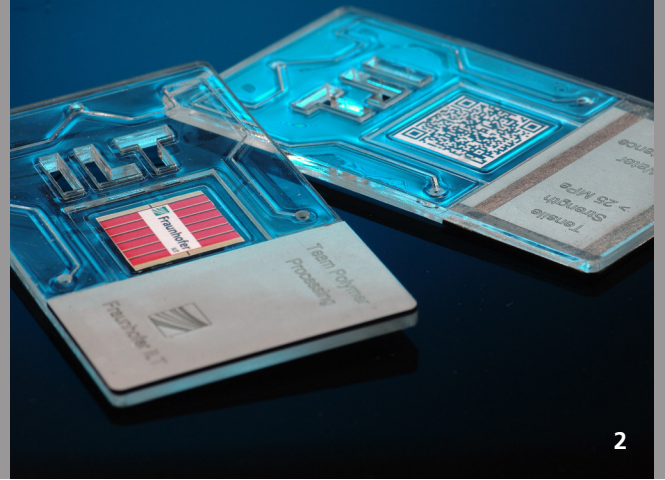




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## LASER PROCESSES IN PLASTICS PROCESSING

### Task

The requirements upon processing methods in plastics technology today are manifold. The Fraunhofer Institute for Laser Technology ILT has developed and qualified individual processes for the welding, cutting, drilling, structuring and marking of plastics.

The technology demonstrator model presented here was designed as part of a technology study and shows a wide range of laser-based methods that can be successfully applied in plastics processing.

### Method

For the production of the demonstrator model, a process chain was set up during the technology study, which covered the following process steps:

- Cutting PMMA in various thicknesses (0.3, 1 and 2 mm) with CO<sub>2</sub> lasers
- Removing PMMA in the form of microfluidic structures with CO<sub>2</sub> lasers
- Absorber-free laser welding PMMA with diode laser radiation ( $\lambda = 1660$  nm)
- Laser microstructuring stainless steel (1.4301) with fiber laser radiation ( $\lambda = 1064$  nm)
- Joining a plastic-metal hybrid compound with diode laser radiation ( $\lambda = 940$  nm)

1 *Components of the technology demonstrator model.*

2 *Joined demonstrator model.*

### Result

Based on the demonstrator model, the institute can show the diverse applications of laser technology in the processing of plastics. All laser-based methods are characterized by a high flexibility, high automation and an energy deposition precisely adjustable to time and location.

### Applications

Given the broad spectrum of the procedures, this laser technology is suitable for plastic machining in almost all industries, from the automotive industry via the electric industry to the food and health industries.

### Contacts

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