



**memsstar is a premier supplier of etch and deposition solutions for semiconductor and MEMS manufacturing processes.**

Offering in-depth process expertise and a range of new and remanufactured etch and deposition equipment, memsstar provides a full complement of processes and related services for multiple applications throughout the markets served.

With full manufacturing, design, process engineering and demo capability, our offering combines a blend of next-generation proprietary release etch and coatings technologies and remanufactured equipment.

Our manufacturing facilities and support functions headquartered in Europe, combined with a worldwide

network of sales and distribution partners, have been delivering a cost-effective and all-inclusive sales, services and support package across the globe since 2003.

A new, dedicated 1600 sq m facility offers a state-of-the-art 300 sq m Class 1000 cleanroom, purpose-built for manufacturing, in addition to providing customer training and service areas.

Our large warehouse houses our spare parts provision and distribution centre.

Dedication to customer service is a passion for us and our customers enjoy high-value relationships with our world-class engineering team.

**Precision engineering delivering fast, efficient and cost-effective manufacturing systems for the semiconductor and MEMS industry**

Serving: European wafer fab/semiconductor markets, Global MEMS markets

## memsstar ORBIS Platforms

The new generation of proprietary ORBIS platforms enable the most advanced processing capability from research to commercial R&D through to high-volume manufacturing.

**ORBIS Alpha:** Silicon and Oxide Etch development platform for cost-effective MEMS research

**ORBIS 1000:** A single-wafer load-manufacturing chamber for development and low-volume MEMS production

**ORBIS 3000:** Automated handling and process integration for high-volume MEMS manufacturing

ORBIS

Alpha

ORBIS

1000

ORBIS

3000



*ORBIS Alpha*

## Remanufacturing

We are the European market leader supplying fully remanufactured etch and deposition systems from **Applied Materials**, **Lam** and **Novellus**. We can assist with equipment refurbishment, reconfiguration, upgrade, final test and compliance testing. We can provide fab capacity expansions, equipment support and upgrades.

### Spare Parts

We also have an extensive range of inventory and a large global network of materials to support our customers.



*Novellus*

## On-site Services

Working closely with our customers, we provide a comprehensive range of pre- and post-sales services, ensuring full delivery of systems and processes from start to finish.

Our qualified trainers can provide professional on-site training to ensure complete customer knowledge and capability to maximise equipment performance.



*Lam Research*

### ISO 9001 Certified Manufacturing and Services

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### ORBIS ALPHA

memsstar's propriety range of new generation ORBIS platforms provide reliable, cost effective solutions for advanced processing from research, to commercial R&D through to high volume manufacturing providing a seamless transfer from lab to fab.

A low cost and compact footprint platform enabling the development of production-capable processes for the next MEMS generation devices within R&D.

**The Alpha Silicon Etch** provides continuous flow design for etch materials and has high selectivity towards  $\text{SiO}_2$ ,  $\text{Si}_3\text{N}_4$ .

**The Alpha Oxide Etch** offers complete abatement solutions and a gas detection system. It benefits from market leading selectivities towards  $\text{Si}_3\text{N}_4$  and is compatible with a wide range of materials.



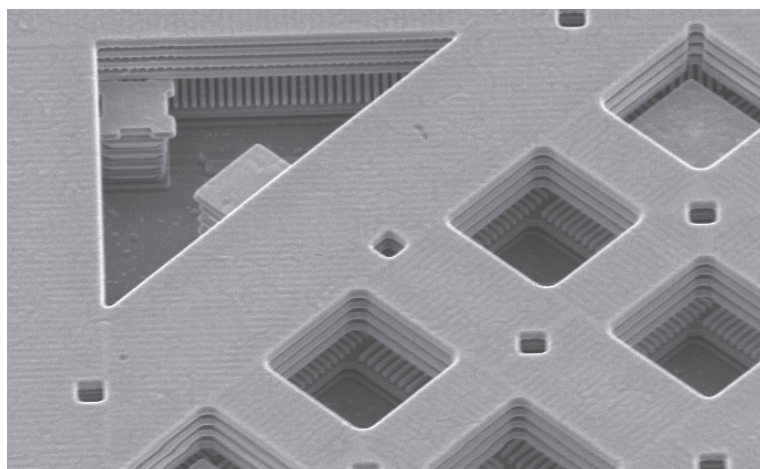
<b>R&amp;D platform</b>	<b>Easy to maintain</b>
<b>Low cost</b>	<b>Excellent selectivity to key materials</b>
<b>Small footprint</b>	<b>Silicon Etch-XeF<sub>2</sub></b>
<b>Easy to install</b>	<b>Oxide Etch-HF</b>

### Key Features

- Process samples from chip size up to 200 mm diameter
- Wafer temperature control
- Large process window to optimise for any structure

### Major Benefits

- Process control
- Industry leading etch rates
- Endpoint capability and in-situ monitoring
- No corrosion or stiction
- Automated chamber process



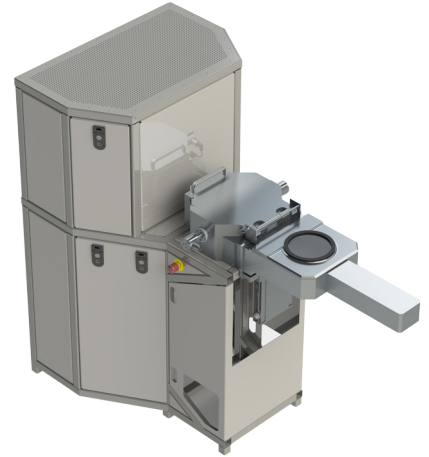
*Residue and corrosion free process, clean contact areas.*

Ideal for: Sensors, RF MEMS, micro-bolometer arrays, accelerometers, RF switches, temperature gauges

## ORBIS 1000

**A single-wafer vacuum loadlock which integrates with the XERIC Oxide Etch, XERIC Silicon Etch and the AURIX coating modules.**

Designed for commercial R&D and pilot line MEMS production, the ORBIS 1000 features fully-automated processing that dramatically improves cycle time between wafers, providing the ideal level of productivity for commercial development and low-volume production. The 1000 can be updated to the full ORBIS 3000 platform at a later date.



## ORBIS 1000

## ORBIS 3000

**Fully automated wafer handling platform enabling full process integration for volume MEMS manufacturing.**

With a proven track record in high volume production, the ORBIS 3000 platform provides fully automated single wafer processing. Its cluster capability allows for any combination of memsstar's XERIC and AURIX process modules. All process modules are based on memsstar's unique technologies for advanced process control, faster process times, superior within-wafer uniformity; and wafer-to-wafer repeatability.



## ORBIS 3000

### Key Features

- Suitable for commercial R&D with pilot line capability
- Integrate XERIC dry release process module with AURIX SAM coatings
- Industry standard components
- Large process window to optimise for any structure

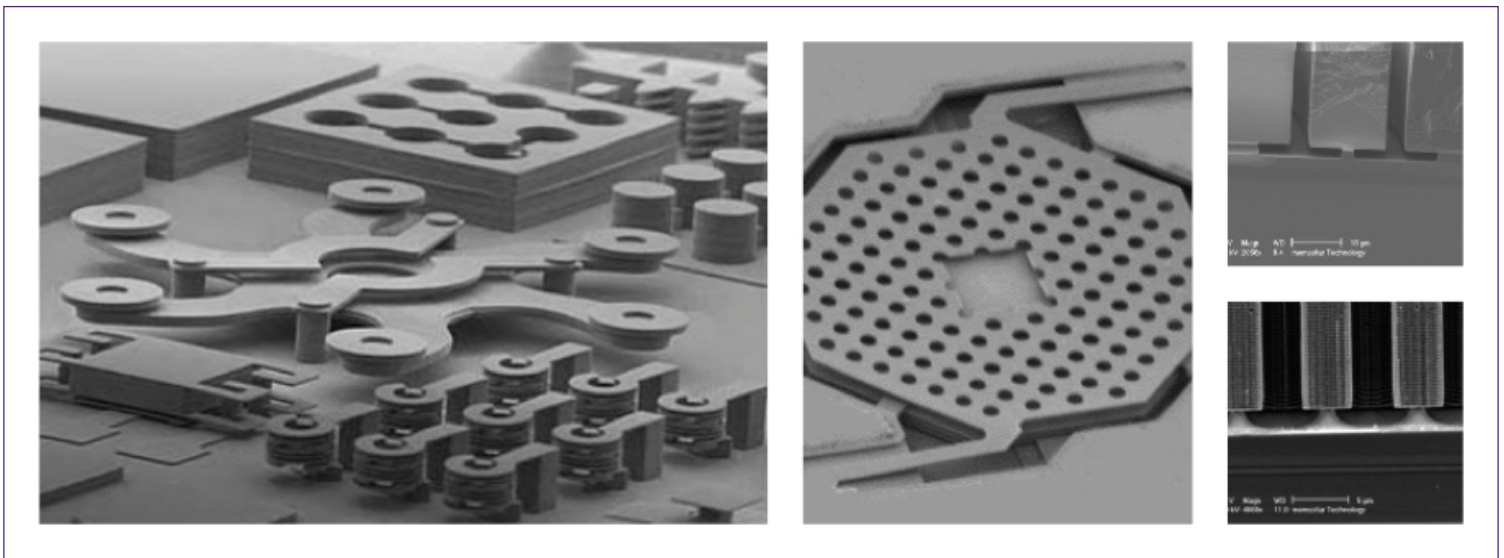
### Major Benefits

- Highly reliable
- Easily connected to cleanroom facilities
- Easily maintained
- Backed by memsstar's comprehensive equipment service

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memsstar provides the best possible processing solutions from R&D through to high-volume manufacturing. We are market leaders in single-wafer dry release etching using vapor HF and XeF<sub>2</sub> chemistries and surface modification (SAM coating) processes.

## XERIC Oxide Etch

Advanced dry release processing for current and next-generation MEMS devices. XERIC™ Oxide Etch system, using anhydrous hydrogen fluoride (aHF), offers many benefits to companies engaged in MEMS development and manufacturing.

This unique sacrificial vapor release etching process eliminates stiction in a single step and is compatible with the widest wide range of metals—especially Al/ alloy and other metals commonly used in MEMS mirrors and electrical contacts.

- **Sacrificial Oxides:**  
Thermal oxide, TEOS, SOI, quartz, PECVD oxide, spin-on oxide, low-temperature spin-on glass
- **Protective Layers:**  
Aluminium, silicon carbide, LPCVD nitride, PECVD nitride
- **Compatible Metal Layers:**  
Gold, Copper, TiW, Nickel, Aluminium, Ti, TiO<sub>2</sub>

## XERIC Silicon Etch

The XERIC™ Silicon Etch system provides dry release etching using xenon difluoride (XeF<sub>2</sub>) in conjunction with a continuous flow design for the etch material. The patented memsstar XERIC XeF<sub>2</sub> process is highly selective to a range of materials, notably SiO<sub>2</sub> and Si<sub>3</sub>N<sub>4</sub>.

Large undercuts of structures can be performed with no degradation in etch rate and a wide range of films including silicon (in all forms), molybdenum, germanium and tungsten can be etched.

- **Sacrificial Layers:**  
Polysilicon, amorphous silicon, single-crystal silicon, molybdenum, germanium, tantalum, tungsten
- **Protective Layers:**  
LPCVD & PECVD nitride, PECVD silicon dioxide, thermal oxide, TEOS, quartz

Applications: sensors, RF MEMS, micro bolometer arrays, accelerometers, RF switches, temperature gauges

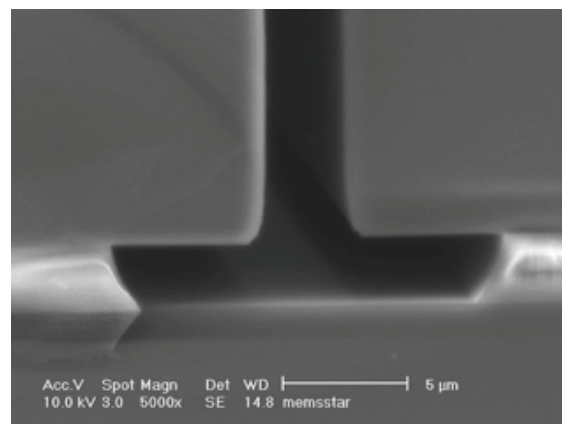
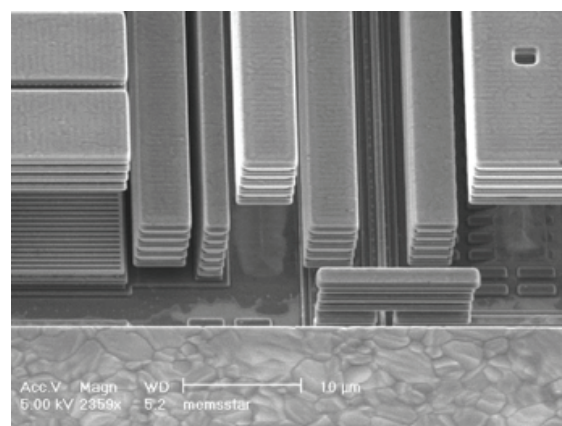
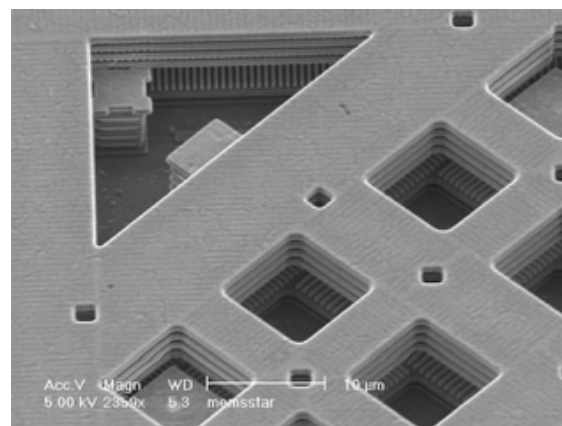
# AURIX

## Surface Preparation and Deposition

The AURIX system provides the ideal solution for advanced surface coatings to deliver reliable, cost-effective protection for sensitive devices.

The vacuum deposition environment of the AURIX™ system provides vapor-phase self-assembled monolayer (SAM) coating capabilities while eliminating the effects of moisture, which is crucial in creating repeatable and robust surface coatings. Precision-tuned processes with patented control minimise the amount of chemicals used and offer superior surface properties and improved surface energy control.

SAM coatings can be deposited immediately following the release etching process, enabling the MEMS structure to be treated without breaking process-vacuum, maximizing yield and throughput during production.



### SAM Coating Materials

- Anti-stiction precursors: DDMS, FDTMS, FOTS
- Hydrophilic precursors: PEG, AECTS
- Bio-compatible precursors: PEG, PMMA

### Standard Coatings Available

- Hydrophobic – anti-stiction
- Hydrophilic – microfluidic applications

### Key Process Benefits

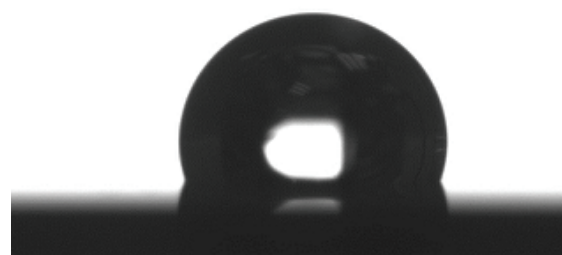
- Strict process control
- Elimination of stiction
- Compatible with wide range of materials

### Advantages

- Continuous flow processing
- Short process times
- Precise precursor delivery
- Remote plasma processing
- Robust and cost-effective process
- Can be integrated with release etch for maximum protection from stiction

### Key Process Features

- Process samples from 100mm – 200mm
- Single-wafer processing with high repeatability
- 1000 or 3000 configurations available
- Temperature control
- Large process window for optimisation



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