1.1 Terminology and General Information

- **Micromachining**

  The IC fabrication processes which were applied to make very small mechanical components is defined as the term "Micromachining" at 1982

- **Microelectromechanical System (MEMS)**

  A tiny device including electrical and mechanical components fabricated through IC fabrication processes (early meaning)

- **MOEMS, RF-MEMS, Bio-MEMS, etc.**

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- **Comparative scale of micromachined devices**

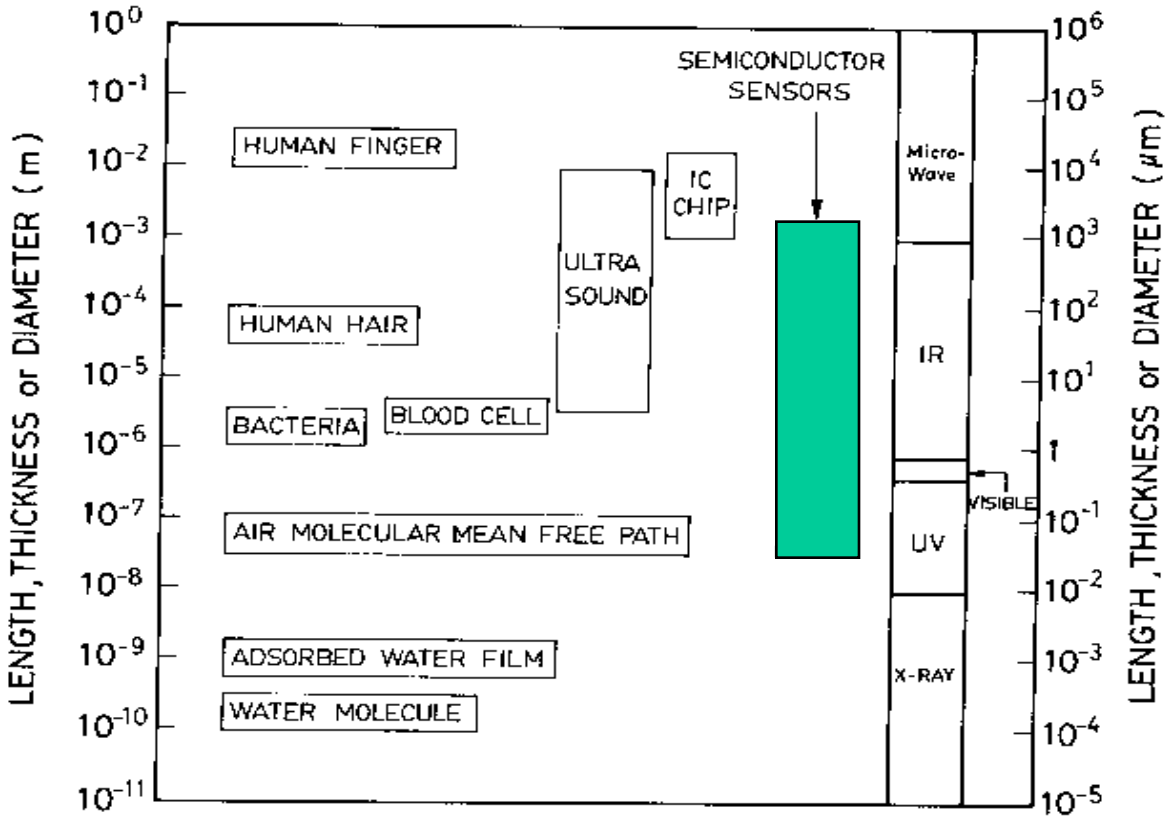

Fig. 1 Comparative scale of semiconductor sensors. (After Ref. 1)

Semiconductor Sensors, edited by S.M. sze, 1994.

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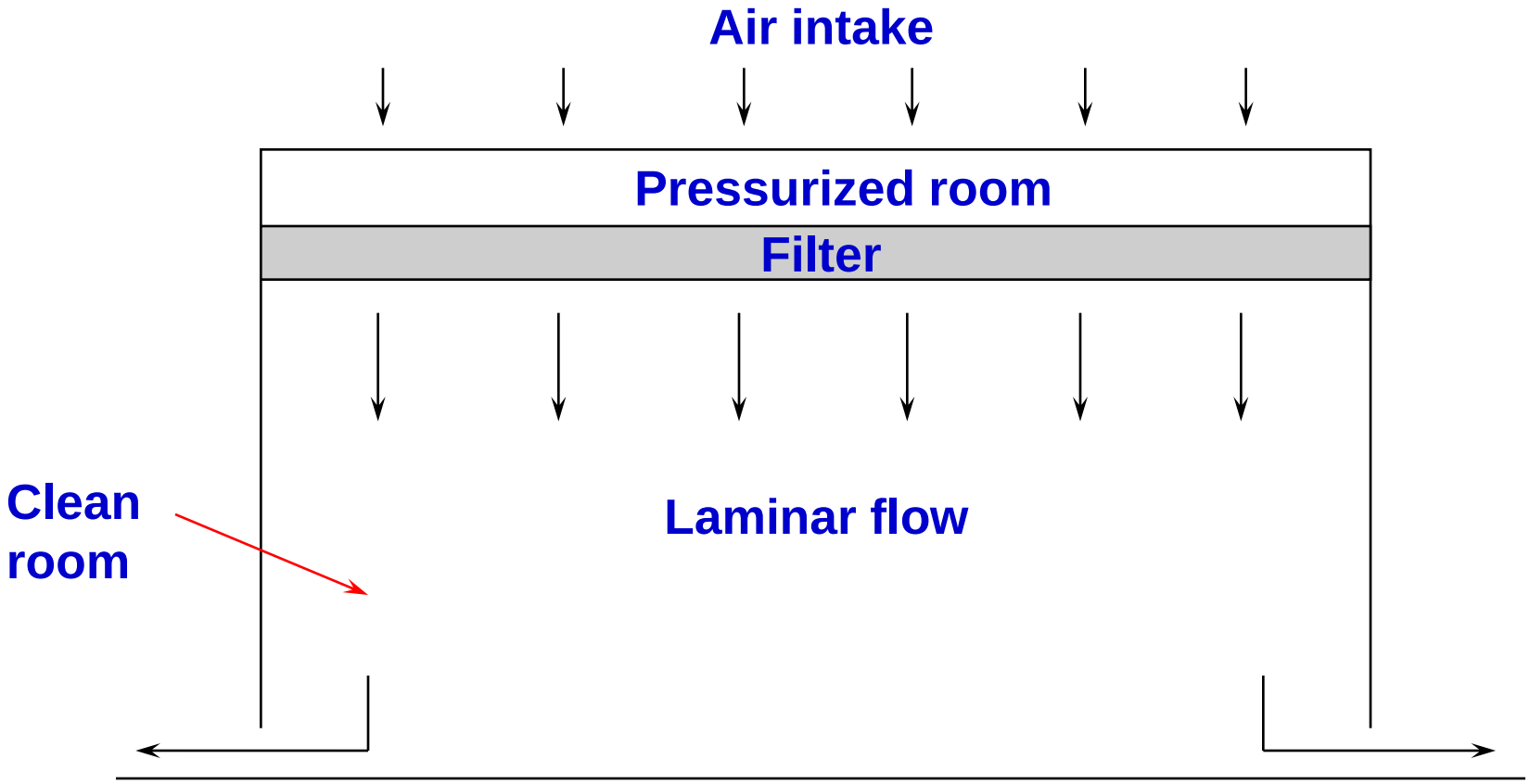
- **Clean room**



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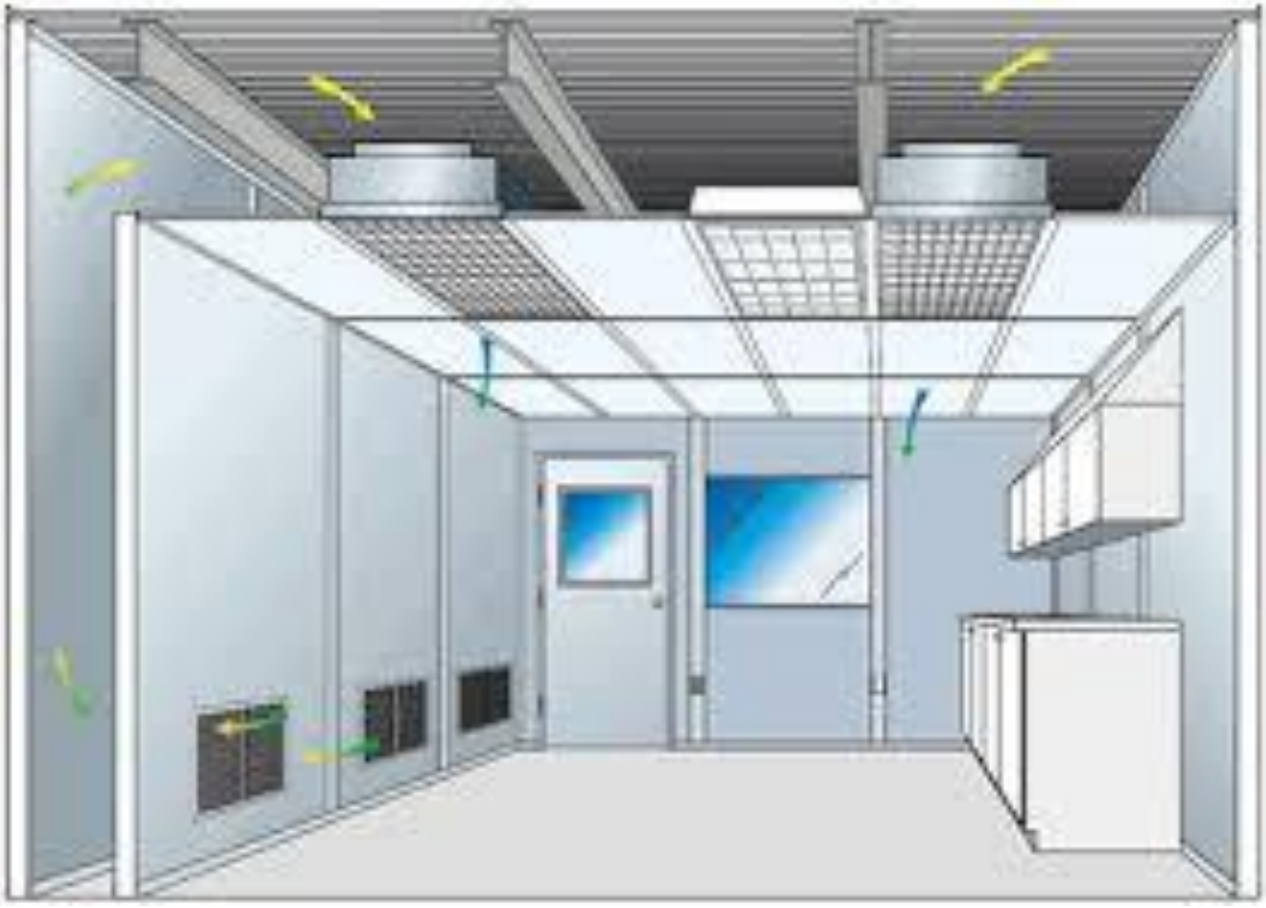

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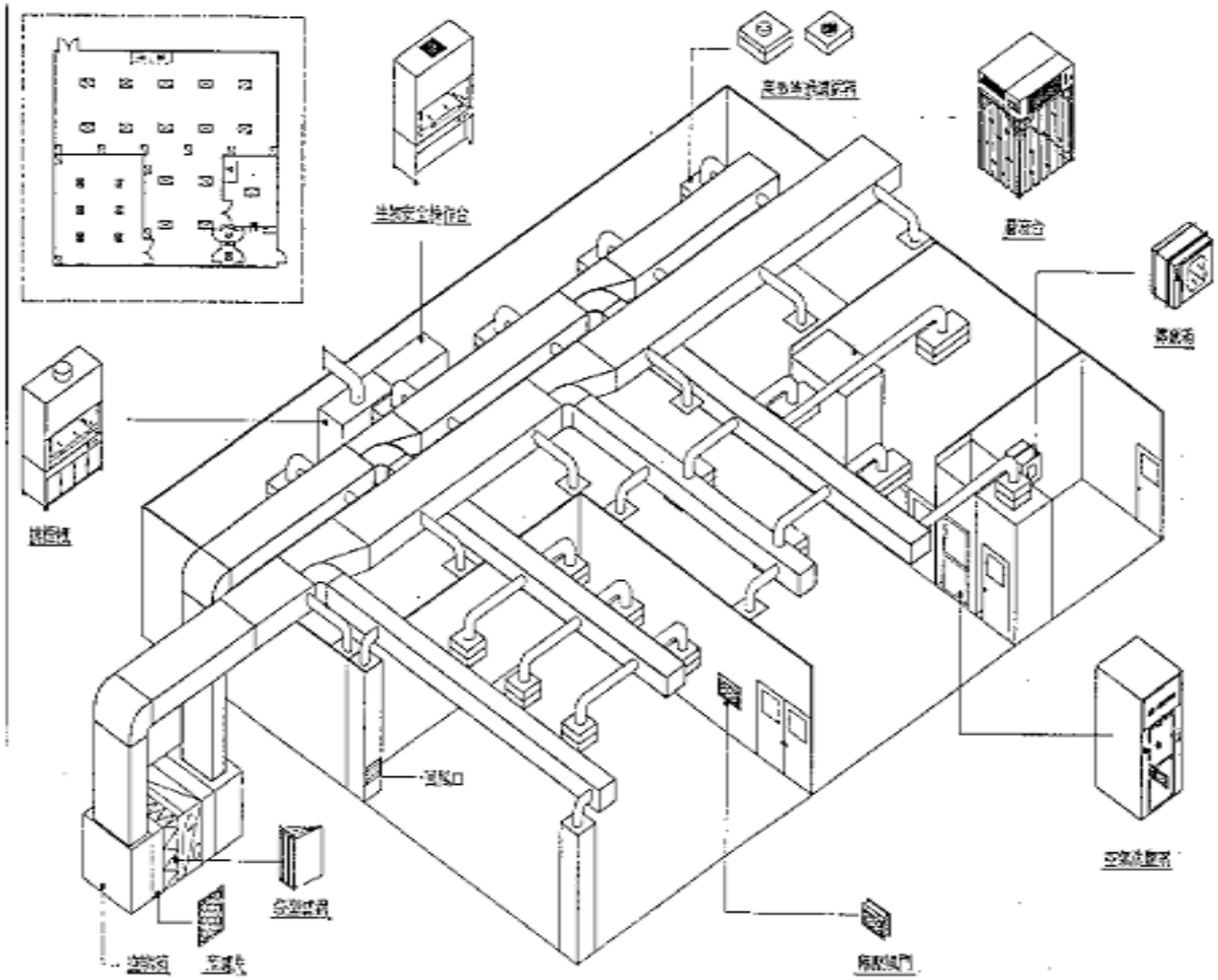

Typical layout of clean room

Figure source: 海天科學公司

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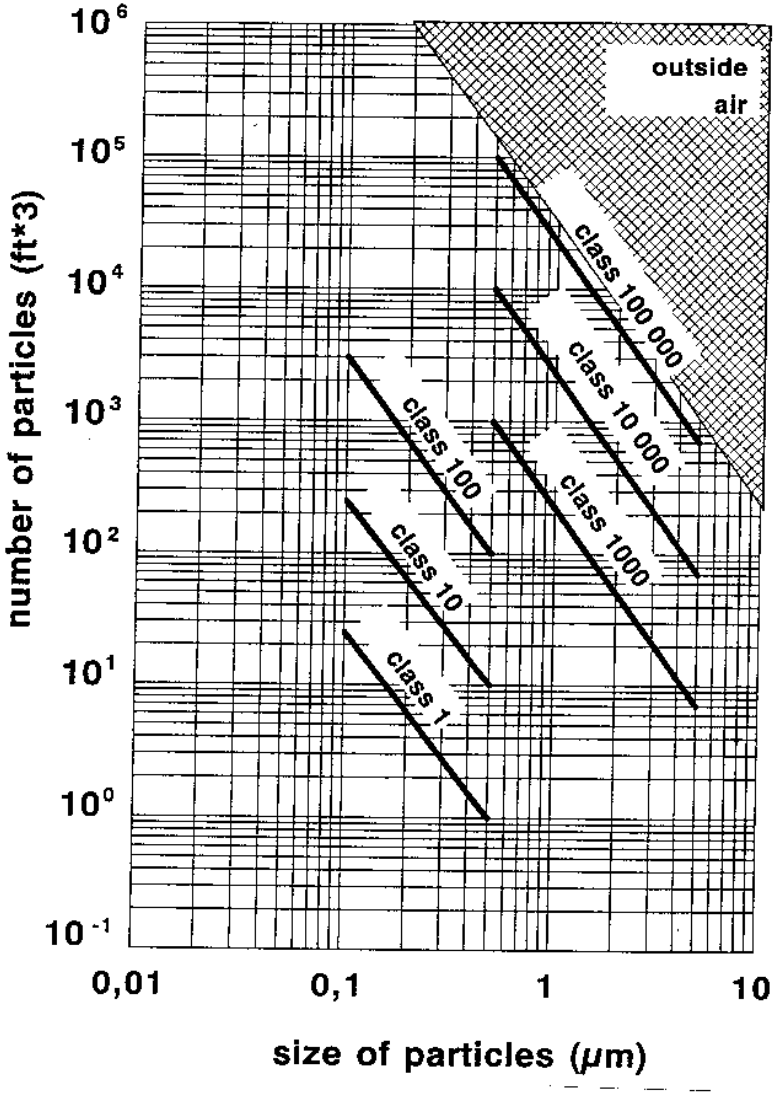
- **The quality class of clean room**



Microsystem Technology for Engineers Intensive Course, W. Menz, 1994.

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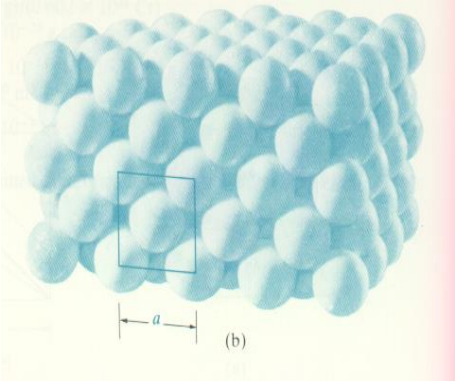
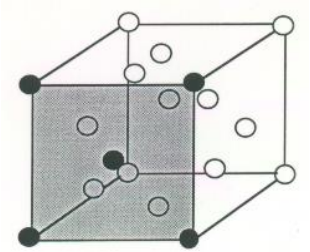
- **Crystal structure of a single crystal silicon**



L.H. Van Vlack, Element of Material Science and Engineering, 1989.

- **Three important crystal planes in Si unit cell**

(100)



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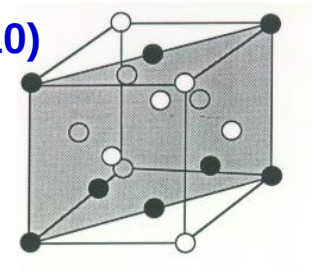

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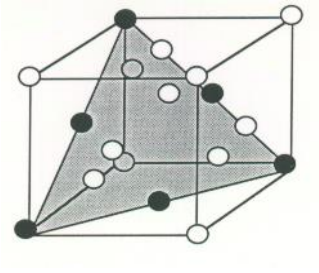

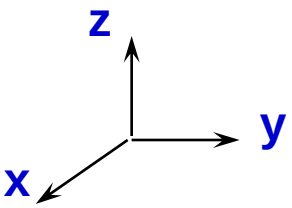

J.A. Wickert, D.N. Lambeth, and W. Fang, STLE/ASME Tribology Conf., 1991.

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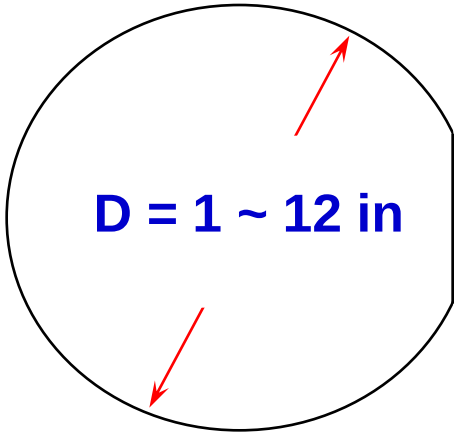
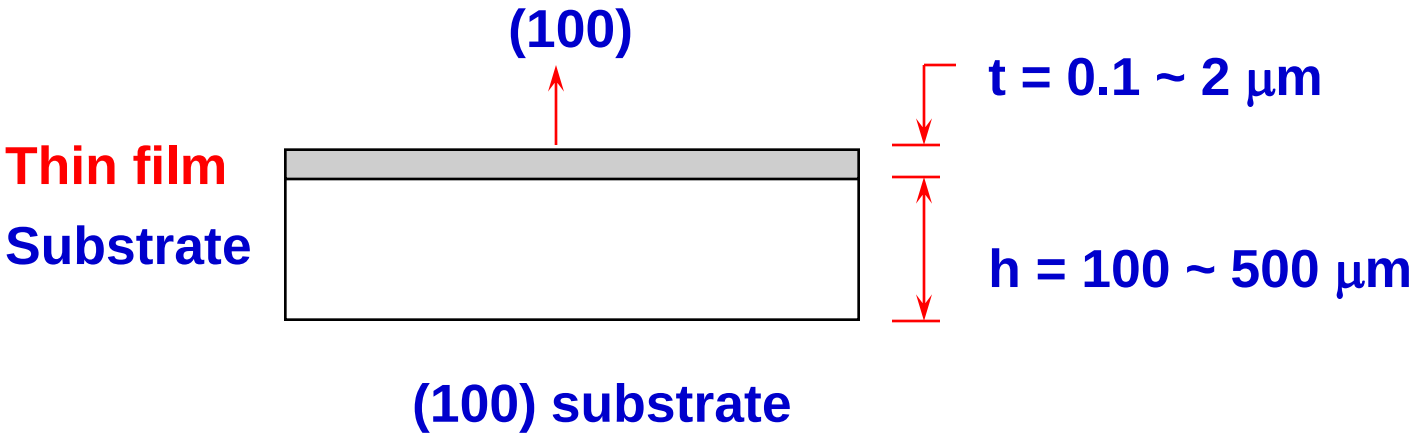
- **Silicon substrate (wafer) and thin film**





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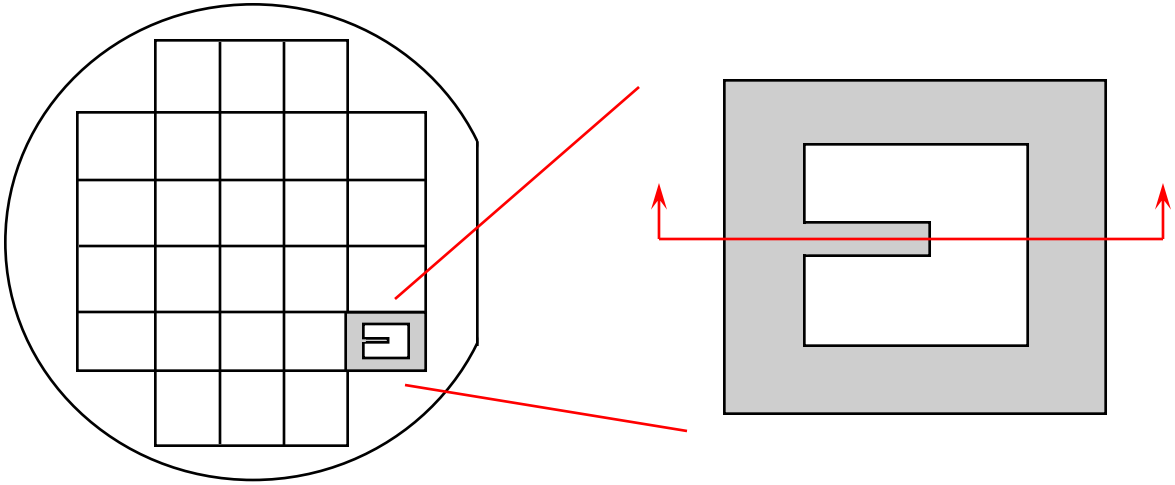
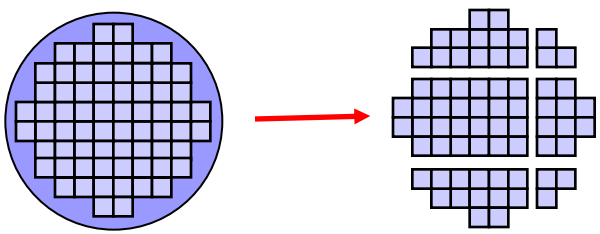
- **Batch fabrication**





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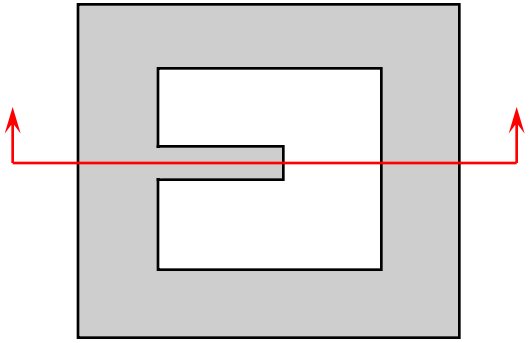
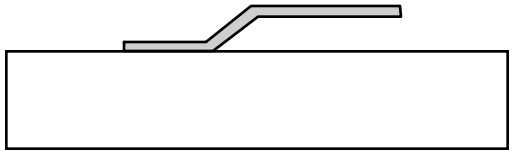
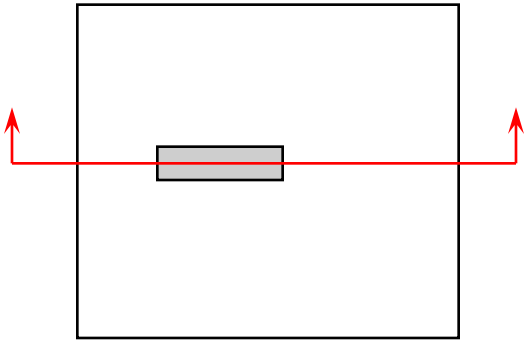
- **Bulk micromachining**



- **Surface micromachining**





- **LIGA process**

LIGA is the abbreviation of three German words

Lithographie (lithography in English)
Galvanoformung (electroplating), and
Abformung (moulding)

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