



NanoLab Equipment Release



Ionmill6 Released

The Marvell Nanolab is pleased to announce the release of the ionmill6 tool. Ionmill6 is a high uniformity, 6 inch ion milling system. The sample holder is a 2 axis stage with rotation, tilt control, and water cooling. The ion mill beam is a conversion from our ion dep tool, which has achieved 2.3% etch uniformity across a 6 inch substrate during milling of a thermal oxide substrate.

A standard recipe for wet thermal oxide milling has been developed:

Beam settings: 750V, 350mA.

Substrate angle: 45 degrees

Time: 5 minutes.

Substrate: 1000A wet thermal silicon dioxide.

Expected etch rate: 440-450A/Min

See test data below.

Sample	Pre-Mill (A)	Post-Mill (A)	Etch(A)	Rate (A/Min)
T	9521	7299	2222	444.4
C	9544	7224	2320	464
F	9546	7333	2213	442.6
L	9512	7285	2227	445.4
R	9526	7286	2240	448
Average	9529.8	7285.4	2244.4	448.88
Uniformity	0.17%	0.7%	2.3%	2.3%

Table 1. Etch rate data for Ion Milling with Ar plasma.

Ionmill6 uses an argon beam for milling with no reactive components. Selectivity is low, however the ion milling process can be used to etch nearly any material with the right settings. This makes it especially useful for etching materials that are immune to traditional etch methods like wet chemical etching or plasma etching. Ionmill6 is a high vacuum system and its materials restrictions reflect that. No volatile organic materials are allowed in the chamber. Check with process engineer 1 (Ryan Rivers) for clarity or review of any specific material you want to use Ionmill6 to etch.

Ionmill is a simple train and qualify tool. Speak with any qualified member for training; speak to a superuser process engineer 1 for qualification.

