PHOSFOS Fact Sheet – Embedding of (opto-) electronic chips

Introduction

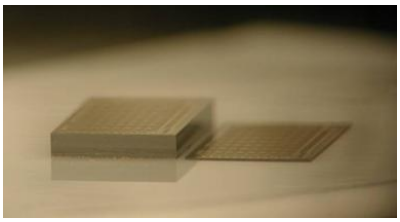
Since its start in 2008, PHOSFOS has created a new paradigm for flexible optical sensors integrated with electronic modules and control circuitry. It aimed at developing a generic technology that offers an integrated solution to this increasingly important problem. The project is now reaching its end and has achieved several major breakthroughs in the field of optical sensing, flexible materials, embedding technologies and integration concepts which may be used in a wide range of applications.

Breakthrough

The PHOSFOS-project consortium developed a generic technology for embedding (opto-) electronic chips into flexible substrates.

Technology

Our generic technology for the integration of (opto-) electronic chips into flexible substrates is capable of providing 40 µm thin foils which are flat and extremely flexible. To obtain such thin foils, a process was developed to thin down commercially available (opto-) electronic chips to a thickness of 20 µm so that they become flexible themselves without compromising functionality.



Thin optical sources and detectors are embedded in optical clear polymers, and electrically contacted using well-established micro-via, metallization and patterning technologies. Using this basis technology, we have demonstrated the possibility to integrate optical sources and photodetectors, compatible with the optical fibre sensors developed within the PHOSFOS-project.

Application

Flexible substrates are a well-known trend in the electronics packaging industry, with interesting applications. But also for optical components and fibres, flexibility is a key asset. In case of data-transmission applications, it enables compact 180° optical coupling of racks and boards, 90° coupling of mother with daughter boards, hinge-like optical interconnects in mobile phone hinges and on-board bended optical connections. In the sensing area there is a substantial demand for tactile sensors that could measure pressure and shear stresses unobtrusively. These would have to be compact and flexible for them to be used on moving body parts and wrapped around curved surfaces. This demand especially comes from the medical community, which would use unobtrusive tactile sensors for example for measuring interfacial stresses between a prosthesis and stump.

Contacts

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