Model 2006 MicroWash™ Wafer Cleaning Station

FEATURES

- **Cleans wafers up to 6″ diameter**
- **Microprocessor control for maximum flexibility and repeatability of the cleaning process**
- **Eliminates variables, breakage and chemicals used in manual cleaning methods**
- **Program storage allows fast production callup of tailored cleaning programs**
- **Rugged construction for heavy-duty production operations**
- **Extensive, built-in self-test features**

CLEANING APPLICATIONS

While Micro Automation dicing saws and systems have been proven effective in removing the residue of sawing, most microelectronic assembly engineers recognize the advantages of a final cleaning operation prior to device packaging. The design of the Model 2006 allows it to be used as an effective stand-alone unit, as part of the System 3300 automatic dicing/cleaning system, or wherever reliable, hands-off wafer or substrate cleaning is required. Microprocessor flexibility and fully programmable machine functions allow separate and unique cleaning processes to be tailored for each cleaning requirement.

DESCRIPTION

The Micro Wash Cleaning Station accepts unmounted or ring-mounted wafers up to 6″ in diameter, or up to 5″ in diameter when mounted on MAI Film Frames. All cleaning functions can be applied in any combination of sequences to remove particulate contamination and residues. The Model 2006 incorporates a fully enclosed cleaning chamber, free from all operator variables that reduce yield and quality.

PROCESS FLEXIBILITY WITH PROCESS CONTROL

Full microprocessor control allows precise programming of every cleaning function and wafer parameter in either English or metric via touchpad pushbuttons on the front panel. Each unique program is stored in memory and battery protected.

RINSE

The RINSE function applies the primary liquid (usually DI water) to the wafer surface through a pivoted spray bar. The spray is forceful but not a high pressure water knife in order to avoid possible damage to the exposed die edges. For added process flexibility, up to two separate liquid additives can be time programmed to mix with the rinse liquid in any preselected dilution. Each selection of the RINSE function can be programmed for a different time duration and additive selection. Thus RINSE can be programmed as a PRE-RINSE and later as a POST-RINSE — or for other process requirements.

WASH

The WASH function employs a cylindrical brush with a unique upsweep action during both passes across the stationary wafer. To insure maximum cleaning action, and for thorough cleaning of the widest variations of surfaces and process requirements, three brush styles of varying degrees of stiffness are offered. In addition, the amount of brush contact is user-controlled via the programmable parameters of (wafer) THICKNESS and DEPTH (of brush penetration). The brush rotates in an up-sweep direction during both forward and reverse brush strokes while a flood bar directs the cleaning liquid onto the wafer surface. As in the rinse function, two separate liquid additives can be introduced under program control during any WASH cycle.

DRY

During the DRY cycle, a pivoted bar directs a series of air-jets over the surface of the wafer for the user programmed time duration. Thus, the MicroWash module eliminates the problems caused by drying 100% sawn-through wafers with a high rotation (centrifugal force) technique.

CHUCK

The cloth-covered vacuum chuck provides a uniform support surface for wafers or other substrates plus several programmable features described in the photo on the other side of this sheet.

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PRODUCTION ORIENTED

Every detail of the Model 2006 is designed for demanding production operations providing operator free process repeatability, fool-proof operation and low maintenance. Program storage capacity is large enough to retain virtually every cleaning sequence used for your entire production. Memory verification is automatic each time a new cleaning program is called up.

Extensive self-test sensors and diagnostic software provides front panel display and fail-safe operation in the event of: program entry errors, operational errors, utility failures, equipment limits, electrical or hardware failure. Input power is selectable from 85 to 280 VAC in six ranges. Input utilities are filtered and regulated. Complete documentation, low parts count and worldwide sales and service support contribute to the wide acceptance of the MicroWash Cleaning Station.

SPECIFICATIONS

Function Modes:
Three (3), Rinse/Wash/Dry

Function Duration
1 to 225 seconds each

Program Length:
Up to 30 steps

Program Storage:
Variable (Length dependent), typically 50 programs with memory verification

Additives:
Up to four (4) separate liquids

Maximum Wafer Diameter
Up to 6" (152.4mm)

Programmable Wafer Thickness
Up to 0.375" (9.525mm)

Programmable Brush Penetration:
None to 0.255" (6.477mm)

Water Requirement (Typically DI):
25 psi maximum, regulated; ¼ to ½ GPM typical

Air Requirement:
Five (5) micron filtered at 35 psi maximum, regulated; consumption is 0.5 to 0.75 CFM typical

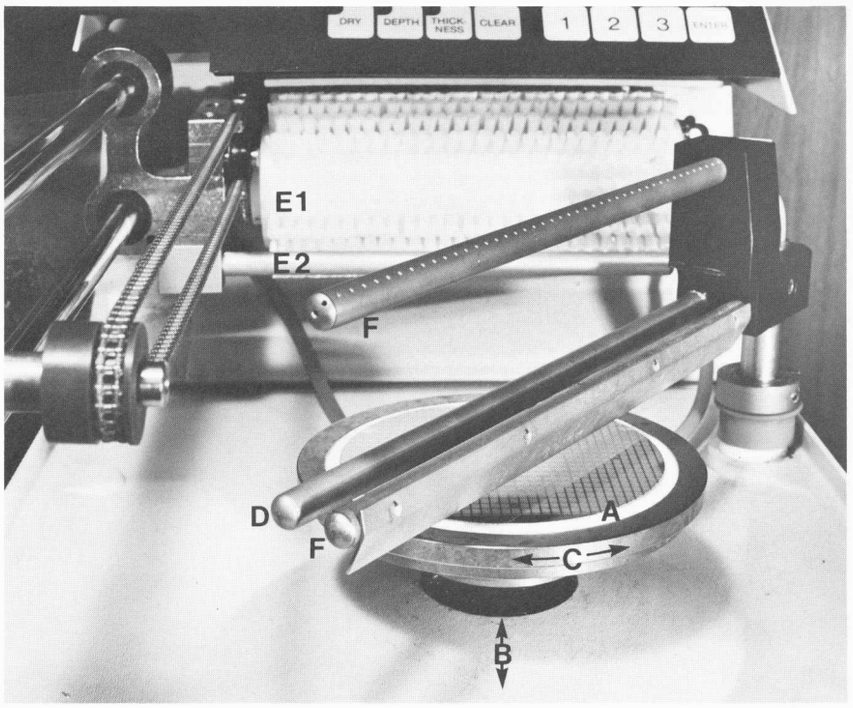
Vacuum Requirement:
Twenty (20) inches Hg minimum

Power Requirement:
Selectable from 85 to 280 VAC, 50/60 Hz; 300 Watts typical

Drain Requirement:
One (1) inch ID gravity

Exhaust: User optional

Dimensions & Weight:
Base is 30" X 12½"; height is 24" open, 16½" closed; weight 82 pounds (37 kg); shipping weight 155 pounds (71 kg).



Interior view of cleaning chamber shows cover removed for easy access to all functions. (A) Vacuum chucks can accommodate unmounted wafers (as shown),or substrates, ring mounted, or MAI square film frame mounted wafers. The lint-free cloth cover allows vacuum removal of liquids from the back side of the wafer during processing. (B) Chuck is mounted on a base assembly which is adjusted in height via a stepper motor to provide the user programmed DEPTH of brush penetration while automatically compensating for the user programmed wafer THICKNESS. (C) Chuck automatically rotates 90° between each pass of the brush (E) and each sweep of the rinse bar (D) and the jet-dry bar (F) to insure thorough cleaning and drying action. (D) PreRinse and PostRinse bar sweeps close over wafer under program control while chuck rotates 90° (E1) Brush cleaning accomplished with upsweep action in both passes across wafer while spray bar (E2) provides wash liquid. Throughput is increased by limiting the brush stroke to the programmed wafer diameter. (F) Lower jet dry bar sweeps across surface of wafer while upper dry bar clears the chamber cover.

Model 2006 Wafer Cleaning Station is machine compatible with the MAI MODEL 3300 Wafer Dicing System shown above. Wafers mounted on Film Frame Carriers are unloaded from magazines in the Sender Module on the left. A continuous track automatically transports each wafer/frame through the dicing saw and MicroWash Cleaning Station, then into the magazine at the Receive Module on the right.

MICRO AUTOMATION is dedicated to the continued improvement in product performance and reliability of its systems. It reserves the right to modify specifications and details of designs without notice.

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