



## SEM TURBO CARBON COATER



### COMPACT BENCH TOP HIGH VACUUM CARBON COATING UNIT WITH ROTARY - PLANETARY STAGE

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# SEM TURBO COATER

## Introduction

The Agar SEM turbo 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 diam x 159mm h and 150mm diam 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.

## 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 anti-vibration 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 ( $10^{-1}$ mb) 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 0-90°. 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 0° tilt uniform thickness of coating is achieved for microprobe applications.

### Carbon Rod Head

The heavy duty stainless steel source uses 6.15mm diameter 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.

## Specifications

Specimen chamber	Dual height 150mm diam x 150mm h and 150mm diam x 65mm h
Vacuum system	Integrated bench top pumping system Turbomolecular pump 80l/sec Two stage rotary pump Pirani gauge (ATM - 0.001mb) Penning gauge ( $10^{-2}$ to $5 \times 10^{-6}$ ) 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 tables with 4 holders Speed controller - 4 speed 0-90° tilt Mounting collar  <i>A choice of the following holders:</i>  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
Film thickness monitor	Control unit Oscillator Crystal head and cables Thickness range 0-999.9nm
Dimensions	525mm wide x 295mm deep Bench space occupied including rotary pump 525mm wide x 600mm deep
Weight	45 Kg