

# Operating Instructions LN2 Transfer Hose

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NMRtools LN2 transfer hose Article no: ART-08.01-122

The NMRtools LN2 transfer hose is manufactured in Germany.

## GENERAL

The NMRtools LN2 transfer hose is a high-tech product designed for increased safety and cost efficiency in NMR laboratories.

These operating instructions are intended to enable safe and effective working with the LN2 transfer hose. For this reason, these instructions must be made available to all users. The user is obliged to read the operating instructions carefully before starting up the unit.

## EXCLUSIVE USE

- Refilling liquid nitrogen in professional NMR laboratories
- Use only by trained and qualified personnel, taking into account the general protective measures for handling liquid nitrogen.
- Refilling liquid nitrogen never unobserved / requires one hundred percent attention

## NOT INTENDED FOR THE FOLLOWING USES

- Use for other liquids, liquefied gases, gases
- Use outside NMR laboratories
- Use with damaged cans

Any use not in accordance with the intended use is considered to be contrary to the intended use.

The manufacturer is not liable for any damage resulting from this. The risk for this is borne solely by the user/operator.

## OPERATOR OBLIGATIONS

The operator must ensure that only trained personnel use the LN2 transfer hose for liquid nitrogen filling in suitable rooms and in compliance with the safety precautions for handling liquid nitrogen (protective equipment, etc.).

## WARNINGS AND NOTES DUE TO THE HANDLING OF LIQUID NITROGEN

### WARNING

Danger of suffocation!

Danger of frostbite!

Use only by trained personnel.

Be sure to wear protective clothing: face shield and gauntlet leather gloves.

It is essential to follow the recommendations of the spectrometer manufacturer (e.g. maximum pressure specifications) for filling with liquid nitrogen.

General protective measures must be observed when handling liquid nitrogen.

## PERSONAL PROTECTIVE EQUIPMENT

Protective clothing must be worn when filling liquid nitrogen. Especially face shield and gauntlet leather gloves

## BEHAVIOR IN AN EMERGENCY

First aid:

Skin contact: Slow warming without rubbing the affected areas.

Inhalation: Provide fresh air supply

## TECHNICAL DATA

Specification	Unit
Total length	2200 mm
Inner diameter	8 mm
Outer diameter	26 mm
Wall thickness inner tube	1 mm
Hose weight	980g
Operating pressure	Solenoids are filled with pressure specified by the manufacturer (0.35-max 0.5 bar). This is to protect the magnets. All manufacturer specifications must be met here.
Temperature range	-200°C to +100°C  Do not heat above 100°C permanently
Lifetime	The LN2 hose is designed for the following service life when properly stored, maintained and operated: indefinite over 5 years from year of manufacture. The year of manufacture is indicated on the type plate.

## STORAGE & USE

- Storage not above 50°C
- Minimum bending radius 20 cm
- Keep away from sharp edges and pointed objects
- Do not heat above 100°C permanently

As a rule, the storage and use of cryogenic liquid nitrogen is only permitted in rooms that have adequate ventilation and are



only accessible to authorized persons. Under certain circumstances, a gas monitoring system may be required.

## MAINTENANCE

Interval	Maintenance work	Personal
Before each commissioning	Visually inspect the transfer hose and connections for proper technical condition before each use.  Before cryogenic liquefied gases enter pipelines, they must be carefully dried.	Operator
With each use	Make sure that the transfer hose cools down evenly over its entire length when in use (indicator: fogging, frost buildup); otherwise, take it out of service	Operator

## REPAIR & DISPOSAL

A repair may only be carried out by NMRtools. Please get in contact with us.

Disposal: please return the LN2 transfer tube to us. Please contact us for this purpose. We will bear the transport costs after prior agreement.

## USE

### Filling process

- After opening the filler and exhaust ports, apply the hose to the filler port to a depth of approx. 2 cm, applying slight pressure and twisting back and forth. Make sure that it is tightly seated. If the fit is too loose, this may be because the hose nozzle is still too cold from the last filling and must first be warmed up further.
- Reduce the pressure in the jug to below 0.3 bar.
- Slowly open the tap of the jug.
- Observe the gas flowing out of the outlet nozzle.
- Cold gas must be diverted away from the magnet.

### Ending the filling process

- Close the tap of the jug.
- Allow the hose connection to heat up or warm it up with a hair dryer. Attention: when heating with a hair dryer, the temperature must not exceed 100 C.
- Dry the hose nozzle before removing it from the condensation.
- Remove the hose from the filling nozzle while gently twisting it back and forth (do not use force).
- Hang the hose on the jug at a distance of at least 40 cm from the outlet so that a bending radius of at least 20 cm is always ensured.
- Do not forget to secure the filling and discharge ports of the solenoid against icing.