CVE Etch Module for XeF_2

XACTIX and Surface Technology Systems are pleased to announce the immediate availability of the CVE etch module for xenon difluoride gas (XeF_2). XeF_2 is a fast isotropic etchant of silicon, without plasma excitation and has a high selectivity for silicon compared with a vast array of other materials commonly used in CMOS and other semiconductor applications.

Key Advantages:

- High selectivity of silicon to other materials
- Dry etch process:
  - No stiction
  - No agitation and damage
- Etching through nanoscale openings or spaces.

One of the main applications of XeF_2 etching is the release of MEMS structures using a sacrificial silicon release layer. As a dry process with low or nonexistent attack on other semiconductor materials, it results in increased yield, lower fabrication costs and higher performance devices.

XACTIX and Surface Technology Solutions have cooperated to create a breakthrough chamber design which provides the high throughput, uniformity, efficiency and uptime required to make XeF_2 a viable process for high volume production. Up to this time achieving high uniformity required either using lower gas pressures and flows or the introduction of a carrier gas. Both these approaches have significant problems. Lower gas pressures and flows reduce etch rates and throughput. Carrier gasses reduce efficiency which significantly increases operating costs. Both approaches limit the types of recipes which can be employed.

The chamber design (patent pending) encapsulates the wafer in a smaller, symmetrical chamber while it is being etched. This results in a very uniform and highly concentrated flow of gas over the wafer. In addition, the movement of the chamber, wafer lift and clamping mechanisms are consolidated into a single mechanical system. The result is a much simpler and more reliable mechanism achieving very low maintenance costs and down time.

The new chamber provides a number of key features essential for successful release of MEMS devices using XeF_2. These include

1. A novel chamber design optimized for gas phase etching using XeF_2
2. Edge lift to protect double sided wafers
3. A cooled chuck with optional backside helium for improved etch rates, uniformity and selectivity
4. A wide range of wafer handling options from low cost load locks to six port clusters
5. Transfer under vacuum from a wide variety of STS DRIE, plasma etch and deposition modules.

The CVE module has been through extensive testing over the last 18 months, both internally and with customer samples. A three module cluster has been shipped this summer.

About XACTIX, Inc.

XACTIX designs and manufactures etchers which use xenon difluoride gas to isotropically etch silicon, molybdenum and germanium. This dry, gas phase etch provides high selectivity, high etch rates and long undercuts while providing high selectivity over the majority of semiconductor materials. While primarily used as a MEMS release etch, XACTIX also serves a number of emerging applications in the wider semiconductor industry. XACTIX is the overwhelming market leader for xenon difluoride etch systems serving both R&D and production applications. It serves markets worldwide through its own distribution network and with partner companies such as STS.

For more information about XACTIX please see http://www.xactix.com

About Surface Technology Systems plc

STS designs and manufactures a range of highly specialized systems incorporating innovative technology used in the production of semiconductors and related devices and is a leader in plasma based etch and deposition technologies. STS serves a range of applications within the telecommunications, data storage, advanced packaging, MEMS and nanotechnology markets.

STS is the market leader in deep silicon etching for the growing MEMS market, offering patent-protected technology. In addition, STS has a strong presence in each of its other served markets and distributes its process solutions worldwide through an experienced sales and service operation. The Group currently markets in over 30 countries and has an installed base of over 1000 systems.

For more information about STS please see http://www.stsystems.com