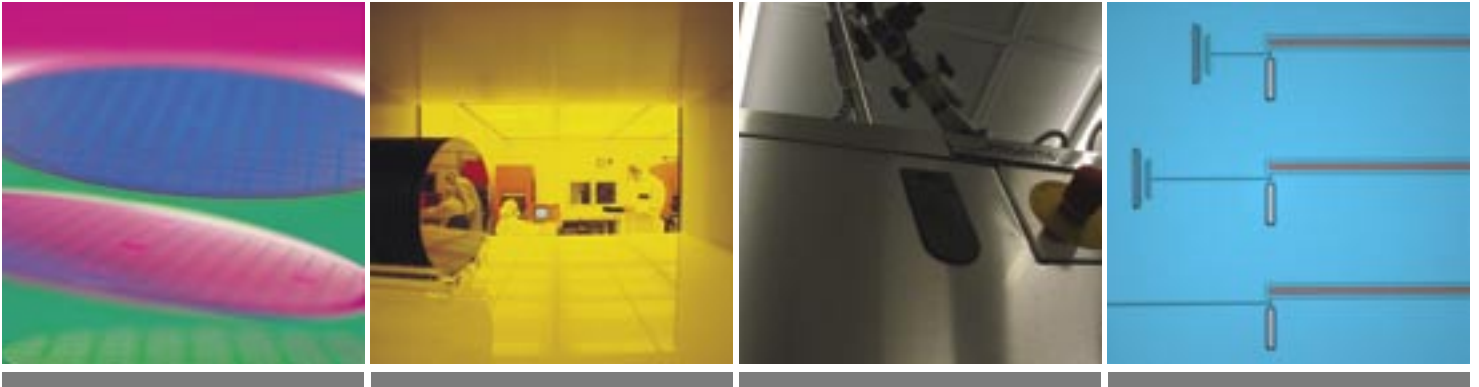


## MEMS Integration

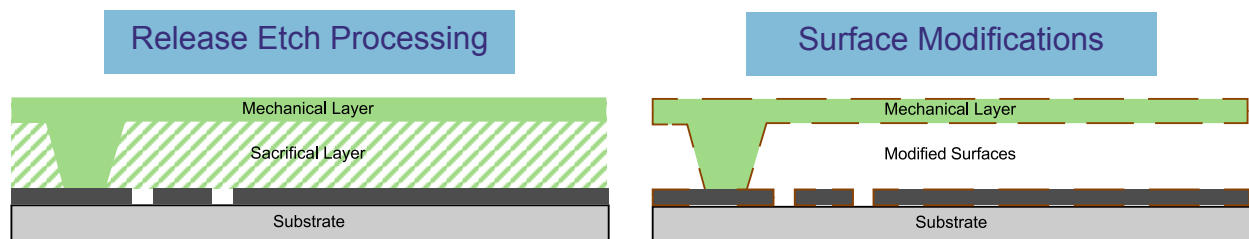


## Integration Challenges

The need for integrated solutions is critical, as increased device functionality and complexity drives the markets and demand for smaller and smarter devices. The technical challenges include;

- MEMS and CMOS in the same fab and on the same die
- Multiple MEMS technologies and nano materials within the same device
- New materials and designs, into existing flows and architectures
- Cost effective wafer scale fabrication with market enabling yields

## Process integration within **memsstar**<sup>®</sup>



### Integrated Release and ST Scheme using **memsstar**

#### Release Etch and Surface Engineering

**memsstar**<sup>®</sup> enables the integration of these key process steps within the same system, using dry chemistries and advanced process controls. This enables devices to be completed prior to packaging or within package without exposure to atmosphere and contamination. Particulate control and the treatment of pristine free surfaces, coupled with process monitors and advanced control systems ensures high yields on a wafer scale.

#### Process Step Integration

In each **memsstar**<sup>®</sup> process module, multiple process steps are integrated within a single wafer vacuum

chamber. In the release etch chambers, breakthrough steps, bulk etch and soft etch steps are combined. In the surface engineering chambers, surface cleaning and activation steps are integrated with the deposition steps, and multiple level film stacks can be deposited.

#### New Materials

Across the various MEMS and nanotechnology fields, new materials are frequently required. **memsstar**'s unique handling of source materials enables process development which can be increased to wafer scale if required, and implemented for manufacture using unique process controls

# Technology Integration and Fab Compatible Platforms

## Fab Compatible

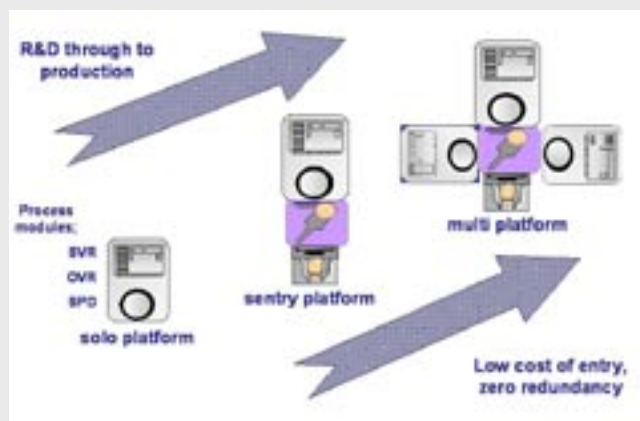
**memsstar®** uses chemistries which are compatible with CMOS fabs and processes. This enables **memsstar®** platform to be run alongside standard CMOS equipment and for CMOS wafers to be safely processed inside memsstar.

## R&D through to Production

Many devices can be proven in an R&D environment, but experience difficulty transitioning to a production environment. The modularity of **memsstar®** means that the same chamber and chemistry can be used in both environments, with a clear and simple upgrade path available. Low cost entry, zero redundancy

## Process Controls

**memsstar's®** unique process controls enable technologies to be integrated on the same substrate, with thermal control, pressure control and endpoint capability.



## Multiple Materials and Chemistries

The combination of **memsstar's®** unique architecture and controls enables new materials and new process windows to be developed and scaled, as new designs and integrations are required.

## Environmental

### Emissions

Our dry chemistries ensure that all by-products are minimized and are easily handled within abatement systems and legislation.



### Materials Usage

Consumption of source materials is precisely measured and controlled, ensuring that costs are kept low and that waste is minimized.



### Health and Safety

**memsstar®** is designed and tested to the latest environmental and safety standards, and is fully automated and computer controlled. Our health and safety department will fully evaluate your needs to ensure seamless integration and compliance with your own environment and safety policies.

If you would like to understand more about and how **memsstar®** can help you meet your needs, then please contact us.



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