SOLUTIONS FOR IMPROVING SEMICONDUCTORS AND LED MANUFACTURING PROCESS
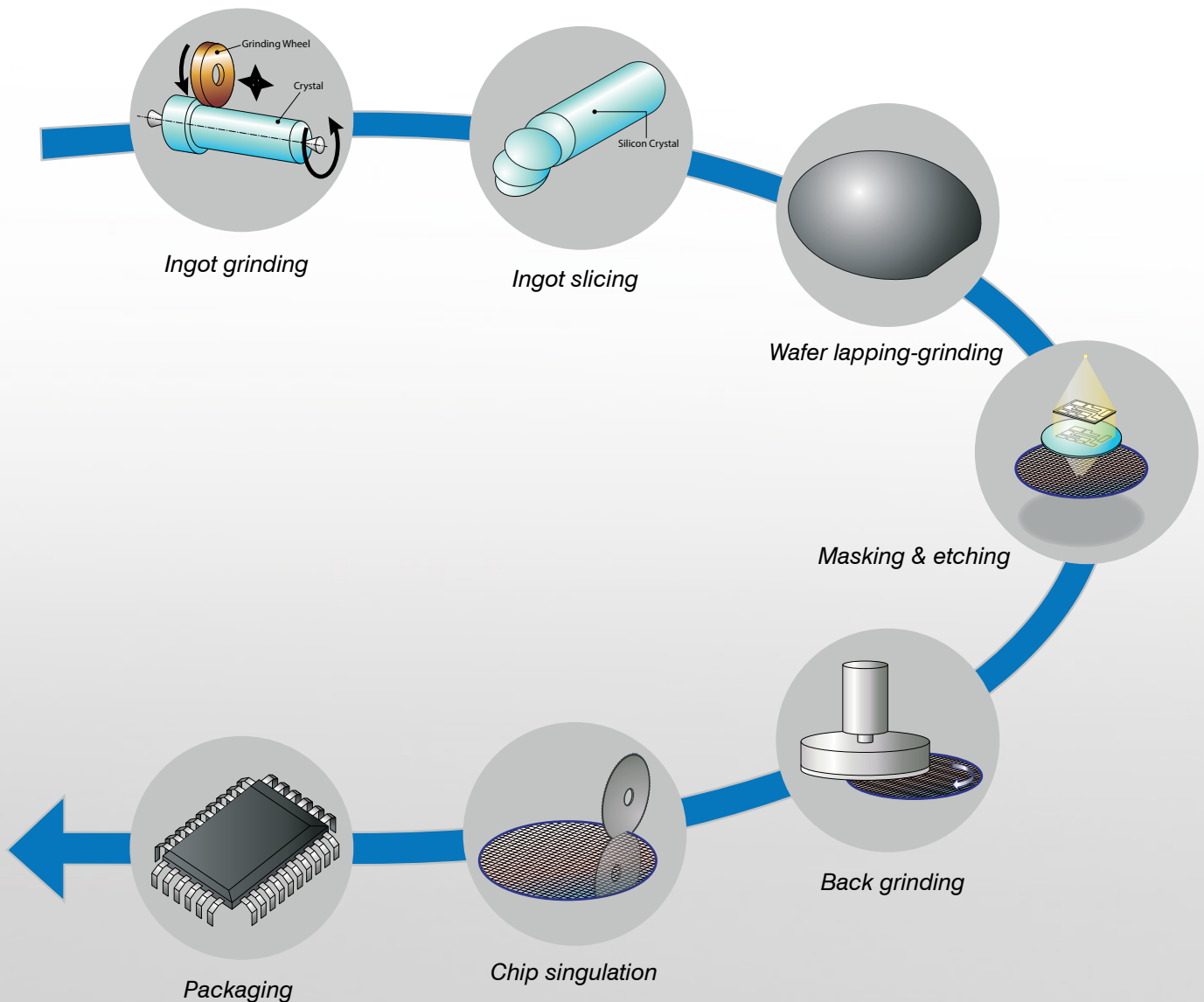

MARPOSS

Marposs solutions

Marposs Group is providing worldwide precision metrology equipment for use in workshop environment during and after machining operations. Since 1980 Marposs has designed and installed applications dedicated to semiconductor and LED industry gaining the trust of OEMs deeply involved in improving the reliability and performance of wafer fabrication process. Marposs Group offers gauges and sensors to improve the different operations, from ingot slicing through final packaging. Marposs products are designed to improve and control the quality of the wafer before, during and after key operations.

Ingot grinding

Ingot slicing

Wafer lapping-grinding

Masking & etching

Back grinding

Chip singulation

Packaging

Placing and maintaining a process under control is the key factor for any production. In particular the very demanding semiconductor and led industries that require the control of an increasing number of process parameters. Marposs engineers are ready to support you in defining how to improve the performances of automatic machines used during wafer processing, the front-end and back-end fabrication steps. We offer sensors and gauges for slicing and lapping machines, back grinders and dicing saws.

The semiconductor and led industries continue to produce ever smaller devices that are more complex in both shape and materials. For these purposes Marposs has a complete range of non contact sensors that can be used for thin film metrology, wafer dimensional characterization, wafer inspection and packaging inspection. Our sensors can be used inside automatic inspection machines to find defects and dimensional variations.

Sensors for wafer processing

Marposs provides thickness, force, torque, vibration, acceleration, true power, coolant flow and acoustic sensors that can improve the machine reliability and help in assuring a constant and high quality production. These sensors have been designed to properly work inside a machine and thanks to dedicated signal elaboration immediately detect events or changes in the machine environment. Here are some specific used of Marposs solutions.
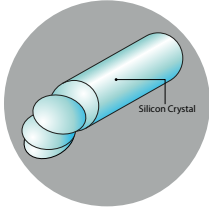
Ingot slicing
During the ingot slicing process, it is important to stop immediately the machine in case the diamond wire brakes. Marposs acoustic sensor can detect the wire breakage and immediately stop the machine.
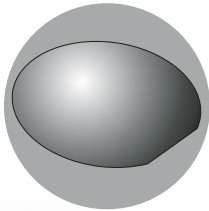
Wafer lapping machine
This process is particularly critic and a strict control of wafer total thickness variation is also required. Thanks to Marposs infrared sensor it is possible to control the thickness during and soon after this important operation.
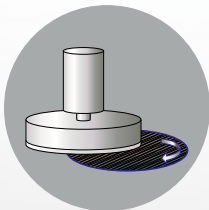
Wafer back grinding machine
Wafer thinning is always a delicate process. Chips are already present on the wafer and any fail in the process affects the production yield and costs. Tight control on the thinning in-process operation is possible using contact gauges or no-contact sensors, even in presence of DI water.

Products in brief

CG contact gauge for wafer thickness control during back grinding

NCG non contact sensor for an absolute wafer thickness measurement inside a machine tool or during the wafer thinning of lapping operations

Optical sensor for bonding wire diameter measurement or diamond wire control (wire saw machines)

Sensors for automatic machine to control force, torque, vibration, acceleration, true power and coolant flow. Acoustic sensor can be used for diamond wire breakage detection on ingot slicing machines and for wheel dressing control on grinding machines

The total forming process can be monitored and recorded all within the machine frame. **Sensors** in the tools provide more detailed information of the forming process like for instance a slug detection on high speed stamping presses

Metrology and surface inspection

Marposs and STIL sensors cover a wide range of applications starting from thickness, TTV, bow, warp measure tiil a complete 2D image and 3D topoghrapy.
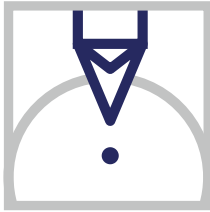
Point sensor
Chromatic Confocal technology is the optimized solution to produce different types of high-accuracy measurements. The optical pens offer different working distance, measurement range, spot size on the target as well as numerical aperture of the light beam. Interferometric (IR and white light) products are also available to detect the thickness of transparent and non-transparent materials performing a very accurate measure.
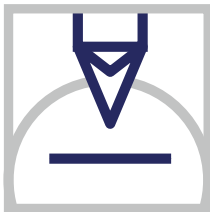
Line sensor
To obtain 3D images, different type of line sensors are available. Coaxial acquisition on a defined line length is performed at high frequency rate.
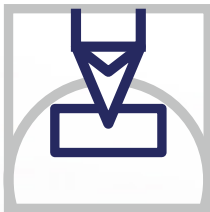
Microscopy
For microscopy purposes, 2D chromatic confocal line cameras are also available for applications where very high-resolution and extended depth of field are required, obtain a perfect focus on Z-axis. In order to get acquisition on a square area a scan system is required.

Products in brief

NCG infrared technology helps in detecting single or multi-layers thickness even on rough or opaque materials

Pencil probes to be integrated inside dedicated fixtures for wafer thickness control in the very first stage of production

CCS single point confocal sensor for distance and shape measurement

IRIX white light interferometry is the proper solution to check very thin films

MPLS confocal line sensor for fast 3D micro/nano-topography

MC2 Chromaline Sensor for inspection and control applications with very high-resolution and extended depth of field

ONE PARTNER MANY SOLUTIONS
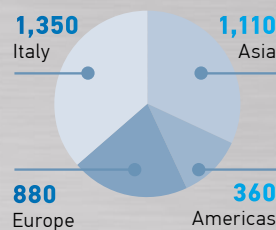
worldwide present in
34
countries

offices worldwide
80

exports
94%

more than
3,700
employees

1,350
Italy

1,110
Asia

880
Europe

360
Americas

26
key acquisitions since 2000

8%
resources invested in R&D

Marposs was founded in 1952 and since then has provided shop-floor solutions for the quality check in the production environment. Marposs' solutions include gauging equipment of mechanical components, before, during and after the production process, monitoring solutions on machine tools, assembly and testing for many industry sectors and automatic machines and checking stations for production lines.

Marposs is one of the main supplier of the major car makers, but operates as well in the aerospace, biomedical, hi-tech and glass industries.

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