

# Q300T ES

## Large Chamber Turbo-Pumped Thermal Evaporator/Sputter Coater



### Key features:

- Fully automatic touch screen control
- Metal evaporation, carbon evaporation and metal sputtering
- Larger area metal evaporation – up to 6"/152 mm
- Larger area sputter/carbon coating – up to 4"/102 mm diameter
- High vacuum sputtering – oxidising and non-oxidising metals
- High vacuum carbon coater – ideal for SEM and TEM
- Controlled, ramped carbon rod evaporation – precise thickness control. Non-sparking process for superior quality films
- Film thickness control options
- Up to 60 minutes sputtering time – thick films capabilities



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## Q300T ES – Overview

The Q300T ES is a large chamber, turbomolecular-pumped coating system ideally suited to metal evaporation onto large diameter specimens up to 6"/152 mm (for example a wafer) or smaller multiple specimens. The Q300T ES also comes with interchangeable sputtering and carbon evaporation inserts to allow a coating radius of up to 4"/102 mm.

The sputter coating insert will deposit both oxidising metals, e.g. chromium and aluminium and non-oxidising (noble) metals such as gold and platinum. A chromium target is fitted as standard.

The Q300T ES has a full range of optional accessories, including specimen stages and film thickness measurement which means the system can be tailored to the precise requirements of the user.

## Product Description

### Thermal evaporation of metals

The Q300T ES is designed for the controlled thermal evaporation of metals onto large substrates (up to 6"/152 mm). For many evaporative processes tungsten filaments supplied with the system are used. However, some metals require the use of a molybdenum boat, which can also be used for heat-cleaning SEM and TEM apertures.

The evaporation head is normally positioned for downwards evaporation, but for small specimens upward evaporation is possible using two terminal extensions supplied with the system.

### Sputter coating for high resolution FE-SEM and thin film applications

The advance design of sputtering head, power supply and system control allows sputtering of both oxidising and non-oxidising (noble) metals for thin film applications and for scanning electron microscopy (SEM) coating. The full range of target materials available is extensive and detailed in the Ordering Information section.

For sputtering applications where thick films are required, then the Q300T ES can operate for up to 60 minutes.

### High vacuum carbon evaporation for SEM and TEM

The carbon rod evaporation insert allows high quality carbon films to be deposited over a radius of up to 4"/102 mm.

The Q300T ES uses controlled ramped carbon rod evaporation to ensure optimum control of the process and quality of results (with or without the optional film thickness measurement system). In addition the quality of the resulting carbon films is enhanced by the eradication of "sparking" which is a common problem with less advanced coating systems.

### High vacuum turbomolecular pumping and vacuum measurement

The Q300T ES is fitted with an internally mounted 70 L/s turbomolecular pump backed by a 5 m<sup>3</sup> hr two-stage rotary pump (order separately). A full range vacuum measurement gauge is included. Typically ultimate vacuum of around 5 x 10<sup>-5</sup> mbar can be expected in a clean system after pre-pumping with dry nitrogen gas.

### Touch-screen control and stored recipes

At the operational heart of the Q300T ES is a colour touch screen which allows users to rapidly enter and store their own process data. A range of typical sputtering and evaporation profiles are pre-installed.

### Vacuum chamber and specimen stages

The Q300T ES is presented in a custom-moulded, one-piece case allowing easy servicing access. The case houses all the working components and includes an automatic bleed control that ensures optimum vacuum conditions during sputtering. The vacuum chamber has an internal diameter of 283 mm/11" and comes with an integral safety guard. The vacuum shutdown option can enhance vacuum performance by allowing the chamber vacuum to be maintained when the coater is not in use.

A variable speed rotary specimen stage is fitted as standard and accommodates specimens up to 4"/102 mm in diameter. For details of other stages please see the Options and Accessories and Ordering Information.

# Options and Accessories

## Specimen stages and holders (for details see: Ordering Information)

The Q300T ES has additional specimen stages to meet most requirements. All are easy-change, drop-in style (no screws) and are height adjustable (except 10360). Rotation speeds are variable between pre-set limits.

- 10787 rotation stage for 4" wafers (supplied as standard)
- 10810 rotation stage for 6" wafers
- 10067 flat rotation stage for SEM specimen stubs
- 10357 rotation stage with pre-set tilt for SEM specimen stubs
- 10360 rotate-tilt (rotary-planetary style) stage
- 10358 rotation stage for glass microscope slides
- 12043 eight-place stage for 25 or 30 mm embedded, polished specimens
- 10808 coverslip stage for nine 20 x 20 mm coverslips
- 12996 sun and planet-style stage
- AL410-414 TEM grid holder

## Other options

- 10595 standard height chamber
- 10596 extended height chamber (supplied with system)
- 10454 film thickness monitor (FTM)
- 12937 conductance film monitor (CFM)

## Specifications

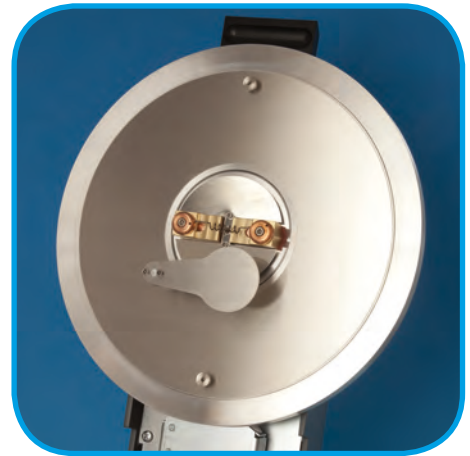
Dimensions	585 mm W x 470 mm D x 410 mm H (total height with coating head open: 710 mm). Weight: 37 kg
Packed dimensions	725 mm W x 660 mm D x 680 mm H (45 kg)
Work chamber	Borosilicate glass 283 mm ID x 215 mm H
User interface	Intuitive full graphical interface with touch-screen menus and buttons
Sputter target	Disc style 57 mm Ø with thickness depending upon the target fitted. One 0.3 mm thick chromium (Cr) target (TK8845) is fitted as standard
High vacuum pumping	Internally-mounted 70 L/s turbomolecular pump
Rotary pump	5 m <sup>3</sup> hr two-stage rotary pump with oil mist filter. (Order separately; see 13034). Dry pumping options are available
Typical ultimate vacuum	5 x 10 <sup>-5</sup> mbar in a clean system after pre-pumping with dry nitrogen gas. Measurement using a full range Penning gauge
Specimen stage	10787 stage for 4 inch wafer supplied as standard. For alternative stages see Options and Accessories (fitted as standard)

## Services and other information

Gases	Argon sputtering process gas, 99.999% Nitrogen venting gas (optional)
Electrical supply	90-250 V 50/60 Hz 1,400 VA including rotary pump, 110/240 V voltage selectable



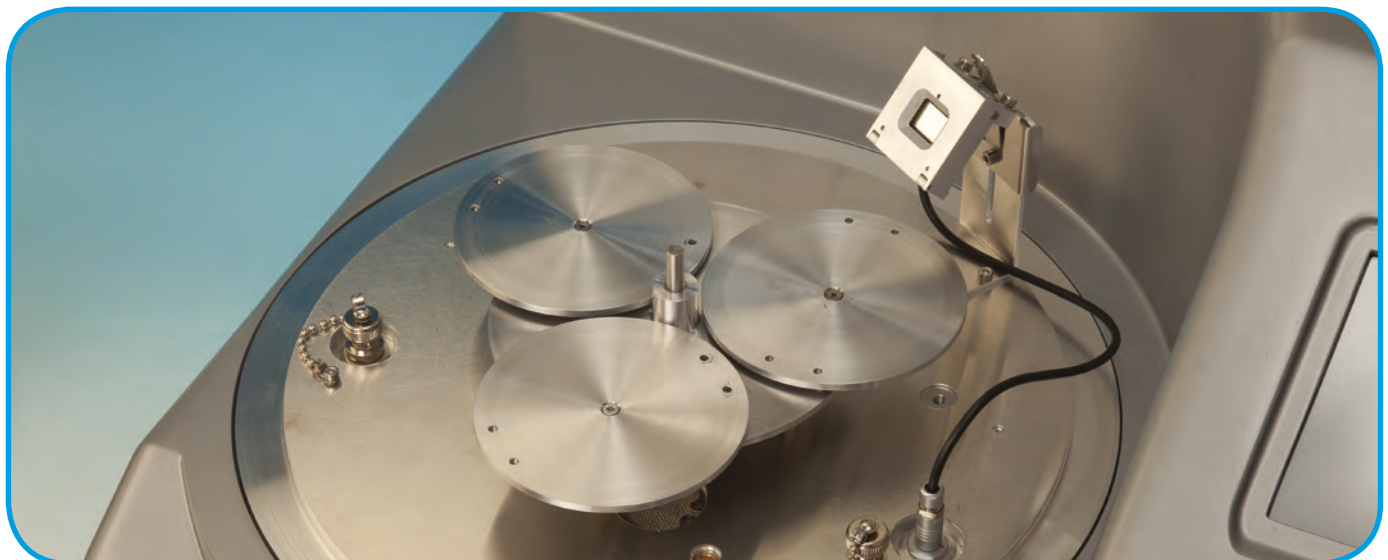
Sputtering insert



Thermal evaporation insert



Carbon rod evaporation insert



Sun and planet-style stage with conductance film thickness monitor

## Ordering Information

**NB:** For a full quotation, including on-site installation and customer training, please contact us or our local distributor

**Q300T ES** Turbomolecular-pumped sputtering, metal evaporation and carbon coating system with 300 mm Ø x 215 H mm work chamber. Consists of high 10034 quick release sputter insert with a TK8845 57 mm Ø x 0.3 mm chromium (Cr) target. High vacuum carbon rod evaporation coater and 10457 metal evaporation head. Coating inserts are interchangeable. 10787 4" wafer stage supplied as standard. Integrated full range gauge assembly for high vacuum measurement

### Rotary pump requirements – order separately

Pumps supplied with vacuum hose and coupling kit

<b>13034</b>	5 m <sup>3</sup> hr two-stage Pfeiffer Duo 6 rotary pump with oil mist filter
<b>11540</b>	Diaphragm pump. A "dry" alternative to the standard 13034 oil-based rotary pump
<b>20063</b>	Edwards nXDS6i scroll pump. Lubricant-free and hermetically sealed giving totally clean and dry vacuum to prevent cross-contamination

### Options and accessories – specimen stages

Rotation stages rotation speed variable between pre-set limits

<b>10357</b>	Rotating 50 mm Ø specimen stage with adjustable tilt. There are six specimen stub positions for 15 mm, 10 mm, 6.5 mm, M4 thread or 1/8" pin stubs
<b>10067</b>	50 mm Ø variable height specimen stage with six stub positions for 15 mm, 10 mm, 6.5 mm disc stubs, M4 thread or 1/8" pin stubs
<b>10360</b>	50 mm Ø rotary tilting stage. A rotary planetary style stage with variable tilt angle from horizontal to 30 degrees. There are six positions for 6.5 mm, 10 mm, 15 mm disc stubs, M4 thread or 1/8" pin stubs
<b>10358</b>	A 90 mm Ø specimen stage for glass microscope slides (up to two 75 mm x 25 mm slides or a single 75 mm x 50 mm slide). The stage can alternatively accommodate up to six 1/8" SEM pin stub. Includes gear box to allow optional FTM to be used
<b>10810</b>	Rotation stage for 4" or 6" wafers
<b>12996</b>	Sun and planet-style rotation stage (each stage is 92 mm Ø)
<b>12043</b>	Eight-place stage for 25 or 30 mm embedded, polished specimens
<b>AL410-414</b>	Nine-place TEM grid holder

### Other options and accessories

<b>10454</b>	Film thickness monitor (FTM) attachment. Including oscillator, feed-through, quartz crystal holder and one C5460 quartz crystal
<b>C5460</b>	Spare quartz crystal for FTM
<b>12937</b>	Conductance film monitor (CFM) attachment including housing, feedthrough, glass slides and cable. A factory fitted only option for monitoring sheet resistance of evaporated films allowing termination at a known resistance
<b>10596</b>	Extended height glass cylinder, 300 mm Ø x 215 mm high (supplied as standard)
<b>10595</b>	Standard height glass cylinder, 300 mm Ø x 127 mm high

<b>11223</b>	A lockable emergency stop (e-stop) switch mounted on top of the system for easy access
<b>13278</b>	Coating shields. Can be fitted to protect large surfaces in the chamber from coating deposition – easily removable for ease of cleaning
<b>10422</b>	Vacuum spigot allows a more convenient connection of the vacuum hose to the rear of the Q300T ES when bench depth is limited

### Evaporation supplies

<b>B5230</b>	Tungsten wire baskets – pack of 10
<b>B5228</b>	Molybdenum boats – pack of 10

### Sputter targets

All targets are 57 mm in diameter – thicknesses vary  
The Q300T ES is fitted as standard with one 57 mm x 0.3 mm chromium (Cr) target (TK8845). Other optional targets are available:

<b>SC502-314A</b>	Gold (Au) 0.1 mm
<b>SC502-314A/0.2 mm</b>	Gold (Au) 0.2 mm
<b>SC502-314B</b>	Gold/palladium (Au/Pd) 0.1 mm
<b>SC502-314B/0.2 mm</b>	Gold/palladium (Au/Pd) 0.2 mm
<b>SC502-314C</b>	Platinum (Pt) 0.1 mm
<b>SC502-314C/0.2 mm</b>	Platinum (Pt) 0.2 mm
<b>SC502-314D</b>	Nickel (Ni) 0.1 mm
<b>SC502-314E</b>	Silver (Ag) 0.1 mm
<b>SC502-314G</b>	Palladium (Pd) 0.1 mm
<b>SC502-314H</b>	Copper (Cu) 0.1 mm
<b>TK8875</b>	Aluminium (Al) 1.0 mm
<b>TK8869</b>	Carbon (C) 1.5 mm
<b>TK8845</b>	Chromium (Cr) 0.3 mm
<b>TK8862</b>	Chromium (Cr) 1.5 mm
<b>TK8900</b>	Cobalt (Co) 0.1 mm
<b>TK8889</b>	Gold (Au) 0.3 mm
<b>TK8891</b>	Gold/palladium (Au/Pd) (80:20) 0.3 mm
<b>TK8907</b>	Indium tin oxide (ITO) 3 mm
<b>TK8899</b>	Iridium (Ir) 0.3 mm
<b>TK8897</b>	Iron (Fe) 0.1 mm
<b>TK8905</b>	Magnesium (Mg) 0.5 mm
<b>TK8903</b>	Molybdenum (Mo) 0.1 mm
<b>TK8893</b>	Platinum (Pt) 0.3 mm
<b>TK8887</b>	Platinum/palladium (Pt/Pd) (80:20) 0.3 mm
<b>TK8906</b>	Tantalum (Ta) 0.1 mm
<b>TK8902</b>	Tin (Sn) 0.1 mm
<b>TK8879</b>	Titanium (Ti) 1.5 mm
<b>TK8895</b>	Titanium (Ti) 0.5 mm
<b>TK8846</b>	Tungsten (W) 0.5 mm
<b>TK8867</b>	Tungsten (W) 0.2 mm

*For full specifications, please see our website*



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