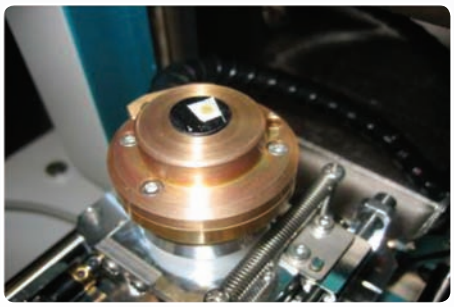
COOLSTAGE Peltier heating & cooling stage for SEM applications



With increased use of Low Vacuum or Variable Pressure microscopes many microscopists now appreciate the need to control water evaporation from wet samples. Saturated vapour pressure of water decreases considerably with temperature. At room temperature water will very quickly evaporate causing considerable changes to the specimen structure. By cooling a wet specimen, water evaporation may be slowed or depending on chamber pressure stopped altogether.

Deben UK have now developed their popular Coolstage for all common low and high vacuum SEMs. The system is mounted via a free chamber port and can be easily fitted and removed by the user.

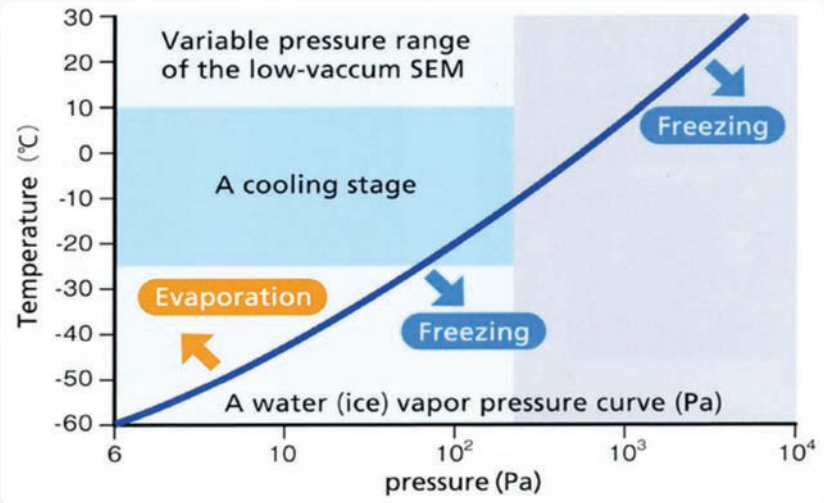
By operating the SEM at low vacuum pressures and cooling the specimen to around -25°C water evaporation can be substantially reduced. Advantages of this procedure are clear to see, by cooling a specimen in low vacuum changes in specimen structure due to water evaporation can be minimised and viewing time before specimen drying occurs can be extended.

The Coolstage system is fully self-contained and comprises a thermally isolated specimen holder with a single stage Peltier device, dual temperature sensor, vacuum feed-through flange, water chiller, power supply box and keypad for digital temperature readout and control. No external water supply or chiller is required.

The specimen holder is water cooled from a small self-contained closed loop chiller box which can be positioned approximately 2M away from the SEM.

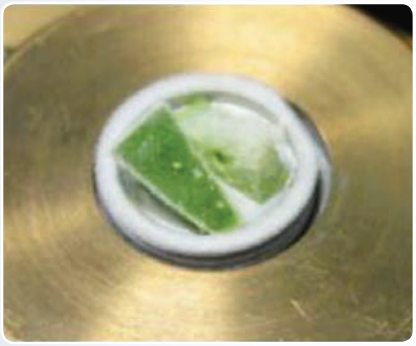
The temperature of the specimen holder is accurately monitored and controlled by microprocessor. A small keypad with bright VF display allows the user to set the required temperature and displays target and current temperatures at the same time. The specimen holder has been designed to minimise image drift due to temperature change, giving a stable image at high magnification. Specimens with height up to 5mm and diameter of 10mm can be easily observed. Flat and dished specimen holders are supplied, with the dished holders especially suited to observing liquids.

An integrated RS-232 or USB interface allows temperature to be set and read from the SEM by using Deben software or on certain SEMs using integrated software control through the SEM interface.

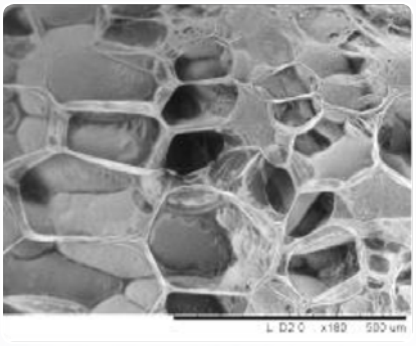


DEBEN Microscope Accessory Solutions

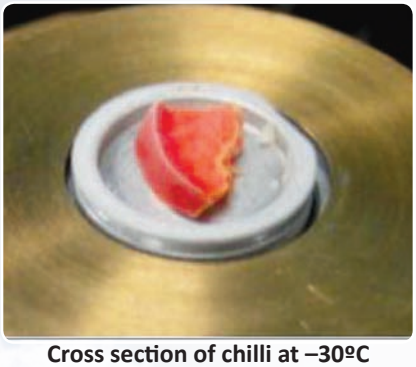
Sample applications



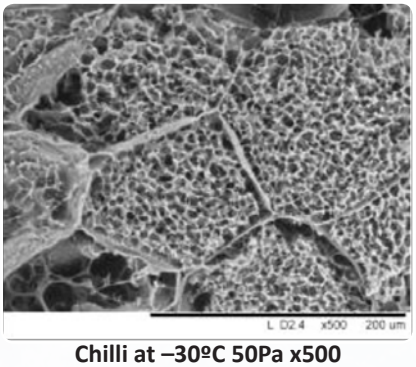
Cross section of cucumber at –30ºC



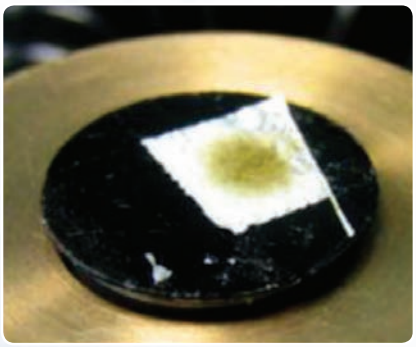
Cucumber at –30ºC 50Pa x180



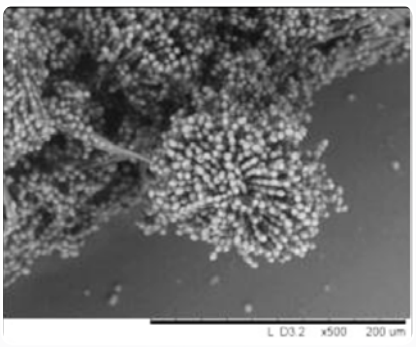
Cross section of chilli at –30ºC



Chilli at –30ºC 50Pa x500



Mould on hard cheese at –30ºC



Mould at –30ºC 50Pa x500

Specifications:

- Standard temperature range –25ºC to +50ºC at 50Pa with ambient at 20ºC, (optional ULTRA –50ºC to +50ºC and Enhanced –25ºC to +160ºC)
- Temperature accuracy +/-1.5ºC or 2%, whichever the greatest
- Temperature display resolution 0.1ºC
- Temperature stability +/-0.2ºC
- Temperature display resolution 0.1ºC
- Maximum cooling/heating rate 12ºC per minute
- Keypad/display for temperature display and control
- Simultaneous display of actual and target temperature
- Vacuum feed-through flange with all connections
- Design optimised for minimal image drift
- Microprocessor controlled
- Supplied with 10x standard specimen stubs, 10x dished specimen stubs, ball driver kit
- RS-232 interface (USB optional) for remote readout and control

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