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Agar Turbo Carbon Coater

AGB7230

Introduction

The Agar turbo carbon coater has been designed for use in laboratories that require a high vacuum carbon coater. High vacuum evaporation of carbon gives the predictable spatial distribution and thickness required for x-ray microanalytical applications.

The compact desk top design incorporates a turbo molecular pump which in addition to providing a rapid high vacuum environment has the advantages of not requiring cooling water or a long warm up period.

The rotary planetary specimen table ensures that highly contoured samples are evenly coated with the minimum thickness of carbon to prevent charging.

Vacuum Chamber

Two heavy duty Pyrex work chambers 150mm dia x 159mm h and 150mm dia x 65mm h are provided. The work chamber is sealed with wide section ‘O’ rings to the base plate and hinged top plate. The hinged top plate is mounted onto a telescopic support which allows either of the two chambers to be fitted. This allows the effective working distance from the source to the specimen to be altered. The base plate contains the large area pumping port and feed through port for the optional film thickness monitor.

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Pumping System

The pumping system comprises a turbo pump (80 litres/sec) backed by a two-stage rotary pump. The turbo pump is mounted directly on to the coater chassis and has a large bore pumping line directly connected to the chamber. The rotary pump is mounted on an antivibration platform and is connected to the turbo pump by a short stainless-steel bellows.

Operation of the system is automatic, and the vacuum is continuously monitored via pirani and penning gauges with meter read out. Switchover between pirani and penning gauge display is automatic. Indicator lights mounted on the front panel display the turbo pump status.

For coating SEM samples where a relatively poor vacuum is desirable
(10 -1mb) to maximise dispersion of the carbon, the vacuum can be accurately controlled by the precision leak valve.

Rotary Planetary Stage

The motorised rotary planetary stage is intended for SEM sample coating. The four sample holders mounted onto a tilting platform describe a rotary planetary motion. Sample holders are interchangeable and can be selected to suit most types of SEM stubs or metallurgical mounts. Up to twenty-four pin type stubs can be coated at one time. Four speeds of rotation are available with a tilt range of 0-90º. The short working distance with high tilt can be used for maximising the coverage of highly topographic SEM samples. Using the long working distance with 0º tilt uniform thickness of coating is achieved for microprobe applications.

Carbon Rod Head

The heavy-duty stainless-steel source uses 6.15mm dia shaped carbon rods. The unique feedback controlled power supply gives a maximum current of 200A at 5V. A safety interlock prevents operation with the chamber at air.

All controls for carbon evaporation are mounted on the front panel. In the manual mode operation can be continuous or pulsed with voltage set by the variable control. In the automatic mode the desired voltage is entered via the digital set H.T. control and the period of evaporation set via the digital timer.

Film Thickness Monitor

The Agar film thickness monitor can be easily fitted to the coating unit for thickness measurement of carbon or metal evaporated films. A dual memory allows storage of different material densities whilst the tooling factor automatically compensates for differences between the measuring crystal and specimen position. A digital read out displays thickness directly in nanometres.

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Specifications

Specimen chamber dual height: 150mm dia x 150mm h and 150mm dia x 65mm height

Vacuum system
Integrated bench-top pumping system.

- Turbomolecular pump 801/sec
- Two stage rotary pump
- Pirani gauge (ATM - 0.001mb)
- Penning gauge (10^{-2} to 5 x 10^{-6})
- Precision needle valve
- All metal pumping lines

Carbon evaporation source
Dual 6.5mm carbon rod source.

- Feedback controlled voltage supply, current metering 0-200A
- Auto/manual operation
- Pulse/continuous mode selection
- Digital timer

Rotary planetary stage
Motorised 4 position rotary planetary motion table with 4 holders

- Speed controller - 4 speeds
- 0-90° tilt
- Mounting collar

Choice of the following holders:

Sample holder for 6 x 12.5mm pin stubs
Sample holder for 3 x 19mm pin stubs
Sample holder for 4 x 10mm stubs
Sample holder for 4 x 12.5mm stubs
Sample holder for 4 x 15mm stubs
Sample holder for 4 x Hitachi stubs
Sample holder for 1 x 25mm mount
Sample holder for 1 x 32mm mount

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Film thickness monitor control unit

- Oscillator
- Crystal head and cables
- Thickness range 0-999.9nm

Dimensions: 524mm wide x 295mm deep

Bench space occupied (including rotary pump): 525mm wide x 600mm deep

Weight: 45kg