Veeco Precision Surface Processing technology allows for an automatic sequential process for critical Under Bump Metal applications with:

- Programmable etch rate
- Chemical recirculation
- Post etch clean-up with high velocity spray
- WaferChek® in-situ adaptive process control for endpoint detection
Veeco’s single wafer wet etch technology implements an automatic sequential process. For Under Bump Metal (UBM) etching, minimal undercut is paramount and undercut is a function of etch time. By terminating the process at the completion of the etch, the undercut is kept to a minimum. This adaptive, per-wafer control utilizes a color CCD camera and Veeco's proprietary WaferChek software. The wafer color changes as the metal etches away. With an optimal setup, the color shift appears uniformly over the entire surface of the wafer. The process is complete when the wafer reaches a specified color. The dry-in/dry-out operations can include both a resist strip module with solvent recirculation and CO2 fire suppression, and a post-etch cleanup module.

Wet etching rates can be controlled by traditional techniques of managing chemistry concentration, temperature and flow rate. If an etch rate changes due to chemistry, temperature or concentration, the WaferChek system automatically changes the dispensing time so that the same etch will be achieved on each wafer. The result is uniform film conditions, wafer to wafer, despite process variables. This is advantageous for both single pass and recirculated chemistry applications.

Chemical Recirculation
All of Veeco’s molded chambers are available with internal, programmable open or closed chemical collection system. This open or closed system is programmable by individual step, including delay time, and will enable precise control over the collection of fluids for chemical recirculation. Collection efficiencies are >99%. When closed, the collection ring is sealed shut and will not allow invasion from other fluids, even an aggressive post etch spray process.

Control of Chemistry Concentration and Temperature
Veeco’s WaferEtch® includes PC programmable chemical blending, with complete feedback control. On-the-run temperature control, driven by the PC according to the user’s recipe, with heaters sized according to desired flow, achieves full single wafer control for maximum etch selectivity.

Etch Rates and Chemistry
On-board chemical blending can be used to mix standard etchants. Some examples are shown below.

Cu: H3PO4:H2O2:H2O 1:1:50 at 20°C for ~3000Å/min
Ti: H2O:HF 200:1@ 20°C for ~500Å/min
TiW: H2O2 (5%) @ 75°C for ~1500Å/min

Use of specialized formulations for increased etch selectivity are also available.