SUPERCLEAN 1800-50 FRONT-LOADING SPIN RINSER DRYER

1. General Information

1.1 Product Description

The SuperClean 1800-50 Spin Rinser Dryer is a front-loading programmable rinser/dryer used to clean semiconductor substrates such as wafers, photomasks, and other wafer manufacturing devices up to 8 inches (200mm) in diameter. It is the most common rinsing and drying tool used in the semiconductor fabrication process due to its generally high process performance.

The cleaning performed by the SRD involves the removal of contaminants from the wafer surface between process steps. The use of wet processing has been the primary technology utilized for general cleaning applications because it typically removes a greater percentage of contaminants.

The patented noncontact nitrogen labyrinth seal is key to the effectiveness of the 1800-50 SRD. Filtered nitrogen gas flows through the seal area forming a gaseous barrier that seals the bowl from outside contaminants and keeps air and water in the bowl from escaping. Since the shaft and bowl of the SRD have no mechanical contact, particulate contamination is virtually eliminated.

Upon completion of the final rinsing step of a wet process, the wafer and cassette surfaces are primarily dried through spinning action, while liquid droplets on the bowl and other surfaces are evaporated with heated nitrogen which absorbs moisture rapidly, and ionized nitrogen which neutralizes static charges in order to prevent particle reattachment. The unit provides effective drying while minimizing the number of particles as small as 0.15 micron being added to the wafers. The SRD can also be used to pre-rinse wafers prior to drying.

The 1800-50 SRD can run two types of cycles: rinse and dry. The cycles are controlled independently, therefore, a rinse and dry, rinse only, or dry only cycle can be programmed.

1.2 Rinsing

A typical rinse cycle consists of DI water being sprayed into the bowl through eight nozzles while the rotor (and cassette) rotates. The length of the rinse cycle is determined by either the programmed cycle duration, or by an (optional) resistivity monitor that measures when the resistivity of the rinse water has reached the desired setpoint.

1.3 Drying

A typical dry cycle consists of filtered nitrogen entering the bowl through the door blowoff nozzle, static eliminator manifold, and bowl nozzles. The nitrogen flowing through the door blowoff nozzle is heated if the heater has been programmed into the recipe. The nitrogen that floods the bowl is ionized if the optional static eliminator has been programmed into the recipe. The duration of the dry cycle and speed of the rotor are determined by values programmed into the recipe.

1.4 Recipes/Steps

Proper process recipes define the ultimate performance capabilities of the SRD. Process recipes include the cycle duration, spin speeds, whether to include a rinse step or not, and even the use of stepped speeds and temperatures. Speeds for varying wafer sizes may be different as can be the time required to dry bowl and cassette surfaces.

The SRD can be programmed to store up to ten recipes, with each recipe capable of containing up to ten steps. Each step of the recipe controls either a rinse cycle or a dry cycle, depending on the requirements of each unique process.

1.5 Automatic Wash

If the unit is used for dry cycles only, it must be periodically rinsed with DI water to ensure consistently clean operation. The rinser/dryer can be programmed to illuminate a warning LED if a user-programmed number of dry only cycles have been run or a user-specified time interval has passed with the machine idle, indicating to the operator that a rinse cycle is due.

If the Automatic Wash feature is included, the unit will automatically initiate a rinse cycle after the cycle or time counter has expired. The bowl is rinsed for a user-specified number of minutes as it rotates at 100 rpm. After the automatic rinse cycle, a 10 minute dry cycle is run to prepare the bowl for operation.

1.6 Load Capacities

The 1800-50 SRD can process up to fifty 8-inch (200mm) or smaller silicon wafers.

Caution

Using the wrong cassette in the SRD may cause damage to the rotor. Ensure the serial number on the cassette matches the number on the front of the rotor.

2. System Parameters

Rinse Cycle Speed: 0 (50) to 3200 rpm (May be limited for certain rotors)

Dry Cycle Speed: 0 (50) to 3200 rpm (May be limited for certain rotors)

Rinse Timer: 0 to 9999 seconds

Dry Timer: 0 to 9999 seconds

Resistivity: 0 to 20 megohms

3. Control Panel

Caution

Never run a cycle without the cassette installed in the process bowl.

The control panel for the Superclean 1800-50 is shown in Figure 1: Keypad Layout. The programmed values for Time, RPM, and Resistivity Setpoint appear in the display portion of the panel, as does the recipe number selected and the recipe step currently controlling bowl conditions.

The status of the five I/Os is indicated by the green function LEDs on the left side of the panel. An I/O is "ON" when its corresponding function LED is on. The remaining keys on the control panel are control keys used to program or view recipes.

Several keys on the keypad have dual uses: an upper and a lower use. These dual purpose keys operate like the uppercase and lowercase keys on a typewriter. The lower function is active in normal mode, while the upper function is active when the keypad is in SHIFT mode.

To switch the keypad to SHIFT mode, press the ***SHIFT*** key. The **SHIFT** LED illuminates and the upper function of each dual purpose key is activated. To