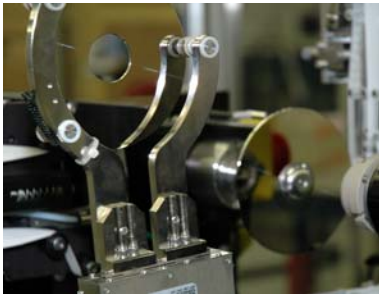




**SEMICONDUCTOR INDUSTRY**

**HARD DISK DRIVE MEDIA AND CASSETTE HANDLING**



*Edge Grip Loading Spindle*

The handling requirements for hard disk drive media continue to become more demanding due to the proliferation of form factors, tighter cleanliness requirements and increasing throughputs. Owens Design thoroughly understands the unique requirements for hard disk media manufacturing. Our proven disk and cassette handling designs are used in equipment that processes over 60% of the world's hard disk media. Our equipment is well known within the industry for its excellent engineering, extremely high reliability, and ease of service.

**Disk and cassette handling solutions:**

- ID mandrels, grippers and suction cups.
- OD saddles, grippers and vacuum paddles.
- Process, shipping and custom cassettes.
- Single disk and batch processing systems.
- ESD, clean room and chemical compatibility.



*Innovative Media Drive Design  
(Outer Brush Removed for Clarity)*

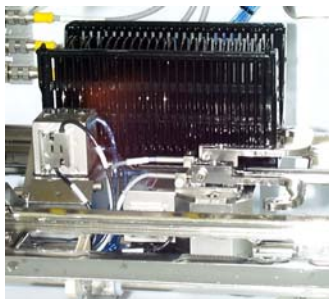


*Vacuum Loading*

**Multiple form factor solutions:**

The growing demand for low-cost, high-capacity, and compact storage for mobile devices is pushing development of small form-factor hard disk drives.

- Compatible with all form factors (22-95mm) in glass and aluminum
- Fully automated systems that adjust to multiple form factors without operator intervention
- Quick form factor conversion
- Aluminum and glass substrates



*Cassette Indexing Mechanism*



*Edge Grip Loading to Vacuum Chuck*



## HARD DISK DRIVE MEDIA AND CASSETTE HANDLING (CONT'D)

### Equipment Experience

- Cassette exchange
- Disk merge
- Polish automation
- Texture
- Post polish, texture and final clean
- UV and IR cure
- FTP (buff and wipe)
- Optical test (automated spindle loading)

### Capabilities

- Disk Sizes: 21-95mm OD
- Cassettes: Process and Shipping, all sizes, color and materials.
- Substrate Types: Aluminum, Glass (bare and coated).
- Environment: Dry, wet, high temperature and vacuum.
- Disk handling: ID mandrels, grippers and suction cups. OD saddles, grippers and vacuum paddles.

### Throughput

- >1000 pph (50 disk batch process)
- >500 pph (single disk process)
- >90% Utilization

### Cleanliness

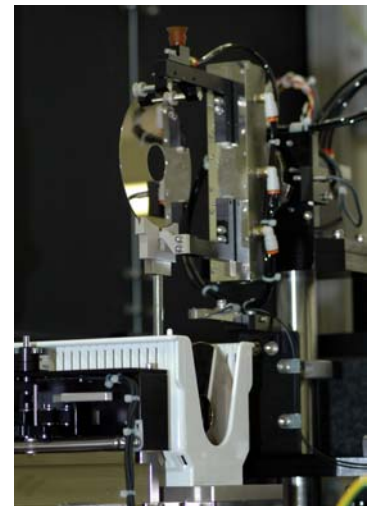
- Class 1 capability
- ESD compliant

### Regulatory Compliance

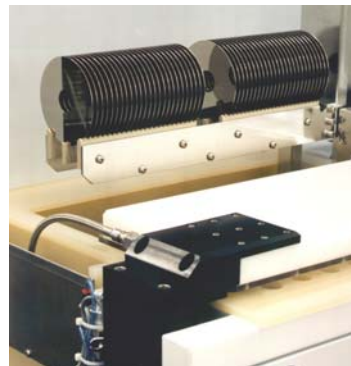
- All EHS and compliance standards as required
- CAL-OSHA, SEMI, NFPA, NEC, UL and CE



*ID Gripper Loading Saddle*



*Disk Lifter Mechanism*



*Cassetteless Disk Lifter Mechanism  
Shown in Load Position*



*Input Conveyor*