

# Superisolierte Flüssigstickstoff-Kreislaufsysteme Superinsulated LIN-Closed Loop Systems

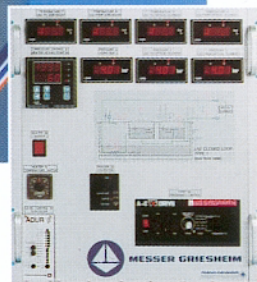


Bauteile mittels Wärmetauscher wirtschaftlich und zuverlässig auf 66-90 Kelvin abgekühlt werden können.

Durch das Arbeiten mit unterkühlter Flüssigkeit werden Gasblasenbildung und damit einhergehende Vibrationen vermieden.

Dadurch eignet sich das Kreislaufsystem besonders zur Kühlung von

- empfindlichen optischen Geräten bzw. Systemen wie Monochromatoren in Synchrotron-Strahlengängen



- Hochtemperatur-Supraleiternkabeln (HTSL) etc.

Hohe Durchflußmengen, Unterkühlungsgrade und Kühlleistungen bis 4 kW garantieren bestmögliche Wirkungsweise und Betriebssicherheit.

The development, design and manufacturing of cryogenic equipment has been our business since more than 30 years.

That stands for more than 40,000 superinsulated vessels and several hundreds of kilometers of superinsulated transferlines meanwhile. Since 1993 our delivery programme also includes special closed loop systems which are operating with subcooled cryogenic liquid, such as liquid nitrogen (LIN), for economic and reliable cooling of components up to 66-90 Kelvin by heat exchangers.

Working with subcooled cryogenic liquid guarantees that disturbing gas bubbles and corresponding vibrations will be avoided.

Therefore, the closed loop system is suited for cooling

- sensitive optical devices or systems, like monochromators installed in synchrotron beamlines

- high- $T_c$  superconductors, etc.

High flow capacities, subcooling effects and cooling powers of 4 kW ensure a very high degree of efficiency and operating reliability.



*Superisoliertes LN<sub>2</sub>-Kreislaufsystem mit Steuerungseinheit*

*Superinsulated LIN-Closed Loop System with Control Panel*

Seit mehr als 30 Jahren entwickeln, konstruieren und fertigen wir superisolierte Ausrüstungen für die Tieftemperaturtechnik.

Das sind inzwischen mehr als 40.000 Behälter und einige hundert Kilometer Transferleitungen.

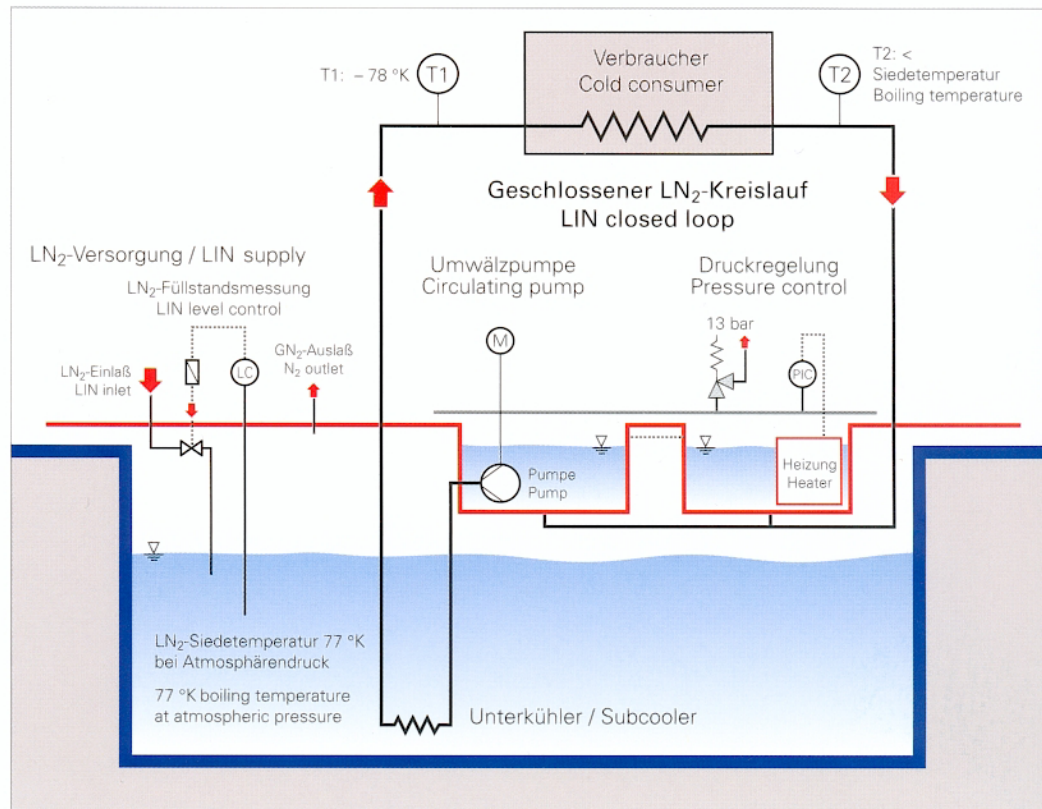
Seit 1993 bauen wir geschlossene Kreislaufsysteme für unterkühlte, tiefkalte Flüssigkeiten, wie z.B. Flüssigstickstoff, mit denen

## Vorteile

- Keine siedende Flüssigkeit am Verbraucher
- Erschütterungsfreier Betrieb
- Dauerbetrieb
- Geschlossener Kreislauf
- Niedriger LN<sub>2</sub>-Verbrauch
- Hoher Wirkungsgrad
- Hohe Kühlleistungsreserve
- Hohe Flexibilität
- Vollautomatischer Betrieb
- Hohe Zuverlässigkeit
- Mobil durch leichtgängige, feststellbare Lenkrollen bzw. Gabelstaplertaschen
- Nur Elektro- und LN<sub>2</sub>-Anschluß erforderlich

## Advantages

- No boiling liquid at the consumer
- Vibration-free operation
- Permanent operation
- Closed-loop system
- Low LIN consumption
- High efficiency
- Large cooling power reserve
- High flexibility
- Fully automatic operation
- High reliability
- Mobile by easy-running castors with locking device resp. forklift truck-slots
- Only electric and LIN connection required



## Technische Daten / Technical Data

	Dim.	Typ / Type				
		1	2	3	4	5
Kühlleistung Cooling power	W	2000	2000	4000	2500	4000
Kühltemperatur Cooling temperature	K	78-90			66-78	
Max. Fördermenge Max. Flow Rate	l/h	500	2000	3000	1400	3000
Max. Druckdifferenz Max. Pressure Differential	bat	3,5	2	2	3,4	2
Max. Betriebsüberdruck Max. Operating Pressure	bar	13	13	13	10	20
Abmessungen / Dimensions						
Gesamthöhe / Total Height	m	1,90	2,00	1,90	1,80	1,90
Gesamtbreite / Total Width	m	0,60	0,60	0,60	0,70	0,60
Gesamtlänge / Total Length	m	1,10	1,80	1,30	1,10	1,30

Schema:  
Geschlossener  
LN<sub>2</sub>-Kreislauf

Schema:  
LIN-Closed  
Cooling System

Der Umwelt zuliebe – mit Sauerstoff gebleicht

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# People say light as a feather ...

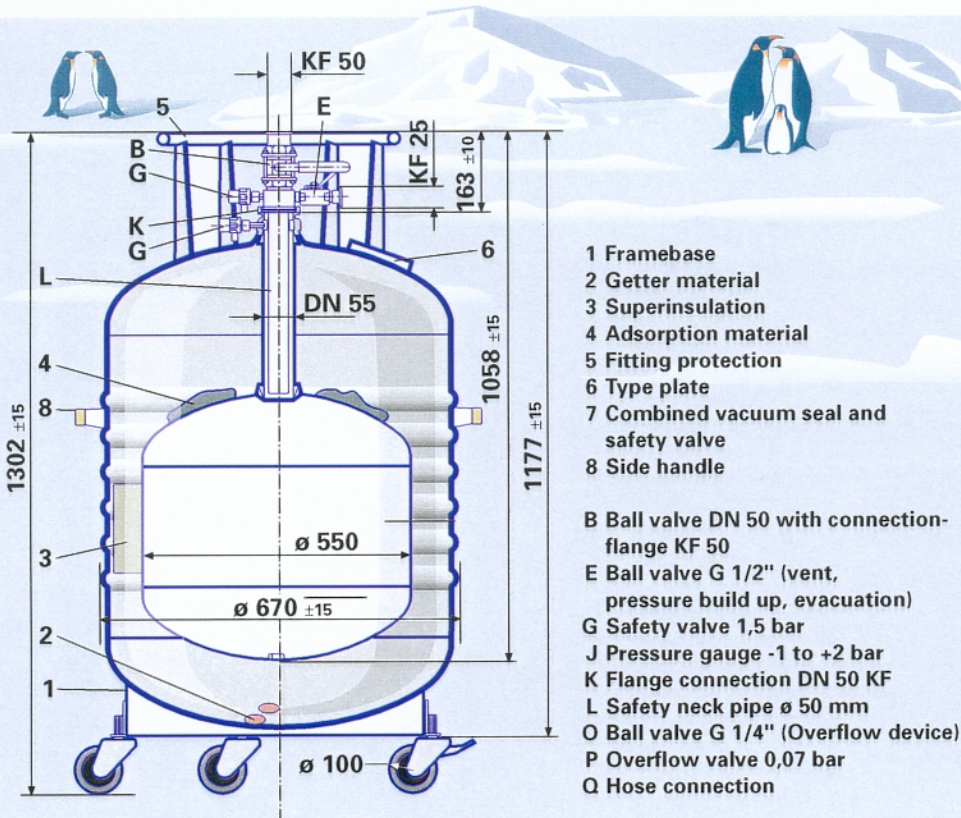
... is our Transport and Storage Vessel STRATOS® 100 SL.

It is ideal for laboratory experiments  
and transports of cryogenic liquid helium.

# The Ultimate Liquid Helium Transport Vessel: STRATOS® 100 SL (= Super Light-Weight)

The right decision has many advantages – see for yourself:

Handling	
Easy Transport – upstairs/downstairs? No problem ...	... with only <b>51 kg full weight</b> and 2 clever side-handles.
Integration of cryogenic experiments? No problem ...	... with the KF 50 top flange connection and diameter 50 free access.
Integration of decanting siphons in rooms with low ceiling? No problem ...	... with only 1.3 m total height (incl. castors).
Integration of different kinds of decanting devices? No problem ...	... the KF 50 adaptors are available with all kinds of O-Ring-fittings.
Safe stand on lifting devices? No problem ...	... with solid base frame and the easy removable and sure-fixed roller base.
Safety	
Type-approved rugged design ...	... thanks to specially braced outer vessel, reinforced manifold protection, and approved neck tube junction.
Protection against blocked neck ...	... thanks to the safety neck tube, which forms two separate overpressure-protected neck spaces.
No bursting discs needed ...	... thanks to type-approved (4K) full flow safety valves.
Fire proof quality ...	... thanks to unburnable superinsulation and adsorbant materials.
Profitability	
Earning money every day ...	... thanks to multilayer superinsulation and optimized shield cooling which minimize the evaporation rate to <b>only 0.7 %/day</b> .
Fast and economic cool down ...	... thanks to extremely low mass and high thermal conductivity of the aluminium inner vessel.
Low maintenance ...	... thanks to adsorbant and getter materials which provide for a long term stability of the vacuum.



- 1 Framebase
- 2 Getter material
- 3 Superinsulation
- 4 Adsorption material
- 5 Fitting protection
- 6 Type plate
- 7 Combined vacuum seal and safety valve
- 8 Side handle

- B Ball valve DN 50 with connection-flange KF 50  
 E Ball valve G 1/2" (vent, pressure build up, evacuation)  
 G Safety valve 1,5 bar  
 J Pressure gauge -1 to +2 bar  
 K Flange connection DN 50 KF  
 L Safety neck pipe ø 50 mm  
 O Ball valve G 1/4" (Overflow device)  
 P Overflow valve 0,07 bar  
 Q Hose connection

Technical data	
Operating overpressure	1,5 / -1 bar
Geometrical volume	103 l
Material	Al-alloy
Weight empty	ca. 39 kg
full	ca. 51 kg
Static evaporation rate	ca. 0,7 %/d
Art.-No.:	794.21109
Type approved gas pressure vessel according to TRG, GGVS, ADR, GGVE, RID	
Also as AELOS 100 SL available according to the IATA rules.	

Accessories:	Art.-No.:
Roller base with 5 castors	794.21124
Siphon adapter KF 50 ø 12	794.21373
Siphon adapter KF 50 ø 12,7	782.00229
Siphon adapter KF 50 ø 16	782.00230
Level probe with KF 50 intermediate piece	792.48662
Level gauge	782.00194
Decanting siphon	794.20020

Art. Nr.: 78210121  
 Oxygen-bleached for the sake of the environment

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Quality management system  
 ISO 9001 certified Reg. No.: 09 100 93047



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