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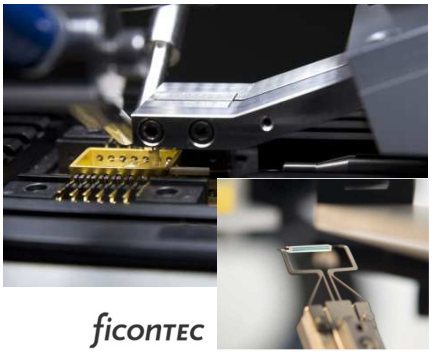
Automated Assembly of Micro-Optical Components + Benches



Placing and optical characterization of lasers and optical components inside tight packages with accuracies < 200 nm and < 2 arcsec and 6+2 degrees of freedom

Optical "pick & place" production machines for prototyping, small and medium series production of photonic assemblies (Ficontec machines in a class 1000 clean room).

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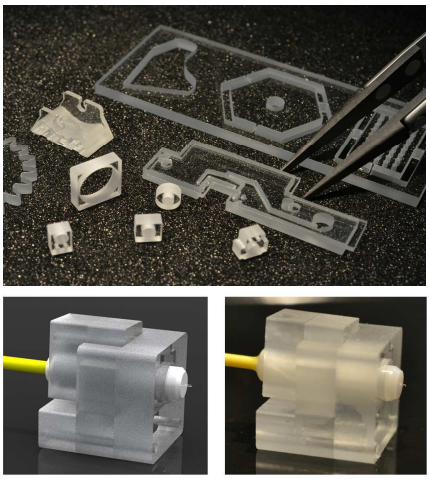
At Fraunhofer IZM, there is an extensive expertise in high precision approaches for active and passive alignment and assembly of optical and electrical components on micro benches. The alignment and reliable mounting of optical subcomponents such as semiconductor laser and photo diodes, micro lenses and micro prisms require far higher mounting and alignment accuracies than for microelectronic parts.

Large volume production can take advantage of passive alignment schemes, where the mounting accuracy is achieved with highest accuracy components, which align themselves when being roughly brought into position.

For prototype or small series production with more flexibility and short product cycles, however, Fraunhofer IZM has state-of-the-art active alignment machines for sub-micron optical precision mounting, which are highly adaptable, and can also be used for improving and testing glueing and curing schemes (UV, IR-fibercoupled) for laser submounts and general fiber coupling.

IZM has most scientific and industrial testing and failure analysis machinery in-house to also prove the reliability of all mounting, soldering, glueing processes and is permanently expanding know-how and investing in current machinery.

For highest adaptability and fastest design cycles as needed in prototyping, small and medium series production of photonic assemblies, IZM has installed a high-speed glass structuring machine by MDI-Schott. Thin panel glass with a maximum size 600 mm x 600 mm and 50 µm to 5 mm thickness can economically be cut by green and CO_2-lasers (free form and optical quality cutting, respectively).



From CAD-drawing to produced samples by precise stacking of lasered thin glass parts. Shown here: optical fiber assembly in glass and micro-optical interferometer prototype.