

MCT Large Substrates

FULLY AUTOMATIC MICRO-CLUSTER
TRACK (MCT) TOOL FOR COATING &
DEVELOPING



HIGHLIGHTS

- Suitable for High Volume Manufacturing (HVM)
- High reliability, yield and uptime
- Highly configurable tool
- Customization possible for specific customer process and throughput requirements

MCT Large Substrates

GENERAL INFORMATION & TECHNICAL DATA

Key Features

Obducat's MCT Large Substrate system provides excellent performance as a result of the embedded cutting-edge solutions derived from many years of close cooperation with our customers.

This ensures that the system is prepared for current and future high-volume manufacturing (HVM) requirements at a competitive Cost-of-Ownership. The configuration flexibility of the MCT Large Substrates makes it adaptable to processing requirements in a wide variety of applications such as Optics, Displays and Advanced Packaging.

The system can handle substrate sizes from:

System	Substrate Ø	Square substrate
MCT 600	600 mm	450 mm x 450 mm
MCT 775	760 mm	540 mm x 540 mm
MCT 1200	1000 mm	850 mm x 850 mm
MCT 1500	1400 mm	1000 mm x 1000 mm

Tool Configurations

The standard MCT Large Substrates configuration is equipped with an I/O station and a multi-axis robot system on a linear track. It can incorporate up to 10 modules configured for Coating, Developing and/or Thermal processing.

Coating is performed using the standard open process bowl and a standard vacuum chuck. This ensures a uniform and repeatable coating process. As an option, the open bowl module can be replaced with our Rotating Covered Chuck Technology (RCCT™) module. (See tool options)

The developer can perform both puddle and spray-based processes.

The Thermal processing units can be equipped with up to 8 temperature plates in a stacker – hot plates, cool plates & HMDS vapor prime hot plate. The hot plates have a programmable temperature range up to 300°C and are equipped with programmable proximity pins.

The HMDS vapor prime hot plate has a programmable temperature range up to 200°C. The process is fully automated and adheres to all recognized safety standards.

- Easy to operate windows-based PC with 22" color touch screen
- Unlimited process recipe / flow storage capacity plus USB port
- Batch & process parameter tracking
- Ethernet port

Tool Options

Coater Module - Rotating Covered Chuck Technology (RCCT™)

Obducat's revolutionary Rotating Covered Chuck Technology (RCCT™) process environment design provides for:

- Completely sealed solvent saturated atmosphere
- Minimal turbulence around the substrate eliminating rotational corner effects on squared substrates, enabling industry leading resist uniformity across the entire substrate at lower spin speeds.
- Superior coating uniformity on submicron layers as well as for thick resist layers compared to open bowl.
- Reduced process cost and improved environmental profile by lowering material consumption.
- Eliminating the need for Backside Rinse (BSR).

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Edge Bead Removal (EBR)

Obducat's high performing EBR technology is used to remove the build-up of material at the substrate edges after spin coating. Removal of the edge bead prevents stepper focusing problems and any build-up of photoresist on the backside of the wafer. It also prevents 'chipping' of the photoresist that could cause contamination issues.

Obducat offers three types of EBR processes – standard solvent based, SmartEBR by either solvent based process or UV exposure process.

- The standard solvent based EBR process uses a programmable nozzle directing the solvent fluid towards the round substrates edge thereby removing the edge bead during spinning.
- For SmartEBR solvent based process the exact shape of a square substrate is first determined by a sensor. Knowing the geometry of the substrate, the system can remove the edge bead by moving the substrate while applying solvent from a programmable nozzle.
- For SmartEBR UV exposed based process, the exact substrate shape is similarly determined but in the following step the edge bead is exposed to UV light. This UV exposure allows for the edge bead to be removed in a later process step.

Multiple Chuck solutions – Vacuum, Low contact

Chuck solutions for coating:

- In case the backside has active areas, the use of an edge handling chuck with an edge exclusion of typically 4mm is recommended.
- Glass substrates are very sensitive to temperature gradients. Since vacuum substrate handling may cause such temperature gradients, Obducat offers glass substrate handling by corner suction cups with alignment pins minimizing these gradients.

Chuck solutions for Developing:

- For round substrates that are wet treated the low contact chucks are used, where the substrate is held in place by supporting pins and centripetal force fixing it during the high-speed drying.
- Squared substrates are held at the corners by alignment pins using low contact chucks. The advantage of this chuck is the entire backside can be rinsed.

Environmental Control Unit (ECU) and Filter Fan Units (FFU)

To guarantee superior process stability and high yields, the tool can be equipped with an ECU, this will control the temperature and humidity in the processing area. FFU's can be connected to the ECU to ensure a particle free environment.

Temperature controlled resist and chemical lines

Photoresist:

A key process parameter for coating uniformity is temperature. To enable a high level of coating uniformity, the tool can be equipped with temperature-controlled photoresist lines that will enable a repeatable temperature level of the photoresist substrate to substrate at point of dispense.

Developer chemicals:

When chemicals are supplied from the fab supply or stored outside the cleanroom the temperatures are different to the cleanroom environment causing chemicals to react and perform differently with changes in temperature. This can result in processing variations. This option can ensure a repeatable temperature level of the chemical's substrate-to-substrate at point of dispense.

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In-line film thickness measurement

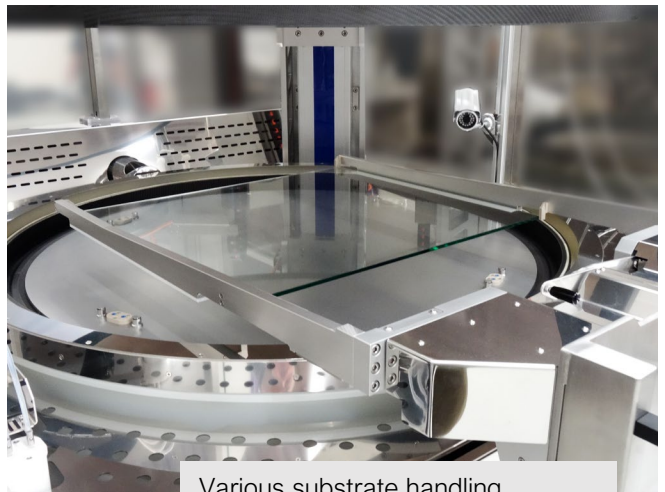
The high performing measurement method uses white light interferometry, where a low pass filter blocks all wavelengths below 450 nm to protect photoresist from being exposed.

- In-situ film thickness measurement in real-time enables immediate quality control and yield monitoring.
- High speed wafer mapping with a programmable x-y stage can provide relevant data input towards root cause analysis of coating failures.

Connection to wafer fab Manufacturing Execution Systems

The tool can be configured to enable connection to various Manufacturing Execution System (MES) interfaces such as:

- SECS / GEM
- OPC/UA
- Customer specific interfaces



Various substrate handling systems are available to enable full customization.

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TECHNICAL DATA

FACILITY REQUIREMENTS

Clean-room compability	Class 10, ISO 4
Room Temperature	20-24°C
Relatively Humidity	40 - 55 %
Power	3 x 400 VAC / N / PE, 50 - 60 Hz, Amperes dependent on substrate weight
Compressed Air (CDA)	8 bar
Vacuum	-0,8 bar
Nitrogen (optional)	4,0 bar
DI-Water (optional)	4,0 bar

SYSTEM DIMENSIONS

Dimensions W x D x H)	Dependent on number of modules
Weight	Dependent on number of modules

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