Engineered Products for the modern Industry

Flokal
e-newsletter

We focus on product and service excellence

Flokal® wet-benches

Issue 15-October 2003

Flokal® wet-benches.

- ✓ Wet processing overview
- ✓ Flokal wet-benches.

We invite you into the world of our services!
E-newsletter free subscription

CONTACT US

The Netherlands
Tel. +(31).486.41.6240
Fax. +(31).486.41.4514

FLOKAL B.V.

Dorpenweg 27 5371 KS Deursen.

The Netherlands.

www.flokal.com

info@flokal.com

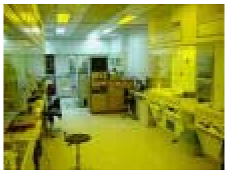
ABOUT US

FLOKAL® - the ultimate resource for:

- ✓ **MFC's** accessories - **Valves** & Accessories - **Gas-systems** & Accessories;
- ✓ **Thermo-elements** (spike and profile)
- ✓ Gas/Liquid Filtration and Purification & Accessories
- ✓ **Vacuum** measure and control devices

We are ISO 9001: 2000 certified

Wet Processing Overview



Because of specific materials issues, different procedures for wet etching of oxide exist at each wet bench. For typical etch rates of oxides and other films in some standard etchants. Amongst of these procedures there are:

- Triton X-100: This is a surfactant, sometimes added to process to aid in etching small features.
- Photoresist Strip: The specific procedure to remove photoresist from wafers will depend on the substrate, the films on the wafer, and materials issues, and the processing that the resist received (implants, certain plasma etches).
- Cleans are generally performed on materials just prior to film deposition or other furnace processes. The specific clean procedures to be performed and which wet bench should be used will depend on the substrates, any materials issue, and the specific type of deposition of furnace process to be performed. Pre-diffusion tube processing or pre-LPCVD/pre-Metal processing cleans for non-metal containing wafers are similar, but differ in the ordering of the clean steps, depending on whether a film is to be deposited or not. Metal-containing wafers that are to be processed in a furnace, LPCVD, or metal deposition systems require a different set of clean procedures.

Clean procedures are restricted to specific wet benches, and the details will vary between wet benches:

- For pre-diffusion clean of non-metal wafers: Diffusion Wet Bench, General Use Wet Bench, Silicide Wet Bench;
- For pre-LPCVD/pre-metal clean of non-metal wafers: Diffusion Wet Bench, General Use Wet Bench, Silicide Wet Bench;
- For pre-furnace/pre-deposition clean of wafers with standard metals: Metal Wet Bench, General Use Wet Bench;
- For pre-furnace/pre-deposition clean of wafers with non-standard metals: General Use Wet Bench.

Any non-standard processing must be done at General Use Wet Bench. Any devices processed need to be decontaminated before re-entering the standard process line. Wet etching is preferred for bulk micromachining of silicon and for processes in which etch anisotropy along different crystal planes in exploited; however, plasma etching of silicon can also be done.

Non-Standard Nitride Strip: Nitride Wet Etching is done with hot phosphoric acid. Standard processing of "clean" wafers takes place at Nitride Wet Bench. Nitride removal from non-standard processed materials is done at General Use Wet Bench. Thin nitride films can also be removed with plasma etch.

The available Wet Benches are:

- Diffusion Wet Bench;
- Solvent Wet Bench;
- Gallium Arsenide Wet Bench;
- General Use Wet Bench;
- Metal Wet Bench;
- Nitride Wet Bench;
- Nonmetal Wet Bench;
- Silicide Wet Bench.

- **Diffusion Wet Bench:**

Description: The Diffusion Wet Bench is used for cleaning 3" and 4" silicon wafers prior to processing in diffusion furnaces, LPCVD furnaces or before metal deposition. To be processed at this station, wafers may not contain or have ever contained any metals, nor been exposed to equipment which may pose this contamination risk. This station contains two hot pots and two Teflon tanks in addition to dump rinse and spin-rinse-dry modules. The available chemical baths are:

- 4:1 Sulfuric Acid: Hydrogen Peroxide for removal of trace organics;
- 5:1:1 H_2O:H_2O_2:HCl for removal of trace metal ions;
- 50:1 HF, for oxide etching;
- 6:1 BOE for oxide etching.

- **Solvent Wet Bench:**

Description: The Solvent Wet Bench is used for any solvent cleaning of silicon, glassware, or any other inert objects such as equipment parts. The bench is equipped with a solvent waste collection system, two heating plates, and an ultrasonic bath.

Gallium Arsenide [GaAs] Wet Bench:

Description: This bench is for Gallium Arsenide [GaAs] processes. GaAs users have priority. Non GaAs work is welcome as space allows.

The Gallium Arsenide wet bench is for acid or base processing of non-standard materials (ie, wafer pieces, devices with gold or non-standard metals). It is also used for non-CMOS compatible processing, such as KOH etching.

Features:

- Two hot plates for heating solutions in beakers;
- Separate drain for HF waste disposal.

- **General Use Wet Bench:**

Description: The general use wet bench is for acid or base processing of non-standard materials (ie, wafer pieces, devices with gold or non-standard metals). It is also used for non-CMOS compatible processing, such as KOH etching. With the appropriate, dedicated glassware, KOH cleanup can be done to decontaminate wafers for later CMOS-compatible processing.

Features:

- Two hot plate stirrers for heating solutions in beakers (wbgeneral-hpr and wbgeneral hpl);
- Constant temperature bath (wbgeneral-ctb);
- Separate drain for HF waste disposal.

- **Metal Wet Bench:**

Description: The Metal Wet Bench is used for processing of silicon wafers with standard metals. In addition to the standard dump rinse and spin-rinse-dryer modules, this station also has an aluminum etch hot pot, hot pot for stripping resist from metal-coated wafers, hot pot for final cleaning of metal wafers before anneal, two HF tanks, and a room temperature bath for peroxide solutions.

- **Nitride Wet Bench:**

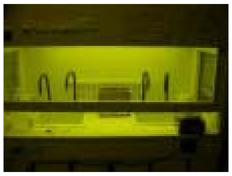
Description: The Nitride Wet Bench is used for hot phosphoric acid stripping of nitride films from silicon or quartz substrates. This Wet Bench contains a hot pot, in addition to dump rinse and spin-rinse-dry modules.

- **Nonmetal Wet Bench:**

Description: it is a Santa Clara Plastics (now SCP Global Technologies) semi-automated wet etch bench, primarily for stripping photoresist, removing scribe dust and wet oxide etching. This station contains two hot pots and three Teflon tanks, in addition to two automatic dump rinser and a spin/rinse dryer. The available chemical baths are:

- 90% sulfuric acid/hydrogen peroxide ("piranha"), for stripping resist and removing scribe dust (two hot pots);
- 50:1 HF, for etching oxide;
- 20:1 BOE, for etching oxide;
- 6:1 BOE, for etching oxide;
- Only 3" and 4" Si, SiGe, and quartz substrates are allowed at this station, subject to Materials compatibility constraints.

Silicide Wet Bench:



Description: The Silicide Wet Bench is for the cleaning of 3" or 4" silicon or SiGe wafers before or after processing through silicide furnaces or for pre-metal clean. Wafers containing Tungsten or Titanium silicides, but no other metals, may be processed here. This station contains sulfuric/peroxide hot pots, an HCl hot pot, and HF tanks in addition to dump rinse and spin-rinse-dry modules. The available chemical baths are:

- 90% Sulfuric Acid/Hydrogen Peroxide ("piranha") for resist strip;
- 4:1 Sulfuric Acid:Hydrogen Peroxide for removal of trace organics;
- 5:1:1 H_2O:H_2O_2:HCl for removal of trace metal ions;
- 50:1 HF, for oxide etching;
- 6:1 BOE for oxide etching.

Flokal offers a variety of wet-benches systems. Amongst them:

Specialized wet processing stations

Manual, semi-automated, and full-automated stations are available for product development through to production.

Wet Processing Stations: Metal Lift Off; Wafer Cleaning; Ultrasonic Agitation;Dump & Cascade DI Rinse.

Semiconductor Etching Stations: Si, GaAs, InP; Dielectrics: Si_xN_y, SiO_2.

Fume hoods

Quality fume hoods are designed for safe and easy operation. Standard system include 2ft, 4ft, 6ft and 8ft units for Cleaning, Etching, Plating, Stripping, Polishing and many other process solutions...

Large front access area; Configurable tank layout; DI rinse tank options; Easy open & close safety shields; EPO Emergency button; Optional heated, filtered and rinse tanks; Minihelic Exhaust Guage; Low maintenance design; Meets 3rd. party electrical inspection; CE and Semi S2 certificates available; FMGlobal 4910 material options; Stainless steel construction option;Optional fire suppression system.

Manual operation

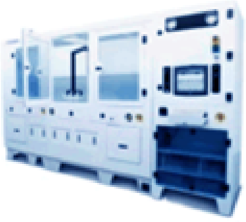
Manual operation wet benches are designed for safe and easy operation. Standard system include 2ft, 4ft, 6ft and 8ft units for Cleaning, Etching, Plating, Stripping, Polishing and many other process solutions...

Configurable tank layout; DI rinse tank options; Easy open & close safety shields; EPO Emergency button; Optional heated, filtered and rinse tanks; Minihelic Exhaust Guage; Low maintenance design; Meets 3rd. party electrical inspection; CE and Semi S2 certificates available; FMGlobal 4910 material options; Stainless steel construction option; Optional fire suppression system.

Semi Automated Wet Processing Equipment for Cleaning, Etching, Plating, Stripping, Polishing and many other process solutions...

Easy operator touch screen interface; Capable of processing cassettes 300mm substrates; Real time process viewing/tracking; Historical data storage; Friendly recipe editor; Administrator control screens; Programmable security levels; Full function maintenance controls; Unlimited programmable recipes; SECS-GEM communication capabilities; Meets 3rd. party electrical inspection; CE and Semi S2 certificates available; FMGlobal 4910 material options; Optional fire suppression system.

Fully Automated Wet Processing Equipment for Cleaning, Etching, Plating, Stripping, Polishing and many other process solutions…



Easy operator touch screen interface; Configurable for dry to dry processing; FOUP Load port options; Multitasking feature for high throughput; Capable of processing cassettes of 800mm substrates; Real time process viewing/tracking; Historical data storage; Friendly recipe editor; Administrator control screens; Programmable security levels; Full function maintenance controls; Unlimited programmable recipes; Can accept and pass cassettes to other equipment; SECS-GEM communication capabilities; Meets 3rd. party electrical inspection; CE and Semi S2 certificates available; FMGlobal 4910 material options; Optional fire suppression system.

Lamarflo Wet Benches

Temperature controlled etch tanks; Two DI rinse tanks with weirs; Solvent tanks; Ultrasonic cleaning tank; Spin rinse dryer for 100 mm wafers.

FLOKAL
.COM

We invite you into the world of our services!

We provide Products and services for the front end Semiconductor Market (Diffusion/ LPCVD / APCVD / PECVD / MOCVD and epitaxial processes), for Fiber Optical Manufacturing and for various processes in the petrochemical and chemical industry. We focus on product and service excellence. We offer:

For the semiconductor industry

- Diffusion-oxidation systems
- LPCVD-PECVD-systems
- RTP & RTA - Systems
- System Upgrades
- Wet-benches
- Spin-coater
- Hot-plates
- Temperature controller
- Clean room equipment
- Dry &Wet etch & clean
- Photochemical filtration and dispense systems
- Thermal control systems
- Gas systems
- MFC's & Valves
- Pressure and Vacuum measurement & control
- Gas flow standards
- Gas/Liquid purification and filtration
- Vacuum products
- Vacuum inlet and waste gas collision traps
- Chemical blending and delivery modules
- Power supply/readout
- Accredited calibrations (flow, temperature, pressure, geometry)
- Cleaning, repair and maintenance
- Automation and Software
- Humidity sensors
- Specialty gases, liquids, solids
- Heating elements
- Thermocouples
- Precursor delivery technology
- Process Analysis
- Quartz; Tungsten; Molybdenum; Tantalum; Graphite; Platinum; Others

For the process industry

- Gas / liquid flow measurement & display
- Temperature measurement & display
- Pressure measurement & display
- Valve positioners & control valves
- Level measurement & display
- Turbidity measurement & display
- Humidity measurement & display
- Accredited calibrations (flow, temperature, pressure, level)
- Process Analytical solutions
- Automation and Software
- Flow meters

For the pharmaceutical industry

- Cryotechnology
- Gas / liquid flow measurement & display
- Temperature measurement & display
- Pressure measurement & display
- Accredited calibrations (flow, temperature, pressure, level)
- In-line particle analyzers
- Fluid dispensers & metering pumps
- Filter and separation systems
- Process Analytical solutions
- Automation and Software

Visit our site www.flokal.com

For any particular request please contact: info@flokal.com

Your request/Feedback

We welcome your feedback and suggestions to improve Flokal e-newsletter. Please send your feedback to info@flokal.com or fax us at +(31).486.41.4514

Flokal
e-newsletter

Free subscription Application

Name: ______________________________ **Title:** ______________________________
Company Name: ______________________________ **Dept:** ______________________________
Address: ____
Postal Code: ______________ **City:** ____________________ **Country:** ____________________
Tel: ______________________________________ **Fax:** ______________________________
E-mail Address: ____