

Detector Dewars

Whisper Quiet Detector Dewars



WhisperTech liquid nitrogen detector dewars

Technifab offers a line of exceptionally quiet Detector Dewars for applications covering the entire electromagnetic spectrum. We have developed a reputation for high quality and competitive prices.

Detector applications

X-ray detectors are used to detect light and to determine surface composition and crystal structure. These applications require an X-ray source that is the electron beam in scanning and transmission electron microscopes (SEM and TEM) or the radioactive source in the case of X-ray

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spectrometers. Visible and infrared detectors are used in night vision equipment, astronomy and the detection of heat sources.

Temperature in detector performance

The signal from the detector is minute and has to be greatly amplified. The first stage in amplification is usually a field effect transistor placed next to the detector. This noise is exponentially dependent on the temperature and can be

greatly reduced by cooling the detector.

Microphonics in detector performance

The connection must also be free of microphonics. This phenomenon occurs when a mechanical vibration results in a variation in the output of an electronic device. The radiation detector and field effect transistor can both be affected. A vibration can cause both of these elements to change size, which in turn changes both the energy required to form electron/hole pairs and the capacitance. A vibration can also transfer energy into vibration of the semiconductor lattice, which in turn generates more electron/hole pairs. All of these effects result in signal noise.



Detector dewars are manufactured to meet very special requirements.

Detector Dewars

WhisperTech detector dewars for special custom applications

What causes noise in detector dewars

Detectors are usually cooled by contact with a cold liquid nitrogen container. The detector typically is mechanically fastened directly to the dewar inner vessel. To understand the desirable characteristics of a Detector Dewar it is necessary to understand the cause of microphonic vibrations.

A Detector Dewar vibrates just before the liquid nitrogen boils. The vibration is caused by vapor bubbles collapsing and reforming, thus vibrating the dewar. This process happens very quickly. The bubbles collapse because the vapor in them is condensing. The better a dewar is insulated and the smoother the inside wall, the lower the boil-off and subsequently the lower the microphonic vibration.

Technifab's whisper quiet detector dewars

Technifab Dewars are manufactured with extremely smooth interior surfaces to minimize potential bubble nucleations. This proprietary process coats the interior of the dewar with a special chrome conversion veneer after final welding of the components. The operation covers surface discontinuities with a satin smooth sheath. The dewars are then insulated with an ultra-low pressure vacuum space and include

radiation shields to nearly eliminate heat transfer. Conductivity is held to a minimum by using heat chokes and low conductivity inner vessel suspension systems. All of this care results in a dewar that minimizes boiling of the liquid nitrogen and the associated noise.

Product design and manufacturing sets the Technifab Dewar apart from the competition. Getter material is scientifically measured based upon the volume of the evacuated space. The dewars are manufactured in a controlled environment that limits moisture invasion of the annular space during construction. This results in high performance detector dewars and years of trouble-free service.

Every dewar is helium mass spectrometer leak checked at 2×10^{-10} cc/sec sensitivity and fully warranted for three years.



We offer private labeling for instrument manufacturers with quantity orders of custom detector dewars.

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