Which **Microstat** is right for you?

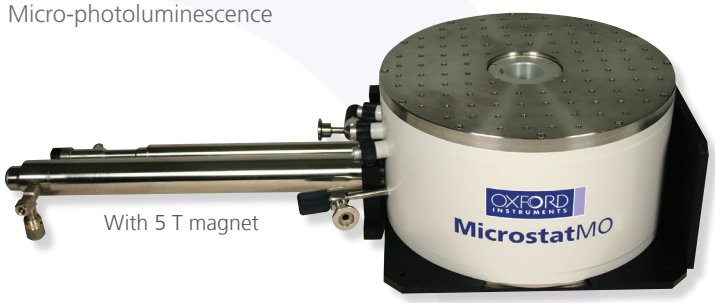
Our easy to use, compact and efficient Microstat cryostats offer a wide range of options to suit most spectroscopy applications. They provide a wide temperature range (from 2 K up to 500 K) while providing excellent optical access.

The Microstat model of choice will depend on the base temperature, cooling technology and sample environment required for your experiments.

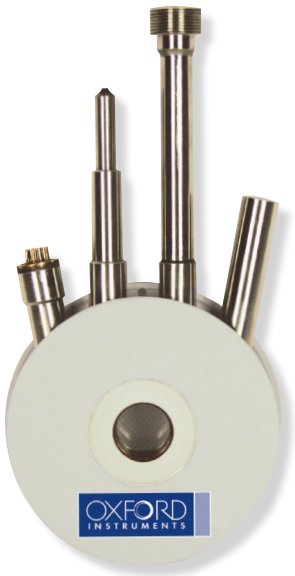
Typical applications:

- Micro-FTIR
- Micro-Raman
- Micro-luminescence
- Kerr and Faraday effects
- Micro-photoluminescence

For spectroscopy applications, see the guide on our Optistat™ products



With 5 T magnet



	Temperature range	Cooling technology	Working distance
MicrostatN	77.2 – 500 K	Nitrogen only	2 mm
MicrostatHe	2.2 – 500 K	Helium or nitrogen	< 5.5 mm
MicrostatHiRes	2.7 – 500 K	Helium or nitrogen	< 5.7 mm
MicrostatMO	6 – 300 K	Helium only	8.5 mm

OXFORD INSTRUMENTS

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Microstat specifications

	 **Microstat**N	 **Microstat**He	 **Microstat**Hires	 **Microstat**MO
Cooling medium	Liquid nitrogen	Liquid helium or liquid nitrogen	Liquid helium or liquid nitrogen	Liquid helium
Temperature range	77.2 - 500 K	2.2 - 500 K	2.7 - 500 K	6 - 300 K
Temperature stability	> 0.5 K	± 0.1 K	± 0.1 K	± 0.1 K
Magnetic field	NA	NA [1]	NA [1]	5 T
Cooldown time	< 10 min	< 10 min	< 15 min	4 hours
Sample space diameter x height (mm)	20 x 2	20 x 5	20 x 5	11 x 11
Working distance[2] (mm)	2	4.5 to 5.5 8 for rectangular tail	2.2 to 5.7	8.5
Vibration (vertical)[3]	< 0.1 µm	< 0.1 µm	< 20 nm	< 20 nm
Lateral sample holder drift at constant temperature[3]	< 1 µm / hour	< 1 µm / hour	150 nm / hour	< 4 nm / min
Cryogenic consumption (L/hr) at 4.2 K for helium at 80 K for nitrogen	< 0.5 (nitrogen)	< 0.45 (helium)	< 0.7 (helium)	2 (helium)

For full details see product page.
Note 1: *Rectangular tail* **Microstat***He and* **Microstat***Hires pillared version are suitable for use with an electromagnet.*
Note 2: *Working distance defined as the distance from the sample holder to the window top surface*
Note 3: *The stability will be dependent upon the final system's configuration and the environment that the equipment is used in.*

Microstat family

Full system integration and control

System components designed for optimum cryostat performance

Transfer tube (helium cryostats only):

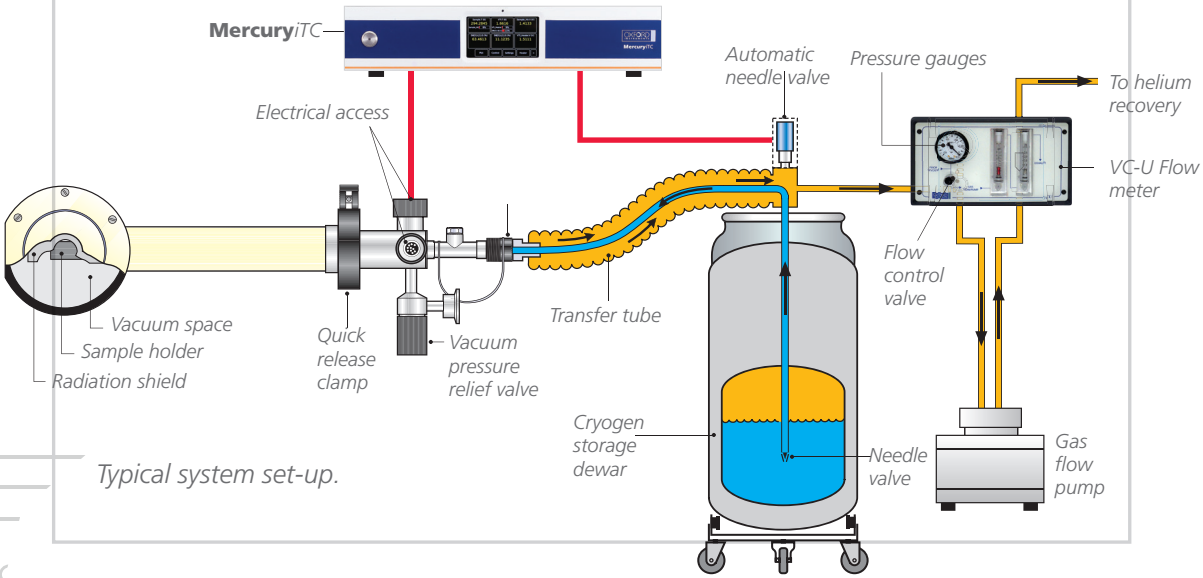
It plays an important part in the overall helium consumption and base temperature capability of helium cooled cryostats.

Oxford Instruments Low Loss Transfer tubes (LLT) use the cold gas exiting the cryostat to cool the shields surrounding the incoming liquid within the transfer tube. As a result, the consumption of our cryostats is the lowest on the market, dramatically reducing your running costs.

Magnet power supply

Best in class stability performance and optimised for accuracy and low noise

The **Mercury**iPS is used to energise the magnet of the **Microstat**MO.



Typical system set-up.

Intelligent cryogenic environment controller

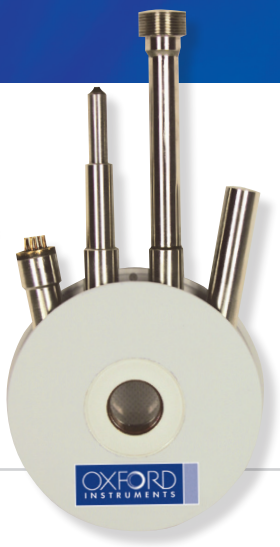
Easy monitoring and control of the sample stage

The **Mercury**iTC controller combines several instruments into one allowing temperature control at the heat exchanger with options for gas flow control as well as an extra sensor channel for thermometry measurement directly at the sample stage. Everything can be accessed through touch screen front panel or remotely.

MicrostatN

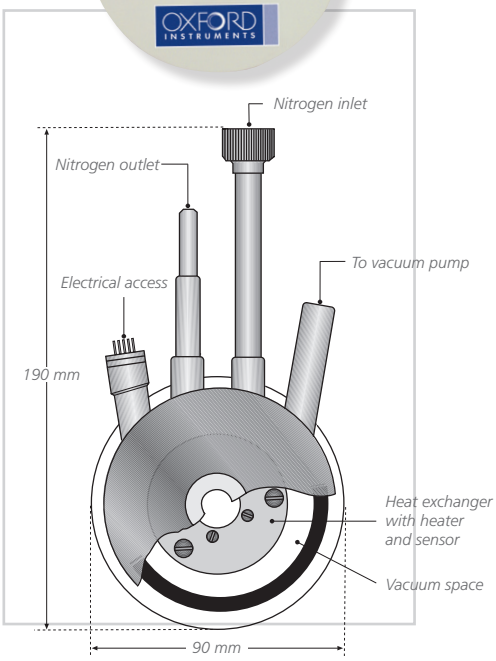
Compact nitrogen cooled

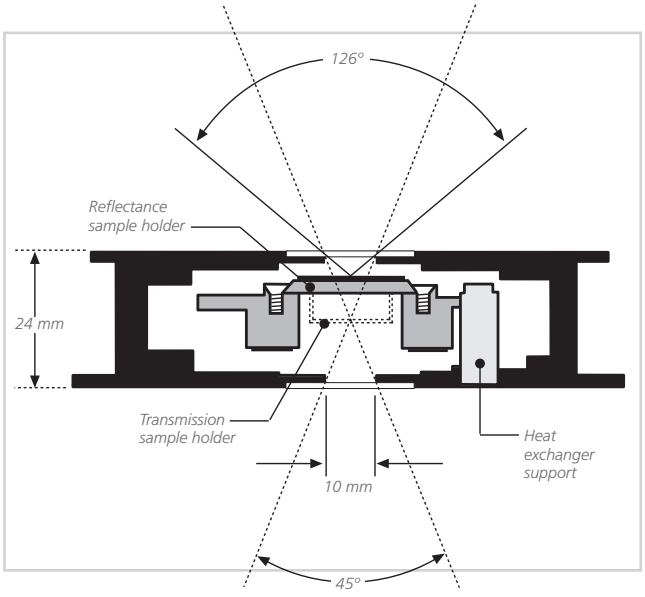
Lowest nitrogen consumption on the market



This cryostat has been designed for experiments requiring liquid nitrogen temperatures. It is very compact and lightweight and only requires a compact nitrogen container which is very convenient when space is limited.

- Wide temperature range: from 77.2 K to 500 K
- Extremely compact: 90 mm diameter by 24 mm thickness. Only 400 g
- Economical use of cryogens: less than 0.5 L/h
- Quick cooldown: 80 K in less than 10 minutes
- Adjustable sample holders accomodate samples up to 8 mm thickness
- Easy integration into commercial microscopes facilitated by its compact size and short working distance (as low as 3 mm). Interface plate available as option for attaching the **Microstat**N directly onto microscope translation stage
- Suitable for reflection and transmission experiments via choice of sample holders
- Electrical measurements via 4-pin electrical feed wire to heat exchanger





Schematic cross-section view of ***Microstat****N. Note the window aperture and angles of admittance for 0.5 mm thick windows.*

Two sizes of windows to choose from depending on sample sizes:

Optical specifications	Reflectance	
Window thickness	**0.5 mm**	**1.5 mm**
Clear access diameter	10 mm	25 mm
Sample holder to window top surface	3 mm	3 mm
Angle of admittance (to surface of sample holder at centre)	126 °	160 °
Max sample thickness	2 mm	1 mm
Max sample diameter	20 mm	20 mm

Note: *All dimensions are approximate and relate to the top window with plain sample holder.*

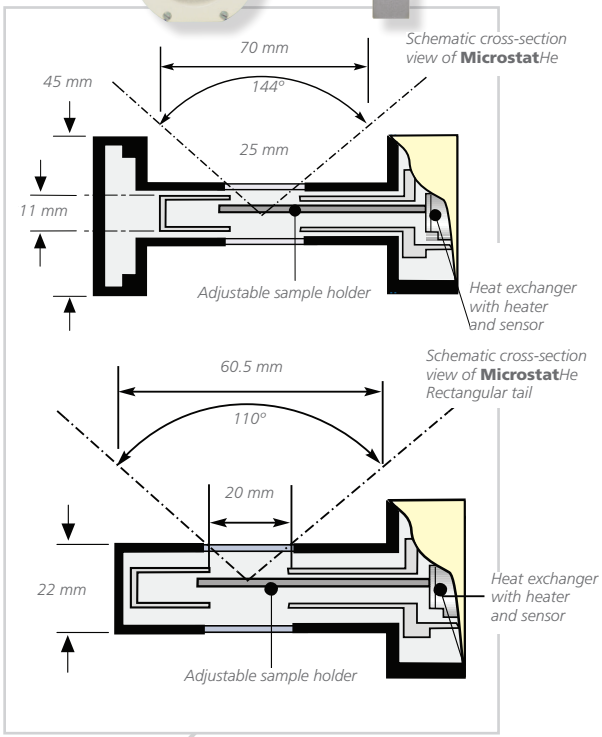
MicrostatHe / **Microstat**He-R

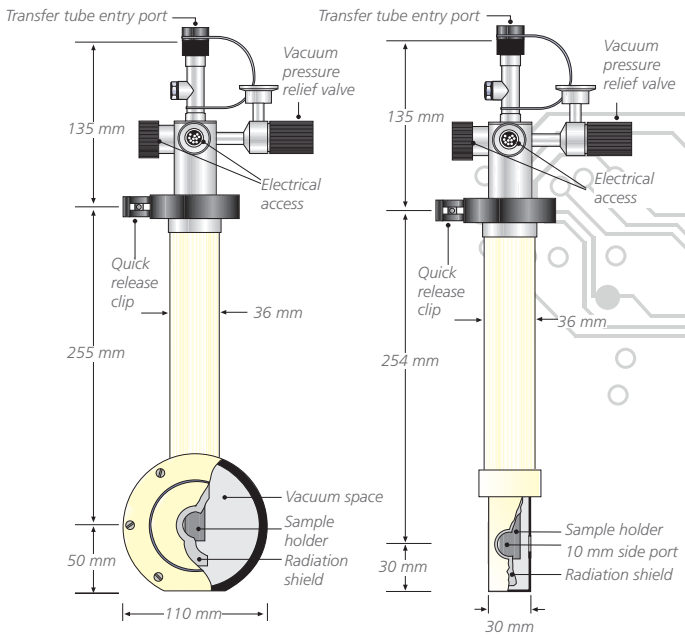
Multi-experiments, helium cooled

This helium cryostat is well suited for experiments requiring a low temperature environment and which can evolved in the future due to its flexibility.

- Wide temperature range: 2.2 K to 500 K
- Easy integration into commercial microscopes facilitated by its compact size and short working distance (as low as 4.5 mm). Interface plate available as option for attaching the **Microstat**He directly onto microscope translation stage
- Economical use of cryogens: the lowest consumption on the market using only 0.45 l/hr at 4.2 K
- Rapid cooldown time: 4.2 K in less than 10 minutes!
- Suitable for reflection and transmission experiments via choice of sample holders
- Adjustable working distance via sample holder. Can be adjusted to less than 3 mm
- Interchangeable tail between the **Optistat**CF-V, **Microstat**He and **Microstat**He-R with rectangular tail
- Can be used with liquid nitrogen
- Electrical measurements via 10-pin electrical feed wire to heat exchanger. Optional coaxial cables

Lowest helium consumption and fastest cooldown on the market





MicrostatHe *and* **Microstat**He-R *with rectangular tail dimensions.*

Cryostat	**Microstat**He		**Microstat**He-R **Rectangular tail**
Window thickness	**0.5 mm**	**1.5 mm**	**1 mm**
Clear access diameter	10 mm	25 mm	20 mm
Sample holder to window top surface	4.5 mm	5.5 mm	8 mm
Angle of admittance (to surface of sample holder at centre)	102 °	144 °	110 °
Max sample thickness	5 mm	5 mm	4 mm
Max sample diameter	20 mm	20 mm	20 mm

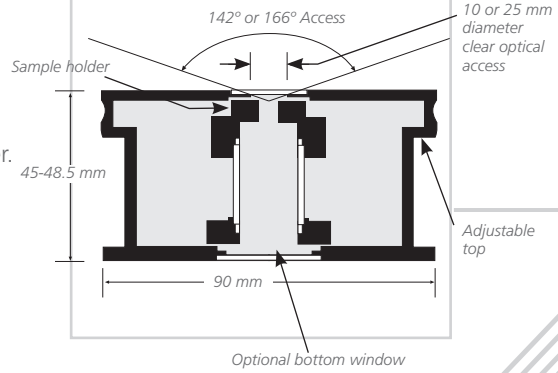
High resolution helium cooled

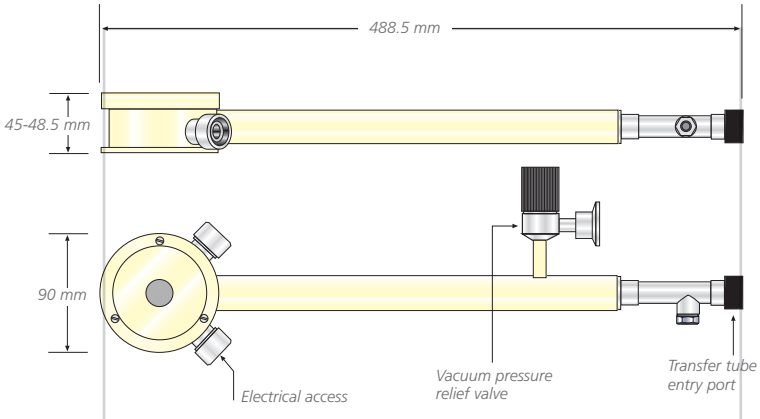
The lowest vibration microscopy cryostat on the market

This cryostat has been designed to minimise vibration and sample drift at stable and constant temperatures. This is achieved by cooling the sample on a stable cold platform rather than a cold finger and feeding the helium to the heat exchanger via a capillary thus isolating the helium flow vibration. The **Microstat**HiRes is particularly well suited to sensitive applications such as micro-photoluminescence mapping of semiconductor microstructures with sub-micron spatial resolution.

- Wide temperature range: from 2.7 K to 500 K
- Low sample drift: 0.15 µm per hour (typical) at 4.2 K enabling measurements over many hours. 13 µm (typical) cooling from 300 K to 4.2 K
- Low sample vibration: < 20 nm typical
- Extremely short working distance of 2.2 mm enabling the use of high magnification optics
- Adjustable top flange (3.5 mm adjustable distance) enabling samples of different thicknesses
- Rapid cooldown time: 4.2 K in less than 15 minutes!
- Easy integration into commercial microscopes facilitated by its compact size. Only 90 mm diameter by 45 mm thickness. Lightweight 1.5 kg only
- Economical use of cryogens: the lowest consumption on the market using only 0.7 l/hr at 4.2 K
- Suitable for reflection and transmission experiments via choice of sample holders
- Experimental flexibility: may be operated in any orientation
- Electrical measurements via 10-pin electrical feed wire to heat exchanger. Optional coaxial cables

Pillared version available as an option for use with electromagnets.





Optical specifications	Reflectance	
Window thickness	**0.5 mm**	**1.5 mm**
Clear access diameter	10 mm	25 mm
Sample holder to window top surface	2.2 mm	2.2 mm
Angle of admittance (to surface of sample holder at centre)	142 °	166 °
Max sample thickness	5 mm	4 mm
Max sample diameter	20 mm	20 mm

All dimensions are approximate and relate to top window with plain sample holder in central position.

Microstat family

MicrostatMO

System for high resolution magneto-optical measurements

The **Microstat**MO is a compact stable cryostat, which provides a cryogenic environment (6 K) ideal for sensitive optical and electrical measurements in

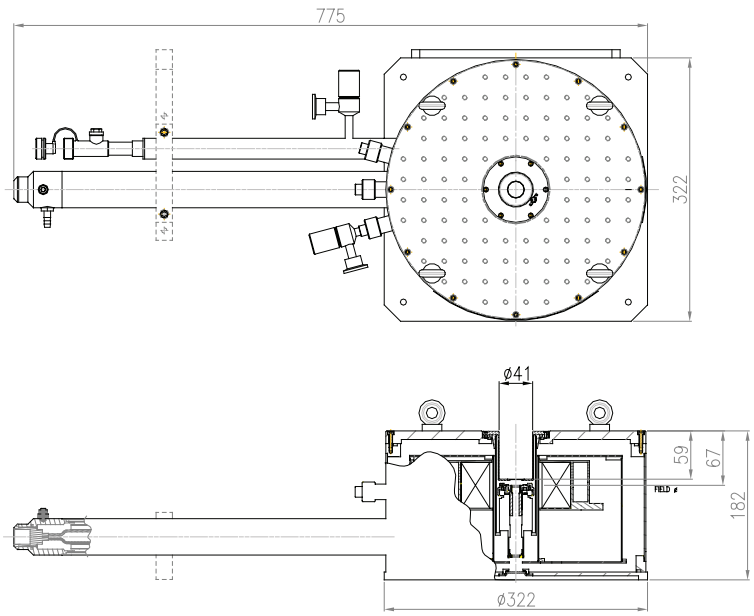
- Wide temperature range: from 6 K to 300 K
- Magnetic field up to 5 T, satisfying the majority of spectroscopy applications
- Low sample drift: typically 4 nm/min
- Low sample vibration: < 20 nm typical
- Short working distance of 8.5 mm enabling the use of high magnification optics
- Can be operated horizontally or vertically, providing flexibility for setting-up the experiment
- Designed for easy integration of optical components on the cryostat top plate
- Can be used for reflection and transmission measurements

Fully integrated system

- Minimum downtime: Convenient continuous operation including improved 300 K operation
- Quick sample change using a demountable sample holder. Two options are available: a copper sample platform for lower base temperature or a sapphire platform for optical transmission measurements
- System can be cooled using a pressurised liquid helium dewar for convenient operation with minimum vibration
- Mounting bracket supplied to clamp the cryostat to the bench thus reducing vibrations introduced by the transfer tube

Typical applications:

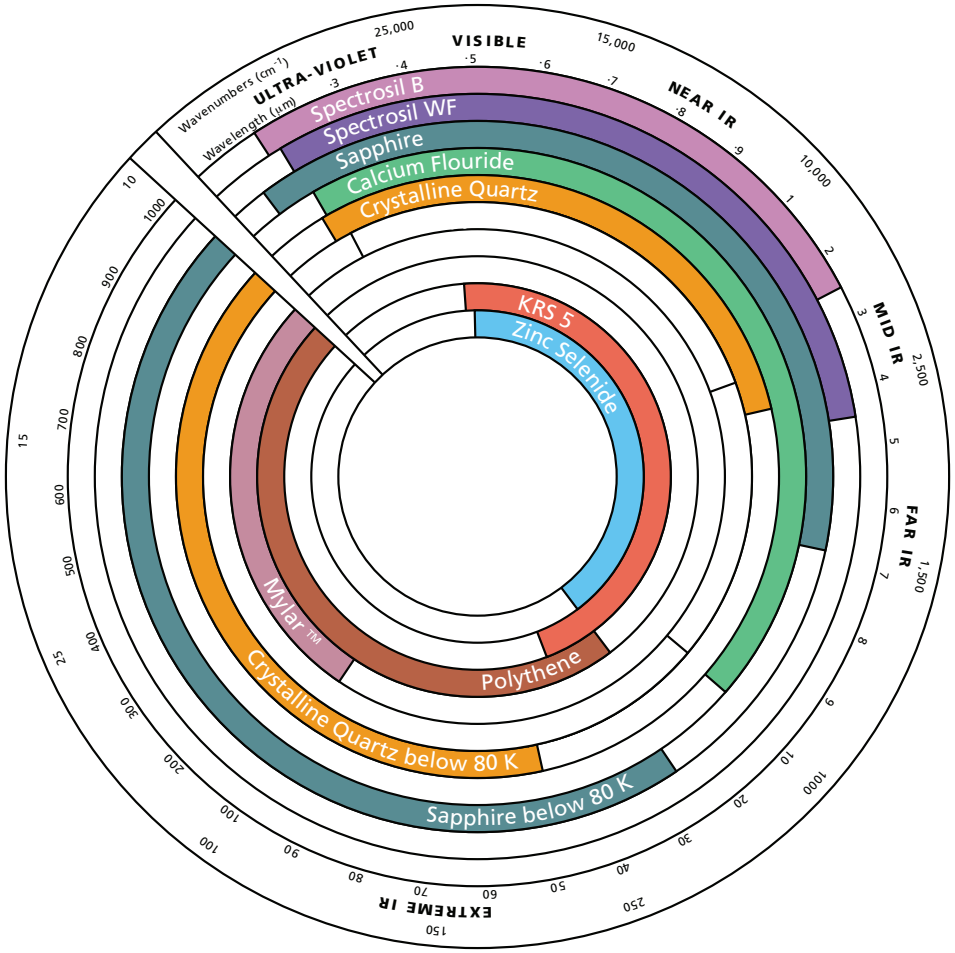
- Flux visualisation of superconducting materials. 5 T magnetic field extends the range of samples that may be studied to include materials with strong flux pinning
- Electrical transport measurements using very small currents for nanoscale samples, quantum devices and nano-devices
- Measurement of dimentional changes of magneto-restrictive materials



Extensive choice of windows to suit your experiment's needs

Microstat cryostats are used in experiments where the samples must be irradiated or measurements made on emitted radiation from such samples. It is, therefore, essential that appropriate windows can be incorporated into your cryostat to permit radiation to pass through the sample space. In **Microstat** cryostats, the windows are glued and the materials selected will be determined by the wavelength and intensity of the radiation and whether beam polarisation is required.

- Spectrosil B
- Spectrosil WF
- Sapphire
- Calcium Fluoride
- Crystalline Quartz
- KRS 5
- Zinc Selenide
- Polythene
- Mylar™
- Crystalline Quartz below 80 K
- Sapphire below 80 K



OIDirect Cryospares

We offer an extensive range of accessories for your cryostats. Please visit **www.cryospares.com** to find out more.

Visit **www.oxford.instruments.com/microstat** or email to **nanoscience@oxinst.com**

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