

CHAD Reticle Handling™

Automate Your Reticle Process

Custom Integrated Design

CHAD Industries is a full service integrator with in-house capabilities for project management, mechanical engineering design, software design, fabrication, assembly, wiring, test and development, field service and customer support.



Each reticle handling application is designed to ensure that the optimal solution is achieved in the smallest possible footprint. The reticle handling and management systems are compatible with standard SEMI presentation formats (SMIF pod, shipping box, stepper box) to make integration with the lithography tool simple

and easy. The flexible workcell design also permits the CHAD reticle handling equipment to be configured as either a reticle transfer tool, or a reticle stocker. Specific design consideration is given to airborne molecular contamination (AMC) and filtration systems, to ensure that the reticles remain clean and contaminant free.

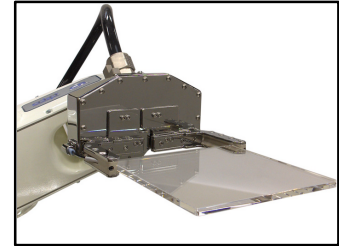
CHAD reticle handling systems are built using standard components integrated into a custom solution. Standard components include the end effector, clean-room robots and application software.

CHAD Reticle Handling System Features:

- Small footprint
- Reticle transport or Reticle sorter
- SEMI standard presentation (SMIF pod, Shipping cassette, Stepper cassette)
- Edge grip end effector
- AMC filtration for Class-2 cleanliness
- Simple PC software
- Integrated OCR/barcode capability
- OHT compliant interface
- SEMI S2 and S8, and CE compliant

End Effector

The reticles are gripped in a CHAD edge grip end effector. This end effector uses a fail-safe design to ensure the reticles are always gripped in the event of a power failure. The design includes special contact surfaces to protect the edge of the reticles and pellicles from damage. The end effector is plumbed to vacuum, ensuring compliance to the strictest particulate requirements. The end effector also incorporates reticle mapping features for reticle inventory management.

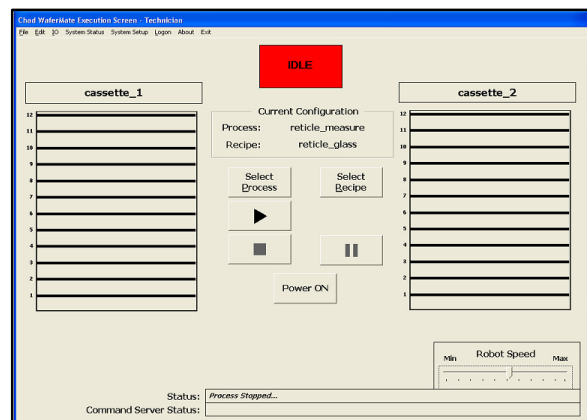


Robots

The reticles are manipulated using a clean robot, either 4-axis or 6-axis. The robots have fluid-magnetic seals and can be fitted with vacuum for stringent Class-1 cleanliness requirements. Robot selection is dependant upon each application.

Software

The integrated workcell uses CHAD's proprietary **WaferWare™** software suite to allow for simple yet wide-ranging application and GUI controls. Special handling routines have been developed to accurately and safely handle the reticles without damage.



FOR MORE INFORMATION:

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Application Example

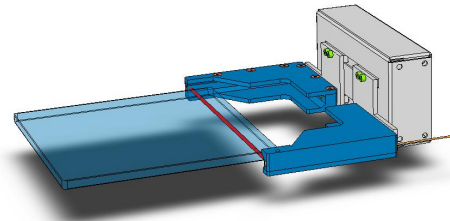
A customer required a Class-2 solution to pick and place reticles, in both horizontal and vertical planes in order to automate a reticle mask inspection tool. The workcell also had to service up to 9 different cassettes, as well as a calibration fixture, and an orientation tool.

A 6-axis clean room robot was used to meet these requirements, and was designed into a custom workcell frame (see below).



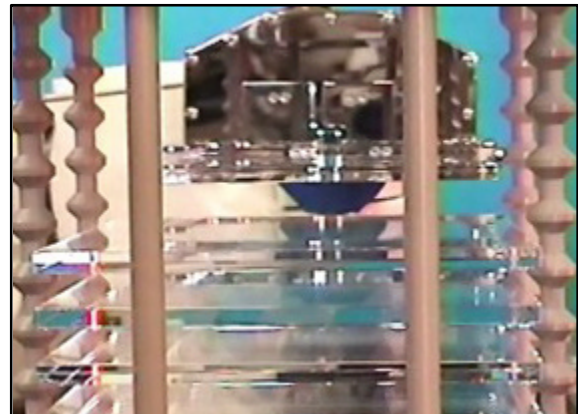
The workcell was designed and painted to match the customer's process tool, including stainless steel surfaces (# 8 mirror finish) in the work area to maintain cleanliness. Likewise, the end effector finish was stainless steel and was plumbed to vacuum. The workcell design included provisions to permit configurations of up to 9 cassette locations.

A through-beam sensor was integrated into the end effector tooling, to serve as a mapping tool for reticles in the cassette (see below) and as a presence tool for reticles at other locations.



The entire reticle mask handling and inspection tool was housed inside an enclosure that included a clean air filtration system for AMC management. This enclosure was designed for safety per CHAD's specifications and schematics.

Finally, a software interface was developed to permit fully automated AGV integration at the end customer site.



[View of end effector from behind cassette]

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