



Page: 1 von 3
Date: 10.07.2009

Stop sawing away your profits – Thermal Laser Separation is our solution.

TLS-Wafer-Dicing™ by Jenoptik is a unique, full separation technology for semiconductor materials. JENOPTIK presented the process and technology of the JENOPTIK-VOTAN Semi 300 for the first time last year at the SEMICON West. One year later, we have improved and technology and advanced it to serious production maturity.

A year ago, Jenoptik introduced their unique development JENOPTIK-VOTAN™ Semi 300 at Semicon West in San Fransisco and won the Best of West Award for it. The time until this year's Semicon West has been used to improve the technology further and extend it to other materials to make TLS-Dicing™ available for more applications. In the past, Ge wafers and GaAs wafers, in particular for high-frequency applications, and also for concentrator photovoltaic applications were applied positively. Besides, new modules have been added to the modular system. All handling modules and wafer take-ups are available for all wafer sizes up to 300 mm. A new handling version in the market uses a Scara robot solution. A very special highlight from the Jenoptik Automatisierungstechnik GmbH development range is the module for processing solar wafers. This further adds to the range of JENOPTIK-VOTAN™ Semi laser systems and taps a wide field of application (materials).

In addition to technical improvements, Jenoptik also advanced its service and sales structure. An application center for the entire Asian market will be set up early in 2010. There, Jenoptik will present a number of technical systems for laser processing materials which find application primarily in the electronics, flat panel and photovoltaics industries. Interested parties can then use Jenoptik laser systems for processing brittle-fracture materials such as display glass, solar cells, ceramic and silicon wafers as well as for the so called TLS-Dicing™ (TLS = Thermic Laser Beam Separation), a special laser separation process. Customers can test production methods on these machines and improve their requirements accordingly.



Page: 2 von 3
Date: 10.07.2009

The most significant and at the first glance the most obvious visible benefit of the TLS-Dicing is the resulting edge surface quality. There is no chipping and no micro-crack generation with the result that the resulting die edges have up to 4 times the breaking strength of conventionally sawed dies. The risk of chip breakage during the subsequent handling and packaging steps is thus minimized significantly. It has also been found that the very smooth surface of the cleaved edge has excellent optical properties for possible use as a mirror in laser diode bars. As result of the almost perfect edge surfaces, an increase in the blocking voltages for vertical devices has also been observed. The cutting speeds observed with the TLS process are also virtually independent of wafer thickness. The resulting total speed of cut (initial notching to final separation) ranges from 100 mm/s to 180 mm/s, which is faster than any other known technology for thin wafers (100 ... 300 μm). The process speed can be increased up to 300 mm/s by parallel processing the scribing and separation steps. Another advantage of the TLS process is the virtual zero kerf loss observed thus enabling circuit designers to take advantage of the increased wafer real estate for improved device yields. TLS works independently of crystal axes and even circular geometries are possible.

In addition to the process related advantages, the TLS process lowers the overall equipment Cost of Ownership since preparation time and cleaning procedures are reduced and further consumables costs for items, such as expensive saw blades, are eliminated altogether.

These and other products of the Jenoptik Group will be on show at the Jenoptik stall 620, South Hall, Semicon West in San Francisco, from July 14-16, 2009.

About the Jenoptik Lasers & Material Processing division

Jenoptik's Lasers & Material Processing division makes it one of the leading providers of laser technology – from component through to complete system. The increased productivity from which our customers benefit is the key factor in the use of Jenoptik laser technology.

In the area of laser technology, the division has specialized in high-quality semiconductor materials and reliable diode lasers as well as innovative solid-state lasers such as for example disk and fiber lasers. In the area of high-power diode lasers Jenoptik is acknowledged worldwide as a leader in quality.

Lasers are developed as components and system for our customers' applications and integrated into material processing systems through the development in close collaboration with the customer as well as optimization and automation of the processes. These systems enable our customers to work with plastics, metals, glass, ceramics, semiconductor materials and solar cells, both in thin-film as well as wafer technology, with



Page: 3 von 3
Date: 10.07.2009

maximum efficiency, precision and safety. As such, Jenoptik has control over the entire added value chain for laser material processing in the form of development, manufacture and sales and is a reliable global partner for the customer.

The division comprises the two diode laser companies JENOPTIK Diode Lab GmbH and JENOPTIK Laserdiode GmbH, the Laser Systems business unit of JENOPTIK Laser, Optik, Systeme GmbH as well as Innovaent GmbH and JENOPTIK Automatisierungstechnik GmbH.

Contact:

Claudia Böhme
Deputy Manager Director

JENOPTIK Automatisierungstechnik GmbH
Konrad-Zuse-Strasse 6
07745 Jena

Phone: +49 3641 65-3652
Fax: +49 3641 65-3683
E-Mail: claudia.boehme@jenoptik.com
www.automation-jenoptik.de