



# MEMS Fab Equipment List

## **1500 Square Foot Raised Floor Clean Room**

- Class 100 designed, measures at Class 10
- Air Shower entry
- Temperature and humidity controlled / real time monitoring with alarms
- House Vacuum and CDA system
- 3000 gallon Liquid Nitrogen Source
- 18 meg ohm ultrapure water system
- Ion Systems overhead ionization balanced output for ultra-sensitive ESD devices

## **2 Custom Programmable Crest Mega-Sonic Wet Benches**

- 12" x 12" X 12" process tanks support up to 8" substrates
- Programmable Single or Two Zone 600 watt Max / 230 watts Min Mega-Sonic Power
- Weir style configuration programmable Static or Flow up 30 GPM
- Heat (3KW) Max temperature chemistry dependent
- Filtration to .1 microns
- Design and fabrication of custom substrate shape fixture available
- NMP Based Dow / DuPont 1165 Microposit Resist strip chemistry, 20C to 60C

## **Typical Process**

- Lift-Off, metal over photo resist
- Photo resist and front side coat stripping

## **Custom Crest Mega-Sonic Quick Dump Rinse Station**

- 12" x 12" X 12" process tanks support up to 8" substrates
- Programmable Single Zone 900watt Max / 360 watts Min Mega-Sonic Power
- Programmable Bottom Fill / Top Spray / Overflow modes
- 18meg-ohm DI water with optional Co2 bubbler for thin metal protection
- Design and fabrication of custom substrate shape fixture available

### ***Xactix X3 (XeF<sub>2</sub>) Etch / Release Platform***

- Up to 6" Wafers / Substrate capable
- Pulse or continuous mode
- Heated chamber
- Video recording optional

### ***Typical Process***

- Isotropic Silicon Etch
- Highly selective MEMS / Dry Release
- Bulk Silicon Surface Micromachining

### ***Semitoool 6-Tank Solvent Process***

- 4"-6" wafer compatible with quick change rotors
- Three heated tanks, Two Filtered.2um
- ATMI-NOE Etch 1 (Heated)
- Ethylene Glycol (Heated) 2 tank virgin / recycle configuration
- IPA 2 tank virgin / recycle configuration
- SRD with 18 meg-ohm DI water

### ***Memmert Programmable Vacuum Oven***

- Heated Shelf
- Slow pump all SS plumbing for low particle performance
- Programmable purge LN sourced nitrogen
- Programmable Temperature range RT to 200C
- Programmable vacuum level atm. to 50mt
- Programmable Pump / Purge profile

### ***Custom High Vacuum Brazing Furnace 6-8" Wafer Capable***

- Programmable Time / Temperature / Heat Ramp / Gas Source
- High Vacuum capable to 5e-10 Torr
- Pressurize to 27psia
- Max temperature 325C
- 5 Degree uniformity across 6" @ 230c
- 3 gas channels 1-Nitrogen 2-80/10/10 Nitrogen/Hydrogen/Helium 3-Open
- Slow Pump / Purge Hardware for particle performance
- Turbo pump for rapid pump down / Cryogenic cold ring for water removal
- RGA up to 100 AMU start pressure 1e-4 Torr
- Custom fixture design and fabrication available

## ***Tresky Vision Assisted Manual Pick and Place***

- Max. PC Board / Substrate Size: 15.5" x 11"
- Placement Accuracy: 1um
- Custom fixture design and fabrication available

## ***VWR Vacuum Oven***

- LN sourced nitrogen purge
- Soft Pump Purge / regulated backfill / all SS plumbing for low particle performance
- Temperature range RT to 200C
- Vacuum level atm. to 50mt

## ***1 VWR Thermal Oven***

- Large format oven
- Temperature range RT to 150C

## ***March Plasma Tool PTX-250***

- Up to 6" substrates
- 300 watt RF power
- Auto impedance matching network
- Configurable internal parallel plate electrodes
- Configurable single or mixed gas selection UHP Argon / UHP Oxygen / LN sourced nitrogen
- Soft Pump / Purge and point of use gas filtration for low particulate performance

## ***CEE Wafer / Substrate Hot Plate***

- Up to 6" capable
- Vacuum Chuck
- Nitrogen blanket lid

## ***Ultra-Sonic Cleaners***

- Branson 3800
- Branson 2510

## ***Metrology Instruments***

- Model 210 Nanospec Film Thickness measurement instrument
- Tencore SURFSCAN 4600 4" to 6" Capable
- Miller Design 4 point Probe up to 6" capable
- Kruss Contact Angle Elipsometer

## Microscopes

- Stereo Zoom Microscope 1 to 10X
- Olympus Model 53 Metallurgical Microscope
  - Bright / Dark Field 10x WF eye pieces.
  - 5X / 20X / 50x / XX
  - Phase Contrast
  - 6" power stage
- Nikon Eclipse L200N Metallurgical Microscope
  - Bright / Dark Field 10x WF eye pieces
  - 1.5x / 5X / 20X / 50x corrected for .7mm Glass / 100x
  - Phase Contrast
  - 8" power stage

## Reliability Testing

- Thermotron Large Format Thermal Cycling Oven
- CSZ Large Area Format Environmental Chamber (85/85)
- Hastest Accelerated Stress Test Chamber (Small Format / In Clean room)

## Parts Storage

- Electronic desiccator <1%RH
- Controlled Nitrogen Box Storage 5% RH
- Nitrogen Purged parts storage <2%

