WORTHINGTON INDUSTRIES

LD Series

Liquid Nitrogen Dewars

Safety

Before using any cryogenic refrigerator, read the *Handle with Care* booklet provided with the unit. It details safety precautions that must be understood before using the equipment. If a replacement booklet is needed, order publication *Handle with Care* from your supplier. Following are a few of the safety precautions described in the *Handle with Care* booklet. Please be sure to read the entire booklet.

Store and use these containers only in well ventilated areas. In a confined area, nitrogen gas from these units may cause suffocation by displacing air needed for breathing. Install a suitable oxygen monitor.

Do not touch liquid or cold metal surfaces with your bare skin. The liquid nitrogen refrigerant in these containers is **extremely cold:** -196°C (-320°F). Exposure of skin or eyes to liquid, cold gas or frosted parts could result in a severe frostbite-like injury. Because of the extremely low temperature, a face shield and gloves must be worn when transferring liquid nitrogen and material into or out of these containers.

Use only the necktube core supplied with this unit or a listed replacement part. A tight fitting plug or stopper will cause a pressure increase in the container that may damage the container and/or cause personal injury.

Dispose of liquid nitrogen only in areas specifically designed for that purpose. Disposal of liquid nitrogen should be done outdoors in a safe place. Pour the liquid slowly on gravel or bare earth where it can evaporate without causing damage.

Operation

Filling: Adding liquid nitrogen to a warm container may cause splashing and will generate a significant volume of nitrogen gas as cold liquid contacts warm Dewar surfaces. Add liquid slowly to minimize these effects. Be sure there is adequate ventilation. Keep your head clear of the heavy volume of vapor that may be produced. It is extremely cold and could cause personal injury.

WARNING

DO NOT OVERFILL. Over-filling may result in personal injury due to liquid spillage.

Determining Liquid Level

Liquid level must be checked at regular intervals – refrigeration depends on the presence of liquid nitrogen. The liquid level in the container can be determined with a dipstick. Insert the dipstick vertically into the container so that it rests on the canister indexing device on the bottom of the unit. After 5 to 10 seconds, withdraw the dipstick and wave it back and forth in the air. A frost line will form representing the depth of liquid in the container. The frost line will typically be u-shaped; read the bottom of the u-shaped line to determine liquid level.

WARNING

Never use a hollow rod or tube as a measuring rod. When a warm tube is inserted into liquid nitrogen, liquid will exit from the top of the tube and may cause personal injury.

The liquid level chart shows volume of liquid nitrogen vs. depth for LD Series Dewars. These values are approximate and are based on standard conditions.

MODEL	LITERS/INCH	LITERS/CM
LD4	0.40	0.16
LD5	0.43	0.17
LD10	0.76	0.30
LD25	1.56	0.62
LD35/LD50	2.67	1.05
CLASSIC-25	0.60	0.23

Routine Care & Maintenance

If ice-build up interferes with normal operation of the Dewar, the unit should be emptied and thawed. To thaw the unit, pour out the liquid, disposing of it out-of-doors where the cold liquid will not damage driveways and other surfaces. Warm the Dewar by purging it with air even after the Dewar has warmed to room temperature to evaporate any collected moisture. When the Dewar is ice-free and dry, rinse the inner vessel with household bleach. Wash the inner vessel with a 40 to 1 ratio of water to laundry detergent solution. Rinse and dry inside and out thoroughly before placing the Dewar back into service. Do not use sharp instruments to chip ice; permanent damage to the Dewar could result. DO NOT attempt to fasten any device to the Dewar. Welding, brazing, or piercing of the Dewar in any manner will cause permanent damage and void the limited warranty.

Check liquid levels regularly. If high evaporation rates are apparent under normal operating conditions, the Dewar may be losing its vacuum. Sweating and the formation of frost or ice on the outer casing are indications that the Dewar may be losing its vacuum. Sweating or freezing of the outside casing are definite indications that the insulation integrity may have been compromised.

If these conditions persist, contact your supplier or Worthington's Customer Service Department at 844-273-7517 / +1 614-438-7968 or e-mail us at customerservice@worthingtonindustries.com for information on how to conduct a normal evaporation rate (NER) test in the field.

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Pricing on any accessories shown can be found by keying the part number into the search box on our website.

The specifications listed in this brochure are subject to change by the manufacturer and therefore cannot be guaranteed to be correct.
If there are aspects of the specification that must be guaranteed, please provide these to our sales team so that details can be confirmed.

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