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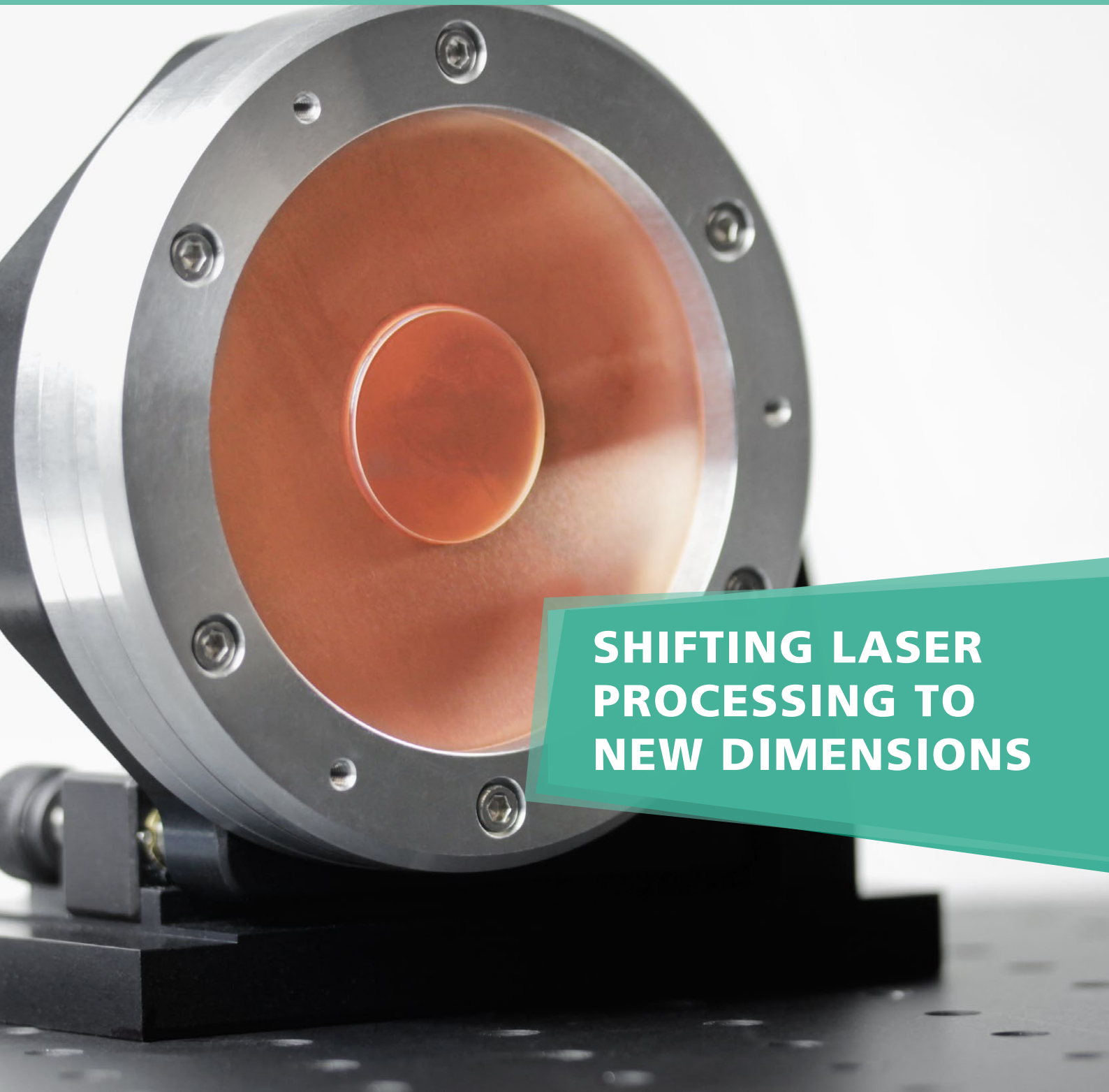
# DYNAMIC FOCUS-SHIFTING MIRROR



## SHIFTING LASER PROCESSING TO NEW DIMENSIONS

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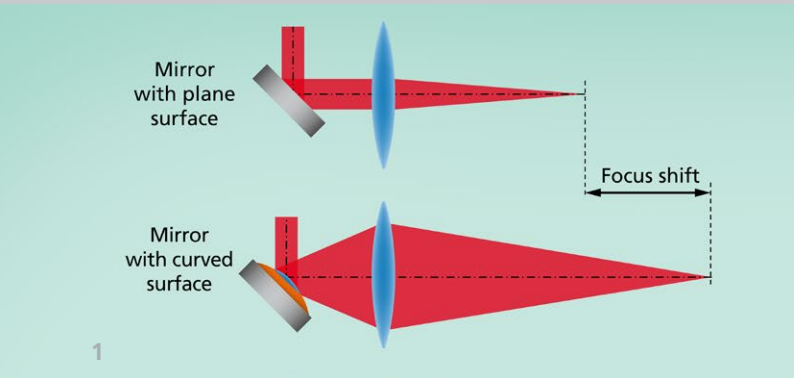

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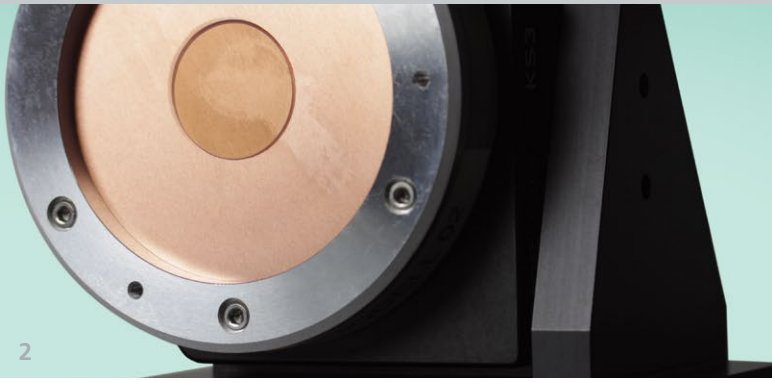
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1 *Possible focal length change.*
2 *Dynamic high-power focus-shifting mirror.*

# DYNAMIC FOCUS-SHIFTING MIRROR FOR LASER PROCESSING

**Laser machining will be driven to whole new areas with this focus mirror. The specific mechanical design allows individual customizations for high-power laser applications such as cutting, welding and micro-structuring.**

The dynamic focus-shifting mirror supports fast focal length changes in optical systems and the adaptation of the focus position in laser processing machines (Fig. 1). The deformable mirror is based on a unimorph concept using a thin glass substrate with a highly reflective multilayer coating applied to a piezoelectric disc (Fig. 2). An integrated copper layer improves the heat dissipation and thus increases the mirror's laser damage threshold. The piezoelectric disc bends the mirror substrate, changing the radius of curvature of the mirror down to a minimum of 3.4 m. Application specific customizations including coatings for various laser wavelengths are possible and the mirror design can be tailored for different beam diameters and angles of incidence.

With this focus mirror, Fraunhofer IOF wants to encourage new, innovative applications in the fields of micro-structuring and 3D material processing using high power lasers. Contact us for further details and a first analysis of how your application scenario can benefit from our new invention

**Features**

- Aperture: 1"
- Response time: <2 ms
- Minimal focal length: 1.7 m (to be combined with a focus lens)
- High-power stability: 6.4 kW @ 1064 nm
- Stable optical beam quality for applications with SM and MM lasers

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