



Owens Design
Capital Equipment Design & Manufacturing

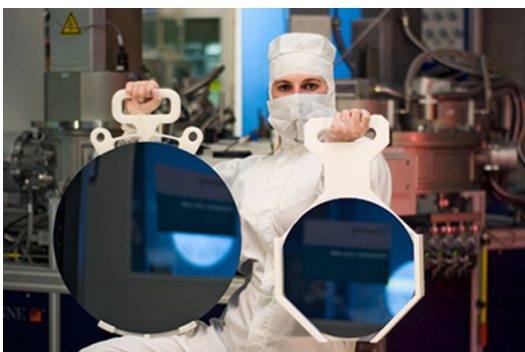
**SOLUTION
SETS**

SEMICONDUCTOR INDUSTRY

ATLAS 450 METROLOGY AUTOMATION PLATFORM

The Situation

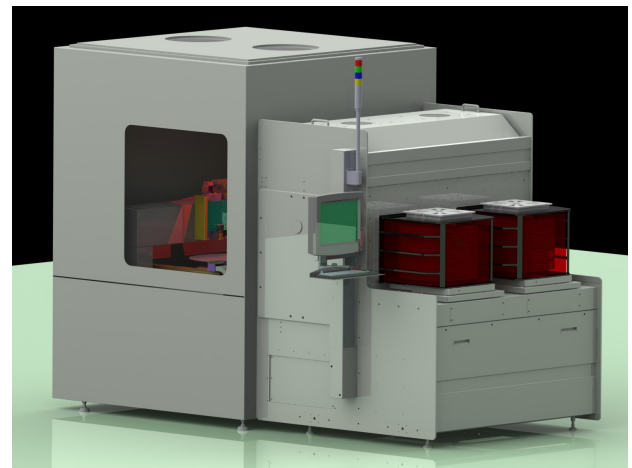
After much debate, it is now clear that leading semiconductor fabs will require 450mm capable systems to scale economically in the near future. However, 450mm systems are unlikely to go into volume production for many more years requiring tool vendors to continue to support existing platforms while simultaneously developing 450mm platforms. The result is a large, yet temporary, need for the tool vendor to increase their platform engineering staff. In addition, there are substantial differences between 300mm and 450mm SEMI standards which create significant risk of non-compliance.



450mm Wafers - Not Only Bigger, but Requires a New Handling Approach

The Solution

Partnering with Owens Design for your 450mm platform will reduce internal staffing requirements while guaranteeing your platform is designed by experts with an extensive track record of developing semiconductor tools. In fact, Owens has developed more semiconductor metrology & inspection platforms than any other service provider. We guarantee that our design is compliant with SEMI 450mm standards. If it doesn't pass third party certification, we will fix it at our expense. Finally, partnering with a semiconductor platform expert for your 450mm development allows your staff to focus on scaling your core technology while continuing to support your existing production and



Atlas 450 Platform Reduces Development Cost

legacy tools. Give Owens Design a call to learn more about how we can help ease your 450mm transition.



450mm FOU - Manual Loading No Longer Allowed



ATLAS 450 METROLOGY AUTOMATION PLATFORM (CONT'D)

Wafer Specifications

- Wafer Sizes: 300mm, 450mm
- Substrate Types: Silicon

Repeatability

- Measured at wafer hand-off location
- X, Y, Z axis: +/- 300 µm
- Theta axis: 0.1 degree

Cleanliness

- Front side: < 0.5 particles @ 0.10 µm, PWP
- Backside: < 100 particles @ 0.10 µm, PWP
- Airborne: No degradation to ISO Class 1 environment

Reliability

- MTBF > 1,500 hrs MTBS > 6 months
- MTBI > 1000hrs MTTR < 2 hrs

Interface / Facilities

- Wafer Identification: OCR (Cognex 1721)
- Carrier Identification: Carrier Auto ID
- UI: 15" Touch Screen, Trackball, Keyboard
- Facilities: 208 VAC, 50/60 Hz, 15 amp

Regulatory Compliance

- Certifications (SEMI S2, S8, CE Mark)
- SEMI E154, E158, E 159, E84
- Sematech Integrated Mini-environment Best Practices

4-3:450mm/300mm Comparison table

SEMI INTERNATIONAL STANDARDS

*Except packaging standards

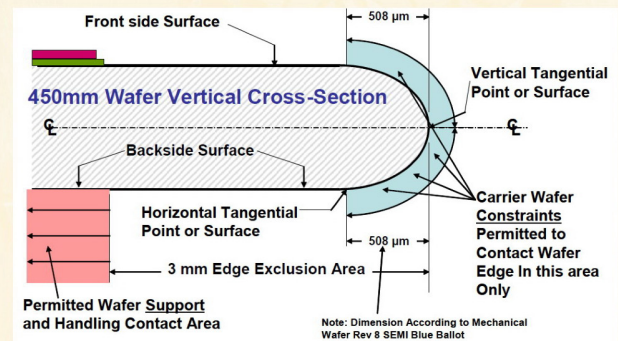
| Item | 300mm | 450mm | Standard Name |
|---------------|-------|--------|--|
| Wafer | N/A | M74 | Mechanical Handling Polished Wafer |
| | M1 | ← | Polished Single Crystal Si Wafer |
| | M28 | M76 | Developmental Polished Single Crystal Si Wafer |
| Load Port | E15.1 | E154 | Load Port |
| | E62 | | FIMS |
| | E63 | | BOLTS-M |
| | E64 | | Cart Docking Flange |
| | E110 | | Indicator / Switch Placement |
| | E83 | E83.1? | PGV Docking Flange |
| | N/A | E162 | FOSB Load port |
| FOUP | E1.9 | E158 | Cassette |
| | E47.1 | | Front Opening Unified Pod |
| | E57 | | Kinematic Coupling |
| MAC | N/A | E159 | Multi Application Carrier |
| FOSB | M31 | M80 | Front Opening Shipping Box |
| STK I/F | E85 | E156 | Stocker Interface |
| Cluster tool | E21.1 | Exx | Cluster-Tool Module Interface |
| | E22.1 | | Cluster-Tool End Effector |
| Communication | E84 | ← | Carrier Hand off Parallel I/O |
| | E99 | ← | Carrier Reader/Writer Functional |
| | E144 | ← | RF Air Interface |

STEP: 450 mm Standards Overview

**Significant Changes to SEMI Standards Require
Careful Review and Certification**

450mm wafers handling guideline

SEMI INTERNATIONAL STANDARDS



STEP: 450 mm Standards Overview

**New Guidelines for Wafer Handling
Must be Considered in Platform Design**