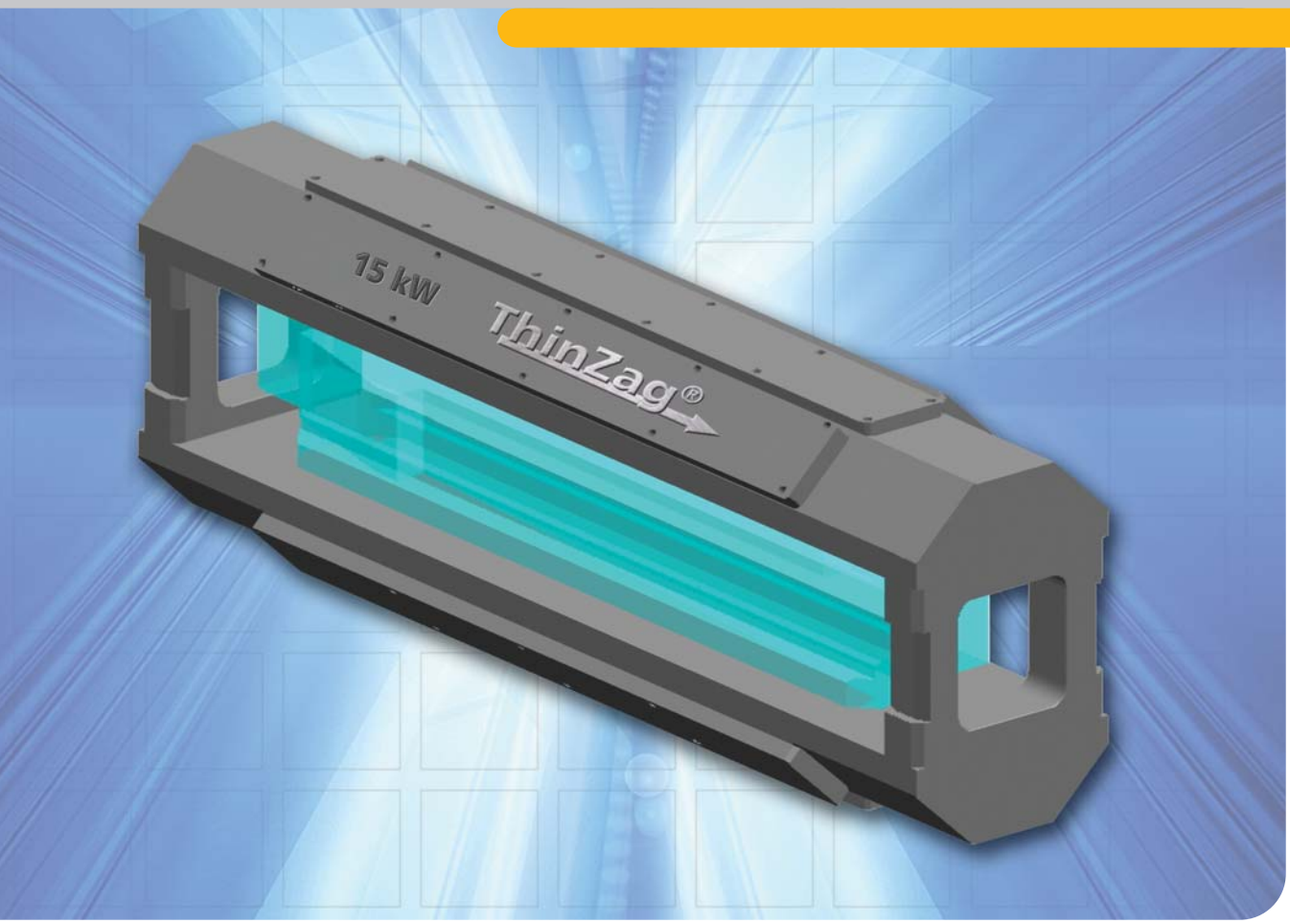
SSLW

SOLID STATE LASERS

Developing tomorrow's precision-strike weapons today



ThinZag® Solid State Laser Technology

Textron Systems' engineers are developing tomorrow's precision-strike weapons today, based on ThinZag®, solid state laser technology. Shifting their designs from crystals to ceramic, engineers can now use larger slab sizes for the gain material. While the military currently uses lasers to guide weapons in combat and to defend aircraft from shoulder launched missiles, in the future, high energy lasers themselves will be used as weapons—precision-strike weapons that limit collateral damage.

SOLID STATE LASERS

A Tradition of Excellence

Since Textron's acquisition of Avco Corporation and the Everett Research Laboratory in 1986, Textron Systems has perpetuated a legacy of expertise in high power laser research and development.

The 1960's, 1970's and 1980's led to the development of landmark high-power lasers such as Humdinger, Thumper and Big Bang for use by the military. The technology flourished in the mid-1980's with the introduction of the EMRLD Excimer laser.

By the 1990's gas lasing materials were being replaced by solid state materials. That's when Textron-Avco scientists—with financial support from the Department of Defense — successfully developed a technique to overcome waste heat dispersion that limited the size and power that these systems could generate.

The ThinZag® Approach

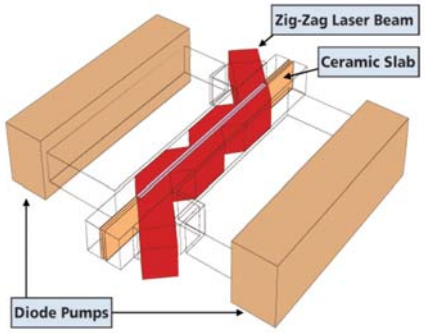
In 2004, Textron Systems funded the scaling of its ThinZag laser from 1 kilowatt to over 5 kilowatts of average power. When combined with the newly developed mechanically robust solid-state ceramic laser material, ThinZag lasers have demonstrated 1, 5, and 15 kilowatts of continuous laser power and have potential to produce even higher power levels from a single laser module.

In 2005, the Department of Defense awarded Textron Systems a contract under the Joint High Powered Solid State Laser (J-HPSSL) program to develop a laboratory-demonstrated 100 kilowatt solid state laser. This program aims to demonstrate that solid state lasers at a technology readiness level of three can generate output power at the 100 kilowatt level continuously with good beam quality.

In 2007-2008 Textron Systems was awarded contracts from DARPA/STO to pursue further development of high power laser technology under the High Energy Liquid Laser Area Defense System (HELLADS) program, with emphasis on lightweight, compact systems.

To achieve these goals, scientists and engineers at Textron Systems are combining their ThinZag laser optical configuration with the newly developed ceramic Nd:YAG laser material. Conventional lasers rely primarily on crystals as the laser medium, but Ceramic Nd:YAG enables larger sizes, better medium uniformity, and higher thermo-mechanical fracture strength.

Textron Systems is recognized in the laser industry as the champion for large single module scaling by use of ceramic laser gain material, enabling fieldable system architectures that are simpler and more compact.



ThinZag technology provides a unique path for scaling high power solid state lasers to high average power for use in the most severe operational and environmental battlefield conditions.

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