



PiFLUMEDES
Piezo Actuated Fluidic MEMS Devices



| Printing for
P Professionals

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Océ Technologies

Océ – Strictly Confidential

Key-figures Océ Group

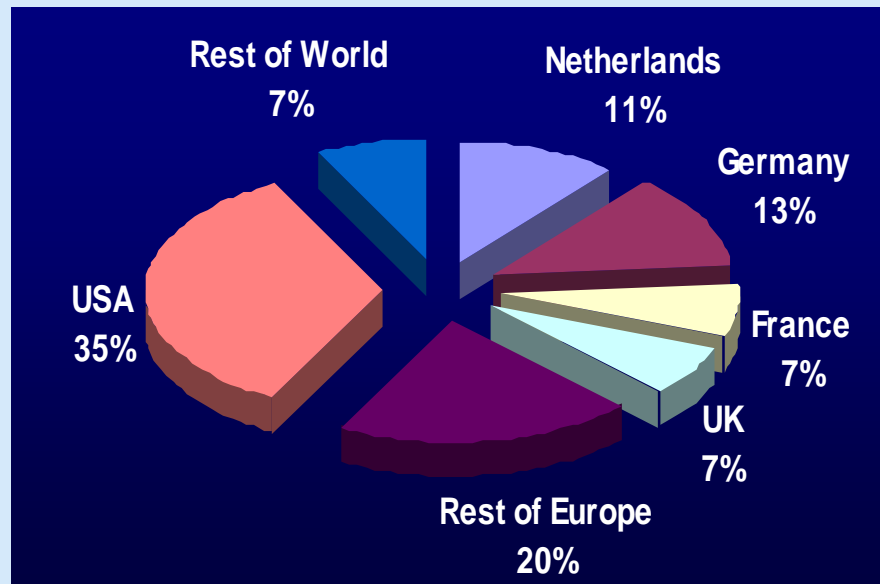


Developer of products for:

High Volume Digital Printing of Documents, Books, Transactions,
Wide Format Posters and Engineering Drawings

Turnover 2007:	€ 3,1 billion
Employees world-wide:	23.798
Employees R&D	1804 (Venlo 965)
Operating companies in 30 countries	

Turnover spread:



Oce and Inkjet printing

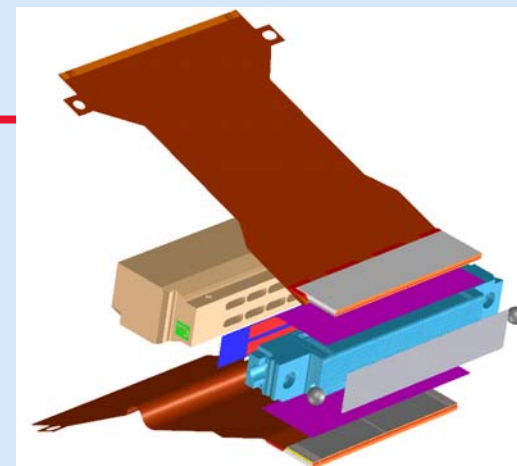


In our markets Inkjet Printing is becoming the dominant technology for Colour printing

- graphical, documents, posters, labels,...
- two dominant technologies
 - Thermal inkjet (Home) HP/Canon
 - Piezo inkjet (Wide Format/ and High-Speed printing)



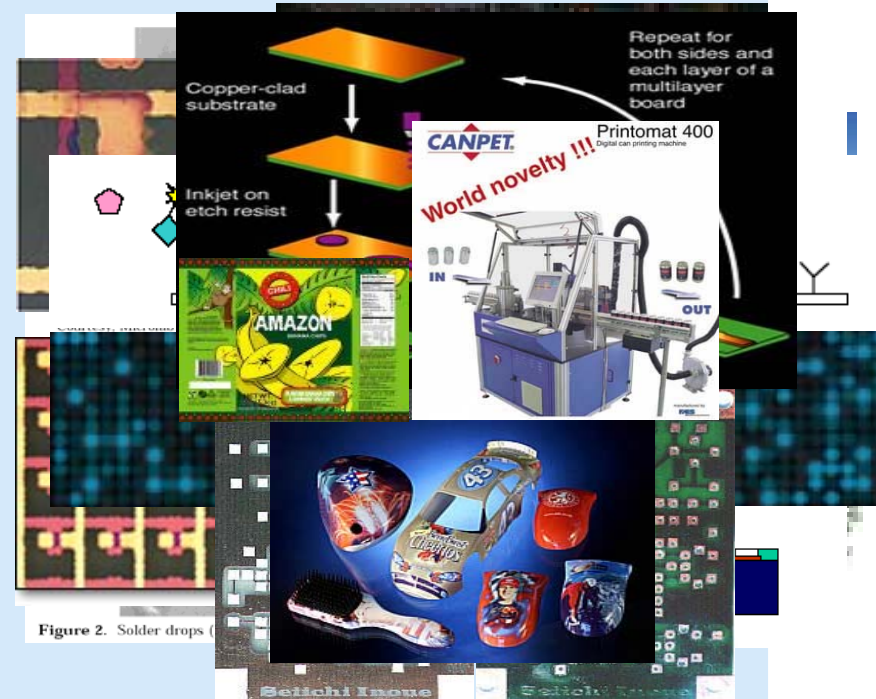
Own developed
Print-head and
Product



Inkjet printing huge emerging market



- Inkjet promising technology for printing on paper and....more than paper
- And now also into new industrial printing markets
- Examples of Industrial Inkjet Applications
 - Displays
 - Printed electronics
 - Solar cells
 - Biosensors
 - PCB manufacturing
 - RFID production
 - Opto-electronic devices
 - Product decoration
 - Packaging



Inkjet innovation drivers

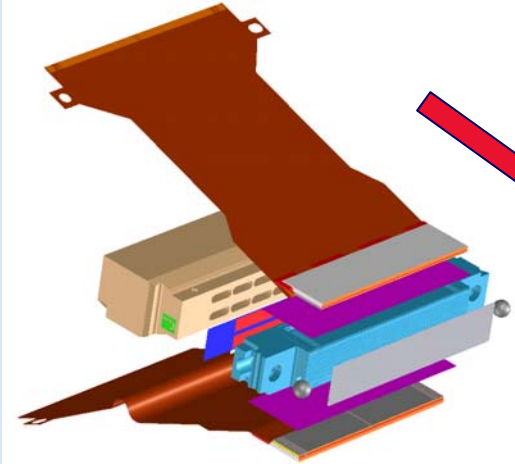


- **Smaller dropsizes**
- **Increasing number of nozzles**
 - Per head
- **Increasing speed**
 - Per nozzle .. DOD jetting frequency
- **Wider range of 'inks' for new applications**
- **Printhead 'arrays' (10000 nozzles in a row)**
 - Assemblies, integration of multiple heads
 - Stationary heads,

Higher integration densities allowing for lower costs

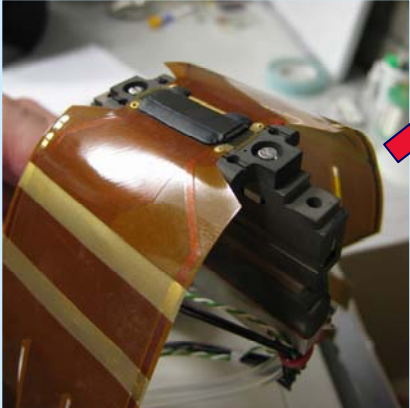
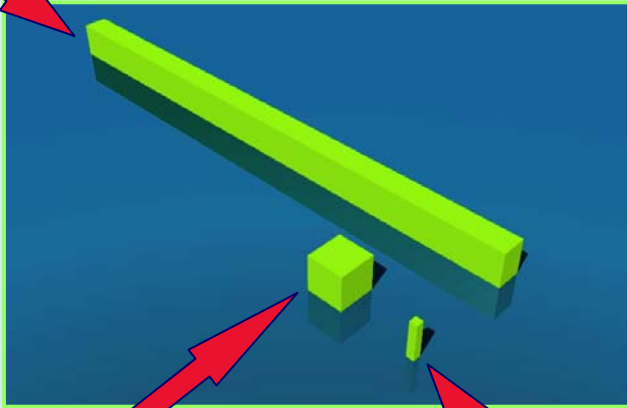
Silicon based Piezo-MEMS -Manufacturing the Enabling Technology

Printhead-roadmaps

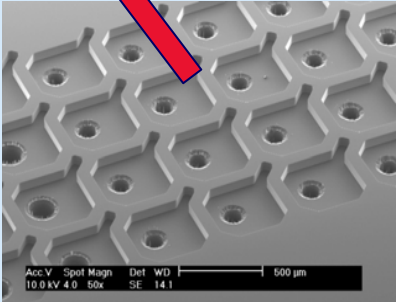


**Present Océ
Micromachined
Printhead**

Costs down integration rate up

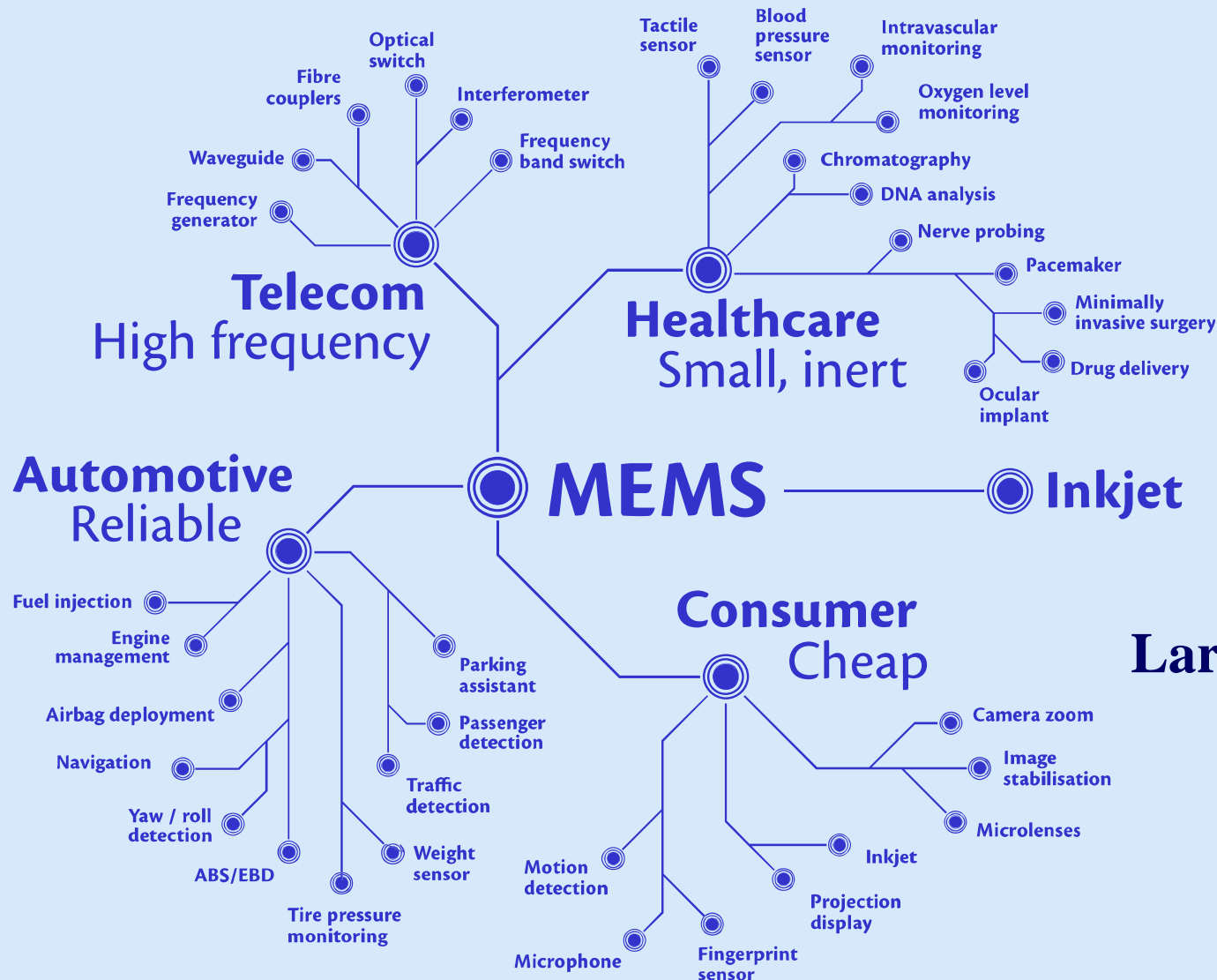


1st gen Océ MEMS based Printhead



2nd gen MEMS Printhead

MEMS – ecosystem



Large infrastructure
Vast process
knowledge

Fluidic MEMS based printhead platform



We intend to create a Scalable inkjet printhead technology-platform

- MEMS based Drop Forming Devices



- Smaller drops, higher channel density



- Wider gamut functional inks



- Serving printers for various markets & applications



- from low volume/high costs



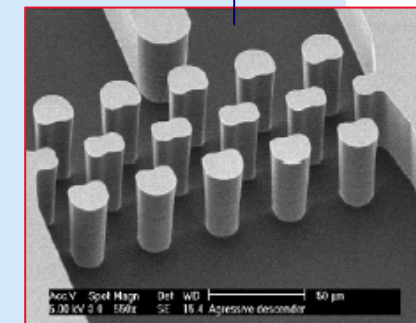
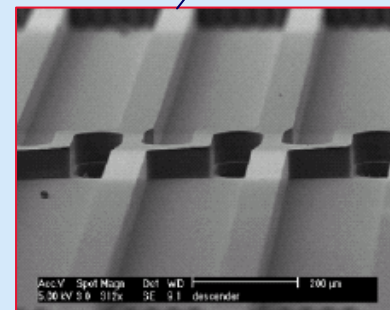
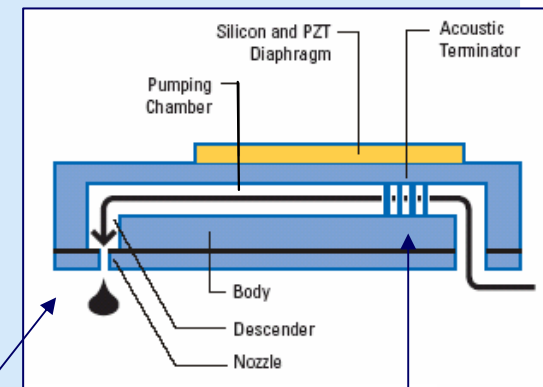
- to high volume/low costs

Challenges for Fluidic MEMS



- complex micro fluidic 3D structures
- High Density electrical and fluidic connections
- thin film layer Piezo deposition
- wafer-to-wafer bonding
- reliability
- packaging
- low costs & high volume

Fuji-Film



European Ecosystem for Fluidic MEMS Devices



Looking for Partners from the European Ecosystem:

- providers of
 - silicon/mems technology and processes
 - pilot production
 - volume production
- application owners that use or intend to use
 - MEMS printheads
 - other fluidic devices

Modeling & Design	Wafer processing & Packaging	Design for Manufacturability	Prototyping & Industrialisation	Exploitation
Demonstrators				

Interested ??



Meet us now or this afternoon.....

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