

# DOUBLE/DOUBLE QUARTZWARE CLEANER

Poly-Flow's classic vertical tube tower - the Double/Double - is the lowest priced, fully automatic quartzware cleaner available. Yet this workhorse doesn't skimp on safety, durability or features. Dual chamber systems precision clean quartzware behind a single, interlocked front door. Each Double/Double has separate tube and parts chambers. They can also be customized with twin tube fixturing or specialized cabinets to fit your fab exactly.

Double/Doubles have been featuring the exclusive two-acid, four-rinse cleaning cycle that thoroughly cleans quartzware for nearly twenty years. The right side provides selectable inside/outside etching of tubes from 48" to 120" long depending upon the model selected. The left side has a 360° rotating carousel for spray etching of cantilevers, sheaths, boats, paddles, pull rods and more.



## Process Information

The all spray process provides not only big cost saving with its reduced chemical consumption but also significant process improvement with its enhanced rinse capability. As the wafer size increases and geometry shrinks, rinsing plays a larger role to eliminate residual particles after the chemical cleaning step. Spray processing provides significantly better rinsing performance than conventional immersion process.

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.

## Fixturing



Twin chambers behind a single front door.



Patented Turbo-Nozzle and auto halo for cleaning tubes.



Rotating carousel for boats, paddles, injectors and other accessories.



Tube retainer adds extra security.  
Multiple injector ports provide efficient cleaning for gas ports.

## Features and Benefits

- Automatic bulk chemical filling/blending
- Hercules 75 acid pumps
- Single point facilities connections
- Automatic halo with foot switch
- External alarm connection point
- Touch screen HMI
- Clear hinged access panels
- Plumbing compartment exhaust with baffles
- Integral facilities installation package
- FM-4910 fire safe materials (with Option X-158)
- SEMI safety compliance (3rd party inspections optional)

## CONTROL PANEL - DOUBLE/DOUBLE QUARTZWARE CLEANER



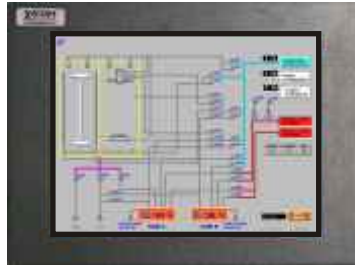
High-performance Visual Logic Controller (VLC) system to control and monitor all of the process and safety functions through this intuitive graphical user interface. Users can easily monitor system status and change operational functions by selecting icons/graphics on the large color touch screen display.

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

### FACILITIES REQUIREMENTS

Footprint	67" L-R X 30" F-B X 126" tall*
1. DI Water	20 GPM @ 50 PSI dynamic
2. DI Water Return	Variable
3. Nitrogen	25 CFM @ 40 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	670 CFM (process)
8. Exhaust	120 CFM (maintenance)
9. HF Drain	20 GPM gravity
10. Acid Waste Drain	20 GPM gravity
11. Power	120 volts, 1 phase, 20 amps full load

\*Cabinet height may vary depending upon maximum tube length.



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.