

MEMSCAP

Design & Manufacturing

ESA 2005



MEMSCAP: Focused on MEMS Business



□ MEMSCAP* is the leading independent provider of innovative solutions based on MEMS technologies

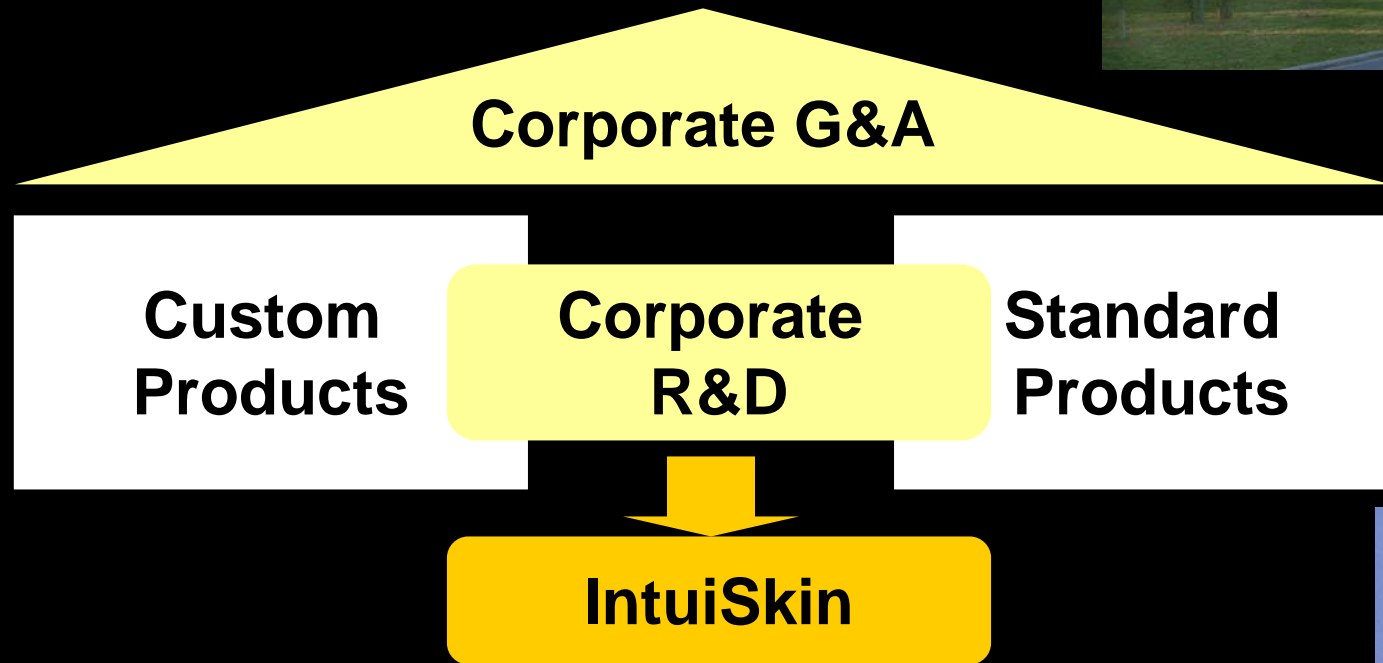
□ MEMSCAP offering is centered around:

- Standard Products
- Custom Products

□ MEMSCAP operates in 3 main sites located in North Carolina/USA, France and Norway.

** In 2001, MEMSCAP (Euronext: MEN) becomes the First Listed pure play MEMS Company*

Company Structure



- Custom Products: RTP, North Carolina
- Standard Products: Norway
- Corporate R&D and Corporate G&A: France
- IntuiSkin, the Skin Station division spin-off: France
- Headcount on December 31, 04 : 100

Standard Products



□ Operations

- located in Norway

□ Differentiation

- Manufacturing Capability: quality & product reliance programs (ISO9001), demonstrated robust product life cycle process, Aeronautics & Medical Certification (CAA, etc.)
- Long track record: More than 30 years & established customer base
- Cost structure, solid roadmap



Market	Product & Applications	Major Customer
Aeronautics / Defense	Air data computer, cabine pressure, auxiliary power unit	Aerosonic, Penny & Giles, Meggitt Avionics, IS&S, Raytheon, Harco, Garmin, Honeywell, etc.
Medical	Invasive blood pressure sensors, blood filtration and purification, drug delivery	Siemens, Philips, GE Medical, Sedat, Dräger, etc.

Custom Products



□ Operations

- Located in RTP (NC, USA), MEMSCAP sole front-end manufacturing facility
- Operating 3 shifts, 150 mm production capabilities

□ Differentiation

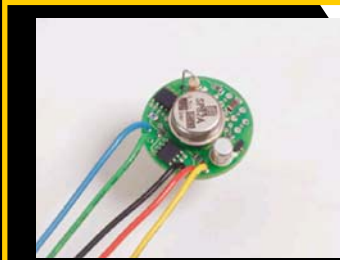
- Manufacturing Capability: quality & product reliance programs (TL9000), demonstrated prototype to volume production as well as robust product life cycle process
- Process Capability: Surface, bulk and metal micromachining on a commercial level, MUMPS standard, Process/design for manufacturability
- Market position: 12 years track record

Market	Product & Applications	Major Customers
Consumer	Silicon μ phones for cell phones, PDA, MP3 recorder, cameras, etc.	Knowles
Communications	VOAs and Switches CXC	JDS Uniphase, Hitachi, GGN, 2 customers in pre-production
Biomedical	Pressure sensors, drug delivery devices, magnetic switches	2 customers in pre-production

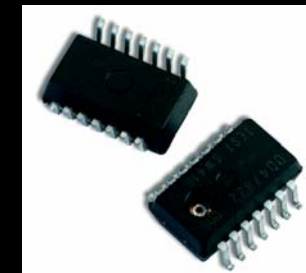
Levels of product offering



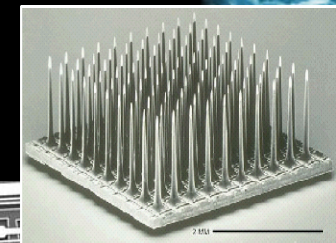
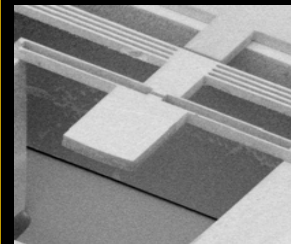
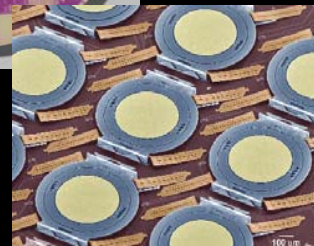
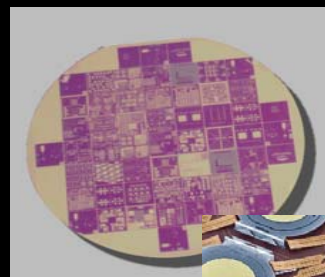
System / Module level



Component level



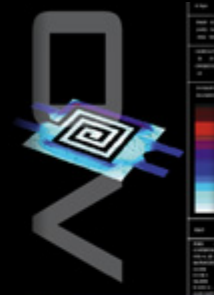
Design, Manufacturing
&
Wafer level
packaging



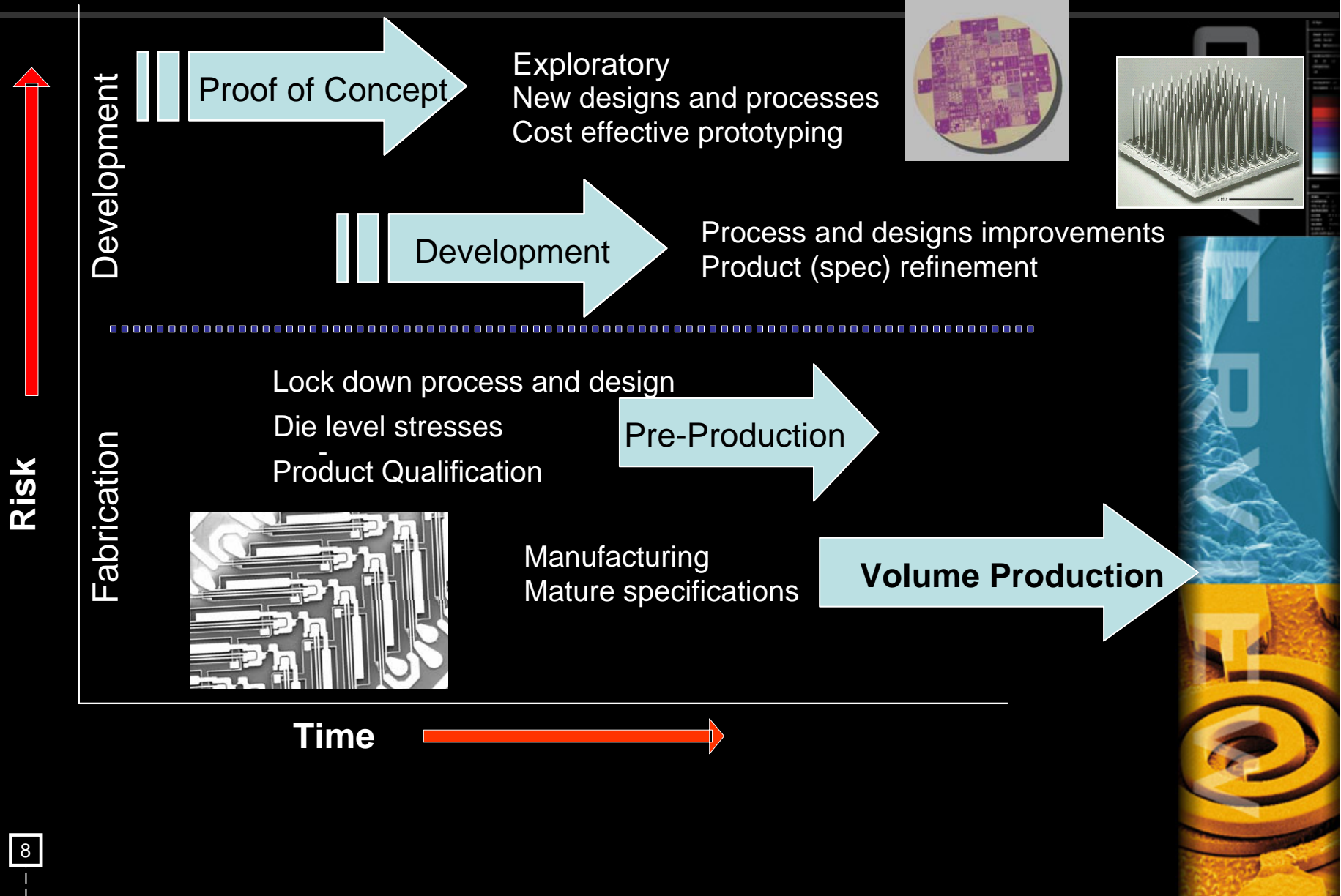
Product Manufacturing

What is a MEMS Foundry?

- Provides Proof-of-concept to Volume Manufacturing
 - Design, fabrication, test and product reliability support
 - Packaging upon request
- Enables accessible and cost-effective early-stage development through standard processes
- Supports multiple process platforms for product flexibility as required
- Provides exploratory development as needed



Product Development Cycle



MEMSCAP RTP

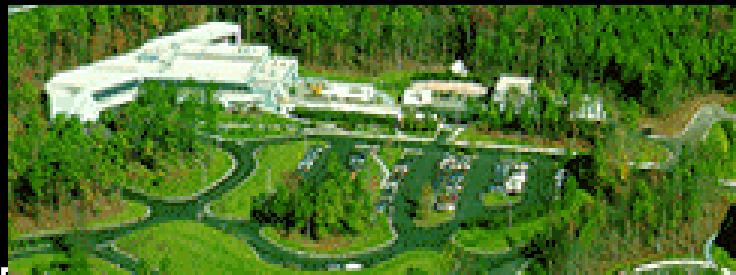


USA

Research Triangle Park, NC

Manufacturing facility

- 3,000 Ft² Class 10 Clean Room
- 2,000 Ft² Class 100 Clean Room
- Capacity of 25,000 wafers/year



Office space & Test lab

- 2,000 Ft² Test Lab class 10000 (class 100 inside of enclosures)
- 12,000 Ft² office space



Process Technology



- Fabrication techniques are merely “tools” that enable realization of microstructures.

- 3 principle techniques supported at RTP Fab
 - Surface micromachining
 - Bulk micromachining (SOI/DRIE)
 - Thick metal

- Each technique made of subprocesses (modules) that provide complete, robust tool set for MEMS fabrication.

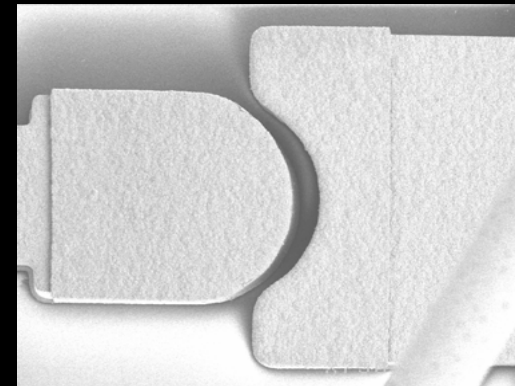
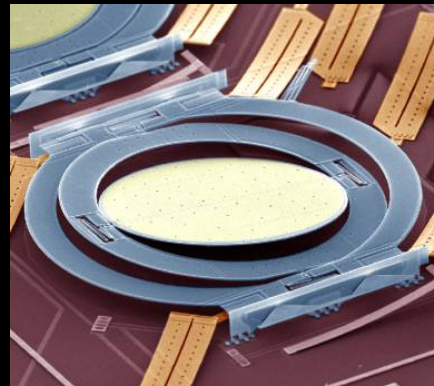
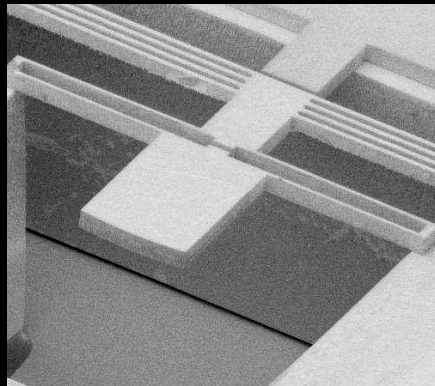


Micro Fabrication Capabilities

- Bulk Micro-machining
 - Deep RIE (including SOI)
 - Wet bulk micro-machining

- Surface Micro-machining
 - Poly-Silicon Processing

- High aspect ratio thick metal plating



Example



Quality Assurance



- Strong Quality Culture
- Certified ISO9001 & TL9000 compliant by UL.
- 22nd Company in the world to certify to TL9000 standards.



UNDERWRITERS LABORATORIES INC. CERTIFICATE OF REGISTRATION



MEMSCAP

3021 Cornwallis Road
Research Triangle Park, NC 27709

Underwriters Laboratories (UL) issues this certificate to the firm named above, after assessing the Firm's quality systems and finding it in compliance with:

ISO 9001:2000

EN ISO 9001:2000; BS EN ISO 9001:2000; ANSI/ASQC Q9001:2000

TL 9000-HW, R3.0/R3.0

UL conducted this assessment in accordance with the TL 9000 Code of Practice for Quality System Register Applicants by the following scope of registration:

3674 (US) : Semiconductors and Related Devices

The development, design and manufacture of microelectromechanical systems and components.

Product Category: 3-Transmission

Further clarifications regarding the scope of this certificate and the applicability of ISO 9001:2000 requirements may be obtained by consulting the organization.

This quality system registration is included in UL's Directory of Registered Firms and applies to the production of goods and/or services as specified in the scope of registration from the address(es) shown above. By issuance of this certificate the firm certifies that it will maintain its registration in accordance with the applicable requirements. This certificate is not transferable and remains the property of Underwriters Laboratories Inc. (UL).

File Number: A6324

Version: 1

Issue Date: December 11, 2000

Revision Date: April 15, 2002

Renewal Date: December 11, 2002

S. Miller

E. Joe Shaha
Executive Vice President and
Chief Operating Officer - International



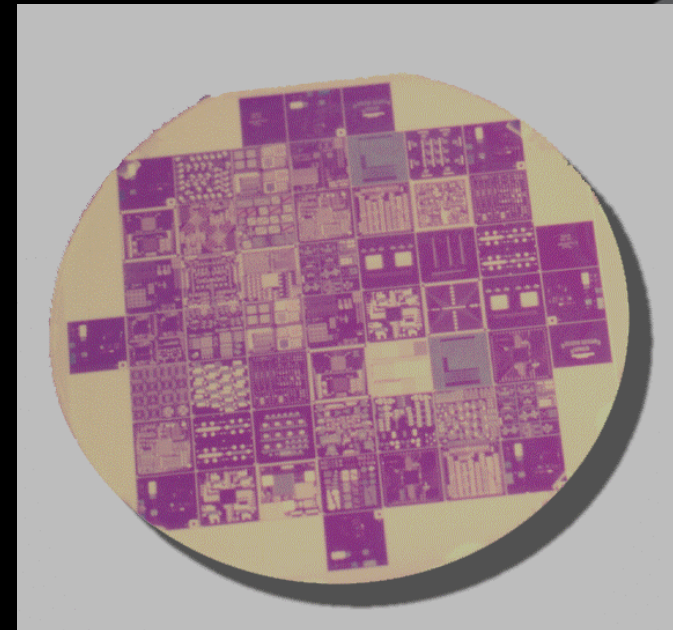
Multi-User MEMS Processes: MUMPs® The cost effective solution for prototyping



- PolyMUMPS® track record since December 1992
 - 3-layer polysilicon surface micromachining process
 - Hundreds of thousands of devices delivered
 - Enjoys international recognition as the leading MEMS prototyping program in the world
 - More than 800 engineers from 150+ organizations have produced over 1800 1cm² submissions
 - 60th run anniversary in Q1 2004

□ SOIMUMPS® Available since Q4 2002

□ MetalMUMPS® Available since Q4 2002



The Web channel:

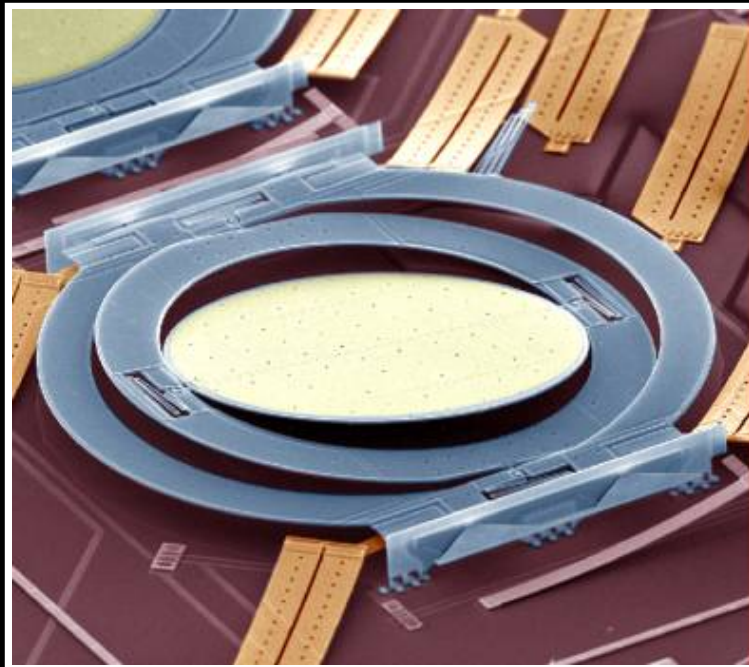
www.memscap.com

MUMPs[®] : The Gateway to custom processes and standard products



Example:
Product
Offspring

2D OXC
Company X.



3D OXC Mirror Array
Lucent Technologies

Volume Manufacturing (1/2): 2 examples: Knowles, Glimmerglass



□ KNOWLES ACOUSTICS CHOOSES MEMSCAP FOR ITS SILICON MICROPHONE WAFERS

- From prototyping to high volume production through taylor made process
- “We chose MEMSCAP as our strategic supplier because we needed to combine performance, reliability and proven experience in quality processes”, Jeffrey Niew, Vice President of Knowles.
- « MEMS technology will grow from less than 1% of the 1.2 Billion microphones sold worldwide in 2003 to 20% of the 1.6 Billion units in 2006 – a compounded growth rate of 206.6%. A similar growth rate in the microspeaker sector will propel the MEMs market in 2004 with 50 million units shipped (...) Knowles Acoustics has more than a dozen cell phone design wins according to our sources »

source: NanoInvestor News March 11.



Volume Manufacturing (2/2): 2 examples: Knowles, Glimmerglass



□ GLIMMERGLASS CHOOSES MEMSCAP FOR BREAKTHROUGH PRODUCTS MANUFACTURING

- « We've chosen MEMSCAP as a key supplier because of their ability to develop and produce complex MEMS products (...) MEMSCAP has met our demands for uncompromising quality and production reliability, necessary for us to supply our customers with reliable, cost-effective solutions. »

Mark Housley, Chief Executive Officer of Glimmerglass.



Key Strengths of Memscap



- Customer Reliance
- Established Quality Process
- MEMS Process Experience and Excellence
- Ability to get customers from concept through qualification to production

