

# VFQC Vertical Furnace

## 200mm/300mm QUARTZWARE CLEANERS

The Vertical Furnace Quartzware Cleaner (VFQC) is a self-contained system designed to automatically clean and rinse a full set of 300 mm (or smaller) vertical furnace quartzware with a combination of a spray and immersion process. The VFQC features twin process areas with engineered fixturing for tubes (outer tubes) and liners (inner tubes) on the twin Spider Stages that provide an inside and outside spray etch and rinse (one stage for tubes and one for liners). Below the Spider Stage (s) is a process sink dedicated for an immersion etch and rinse for boats, pedestals, injectors, and other small accessories. The 300mm process sink measures 54" left to right, 28" front to rear, and 14" deep.

The 200mm process sink measures 54" left to right, 22" front to rear, and 10" deep. USER programming allows the operator to select inside and outside spray etching for the tubes and liners, and/or immersion cleaning for the boats and accessories in a single cycle. Etch and rinse times are also USER selectable. This model will process tubes up to 57" long x 20" diameter (22" flange).

### Process Information

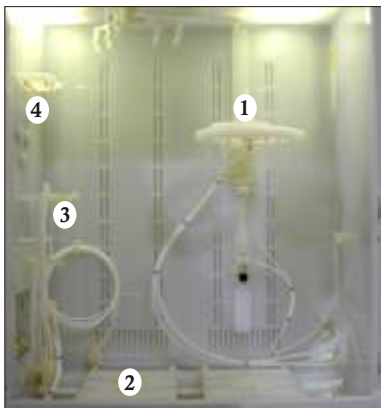
The combination spray and immersion process provides the USER will great flexibility with regards to load schedule. The all spray process for tubes and liners provides excellent etching and rinsing for these parts. The immersion sink for boats and other accessories provides excellent coverage for those small crevice areas. Immersion fill/dump rinse cycles provide a much better rinse than the old traditional immersion overflow rinsing with Horizontal (dip and dunk style) systems.

For comparison and throughput estimations, please use the example chemical compositions and corresponding etch rates as listed below.

Film	Chemical Composition	Etch Rate
Nitride	HF 49%	0.1 $\mu\text{m}/\text{min}$ .
Poly	HF:HNO <sub>3</sub> = 3:1	0.5 $\mu\text{m}/\text{min}$ .
Oxide	HF:DIW = 1:1	1 $\mu\text{m}/\text{min}$ .

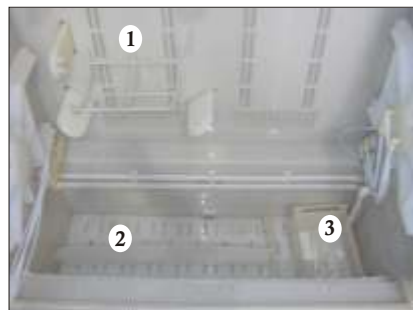
The etch rates are empirical values; the rates will vary depending on the deposition and process parameters such as temperature and doping. Higher temperature and heavier doping normally results in lower etch rates. The etch rates on SIC are typically lower than on quartz. DIW may be added for lower concentration of the chemicals; however, lowering the chemical strength may significantly reduce performance.

### Universal Fixturing 200mm/300mm

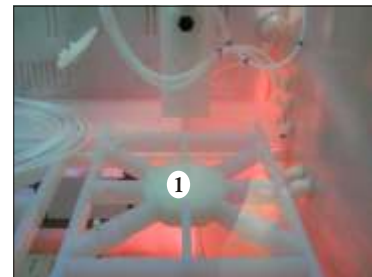


#### Process Chamber

- 1 Turbo nozzle (auto halo) for liners
- 2 upblast stage for tubes
- 3 injectors for gas ports
- 4 torch fixture (inside/outside)



- 1 spray fixture for pedestals
- 2 immersion sink for boats
- 3 basket for quartz plates



- 1 multiple nozzle patterns for dynamic spray coverage



- 1 flip-up stage for easy access to immersion sink
- 2 rotating spray bars for complete etching and rinsing



200mm Models S-310, S-410, S-610  
300mm Models S-355, S-455

### Features and Benefits

- High throughput (full set of quartz in one cycle)
- Thermocouple cleaning with wire protection
- One, two and three acid units available
- Low cost of ownership
- FM 4910 fire safe materials
- SEMI safety compliance
- Automatic bulk chemical filling/blending
- Hercules 75 acid pumps
- External alarm connection terminal
- Touch screen HMI
- Clear hinged access panels
- Plumbing compartment exhaust with baffles
- Integral facilities installation package
- Backed by 30 years of quartzware cleaning experience



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Specifications subject to change without notice. 042506

## CONTROL PANEL - VERTICAL FURNACE QUARTZWARE CLEANERS



High-performance Visual Logic Controller (VLC) system to control and monitor all of the process and safety functions through this intuitive graphical user interface. Users can easily monitor system status and change operational functions by selecting icons/graphics on the large color touch screen display.

The system runs on a Pentium IV based PC with the latest Windows Operating System, and is protected by 3 levels of password security. Operation and maintenance manuals, function charts, and system drawings are stored on the system hard drive and displayed on the touch screen for easy FAB access. The entire system history is archived and logged with date and time stamp for all of the events including cycle start/complete, errors, utility status, and program changes. The system manages soft failure conditions and takes the proper action in accordance with industry safety standards, and enables safe shut down when power to the tool is lost.

Operational data can be exported in ASCII format for process analysis. Virtually unlimited numbers of recipes and programs can be easily developed and stored in the system by simple commands on the touch screen display. The system hardware includes a 15" corrosion-protected color TFT XGA touch screen display, 256 MB RAM, 40GB hard drive, 3 1/2" floppy disk drive, CD-ROM drive, mini-keyboard, USB port, a VGA port for remote monitor, and ethernet port for networking and GEM/SECII capability.



Main screen



Real-time flow schematic



Recipe programming



Analog facilities gauges

## INSTALLATION DATA

### 200MM FACILITIES REQUIREMENTS

Footprint	90.5" L-R X 48" F-B X 107.25" tall
1. DI Water	14 GPM @ 35 PSI dynamic
2. DI Water Return	Variable
3. Nitrogen	25 CFM @ 30 PSI dynamic
4. Clean Dry Air	80 psi @ 8 CFM
5. Bulk Chemical 1	30 PSI max
6. Bulk Chemical 2	30 PSI max
7. Exhaust	845 CFM total (3 connections)
8. HF Drain	20 GPM gravity
9. Acid Waste Drain	20 GPM gravity
10. Power	120 volts, 1 phase, 29 amps full load

### 300MM FACILITIES REQUIREMENTS

Footprint	90.5" L-R X 60" F-B X 113" tall
1. DI Water	16 GPM @ 35 PSI dynamic
2. DI Water Return	Variable
3. Nitrogen	25 CFM @ 30 PSI dynamic
4. Clean Dry Air	80 psi @ 8 CFM
5. Bulk Chemical 1	30 PSI max
6. Bulk Chemical 2	30 PSI max
7. Exhaust	895 CFM total (3 connections)
8. HF Drain	20 GPM gravity
9. Acid Waste Drain	20 GPM gravity
10. Power	120 volts, 1phase, 29 amps full load



Pressurized facilities connections are single point and grouped together for installation convenience. Drain connections are also grouped together as shown above. Power is connected directly to the main line lockable disconnect switch.

For a listing of standard safety features please refer to the Poly-Flow Engineering Product Safety Guide.