Flexible Beam Shaper Couples Directly to Laser Diodes

SCHOTT has developed a solution for forming “square” laser diode light into a homogeneous beam of light of any desired shape. The beam shaper is made of flexible glass fibers and can be coupled directly with the laser diodes. Collimation lenses are no longer necessary.

Today, laser diodes are used in many applications, including the pumping of solid-state lasers. They are compact and efficient, yet emit light asymmetrically. In order to compensate for this limiting factor, difficult-to-adjust Fast Axis Collimation (FAC) lenses are usually needed. SCHOTT has developed a solution that is much easier to use.

The beam shaper consists of multi-component glass fibers that have been fused into a rectangular shaped input profile. At present, sizes of up to 15.0 mm x 1.0 mm are available. Coupling the laser diodes without FAC lenses improves the overall performance and flexibility of these devices.

The light emitted by the laser diodes can be converted into various shapes, for instance a circular shape with a small diameter, and thus exhibits high laser beam quality. The existing fibers cover a numerical aperture range from 0.4 to 0.8. Furthermore, transmission of 80% is possible for common light guide lengths of up to 2,000 mm.

Beam shapers are capable of withstanding temperatures of approximately 150 °C. However, depending on the power density, the connectors might need to be cooled off. Due to their robust design and easy handling, these light guides make existing applications of laser diodes much easier and improve their performance. This, in

turn, opens the door for new applications in industrial and medical fields, for instance.

SCHOTT North America
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