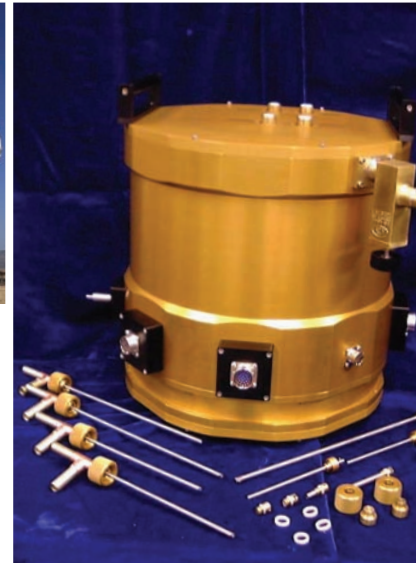


Cryogenic SOLUTIONS



Dewar systems solving the cryogenic challenges for astronomy, physics, chemistry and aerospace research

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L A B O R A T O R I E S

About Infrared Laboratories

Since 1967 Infrared Laboratories has helped solve the advanced instrumentation challenges of hundreds of scientists and organizations working in astronomical, physics, chemistry and aerospace research communities around the world. We have produced over four thousand open and closed cycle systems, including many globally notable projects.

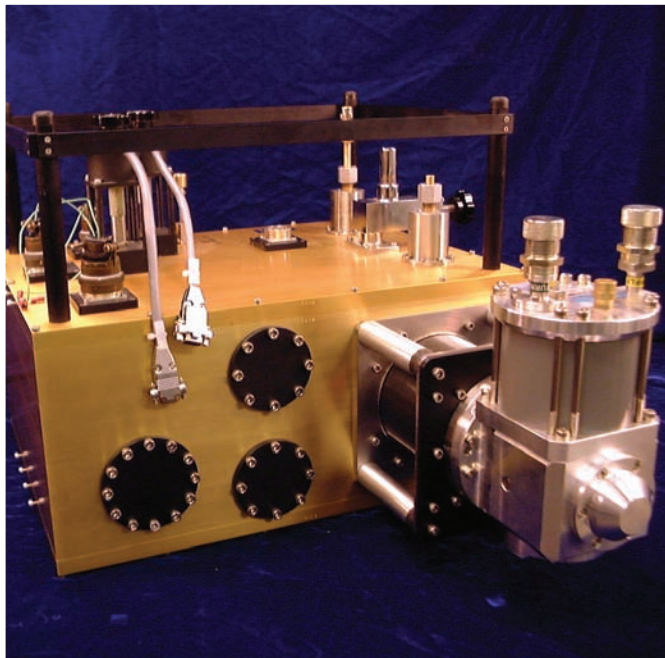
Infrared Laboratories' leading edge dewar technology combines the highest quality, reliability and expertise in thermally conductive materials to minimize cryogenic consumption and maximize thermal conductivity; vibration isolation to enable the most vibration sensitive applications; and time-tested ergonomic designs for ease of operation. Our unique designs allow the scientist flexibility to use standard dewars for more than one specific application or test.

Whether your cryogenic requirements are best served with a closed cycle, open cycle or a custom cryogenic system, Infrared Laboratories will work with you to bring your scientific instrumentation needs from concept to engineering design to manufacturing. Our team of talented engineers, extensive in-house manufacturing capabilities, and over 42 years of hands-on experience assures you of quick and efficient delivery and successful operation.

Cryogenic Solutions

Open Cycle Dewars: We provide high efficiency Liquid Nitrogen (LN₂) dewars for 77 to ~50 K and Liquid Helium (LHe) dewars 4.2 to 1.6 K. Standard open cycle

dewar sizes range from 3 to 14 inch (7.5 to 35cm) diameter cold plates. The dewars are designed for efficient cryogen use and long hold times. The unique design allows the user flexibility to configure the dewar for more than one specific application or test.



Closed Cycle Dewars:

Our closed cycle systems provide 300 to 4 K cooling, and use the latest technology in Gifford-McMahon and Pulse Tube coolers, along with proprietary; low-vibration coupling to ensure your instruments will reach operating temperature without being subjected to the vibrations normally associated with closed cycle coolers. When the availability of cryogen are in question, our Closed Cycle Dewar System will meet the needs of the most demanding applications.

Custom Cryogenic

We are the global leader in efficient and reliable custom research and test cryostats for all your applications - in any size or functional requirement. Our capabilities include LN₂, LHe, Helium-3 (.28k) and closed cycle cryogen-

free refrigerator systems which may be integrated with our cooled optics, cryo-mechanical components, camera systems and vibration isolation technology.

Notable custom systems include:

- Instituto Astronomico Del Los Canaries (IAC)
- Canada-France-Hawaii Telescope
- Jet Propulsion Laboratory
- National Astronomical Observatory
- University of Arizona
- IBM
- Arcetri
- UK Astronomy Centre
- Gunma Observatory
- Max Planck Institute

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LABORATORIES

HDL Series

The helium dewars in the HDL line contain two cryogenic vessels. The LN₂ vessel directly cools a radiation shield that surrounds the LHe vessel and the cold work surface. All interior dewar surfaces are lined with metal foil in order to provide additional shielding. Standard work surface diameters are 5.00/12.70, 8.00/20.32, 10.00/25.40, 12.00/30.48, 14.00/35.56 (inches/cm). Larger sizes, including rectangular extensions, are available upon special request.

HDL Systems are frequently used for mid- and far- infrared detector and camera systems, including bolometers, photo detectors, and InSb. Applications also include materials testing, electronic component testing, and the cooling of entire stand alone instruments.

Features:

- { K %o Ć š] v P d u %o Ć š μ Ć Z v P } (with low temperature modification)
- { Liquid Cooled Radiation Shield
- { Multiple Layers of Shielding Foil
- { Completely Customizable Configuration

HDV Series

The helium dewars in the HDV line contain a single cryogenic vessel. A vapor cooled radiation shield surrounds the vessel and the cold work surface. All interior dewar surfaces are lined with metal foil to provide additional shielding. Standard work surface diameters are 3.00/7.62, 5.00/12.70, 8.00/20.32, 10.00/25.40, 12.00/30.48, 14.00/35.56 (inches/cm). Larger sizes, including rectangular extensions, are available upon special request.

HDV systems are frequently used for mid- and far- infrared detector and camera systems, including bolometers, photo detectors, HgCdTe, and InSb. Applications include materials and electronic component testing.

Features:

- { K %o Ć š] v P d u %o Ć š μ Ć Z v P } (Vapor Cooled Radiation Shield)
- { Multiple Layers of Shielding Foil
- { Designed to Customer Specifications

The ND line of nitrogen dewars contain a single cryogenic vessel. A vapor cooled radiation shield surrounds the vessel and the cold work surface. The guard vacuum of the dewar is enhanced by a molecular sieve “getter” which is mounted to the cold work surface. Standard work surface diameters are 3.00/7.62, 5.00/12.70, 8.00/20.32, 10.00/25.40, 12.00/30.48, 14.00/35.56 (inches/cm). Larger sizes, including rectangular extensions, are available upon special request.

ND systems are frequently used for near-infrared detector and camera systems, including CCD, HgCdTe, and InSb. Applications include materials and electronic component testing.

Features:

- { K %o Ć š] v P d u %o Ć š μ Ć Z v P } (Vapor Cooled Radiation Shield)
- { Molecular Sieve “Getter”
- { Designed to Customer Specifications

Infrared Laboratories Legacy in the Scientific Community

Infrared Laboratories, Inc. was founded in 1967 by Dr. Frank Low, who is considered one of the “Fathers of Infrared Astronomy”, and the developer of the original Germanium bolometer and cryogenic systems for astronomical observation. Since that time, Infrared Laboratories has been the world’s premier designer, supplier and integrator of cryogenic systems and IR detectors for demanding ultra-low light level (or background limited) applications in astronomy, scientific research and the semiconductor industry.

Specifications for HDL Series Dewars

	HDL-5	HDL-5	HDL-10	HDL-10	HDL-15
Dewar Outside Diameter (in/cm)	6.95/17.65	9.95/25.27	11.95/30.35	13.70/34.80	15.95/40.51
Dewar Height (in/cm)	12.50/31.75	12.31/31.27	13.50/34.29	13.75/34.93	13.75/34.93
Cold Plate Diameter (in/cm)	5.12/13.00	8.12/20.62	10.18/25.86	12.00/30.48	14.18/36.02
Work Area Height ("B" Dimension) (in/cm)	1.50/3.81	1.50/3.81	2.00/5.08	2.00/5.08	2.00/5.08
Weight (lbs/kg) (without cryogenics)	15.75/7.16	26.00/11.82	42.00/19.09	54.00/24.55	68.00/30.91
LN ₂ Capacity (L)	0.8	2.3	4.2	6.1	8.4
LN ₂ Hold Time (Standard Supports) (hrs)	30	30	35	-	-
LN ₂ Hold Time (Rigid Supports) (hrs)	20	27	32	48	60
LHe Capacity (L)	1.2	2.6	4.4	6.6	8.7
LHe Hold Time (Standard Supports) (hrs)	90	100	135	-	-
LHe Hold Time (Rigid Supports) (hrs)	25	30	47	55	78

Specifications for ND/HDV Series Dewars

	ND/HDV-3	ND/HDV-5	ND/HDV-5	ND/HDV-10	ND/HDV-10	ND/HDV-15
Dewar Outside Diameter (in/cm)	4.95/12.57	6.95/17.65	9.95/25.27	11.95/30.35	13.70/34.80	15.95/40.51
Dewar Height (in/cm)	11.38/28.91	11.00/27.94	10.16/25.81	11.00/27.94	11.25/28.58	11.25/28.58
Cold Plate Diameter (in/cm)	3.12/7.92	5.12/13.00	8.12/20.62	10.18/25.86	12.00/30.48	14.18/36.02
Work Area Height ("B" Dimension) (in/cm)	1.50/3.81	1.50/3.81	1.50/3.81	2.00/5.08	2.00/5.08	2.00/5.08
Weight (lbs/kg) (without cryogenics)	7.50/3.41	10.75/4.89	22.00/10.00	36.00/16.36	48.00/21.82	61.00/27.73
LN ₂ /LHe Capacity (L)	0.5	1.2	2.6	4.4	6.4	8.7
LN ₂ /LHe Hold Time (Standard Supports) (hrs)	24/6	72/18	90/24	115/30	-	-
LN ₂ /LHe Hold Time (Rigid Supports) (hrs)	-	70/6	80/10	106/12	120/14	143/16

