smartPro

SVG8X WAFER CLEANER

System Advantages:

- The C&D SVG8X Single Sided Cleaner mechanically cleans substrates from 50 mm to 200 mm diameter.
- Cleaning is done by a brush or high pressure arm or a combination of the two in either sequence in the same process station.
- The total design is committed to the reduction of the contamination and to improved process capability.
- Self-calibrating colinear dual motor drive system provides high torque for low speed scrubbing and high speed for efficient drying.
- Air ring keeps the back of the substrate and the chuck completely dry during processing.
- Large diameter scrub brush covers the full width of a 8 inch substrate, so the substrate "sees" the brush in both directions.
- "Through the brush rinsing" helps keep the brush clean and rinsed at all times.
- A counterweight system balances the brush weight allowing brush force to be set from 0 to 2 lbs.
- Scrub brush is removed without tools.
- The brush drive mechanism is mounted outside the catch cup area which reduces particulate contamination.
- Adjustable high pressure nozzle, located only 1/8" (3mm) nozzle, above the substrate surface, covers the full substrate diameter during each single cycle.
- Large vacuum formed polyethylene process enclosure with large exhaust reduces misting and splash back.
- Standard cover interlock switch prevents wafer from spinning without the process chamber cover in place providing an added safety feature.

System Features:

- Standard stainless steel cabinets and open space around the track reduce particulate contamination.
- Dual cassette load/unload indexers can increase throughput. The unique dual load/unload feature allows the operator to load fresh cassettes to an index station at any time. When the processing of a cassette of substrates is completed, the indexer will automatically travel to the pass-thru mode, allowing the new cassette to index into processing position. The system can consistently out perform any other single load and unload system. An operator can oversee more tracks since less time is needed for loading and unloading.
- Universal platform on indexers accommodates SEMI Standard H-Bar cassettes ranging from 50 mm to 200mm with no adjustment.
- When the key lock on the control panel is in the "lock" position, program content changes cannot be made.
- The program event is displayed simultaneously with its operation.
- Independent microprocessor controls for each track enhance system modularity.
- Spindle assembly is easily removed in less than five minutes.

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System Description

The all C&D SVG8X Single Sided Cleaner is a fully automatic cleaner designed to scrub with brush and/or high pressure arm, rinse and spin dry substrates.

Standard 3 mil nylon, 5 mil nylon, or microcloth brushes are available from SVG offering increased process choice.

Three fluid nozzles (1 for scrub and 2 for rinse) and one blowoff nozzle are standard.

The adjustable high pressure nozzle results in less static build-up because the high pressure stream passes through a short air distance from nozzle to substrate.

The C&D SVG8X features a newly designed spindle assembly and enlarged process chamber. The brush and high pressure scrub operations are performed at a spindle position in the chamber. This dual level spinning process and large diameter process enclosure reduce splash and spray onto the substrate and the handling mechanism. Splash back onto the substrate is virtually eliminated.

Wafer Handling

Unprocessed substrates remain in the send cassette until ready to be loaded into the process station and then are transported to the scrub process area.

C&D SVG8X has one of the lowest breakage rates and one of the fastest handling systems in the industry. Silicon wafers (down to 0.005 inch thick), GGG, Sapphire, GaAs, thin film heads, and lithium niobate can be processed on standard SVG equipment.

To help insure safe handling, the substrate's presence is checked and verified at the send cassette, as it approaches the chuck , on the chuck , and at the receive cassette. If a position or sequence is not verified, further processing is stopped, and a substrate lost indication and audible alarm is given by the machines diagnostics.

Changing the track to accommodate a different substrate size requires less than fifteen minutes. Only a few minor mechanical changes need be made, no electronics adjustment is required.

Process Capabilities

The C&D SVG8X substrate cleaning system is designed for convenient operation and ease of maintenance. To operate the system, one need only select the proper process program (1 through 9), load the system with substrates and empty cassettes, and press "START". The equipment will then process the substrates according to the program selected. Only the "PROGRAM SELECT" key is required to change to a new program.

Entering a new program or changing portions of a program is a simple keyboard operation. Up to nine programs with nine events (up to four parameters/event) in each program can be stored for each track. In addition, if more than nine events are required the programs can be linked. Any part of a program or event can be altered without affecting other parts of the program.

The engineer can program wafer rotation speed, brush speed, and high pressure nozzle cycle speed - each independently.

The scrub brush is cleaned by "through the brush" rinse which operates during any wet operation. During high speed spin or blowoff this brush cleaning stops to avoid rewetting the substrate.

An optional "SCRUB 2" Event gives the engineer the ability to scrub in two consecutive events with different fluids, substrate rotation speeds, and time without the brush leaving the substrate surface. For example, an event for scrubbing with detergent can be followed immediately by an event for scrubbing with aqueous ammonia, then D.I. water rinsing and drying.

Brush pressure is controlled by precision air regulator which operates an air cylinder connected to the scrub brush. The scrub brush pressure is uniform across the entire substrate surface. The brush weight is balanced by a counterweight so that it does not add to the regulator set pressure. Only the regulator is adjusted to change brush pressure. Brush pressure is independent of substrate thickness. Because of this counterweight, actual brush force is adjustable from virtually zero to up to 2 lbs.

Both the high speed and low speed spin motors are automatically calibrated in the machine's calibration mode.

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System Specifications

Operating Characteristics:
Wafer Size:
50 mm to 200 mm diameter
Cassette Type:
Dual Pitch, SEMI Standard H Configuration, Any two of 3/16” pitch (25 substrates) , 1/4” pitch (20 substrates), or 3/8” pitch (12 substrates) are standard

Processing Modes:
Automatic Continuous automatic cassette -to-cassette processing Single. Single substrate cassette-to-cassette processing with start button activation for each substrate Manual; Hand load and unload individual substrates at process station

Machine Logic:
Z-80 microprocessor control with nine process program storage; programs can be linked for greater flexibility

Program Retention:
Program retained 30days without system power at full battery charge

Process Program Make-up:
Process program consists of any combination of the following operations: Blowoff, Spin, Scrub 1, Scrub 2, High Pressure Scrub, Rinse 1, Rinse 2

Event Times:
Programmable from 0 to 99.9 seconds in 0.1 second increments

Chuck Low Speed Range (Scrub):
50 to 1,990 RPM in 10 RPM increments

Chuck High Speed Range (Rinse, spin dry):
100 to 9,500 RPM in 10 RPM increments

Spin Speed Accuracy:
±20 RPM or ±2% (whichever is greater)

Spin Speed Repeatability:
±10 RPM or ±0.5% (whichever is greater)

Brush Speed:
Programmable from 100 to 600 RPM in 10 RPM increments

Brush Force:
Adjustable from 0 to 2 lbs; brush balanced by counterweight

High Pressure Arm Sweep Rate:
Programmable from 25 to 99 cycles per minute in 1 cpm increments

Nozzle Pressure:
1400-5000 psi adjustable
400 - 1400 psi low pressure range is optional

Diagnostics:
Two types: machine state - indicates status of system; sensor state - allows verification of sensor state

Material And Components

Process Chamber:
Large vacuum formed polyethylene enclosure

Drain:
PVC, 1½ (38mm) OD

Vacuum Chuck:
Delrin

Air Ring:
Electroless nickel plated aluminum

Track Material:
Primary stainless steel or electroless nickel plated aluminum

Power Supply:
Custom transformer with PC board for power distribution; fuses with LED display are front-mounted for access

Track Logic:
Two major P.C. boards - Track Interface and CPU with IC's in plug-in sockets

Cabinets

Material:
Stainless steel panels remove or lift up for access: 3 inch diameter casters and broad pad levelers are included

Configuration:
Depends upon customer requirements.

Facilities Required

Power:
115 VAC, 60 Hz, 10 amp service, domestic standard; many other power options are available for various domestic and oversea requirements

Clean Dry Air:
System - 80 psi (530 kPa), 15 scfm, 1/2" (13mm) OD tubing
Pump input pressure - adjustaable from 20 to 72 psi; yields nozzle pressure from 1400 to 5000 psi

Nitrogen:
80 psi (550 kPa), 20 scfm, 3/8" (9.5mm) OD tubing

Drain:
1½" PVC pipe, 1.9" (48mm) OD; connection made with exhaust

Exhaust:
1½ (38mm) PVC, 20 scfm (28 lpm) @ 2" (51mm) H2O

Vacuum:
20-25" (500 - 635mm) Hg, 3/8" (9.5mm) OD tubing

DI Water:
6 gph (22.7 Iph) @ 20 psi (138 kPa), 3/8" (9.5mm) OD tubing

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