

TECHNICAL PRESS
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Research project produces new generation of laser bars

Performance boost for laser bars

As part of its “BRILASI” research project OSRAM Opto Semiconductors has improved the performance parameters of laser bars (laser chips) – their efficiency, output power, life time and beam quality – and matched them perfectly to each other. The results include laser chips with a wavelength of 910 to 980 nm that achieve an optical output of 120 W under real industrial conditions and a typical efficiency of 70%.

“With this latest generation of laser bars we will be able to offer much more powerful components”, said Dr. Jörg Heerlein, Head of Product Marketing Lasers at OSRAM Opto Semiconductors. All manufacturers of diode lasers will benefit because OSRAM has been long established as an independent supplier of laser chips and laser bars. The semiconductor specialist will launch its performance offensive with laser bars that have a 50% fill factor. The fill factor of a bar defines the ratio of active width to overall width. The main applications of these laser bars include pumping of solid-state lasers and direct material processing. In addition to laser bars with a wavelength of 910 to 980 nm that achieve an efficiency of 70% at 120 W, there will be laser bars with wavelengths of 808 nm and 880 nm. These will have an efficiency of 62% at 120 W.

Structures with a fill factor of 20% complete the range of new more powerful components. They are perfect for optical fiber coupling applications. Here we can initially expect laser bars in the 910 to 980 nm wavelength range with a recommended output of 80 W.

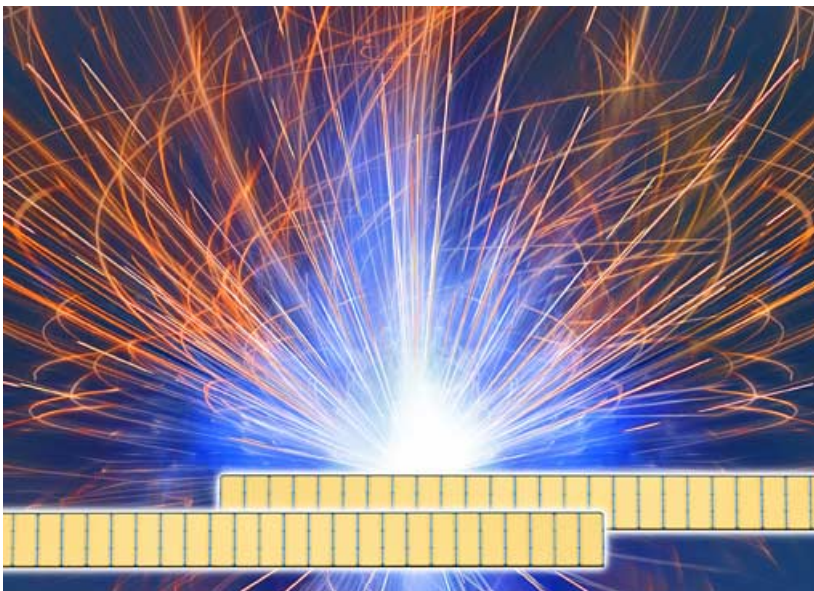
A platform for new applications

With the new more powerful laser bars the system output can be increased with the same life time. Additionally, systems can also be made smaller and more reliable, offering the same output.

Samples of the new unmounted laser bars are already available. The product launch for standard industrial laser bars with a 50% fill factor is planned for summer 2008; structures for optical fiber coupling applications will be launched in fall 2008.

From research to practice

The “BRILASI” research project (Brilliant High-Power Laser Diodes for Industrial Applications, FKZ 13N8601) was initiated by the Germany Ministry for Education and Research. The project executing organisation was the VDI (Association of German Engineers). OSRAM acted as the project coordinator. The project team comprised various partners from the laser system and end user sectors and representatives from research institutes. The aim of the project was to develop highly efficient and reliable diode lasers for industrial applications. OSRAM has achieved the objective of this research project with laser bars which can be used at 100 to 170 W in a 20,000 hour continuous wave (CW) or long-pulse mode - depending on the emission wavelength and mounting technology. The key was the optimization of the epitaxial structures, particular with regard to reducing electrical losses to a minimum. It was possible to reduce the electrical series resistances without increasing the optical absorption losses. The laser resonator was also improved.



Picture: OSRAM

<http://www.osram-os.com/press>

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Performance boost for laser bars

The optimized laser bars herald a new generation of diode lasers. At 120 W they achieve almost twice the output and 10% higher efficiency than previous components.

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