COMPANY VISION

Plan Optiks next step in MEMS cap wafer technology: LED packaging

Plan Optik AG, the leading Cap wafer producer for wafer level packaging applications has launched it's fully equipped 200 mm cap wafer production line for LED packaging wafers recently.

Plan Optik's new 200 mm cap wafer line

This new line is capable of making glass and glass-silicon cap wafers mainly for high power LED packaging as well as packaging wafers for projection technology.

Light emitting diodes (LEDs) require hermetic packaging which protects them from environmental impacts such as humidity, heat and dust. Standard packaging methods sometimes struggle with these requirements since they are typically based on polymer materials which do not fulfil long term reliability requirements. Plan Optik's LED packaging wafers consist of glass and silicon only - both materials are widely used in the MEMS industry for packaging solutions. This makes these LED packaging wafers suitable for automotive, medical and projection applications since they work fine under harsh environmental conditions. The temperature resistance is up to 400 centigrade.

The used borosilicate glass provides an excellent transmission of the LED light whilst the silicon typically acts as a spacer. Anodic bonding of the glass lid and the silicon spacer creates a cavity for a single or multiple LEDs whilst an optional double side anti reflection coating increases the transmittance to more than 97%. Due to anodic bonding spacer and lid glass are coupled in a non-reversible way - even under extremely challenging conditions such as permanent temperature and humidity cycles as often found in the automotive industry.

Plan Optik is already running a mass production of such LED packaging wafers which have been developed together with one of the biggest LED manufacturers world wide and the packed LEDs are already implemented in large executive cars. Demans are dramatically increasing due to the fast implementation of high power LEDs in cars.

Plan Optik produces cap wafers from glass as well as glass silicon compound wafers since many years. They can be bonded to device wafers in various ways (mainly anodic and adhesive bonding). Core processes used by Plan Optik are grinding, polishing (CMP), (ultra sonic) drilling, sand blasting, wet etching and bonding glass and glass-silicon compound substrates. Materials used are borosilicate and alkaline free glass as well as silicon and silica.

Combining the big variety of processing techniques, Plan Optik also offers cap wafers with optical (transparent) cavities, through holes for conductive connection as well as high accuracy blank glass substrates for various MEMS packaging tasks. These wafers are clean room suitable and are already implemented in many high end sensor applications.

All wafers produced by the latest production technology are characterized by low ttv, thickness tolerance, low roughness and high surface quality. Plan Optik set the benchmark in respect to virtually perfect glass wafer surfaces by introducing it's proprietary development MDF polishing to the market. MDF (Micro Damaging Free) polished wafers are suitable for wet etching processes and avoid the well known issue sub surface damaging which can lead to defects. Sub surface damaging leads to small cavities and interconnections between the etched structures, weakens the bonding interface and results in a low yield. The use of MDF polished wafers leads to reliable wet etching results and provides a high wafer processing yield.

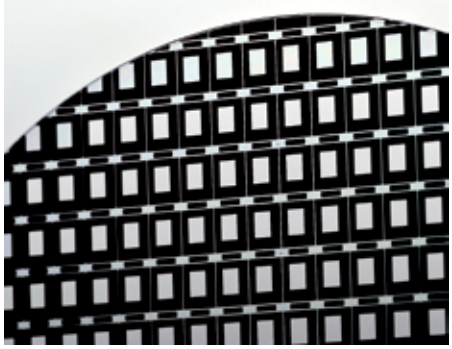
By implementing this new LED packaging wafer production line Plan Optik has increased it's capacity for cap wafers for wafer level packaging by 80% - in addition to the already existing 150-300 mm blank and drilled glass wafer production capacity.

Plan Optik is reacting to the rapidly increasing demand for MEMS cap wafers since late 2009 – mainly for sophisticated glass-silicon compound substrates for wafer level packaging of optical MEMS (MOEMS) such as CMOS image sensors, projection technology and LED applications as well as carrier substrates for semiconductor wafer handling and processing.

The recent capacity expansion includes investments in latest grinding, CMP, anodic bonding equipment and automation of existing processes.

Plan Optik, a public company located in Germany produces wafers for MEMS applications such as tire pressure monitoring systems and drug dispensing solutions since almost 20 years and can refer to a large experience in providing such wafers to almost all key players in the MEMS industry.

Plan Optik's ISO TS 16949, ISO 14001 and ISO 9001 certifications ensure the quality all substrates are produced to.



200 mm LED packaging (cap) wafer

www.planoptik.com

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Mr. Wesselkamp serves as the international sales manager of Plan Optik AG, the technology leader in the production of structured cap wafers for MEMS applications in various industries. Plan Optik's head quarter is based in Elsoff near Frankfurt, Germany. The company is listed in the Entry Standard at the Frankfurt stock exchange under ISIN DE000A0HGQS8.