



laserline

LASER 2007 June 18-21

World of **PHOTONICS**

Verdi Green Laser

Xantos XS Excimer Laser

Diamond CO₂ Family

Legend Elite Ti:Sapphire Amplifier

LabMax High Performance Energy Meter

New PulseLife™ Product Family

New Scientific Field Service

Coherent displays largest product portfolio ever.
We kindly invite you to visit the Coherent booth
located in hall B3, booth nr. 446

This year Coherent is presenting the largest program of lasers and laser diagnostics available in the industry. The 300 m² Coherent booth will have 30 sales and application experts available to discuss your needs and your application.

The following pages will give you a short preview about product news at LASER 2007.

A special grey scale laser marking machine will be on duty to create your personal photo smart card.

Coherent's strong presence in Europe.

With over 800 employees Coherent achieves 30 % of their total business in Europe. The company has 5 European subsidiary offices providing a high level of Sales and Service support directly to its European customers.

Coherent also provides a range of Training, Demonstration and Applications facilities within its European locations. Manufacturing sites are in Leicester, Glasgow, Tampere, Luebeck, Goettingen and in Munich.

Coherent is constantly seeking qualified and motivated employees. You can find all open positions at www.coherent.de/jobs

Coherent in Europe:

Tampere, Finland | Semiconductor Manufacturing
Glasgow, UK | Ultrafast and CW Lasers Manufacturing
Leicester, UK | Optics
Ely, UK | Sales and Service
Utrecht, The Netherlands | Sales and Service
Luebeck, Germany | Diode Pumped Solid State Lasers Manufacturing
Goettingen, Germany | Excimer Lasers Manufacturing
Dieburg, Germany | Sales and Service
Munich, Germany | Excimer and Solid State Lasers Manufacturing
Orsay, France | Sales and Service
Milan, Italy | Sales and Service

Verdi, the best high-power green laser – is it possible to improve it?

Released in 1996, the Verdi™ has shown its superior reliability and performance over the past 10 years. It is the only commercially available laser that is:

- * single frequency
- * low noise
- * maintenance-free
- * CONSISTENT dependable for many, many years

Therefore, the Verdi is the ideal workhorse that always enhances your application – now and in the future.

Is it possible to improve the Verdi's superior performance and reliability? Let's consider the cost of ownership.

Within 10 years, and sometimes in Verdi lasers operating tens of thousands of hours, WE HAVE SEEN EXCELLENT DIODE LIFETIMES.

This success in long-term operation is based on:

- * Aluminium-free Active Area (AAA™) diode material
- * Self-optimization MIN-I™ system
- * Alignment-free optics (patented PermaAlign™ manufacturing techniques)
- * No fibre bundle
- * Hermetically sealed diode bars and laser head

Nevertheless, pump diodes are consumables and eventually need to be replaced.

Therefore, the new Verdi V8 and V10 models are pumped by only one 880 nm pump diode, rather than two diode modules previously. At 880 nm, thermal lensing is smaller and the efficiency is higher.

This one-diode design results in lower power consumption, fewer consumables, and a lower cost of ownership. And, as you would expect from Coherent, we have tested this one-pump technology extensively. That attention to detail is what makes Verdi the proven leader in pump lasers.



Self-Contained Excimer Laser “Xantos XS” features simplified Installation and Operation

Coherent has introduced the Xantos XS, a self-contained excimer laser that features dramatically simplified installation and operation.

Specifically, this new excimer laser contains an internal gas compartment, consisting of pre-mixed laser gas bottle and all necessary gas supply equipment for laser operation. This enables automated gas re-filling without external gas and vacuum lines, and meets all international gas handling and safety standards.

In addition, the Xantos XS operates from a single-phase power source and requires no water cooling, making it a “plug and play” tool that can be easily installed and/or simply moved to a new location without the need for specialized support infrastructure. The laser is available at all fluoride wavelengths – 157 nm, 193 nm, 248 nm, and 351 nm – and delivers moderate pulse energies at repetition rates up to 500 Hz. These characteristics make the Xantos XS an ideal tool for both scientific and precision industrial applications.

Based on the field-proven Excistar XS laser, this unique, self-contained laser also features long tube lifetime, high reliability, and long gas lifetimes thanks to its Almeta all metal-ceramic tube technology. This translates directly into very low cost of ownership, in addition to flexibility and ease of use.

With a beam cross-section of 6 x 3 mm and excellent beam uniformity, the laser output can be easily utilized in a wide range of scientific and industrial applications. The concept of an integrated gas compartment is a unique feature in the excimer laser market and makes laser operation as flexible as possible.





Coherent streamlines Diamond CO₂ family

Sealed CO₂ lasers dominate many materials processing applications, in large part because they offer the lowest cost per watt of any industrial laser technology, together with the broad applicability of their mid-infrared output

Our Diamond family of sealed CO₂ lasers has become the first choice tools in many of these applications because they offer superior stability, excellent mode quality, proven long-term reliability, and fast pulse rise & fall times. We're now streamlining and expanding the entire Diamond product line to support the growth for new CO₂ laser applications. We are developing several new products to reflect changing demands in the marketplace.

The Diamond C family of CW lasers offers output powers up to 70 watts in a fully integrated package, where the RF supply is incorporated within the laser head. While these lasers are commonly referred to as CW, their output can be pulsed at repetition rates up to 25 kHz. These lasers are mainly used in engraving and marking applications. Key demands for these applications are lower purchase cost and smaller footprint, but without a sacrifice in beam quality or laser reliability.

Coherent is meeting the small footprint requirement by using a folded waveguide design, which also contributes to their very fast pulse rise & fall time and delivers excellent beam quality (typical $M^2 = 1.2$). These are major benefits for both marking and engraving, where power on demand and power control are very important in obtaining good results. As reliability is key to grow the market and establish new applications Coherent

champions this area with a continuous improvement/corrective action program to identify and eliminate failure mechanisms. Recent developments in this ongoing program have included several advances in the tube design and fabrication which have extended the maintenance-free lifetime of the C series.

The Diamond G & K family is a series of pulsed lasers with output powers in the 100–500 W range and repetition rates as high as 100 kHz. These lasers offer a very high power/size ratio because they use a slab-discharge resonator design. Moreover, their peak power increases inversely with pulse duty cycle and can be up to 3X the average power. In conjunction with a M^2 value of < 1.3 , this enables processing of tougher materials such as ceramics and thin metals. Diamond G & K-Series lasers service a diverse range of applications, ranging from via drilling to textile, glass and plastic cutting, as well as converting applications such as paper perforating and slitting. In these high-throughput OEM applications, the entire manufacturing system may cost millions of dollars. Consequently, downtime is often a more significant buying consideration.

So, the main market demands are for high reliability, ease of integration, superior beam quality, and support issues such as diagnostic tools and fast field replacement when necessary. One example of how Coherent is responding to these needs is ease of integration. Specifically, lasers in this power range typically have a separate RF source and a thermally shielded RF cable that must handle many kilowatts of RF power. Eliminating this cable by incorporating the RF source within the laser head can therefore simplify integration and increase laser reliability. An important new series of lasers will be launched at Laser Munich and will premiere this concept at this power level.





Better Ultrafast – Every Day: Legend Elite

A fully integrated Ti:Sapphire Amplifier System with superior stability, higher power and shorter pulses.

The new Legend Elite is a compact Ti:Sapphire regenerative amplifier that delivers pulse energies over 3 mJ at 1 kHz repetition rate, with a pulsewidth < 35 fs and $M^2 < 1.35$.

For experiments that need even higher pulse energy the new Legend Elite-Duo delivers over 6 mJ at 1 kHz with a pulsewidth < 40 fs and $M^2 < 1.5$. With an integrated Evolution pump laser and thermally stabilized RGA cavity, the Legend Elite and Elite-Duo set new standards for both passive and active stability in short and long term.

Legend Elite is a single-stage regenerative amplifier whereas the Elite-Duo has an added single-pass linear power amplifier stage. Both amplifier stages use a new generation of thermoelectrically (TE) cooled Ti:S crystal. Because both amplifier stages are integrated into one box and pumped by a single 45 mJ Evolution-HE pump laser, the Legend Elite-Duo is simple in design, easy to use and extremely stable. There is a single software/hardware controller for the entire system. For experiments requiring more than 10 mJ at 1 kHz repetition rate there is the Legend-Cryo multipass amplifier to power amplify the output from the Legend-Elite.

For seeding the Legend-Elite, the **Micra™** delivers broad bandwidth (> 100 nm) mode-locked pulses with high average power from a user-friendly package with integrated Verdi™ pump laser. To optimize the seeding of any ultrafast amplifier the Micra offers user-adjustable spectral bandwidth (from < 30 nm to over 100 nm) and center wavelength tunability.

The Micra-5 has an integrated Verdi-5 W, and for higher power requirements the Micra-10 has an integrated Verdi-10 W. The Micra is available with a full range of accessories and options, including RF synchronization (Synchro-Lock AP), carrier-envelope phase (CEP) stabilization and the **Silhouette™** pulse shaper to generate < 30 fs pulses from the Legend-Elite.

The new **OPerA-Solo™** is following the proven OPerA product. It incorporates improved **Topas™** Technology with all beam routing, wavelength extension options (tuning range 240 nm – 18 μ m) and wavelength separation optics in a single, computer-controlled, integrated unit.

The combination **Micra-Silhouette-Legend Elite-OPerA-Solo** will bring your ultrafast research to a new level. It's Better Ultrafast – Every Day.

Applications include:

- * studies in molecular dynamics
- * photochemistry
- * photo-electron generation
- * fluorescence upconversion
- * non-linear optics
- * attosecond physics
- * high energy physics





Coherent introduces LabMax, a new high performance power and energy meter that integrates with Coherent's unique position-sensing thermopile sensors and the new line of EnergyMax sensors.

Coherent is proudly presenting the new LabMax Meter at Laser 2007 in Munich.

This is a unique solution in terms of performance and flexibility for the customer that supports position-sensing power measurements and pulsed measurement to 10 kHz. The Li battery pack (included) and compact size makes it the ideal tool for field and laboratory use. It can be directly controlled through the ergonomic front panel or controlled by USB, RS232 and GPIB. A LabView Instrument Driver and ActiveX component allow easy integration into measurement environments, and the triggering and synchronization abilities allow for complex experiments.

The meter can be combined with all major Coherent sensors (thermopile, optical, and pyroelectric), and with the newly released EnergyMax series. EnergyMax sensors are available for multipurpose use, as well as specialized measurements on Nd:YAG and its harmonics, UV applications, high repetition rate measurements up to 10 kHz, and at average powers greater than 25 W.



The NEW PulseLife™ product family brings telecom-grade reliability to high power diode lasers

We took telecom grade packaging processes and combined them with our proven AAA™ 808 nm and high efficiency 9xx nm device technology to create the next generation of high power diode pump products. This convergence of technologies extends the versatility and reliability of our high power diode products to give the user, higher operating temperatures, increased output powers, and power cycling; all with commercial-level reliability and value.

This new product line includes:

Single bar **PulseLife Conductively-Cooled Packages (CCPs)** that deliver 50 Watts with > 10,000 hours mean time to failure (MTTF). This reliability is maintained even under tortuous "on-off" cycle conditions due to the optimum balance between thermal conductivity and expansion coefficient matched packaging. Available at 810, 940, and 980 nm, PulseLife CCPs are ideal for demanding direct diode applications, such as plastics welding and soldering.

Vertical conductively-cooled **PulseLife G-stacks** with standard 808 nm bar configurations up to 700 Watts pulsed quasi-CW. With a lifetime expectation > 1×10^9 shots even up to 50 °C heatsink temperatures, these G-stacks set a higher standard of reliability for commercial and defence solid state laser pumping, illumination, and direct diode applications.

PulseLife™ Horizontal Arrays are new water-cooled packages that deliver powers of 80 and 120 Watts CW at 808 nm in two and three bar linear arrays, respectively. These arrays feature Coherent's all-new "macro" channel cooling architecture to eliminate the corrosion problems that have plagued other cooling approaches; enabling a water-cooled package without the cost and complexity of a water condition control system. With a superior lifetime characteristic of > 20,000 hours MTTF, these linear arrays are targeted at side pumped DPSS manufacturers who want higher performance and a lower cost of ownership.



New Scientific Field Service Manager for Benelux, Germany and Austria

Since October 2006 Sven-Olaf Soltau manages the Field Service Group for scientific customers in the Netherlands, Belgium, Germany and Austria. Sven-Olaf joined Coherent in 2000 and has worked in both Sales and Service roles. He holds a physics degree which he obtained from the University of Konstanz in 1996.



The Field Service team for the Benelux, Germany and Austria consists of 5 engineers and managers, who support a very wide range of scientific laser systems with more than 50 years of combined laser experience.

The team is based at the Coherent BV office in Utrecht and at the Coherent GmbH office in Dieburg. Service engineers are also located in the field to be as close as possible to important universities and

institutes. A clear focus is put on providing the highest level of service and support to Coherent's scientific customer base, all built on a long-term relationship.

Their high educational level enables the Field Service team to also provide technical assistance to customers having demanding applications.

Additionally Field Service has a strong interaction with the European Tech Support Group, which takes care of large Ultrafast laser systems, having the advantage that Coherent customers get a one-stop service.

With a recently launched initiative customers will start to see new levels of post-sale customer care. This initiative will make the whole process of new system delivery and installation much more transparent to the customer. Sven-Olaf says: "Everything is aimed at bringing our customers up to speed as quickly as possible, so that our laser systems can do what they were bought for: Enable our customers to do exciting research."

For further information please select your country and send your inquiry to the mentioned e-mail address or give us a call.

See you at LASER 2007!

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