Operating Manual 056-720-00 Rev. 1

Application Cryogenics Thermoflasks

Catalog Number 2122, 2123, 2124, 2129, and 2130

Important Read these operating instructions. Failure to read, understand and follow the instructions in this manual may result in damage to the unit, injury to operating personnel, and poor equipment performance. ▲

Caution All internal adjustments and maintenance must be performed by qualified service personnel. ▲

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Handling Thermoflasks

It is recommended that care be taken in the use of Thermo Scientific Thermoflasks. Any product used under vacuum is a potential hazard and, therefore, should be treated with caution. If in doubt, consult the safety regulations of your laboratory or institution. Specific warnings are listed below to avoid some of the more common errors.

Failure to follow proper procedures, heed warnings, and cautions can result in failure of the flask with potential expelling of the contents and subsequent harm to user.


Warning Contact of liquid nitrogen with the skin or eyes may cause serious (freezing) injury. When handling liquid gases, appropriate Personal Protection Equipment (PPE) must be worn, such as goggles or facemasks, and insulated or rubber gloves large enough to allow quick removal, and insulated or rubber aprons. ▲

Caution A potentially dangerous situation could result from pouring liquid gases into a Thermoflask without pre-cooling the flask. When pouring liquefied gases from one container to another, the receiving container should be cooled gradually to prevent thermal shock. The liquid should be poured slowly to avoid splashing. A receiving vessel should always be vented to the atmosphere and high concentrations of excess oxygen and/or nitrogen should not be allowed to collect. ▲

Warning Nitrogen gas can cause suffocation without warning. Store and use liquid nitrogen only in a well-ventilated place. As the liquid evaporates, the resulting gas displaces the normal air in the area. (The cloudy vapor that appears when liquid nitrogen is exposed to the air is condensed moisture, not the gas itself. The issuing gas is invisible.) In closed areas, excessive amounts of nitrogen gas reduces the concentration of oxygen and can result in asphyxiation. Because nitrogen gas is colorless, odorless, and tasteless, it cannot be detected by the human senses. Breathing an atmosphere that contains less than 19.5% oxygen can cause dizziness and quickly result in unconsciousness and death. Therefore, the use of oxygen monitoring equipment is strongly recommended. ▲

Caution It is recommended to have this vessel tested by the manufacturer or qualified cryovessel service technician every 7-10 years, regardless of any problems (or lack thereof) there may have been in the past. This will help insure your samples against sudden loss of liquid nitrogen due to vacuum failure. ▲

Warning All Thermoflasks in stainless steel containers (catalog numbers 2122-2124) have vented lids to prevent build-up of gas pressure when holding a gassing substance. The ability of the vent to release pressure should be checked periodically. ▲

Handling Thermoflasks (cont.)

Warning Do not cover any glass Thermoflask with any fixed or heavy object that might form a seal around the rim either naturally, or induced by freezing. ▲

Warning If liquid gases or other materials of extremely low temperatures are being used, ONLY use a stirring rod with a PTFE (polytetrafluoroethylene) or comparable form of protective coating, to mix or stir substances in the Thermoflask. ▲

Liquid Nitrogen Holding Times

Size	Holding Time
1 Liter	38 Hours
2 Liters	48 Hours
4.5 Liters	54 Hours

The holding times in the table on the left are intended as a guide only, to illustrate the probable time it takes for a stainless steel Thermoflask, with lid, to empty completely after being filled with liquid nitrogen. The times may change depending on higher or lower ambient temperatures, whether or not the lid is removed for examination of the contents, and according to the mass of the material being frozen.

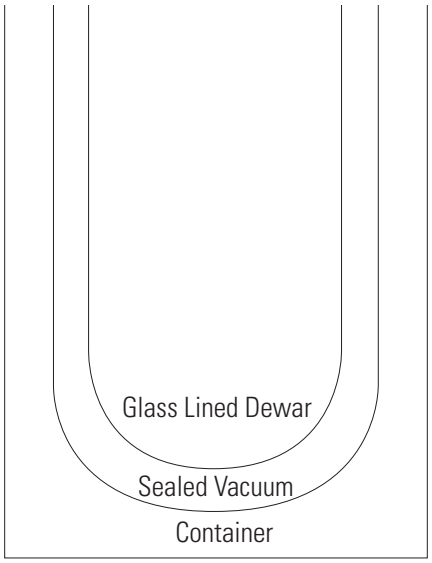
Even though the Thermoflasks may be almost empty of liquid nitrogen, they will continue to be effective storage vessels for frozen material because the contents will be held in the vapor phase of the nitrogen, i.e. the liquid nitrogen will have boiled to become a very low temperature gas. This can benefit users who wish to store materials in a frozen state, but not at the exceptionally low temperature of the liquid nitrogen itself.

Specifications

Catalog Number	Capacity - Liters	Inside Diameter - Inches (cm)	Outside Diameter - Inches (cm)	Height - Inches (cm)	Ship Wt. - lbs (kg)
2122	1.0	3.6 (9.1)	4.6 (11.7)	9.0 (22.9)	6 (2.7)
2123	2.0	4.2 (10.7)	5.6 (14.2)	10.7 (26.9)	8 (3.6)
2124	4.5	5.9 (15.0)	7.2 (18.2)	13.8 (35.0)	10 (4.5)
2129	1000ml	5.1 (13.0)	6.3 (16.0)	4.5 (11.6)	8 (3.6)
2130	1900ml	6.1 (15.5)	7.3 (18.5)	5.4 (13.7)	10 (4.5)

Operation

Before using your any vessel, carefully inspect it. Check for signs of damage, such as scratches, chips or discoloration of glass. If any damage is found, do not use! It is advisable to fill (see Filling Instructions) all new units with liquid nitrogen and watch liquid nitrogen loss rate for a few days. If there are any problems, call Technical Services as soon as possible.



Use a wooden yardstick to measure liquid nitrogen level. Level will be indicated by frost line which develops when dipstick is removed and waved in a back and forth motion away from the user.

To avoid damage to your cryogenic storage vessel which may result in premature vacuum loss, it is important that the following procedure be used during the addition of liquid nitrogen to a warm vessel:

1. Add only a small amount of liquid nitrogen (10% of unit volume) to new or warm vessels.

2. Allow this small amount of liquid nitrogen to sit in the covered vessel for a minimum of 2 hours. This will limit stress caused by the sudden temperature change associated with adding liquid nitrogen to a warm vessel.

3. Add an additional 20% of unit volume of LN_2 to vessel.

4. Allow vessel to sit for 48 hours and monitor liquid nitrogen consumption.

5. Fill vessel as desired. Remember to allow for displacement of liquid nitrogen when canisters and canes are inserted.

6. Insert and remove samples slowly. Allow liquid nitrogen to run out of samples.

Caution Never overfill liquid nitrogen vessels. ▲

THERMO FISHER SCIENTIFIC STANDARD PRODUCT WARRANTY
(LN_2 Vacuum)

The Warranty Period starts two weeks from the date your equipment is shipped from our facility. This allows for shipping time so the warranty will go into effect at approximately the same time your equipment is delivered. The warranty protection extends to any subsequent owner during the first year warranty period.

During the first year, component parts proven to be non-conforming in materials or workmanship will be repaired or replaced at Thermo's expense, labor included. *LN_2 Vacuum Integrity is covered for one year.* Installation and calibration are not covered by this warranty agreement. The Technical Services Department must be contacted for warranty determination and direction prior to performance of any repairs. Expendable items, glass, filters and gaskets are excluded from this warranty.

Replacement or repair of components parts or equipment under this warranty shall not extend the warranty to either the equipment or to the component part beyond the original warranty period. The Technical Services Department must give prior approval for return of any components or equipment. At Thermo's option, all non-conforming parts must be returned to Thermo postage paid and replacement parts are shipped FOB destination.

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Your local Thermo Sales Office is ready to help with comprehensive site preparation information before your equipment arrives. Printed instruction manuals carefully detail equipment installation, operation and preventive maintenance.

If equipment service is required, please call your Technical Services Department at 1-800-438-4851 (USA and Canada) or 1-740-373-4763. We're ready to answer your questions on equipment warranty, operation, maintenance, service and special application. Outside the USA, contact your local distributor for warranty information.

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ISO 9001 REGISTERED

Instruction Sheet 056-720-00 (7002122)

Rev	ECR/ECN	Date	Description	By
1	41172	9/21/16	Updated information and safety symbols	ccs
0	--	1/15/10	Original (was 056-720-00 6/10/08)	ccs