

OKMETIC

Okmetic Company Presentation

Atte Haapalinna
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Okmetic in brief

Okmetic supplies tailor-made silicon wafers for sensor and semiconductor industries. In addition, we sell our technological expertise.

Our silicon wafers are part of a further processing chain that produces end products that improve human interaction and the quality of life.

Okmetic is the world's leading supplier of sensor wafers and an esteemed technological partner.

- Net sales (2008): 67.9 million euro
- Operating profit: 12.5 % of net sales
- Number of personnel (2008 average): 364



Production



Vantaa plant, Finland

- Crystal growth
- Sensor wafers
- Demanding semiconductor wafers
- Advanced wafers (SOI)



Allen plant, Texas, USA

- Value adding wafers (EPI)

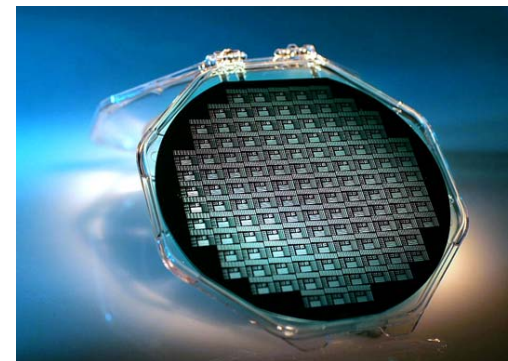
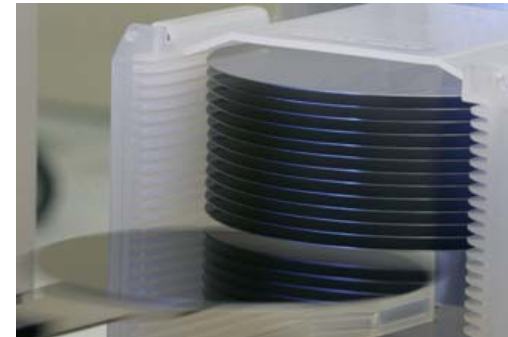


Contract manufacturing, Japan and China

- Semiconductor wafers

Okmetic products

- Silicon-based solutions for sensor and semiconductor applications
- Single-side polished (SSP), double-side polished (DSP), silicon-on-insulator (SOI) , epitaxial and CAP wafers
 - Diameter: 100...200 mm
 - Growth method: Cz, MCz
 - Crystal orientation: $\langle 100 \rangle$, $\langle 111 \rangle$, $\langle 110 \rangle$
 - Types and dopants:
 - N - antimony, arsenic, phosphorus, red phosphorus
 - P - boron
 - Resistivity: 0.0015...1500 ohm-cm



Okmetic High Resistivity MCz wafers

- Diameter: Primarily 150mm, other diameters upon request
- Growth method: Dedicated MCz pullers, tailored growth processes and production materials
- Crystal orientation: <100>, <111>, <110>
- Types and Resistivities:
 - N – type specifications typically at some 500 Ohm-cm.
>1000 Ohm-cm material has been delivered in quantity
 - P – type specification of 1000 Ohm-cm is typical, even higher limits have been tested
- Alternative PiN-diode products based on high resistivity (1 kOhm) epilayers

Okmetic High Resistivity MCz wafers

- Interstitial oxygen of the MCz improves the radiation hardness of silicon
- At the same time, oxygen gives rise to thermal donors
- Effects of these donors are suppressed with the use of
 - Optimized low-oxygen material
 - Wafering process tailoring
 - Device process optimization
- Radiation hardness achieved with MCz has been extensively studied
 - For example:
 - E. Tuovinen, et al, Czochralski silicon detectors irradiated with 24 GeV/c and 10 MeV protons, Phys. Res. A 568 (2006) 83-88.
 - J. Härkönen et al, Magnetic Czochralski silicon as detector material, Phys. Res. A 579 (2007) 648-652.