QS Large Substrates

SEMI-AUTOMATIC QUICKSTEP (QS) TOOL FOR COATING & DEVELOPING

HIGHLIGHTS

- Suitable for R&D and Pilot Manufacturing
- High reliability
- Highly configurable with a wide variety of options available
- Process modules are the same as in HVM tools – enables easy migration to volume production
- Customization possible for specific customer needs

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GENERAL INFORMATION & TECHNICAL DATA

Key Features

Obducat's highly successful QS Large Substrate platform provides the perfect semi-automatic solution for current and future R&D as well as pilot manufacturing requirements.

The platform flexibility enables the QS Large Substrate to cover a variety of applications such as Displays, Optics and Advanced Packaging.

The systems can handle substrate sizes from:

System	Substrate Ø	Square substrate
QS600	600 mm	450 mm x 450 mm
QS775	760 mm	540 mm x 540 mm
QS1200	1000 mm	850 mm x 850 mm
QS1500	1400 mm	1000 mm x 1000 mm

Tool Configurations

The QS Large Substrate platform is highly configurable enabling a fit to almost any customer requirements while offering a superior cost efficiency. The various modules for Coating, Developing and Thermal processing can be combined as needed and each module have a wide variety of options to enable a perfect fit to your processing needs.

The tools are available as stand-alone tools which can be placed next to each other to create a line of processing units.

Coating is performed using the standard open bowl and 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 hot plate, cool plate or HMDS vapor prime hot plate. The hot plate has a programmable temperature range up to 300°C and is equipped with programmable lift 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.

- Operation control unit with 22" color touch display and windows like screen
- Unlimited process recipe / flow storage capacity plus USB port
- 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 photoresist on the backside of the wafer. It also prevents 'chipping' of the photoresist that could cause contamination issues.

Obducat offers solvent based EBR processes for the Quickstep tools.

- The standard solvent based EBR process uses a programmable nozzle directing the solvent fluid towards the edge of round substrates thereby removing the edge bead during spinning.
- For SmartEBR solvent based process the exact shape of a substrate – e.g. 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.

Temperature controlled resist and chemical lines

Photoresist

A key process parameter for coating uniformity is temperature control. 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

When developer chemicals are supplied from the wafer fab 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 developer or chemicals substrate-to-substrate at point of dispense.

Multiple Chuck solutions – Vacuum, Low contact

Chuck solutions for coating:

- Standard vacuum chuck with centering pins.
- 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.

Chuck solutions for Developing:

- Standard round substrates that are wet treated use low contact chucks, where the wafer is held in place by supporting pins.
- 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.

Motorized Syringe Dispense System

The motorized syringe dispense system is designed for rapid change-over of photoresists. It is recipe programmable for dispense & suck-back and is suitable for photoresists up to 60,000 cps. Syringes come in various sizes up to 250ml.

Connection to wafer fab Management 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

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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

SYSTEM DIMENSIONS

Dimensions (W x D x H)	Dependent on required substrate size


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