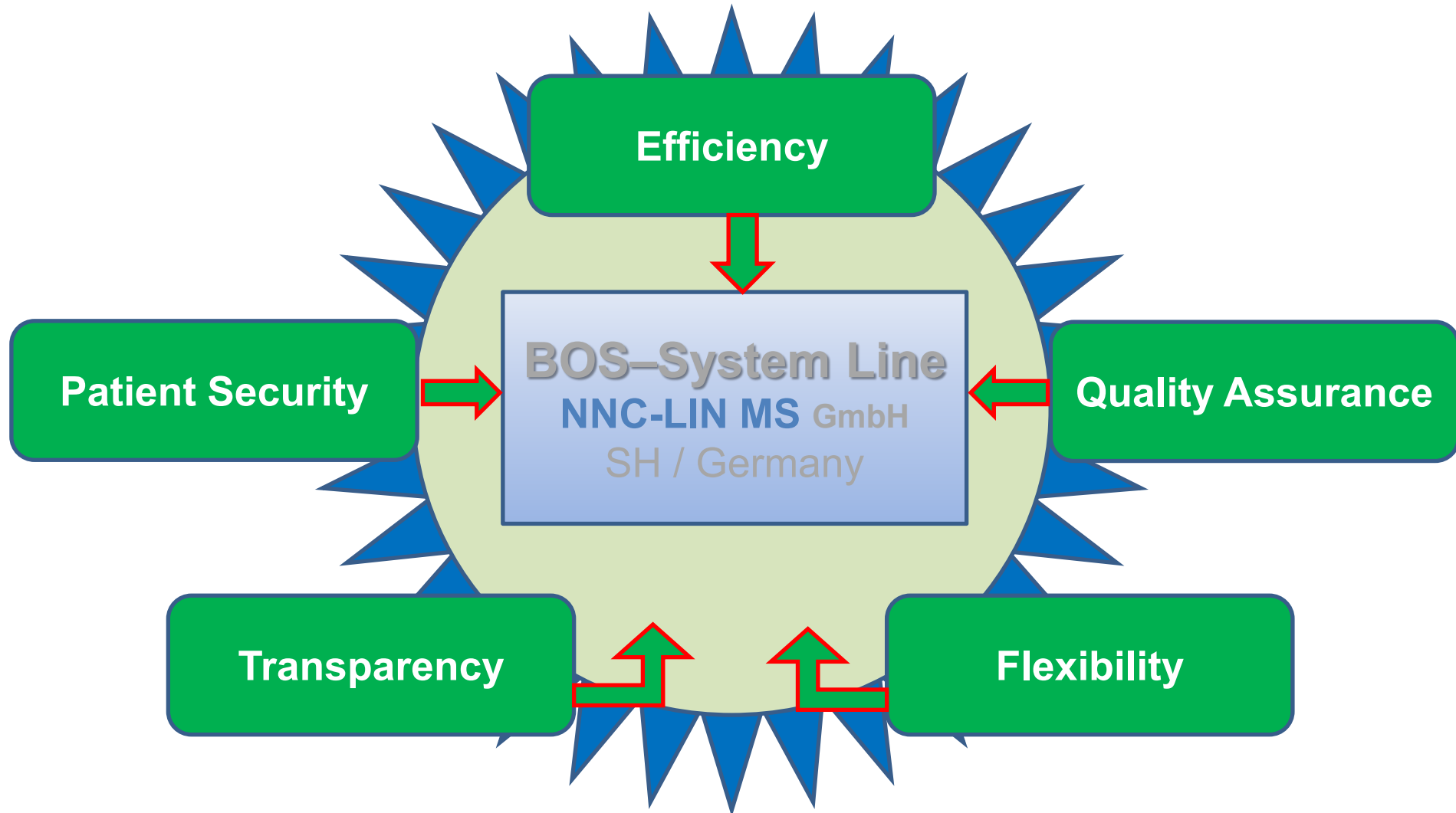
The Role of NNC-LIN MS GmbH

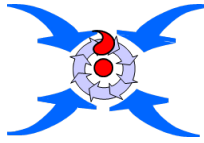
NNC Group develops new, future-oriented cryo-technology in cooling and storage of biological materials, blood and blood products, pharmacy forensic and much more.

- Analysis of current problems to develop new solutions
- Reduction of costs through reorganization and optimization of equipment
- Minimizing operational risks through development of optimized systems
- Development and production of new medical technology for all applications



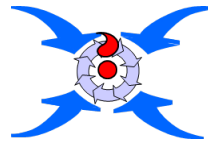
Five important facts > one philosophy



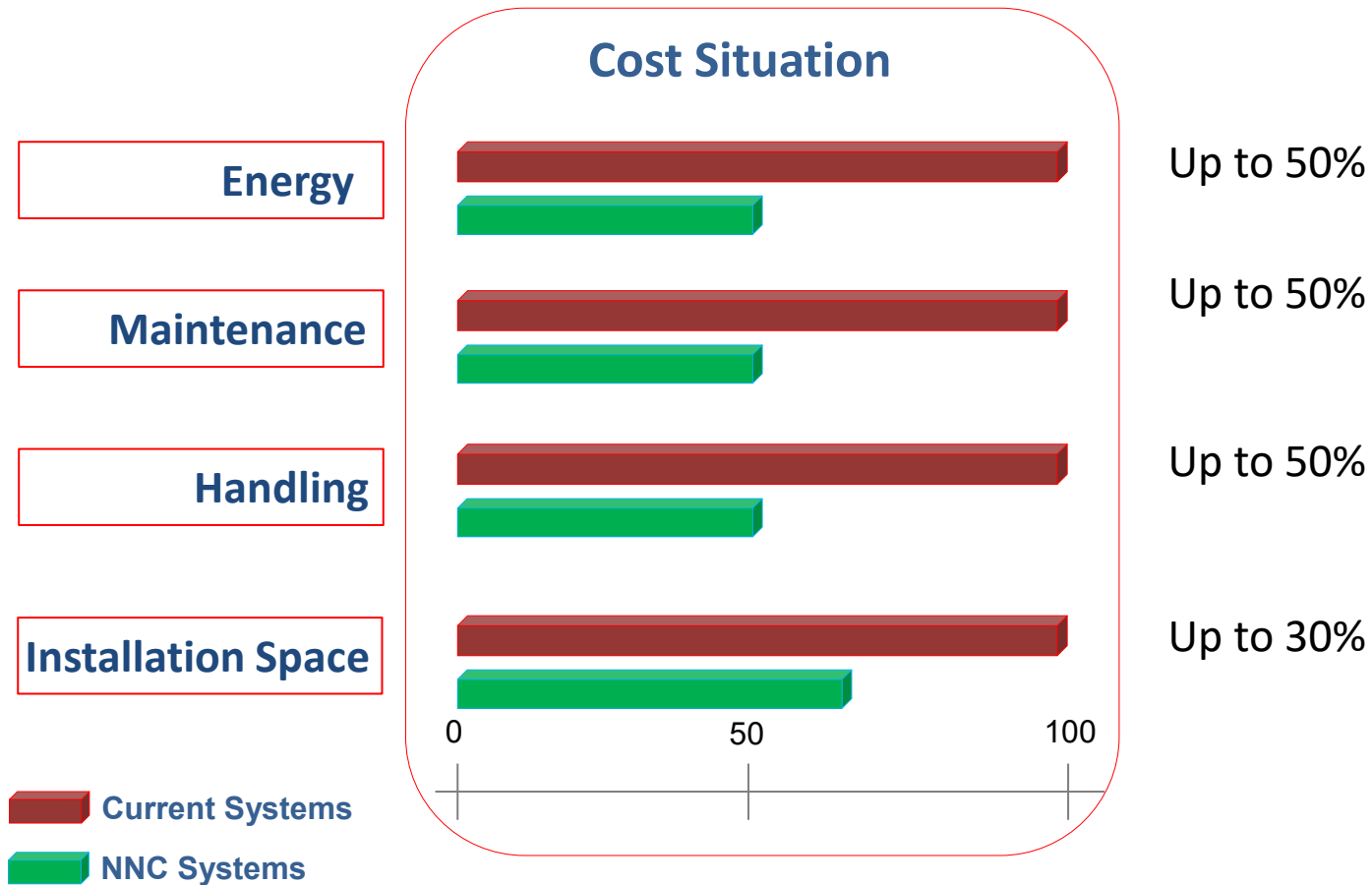


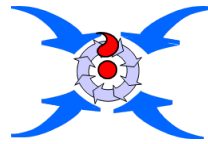
Areas of expertise of NNC

- The efficient, professional use of liquid N₂ for cooling
- To open opportunity's for different using's after cooling
 - cascading
- Optimize organisation, safe coasts and space
- Saving investment and stays for nature protection
- IT-supported storage and management of stored products

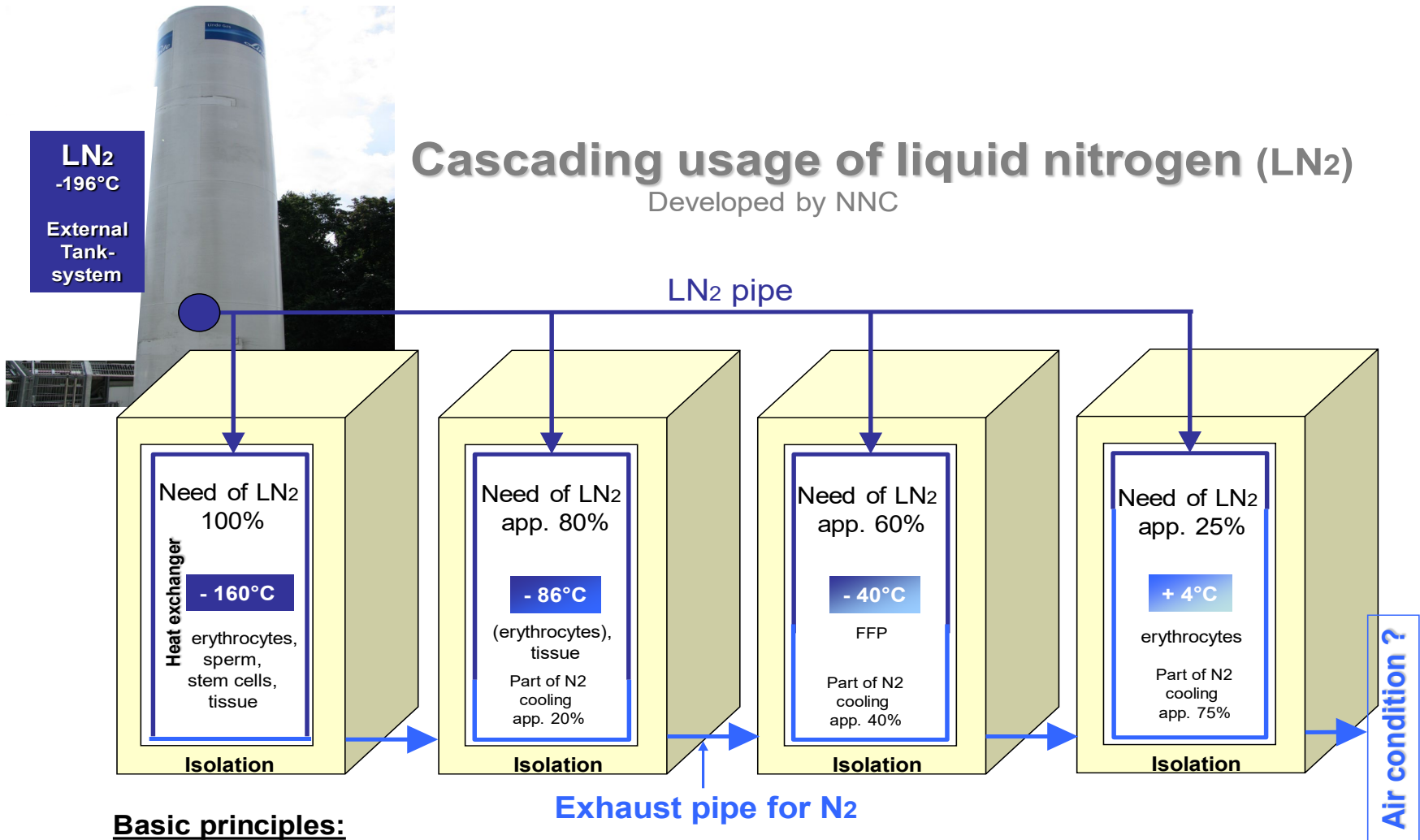


More facts competency of NNC





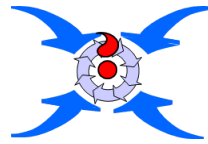
The cascading system of NNC



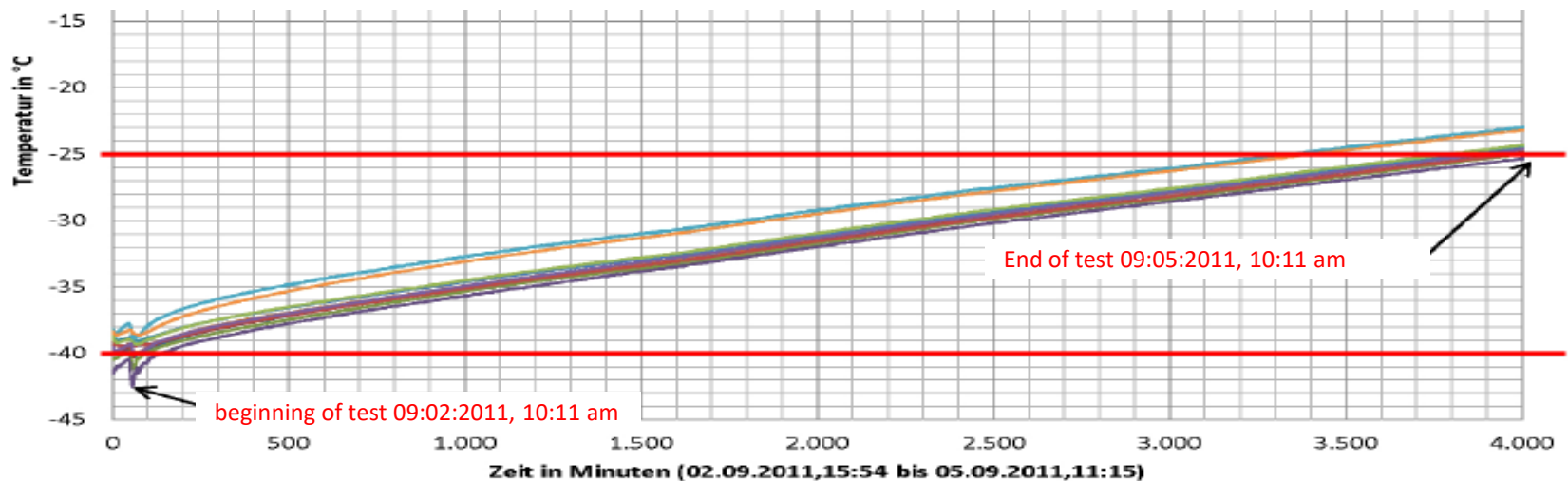
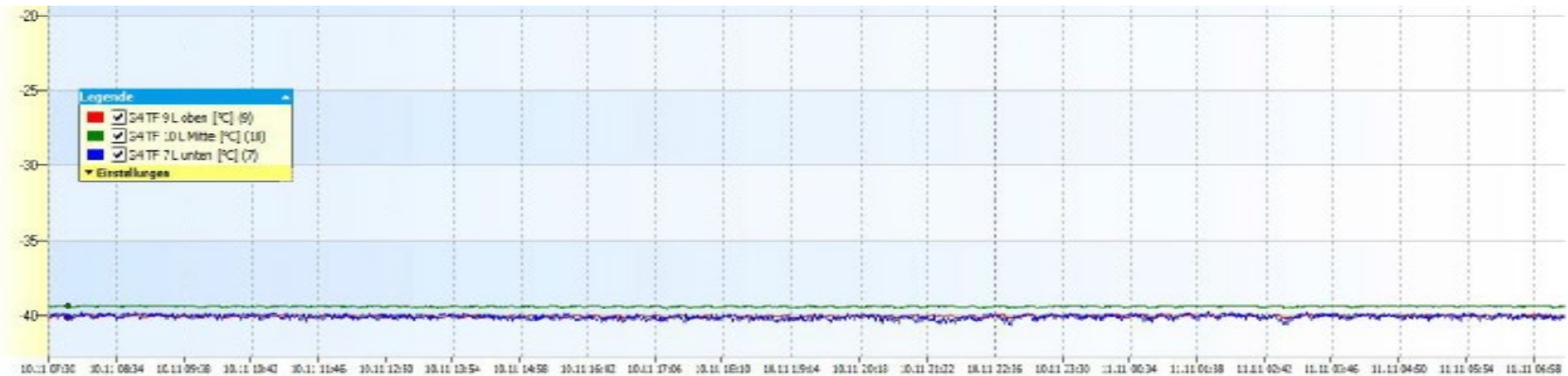
Basic principles:

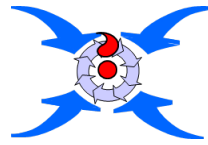
- N₂ provides the basic temperature
- LN₂ will be refilled to adjust the temperature to the required level

The double wall system of NNC



More than 24 ours to lose the temperature





Quality Jump: better temperature stability

Abb. 1 : Temperature inside a plasma-store system with compressor technology

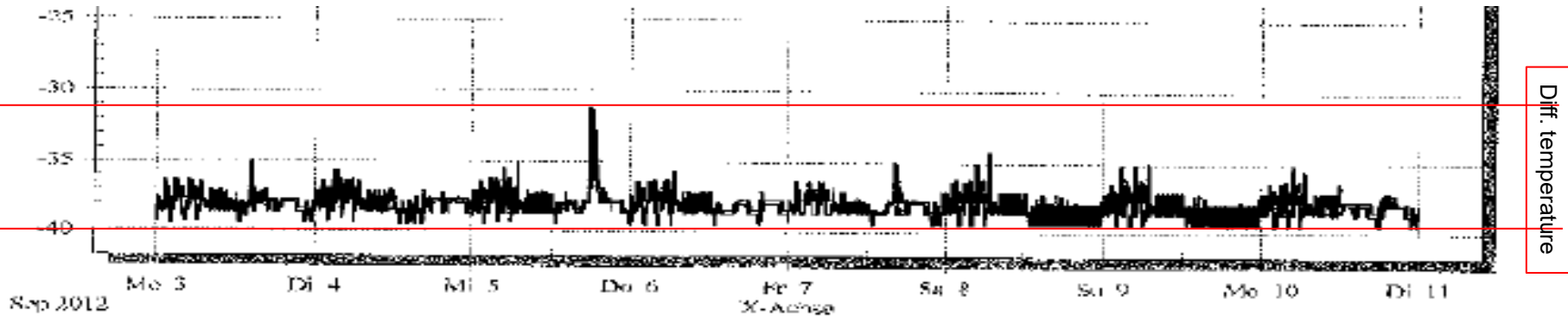
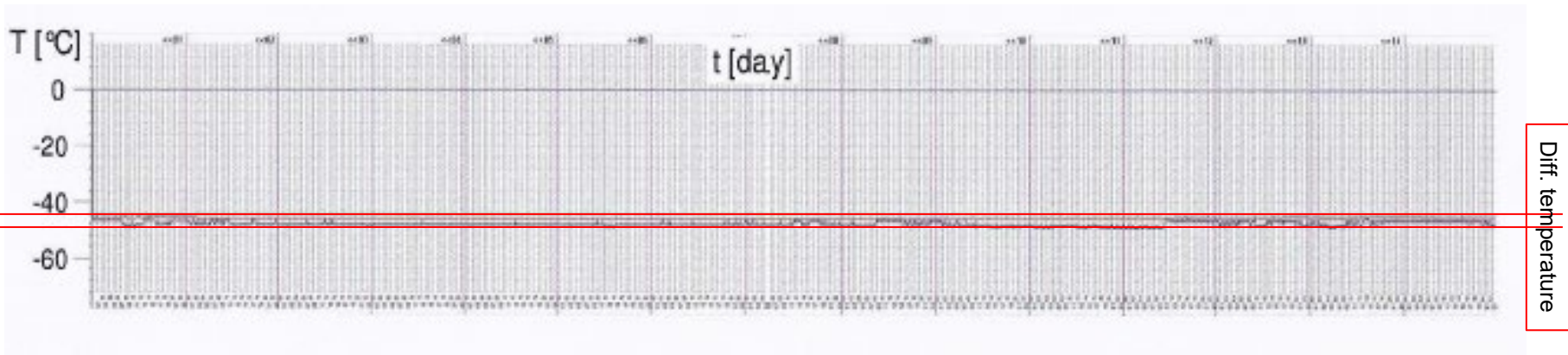
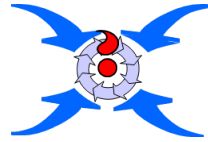


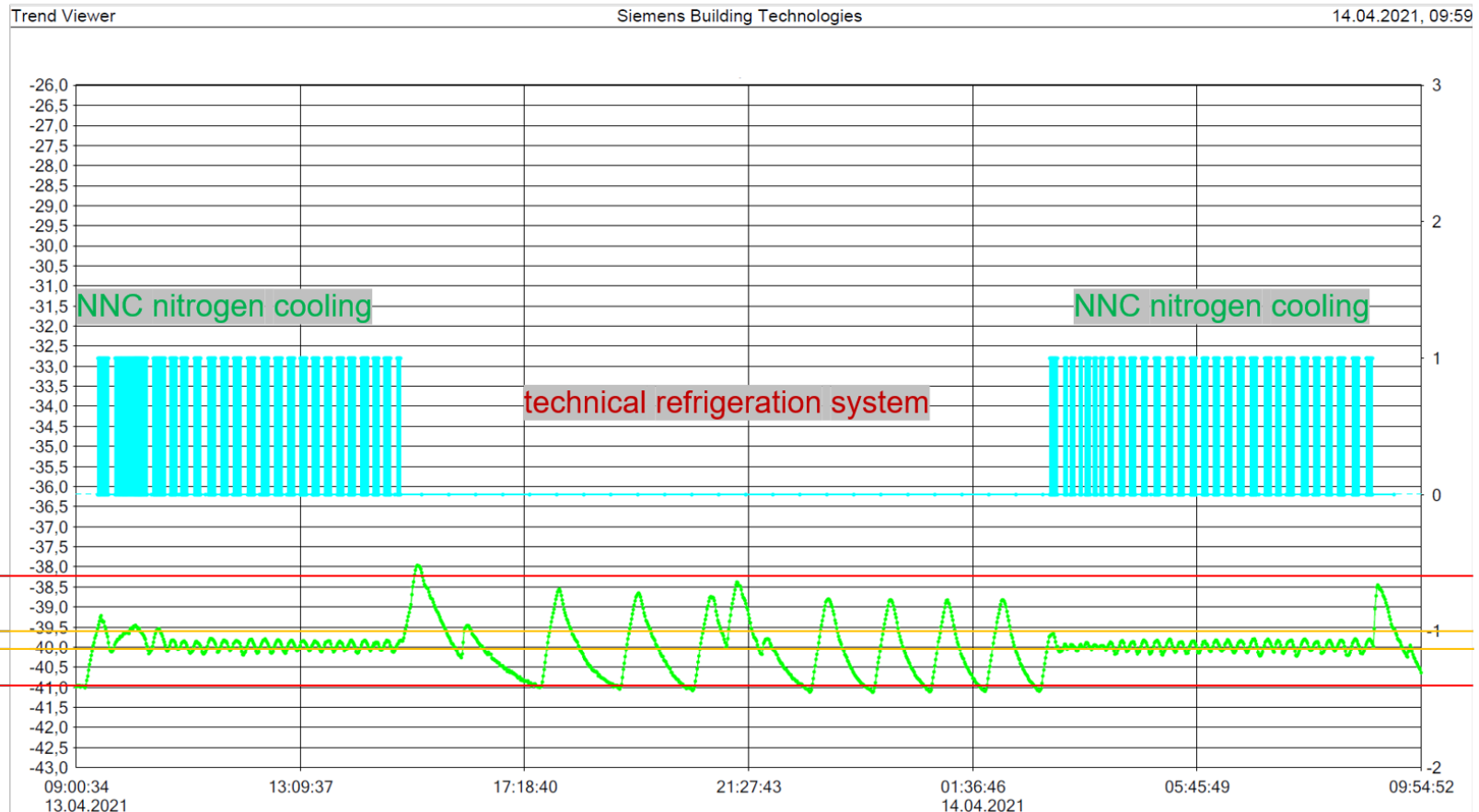
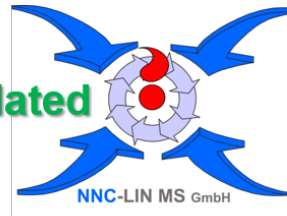
Abb. 2 : Temperature inside a plasma-store system from NNC, running with LN₂





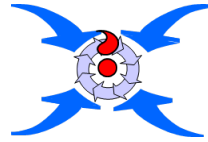
Quality Jump: the NNC BOS room system

There is no alternative, LN₂ regulated - 40 ° C for 300m³ cold room



Design and Optimized Ergonomics

University blood bank



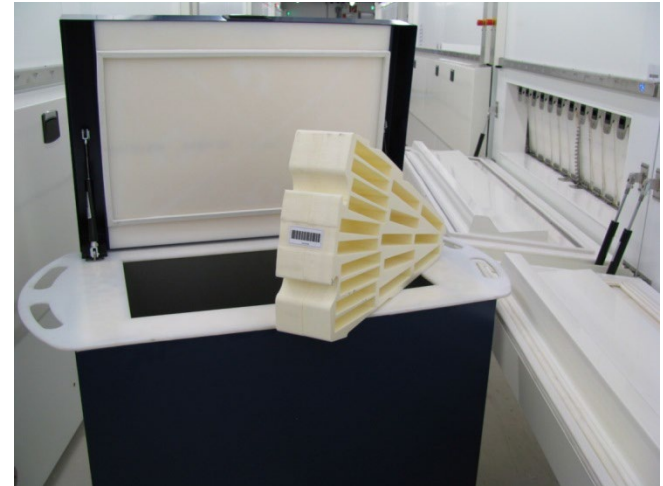
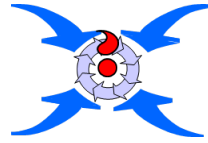
Organized cleanly
and without toxic refrigerants.
In addition, very user-friendly
and very long-lasting.

It's the BOS S from NNC

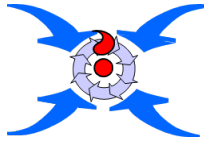


Precision Technology:

Very good performance

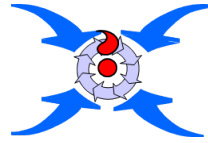


Better Performance at lower Costs



The BOS-System was conceived from the start to provide better performance at lower cost

- The BOS-System is designed to produce better quality products, as the result of precise and consistent temperature control.
- After 2½ years evaluation in practice, the dept. of hemostasis and transfusion medicine of the Heinrich Heine university medical Centre, Düsseldorf compared the product quality of BOS-stored biological products with that from conventional refrigerator technology.
- Using hemostasis profiling, including coagulation factor activities including FVIII:C, the stability of the stored products after freezing and thawing was found to be significantly superior from the BOS-System
- This is the result of the precise maintenance of set temperature of the cooled products, even under conditions of frequent accessing, loading and removal of products.



Better performance at lower costs

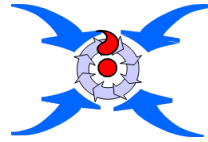
The BOS-System was conceived from the start to provide better performance at lower cost

From the design of the individual storage units, the high-tech Equipment specifications, precise temperature control, integrated organization, low space requirement, and very long-Life Cycle Planning, all components of the specification are integrated to provide the lowest-cost Solution.

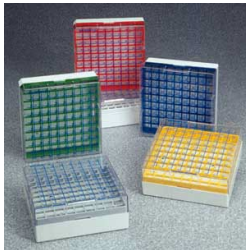
- **Space-Saving:** ca. 4m² for 2.592 Storage Compartments / ca. 3.000l Storage Volume
- **Safer:** automatic surveillance
- **Faster Service:** remote maintenance and service
- **Long service life and maximum reliability.** More than 25years designed-in life expectancy
- **Silent:** no compressors - no noise
- **No air conditioning costs:** No warmth generated by compressors
- **Highly professional logistics performance:** perfect organization
- Continuous product overview: Permanent inventory as standard
- **Capable of integration in other systems:** network capable
- **Precise temperature management:** from +10 to -86°C continuously
- **Perfect for all biological products and dimensions:** Flexible internal compartmentalization

Additionally, on top of all these benefits it is possible that existing systems can be purchased by NNC, to allow the installation of an integrated unified installation. For details of financing possibilities, contact your NNC sales partner.

The BOS-System is extremely flexible



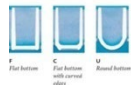
RFID Takes

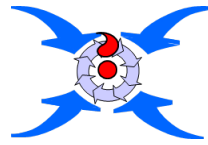


• Flexibility has a name: **BOS System line**

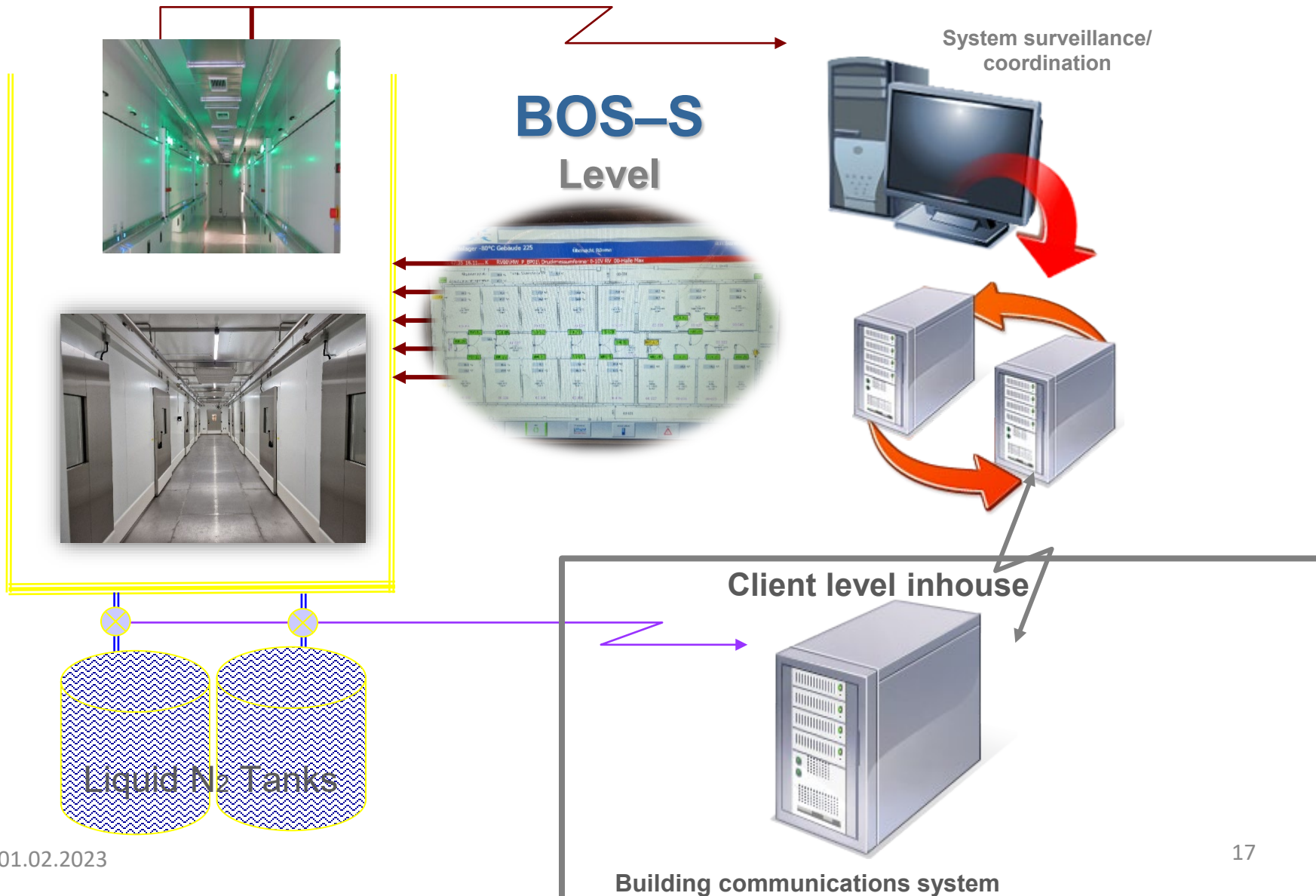
- Blood plasma bags, various sizes, with/without packaging
- Tubes
- Storage „plates“, modules, trays
- Metal, glass, plastic

What would you like to store, and above all, find again?



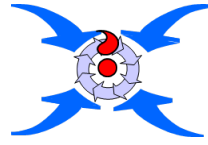


An Example of a BOS LN₂ - System



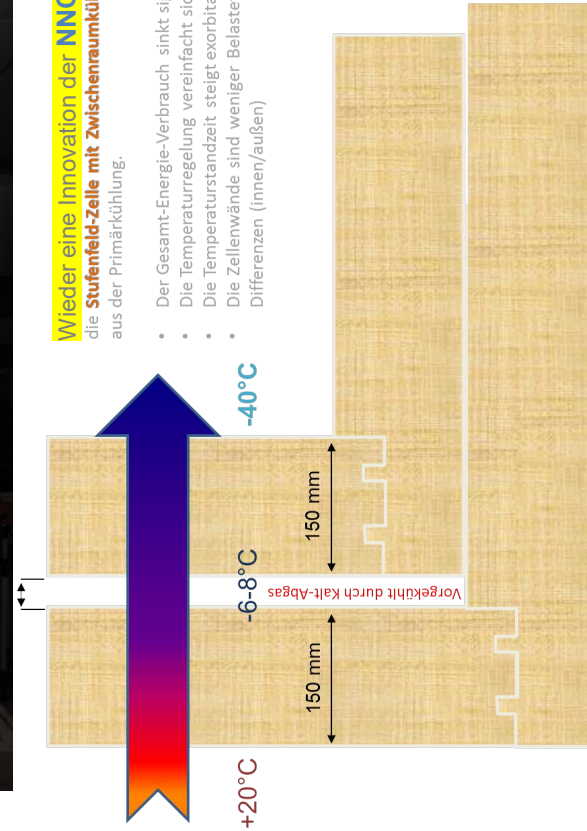
An Example of a BOS LN₂–Installation

Blood-Plasma, Germany, Europe biggest Store for Blood Products



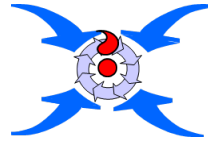
Wieder eine Innovation der **NNC-LIN MS UG**
die **Stufenfeld-zelle mit Zwischenraumkühlung** durch Abgas
aus der Primärkühlung.

- Der Gesamt-Energie-Verbrauch sinkt signifikant
- Die Temperaturregelung vereinfacht sich stark
- Die Temperaturstandzeit steigt exorbitant an, 0,25K/Std.
- Die Zellenwände sind weniger belastet durch Thermische Differenzen (innen/außen)



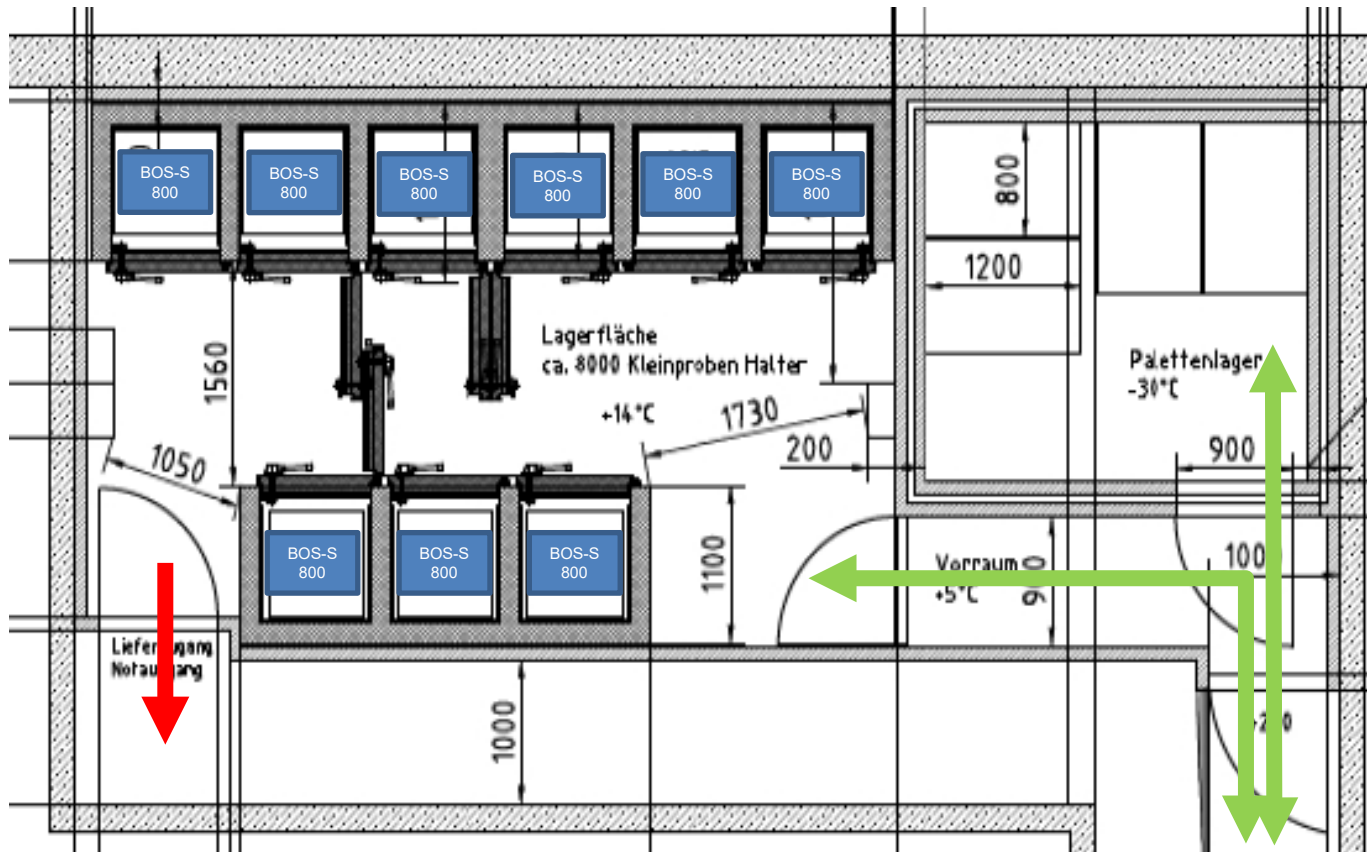
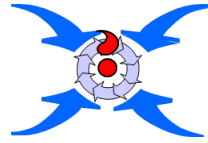
An Example of a BOS LN₂–Installation

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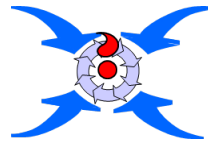
An Example of a BOS LN₂-Installation

University, Germany, Blood Products



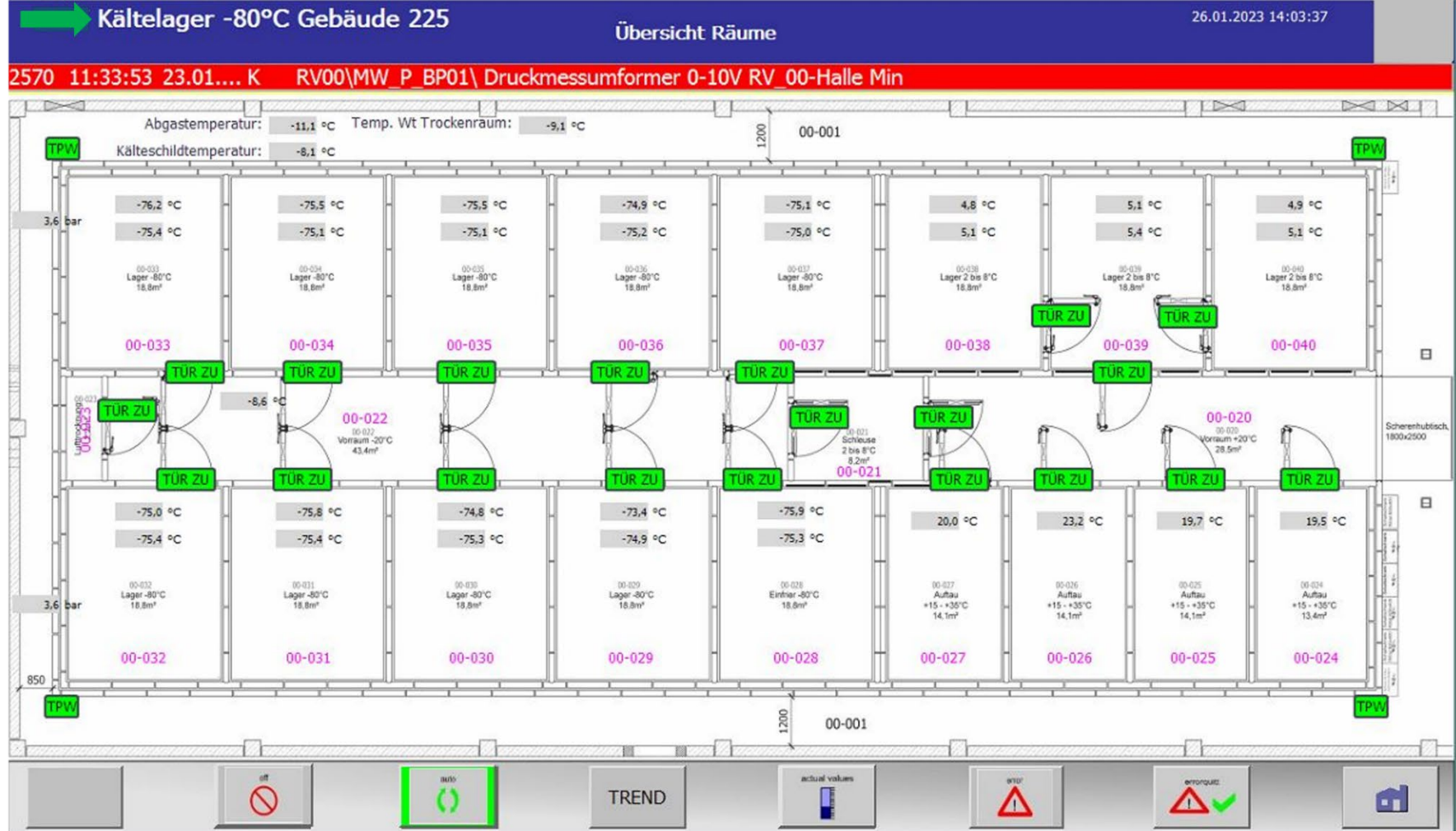
An Example of a BOS LN₂-Installation

Pharma-Germany



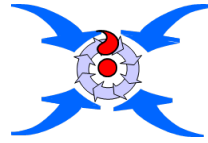
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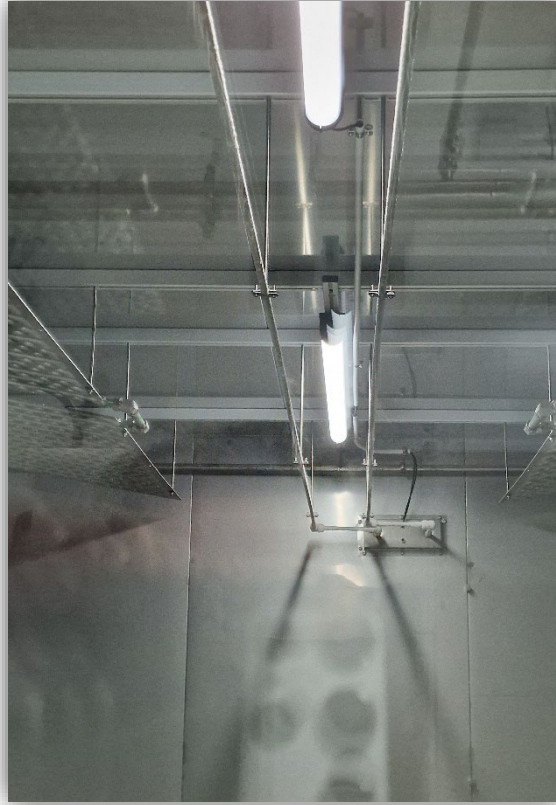


An Example of a BOS LN₂–Installation

Pharma-Germany



+35°C, warming up rooms



-80°C, cool store room



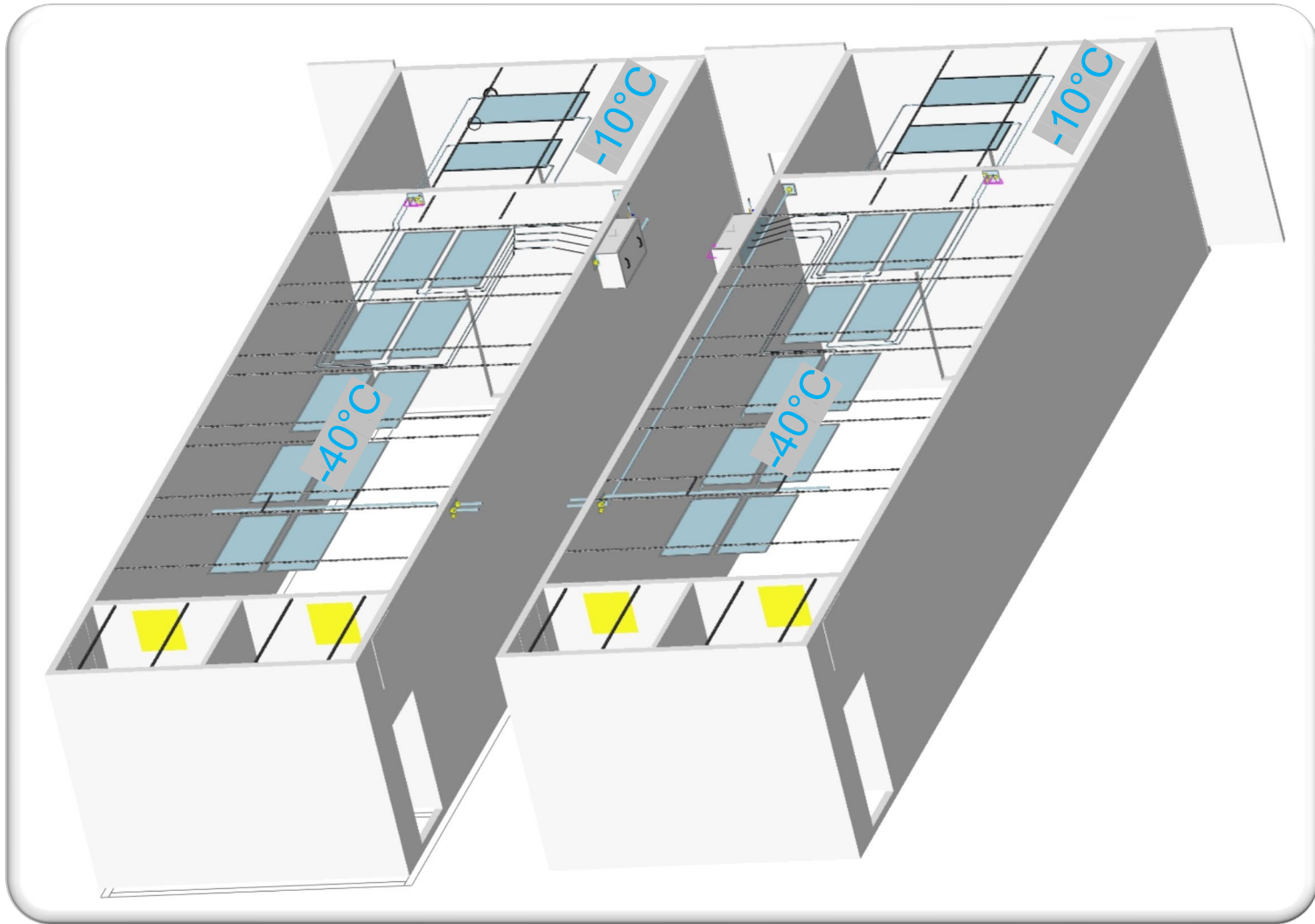
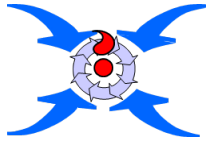
Air dryer



Our cryo-distribution-box

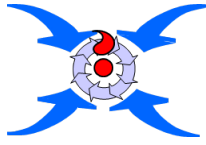
An Example of a BOS LN₂–Installation

Pharma-Germany

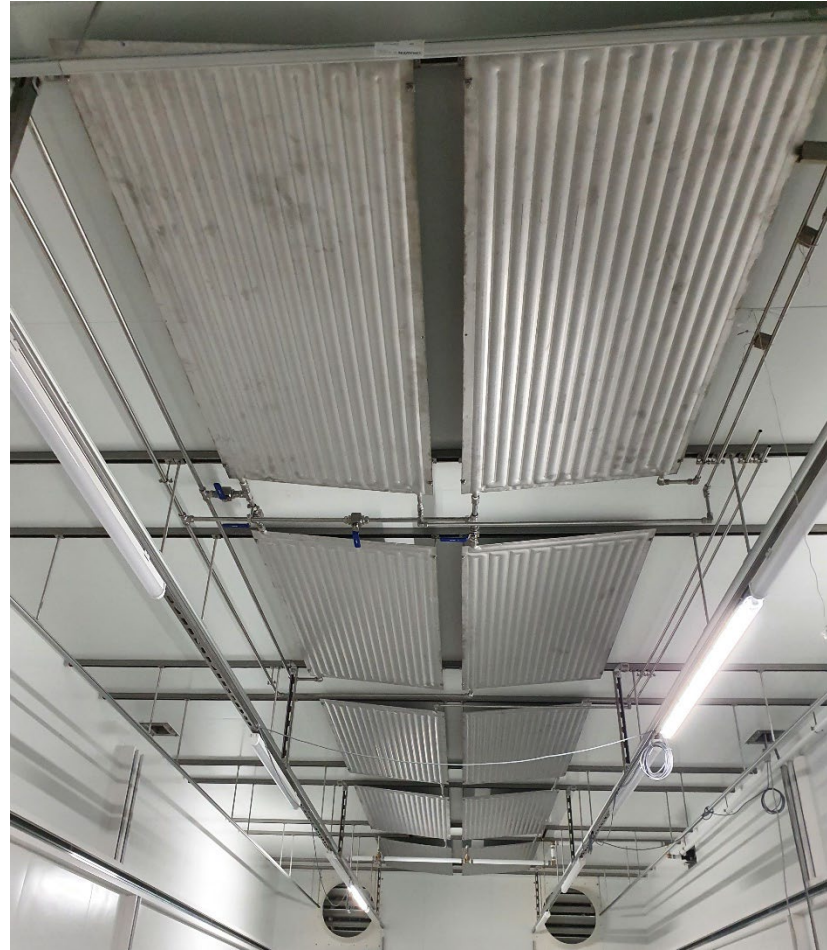


An Example of a BOS LN₂–Installation

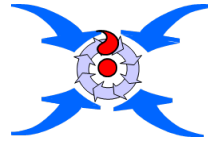
Pharma-Germany



Our cryo-distribution-box



-40°C, cool store room



System Improvements

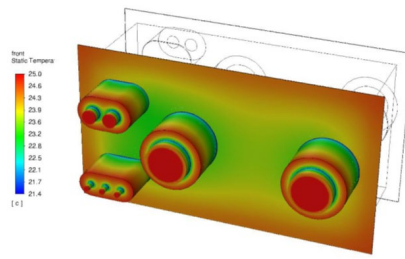
For all our products, systems, concepts we offer to do the full Paperwork.

We work together with independent organizations to do that in high quality.

- Institutes like ILK Dresden, CAE-Bayern, TÜV / Germany
- University's, Lübeck, Cologne, Düsseldorf, Freiburg.....
- Pharma Industry
- Supplier of cold gas (LN₂), Westfalen AG, Air Liquid, Linde, Messer Griesheim...

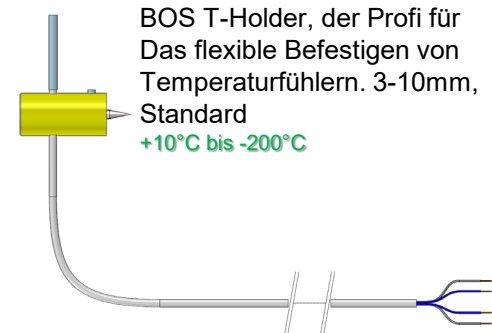
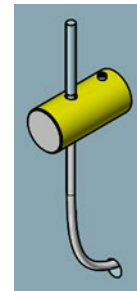
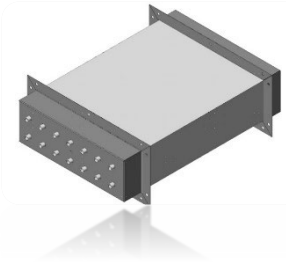
BOS Thermoblock, der Profi für Wand Durchbrüche in Kühlzellen

+10°C bis -200°C



NNC-LIN MS GmbH
Contours of Static Temperature (c)
BOS Thermoblock

ILK Dresden, Kryotechnik und Tieftemperaturphysik
Simulation Temperaturverteilung
ANSYS Fluent 2019 R3 (3d, dp, pbrns, lam)



BOS T-Holder, der Profi für
Das flexible Befestigen von
Temperaturfühlern. 3-10mm,
Standard
+10°C bis -200°C

System News

The new project, BOS S -150 automatic,
the crown

The Partners are

- NNC Group, / Germany
- TEDI, technische Dienste GmbH
- Hörburger AG, Waltenhofen
- Franz Lohr GmbH, Ravensburg
- Ewald Innovationstechnik GmbH
- Cryotherm, Siegtal / Germany
- Air Liquid Gas
- Westfalen Gas
- Fraunhofer Institute Lübeck EMB/ Germany
- ILK Dresden
- University Lübeck / Germany
- University Düsseldorf / Germany
- University Freiburg / Germany
- University Cologne / Germany
- And more partners
- German Government / Funding

Wir fördern Wirtschaft

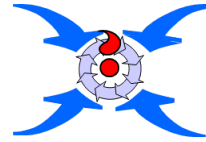


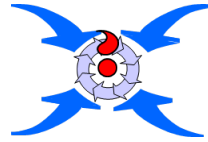
Landesprogramm Wirtschaft: Gefördert durch die Europäische Union - Europäischer Fonds für regionale Entwicklung (EFRE), den Bund und das Land Schleswig-Holstein

Schleswig Holstein. Der echte Norden

01.02.2023

	Plan-System	Askion	Sysmex	Liconics	Brooks
Produkt	BOS-S 150/A	HS-200	Smart freezer	z.B. STC12K5 ULT	z.B. BioStore II
Temperaturbereich	+4°C ... -150 °C	-130 °C	-130 °C	0°C ... -80 °C	0°C ... -80 °C
Stufenlos in der Steuerung	Ja	Ja	Ja	Ja	Ja
Automatisiertes System	Ja	Ja	Ja	Ja	Ja
Standalone Unit	Ja	Ja	Ja	Ja	Ja
Keine baulichen Maßnahmen erforderlich	Ja	Ja	Ja	Ja	Ja
Cherry picking – andere Proben verbleiben bei Tieftemperatur	Ja	Ja	Ja	Ja	Ja
Vereisung der Vials wird vermieden	Ja	Ja	Ja	Ja	
Separater und tiefkalter/klimatisierter Ein- und Auslagerungsbereich	Ja	Ja	Nein	Nein	Nein
Kühlkette wird eingehalten	Ja	Ja	Nein	Nein	Nein
Kühlung ist unabh. von Stromversorgung = LNz	Ja	Ja	Ja	Nein	Nein (optional)
Modularer Aufbau	Ja	Nein	Nein	Ja	Ja
Lagertemperatur über Gefrierpunkt möglich	Ja	Nein	Nein	Nein	Nein
Horizontal angeordnete Tiefkältelagerung	Ja				
Unterschiedlich temperierte Teilbereiche / Temperaturmodule möglich	Ja	Nein	Nein	Nein	Nein
Kühlkette wird eingehalten	Ja	Ja	Nein	Nein	Nein
Integriertes flexibles Probenhandling	Ja				
Einbau in Standardcontainer	Ja	Nein	Nein	Nein	Nein
Variabler Temperaturbereich	Ja	Nein	Nein	Ja	Ja
Deckt weiten Temperaturbereich ab	Ja	Nein	Nein	Ja	Ja
Kein Probenkontakt mit LN/LNz (Gas, Aerosol, Flüssig)	Ja	Nein	?	Ja	?
Gefahr von Kreuzkontaminationen unterbunden	Ja	Nein	?	Ja	?
Wärmetauscher	Ja	Nein	Nein	Nein	Nein
Geschlossene Kaskadenkühlung -150°C System kühlt -86°C Syst. Und weiterführende Installation	Ja	Nein	Nein	Nein	Nein
Energie-Recycling durch Kompatibilität mit Haustechnik	Ja	Nein	Nein	Nein	Nein
Kaltwassererzeugung durch Abkälte am System	Ja	Nein	Nein	Nein	Nein
Unabh. von Probenformat	Ja	Nein	Nein	Nein	Nein
Altproben können kombiniert gelagert werden	Ja	Nein	Nein	Nein	Nein
Massenlagerung möglich	Ja	Nein	Nein	Nein	Nein
Mobile Lagerung möglich (Container)	Ja	Nein	Nein	Nein	Nein
Ext. Raumerweiterung möglich (Container)	Ja	Nein	Nein	Nein	Nein





The **BOS-System** solves other refrigeration problems

NNC you find:

NNC-LIN MS GmbH

Sitz

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Wir fördern Wirtschaft



Landesprogramm Wirtschaft: Gefördert durch die Europäische Union - Europäischer Fonds für regionale Entwicklung (EFRE), den Bund und das Land Schleswig-Holstein

Schleswig Holstein. Der echte Norden

We foster the economy



Regional Economic Programme: Funded by the European Union - European Regional Development Fund (ERDF), the Federal Government and Land Schleswig-Holstein

Schleswig Holstein. The real North