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Microfabrication Company Primoceler Unveils New Glass Welding Machine Producing Significantly Reduced Heat-Affected Zone

Innovative technology presents manufacturers with new possibilities for the creation of products with sensitive components

TAMPERE, Finland, Nov. 30, 2012 -- Primoceler Inc., a microfabrication company specializing in glass welding and laser scribing, has announced its development of a new laser-based welding machine for microelectromechanical systems. Primoceler's new machine produces an extremely small heat-affected zone during the hermetic sealing of sensitive components, improving manufacturing processes and expanding the potential for packaging sensitive components under or inside glass.

A major challenge facing manufacturers has been producing packages that do not mechanically stress their MEMS while providing electrical (and also fluidic or optical) interconnects, protecting micromechanical elements and allowing for the system to interact with external environments as planned. Conventional bonding methods such as fusion bonding and anodic bonding generate large amounts of heat, which can cause damage with sensitive components.

"Our new technology is unique. No other machine can give the same results in the same fashion," stated Ville Hevonkorpi, Primoceler's managing director. "Our laser micro welding methodology makes it possible to bond silicon and glass hermetically without adhesives or heat. Since the technology produces an extremely small HAZ (heat-affected zone), there is no risk of breaking sensitive or organic components. As a result, this laser-assisted micro welding process presents manufacturers with an array of new possibilities for the production of electronic, engineering, medical and scientific research devices such as chips and sensors.

"Packaging has always been an important element of MEMS design and the environment inside the package is vital to its efficacy," said Hevonkorpi. "Primoceler's unique sealing solution allows the use of more fragile and sensitive components than ever before." The machine does not require adhesive material in its operation, so the welding process is a fast one-step process. "We are able to produce welding seams with first-rate mechanical properties and those seams retain their quality over time. Any glue loses its strength in time so in fact, the lack of adhesives materials has led to a seam that is stronger and permanent."

The machine includes a patent-pending auto-focusing system that ensures reliability and quality by keeping the distance to wafer within micrometer accuracy. That high precision, in turn, enables high processing speeds of 50 mm/s or more.

The machine is easy to use with a 19-inch touchscreen, intuitive software and a standardized user interface for the machine, laser and viewing camera. Additionally, clients have the options of integrating the technology with their production systems, including a vision system for alignment and viewing and full remote access for service and assistance via secure remote connection.

"Manufacturers are welcome to challenge us and test their product at our research and development facilities in Tampere," said Hevonkorpi. "They will be blown away by all the possibilities that our new process will open up for them."