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Newsletter September 2010

More than 1,000 installations:
Paladin – The Standard in Quasi-CW UV Lasers

Cher client,

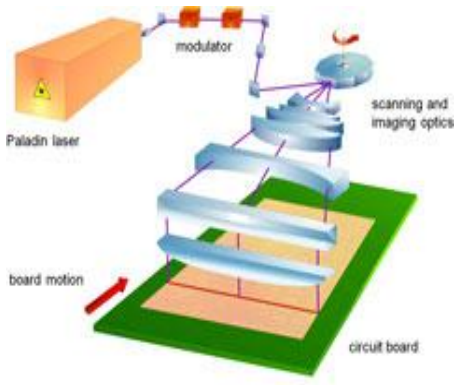
Paladin™ lasers – introduced in 2001 – have developed into the undisputed standard for quasi-CW, high-power UV lasers in materials processing and inspection. With more than 1,000 installations worldwide Paladin is writing laser history. The success of the product line is achieved by its outstanding technical and economic features such as:

- Broad power spectrum (2 W, 4 W, 8 W, 10 W, 16 W) allows for best power-price package tailored to each application.
- Best reliability, lifetime and unit-to-unit consistency enabled by Aluminum-free Active Area (AAA™) pump diodes, clean room-manufacturing with PermAlign™ solder-bonded optics for best mechanical and thermal stability as well as hermetically sealed laser heads.
- Hands-free, stable-parameter operation for over thousands of hours among others due to fully computer controlled operation with automated SHG/THG optimization.
- Virtually downtime-free operation plus high wall-plug efficiency result in the most economic laser in this class (capital, operation, maintenance costs).
- High UV (355 nm) peak powers, short laser pulses (picosecond range), high repetition rate (80 or 120 MHz), excellent beam quality (i.e. TEM_{00}, $M^2 < 1.2$) allows for materials processing with µm precision, minimal thermal effects and highest process quality.

Paladin is a well recognized industrial work horse which has found its way into a multitude of applications. Examples:

LDI (Laser Direct Imaging) of Printed Circuit Boards

The trend towards reduced size, weight, greater functionality, increasing production speed, flexibility, yield, and reduced costs is resulting in high-density interconnect (HDI) circuit boards with increasing number of layers, thinner layers, reduced size for track widths, vias, through-holes,



Scheme of a Laser Direct Imager with Paladin

pads. The production batches become smaller, lead-times shorter. Just-in-time manufacturing is no catchword anymore but a demand. LDI-direct laser imaging of patterns onto the photoresist-coated panel – has developed to a well established technology with hundreds of systems installed worldwide.
In standard LDI implementations, the laser beam is high-speed scanned line by line over the panel writing the circuit pattern directly into the photoresist layer. During a line scan the laser beam is on/off-switched according to the pattern information. The complete process is fully computer driven and controlled by the front end CAM system. The need for a phototool is eliminated.

Key advantages of LDI over conventional techniques are flexibility, time and cost savings for small and medium-size batches, no film-associated quality problems, and higher accuracy.

Thin Film Patterning

FPD thin film layers and transparent ITO anodes are selectively and precisely patterned at high speed without any damage of the substrate. The laser replaces the conventional mechanical and wet chemical technologies.
In the same station the laser can also be applied to repair short circuits and remove defects in the layer system.

Sapphire Scribing

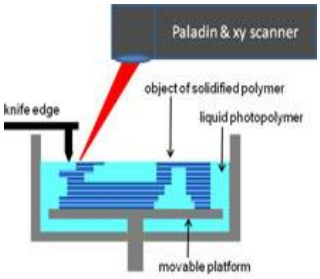
LEDs used in flat panel displays and high-power applications are based on GaN grown on a Sapphire wafer. Sapphire is ideal because of its lattice match with GaN, its transparency and good thermal conductivity. However, it is also expensive, hard and brittle. Paladin's UV light, with its high average power, superior power stability and beam quality allows for excellent scribes with very narrow cuts.

Low-k Materials Scribing

With the shrinking size of integrated circuits the insulating gaps between interconnects become narrower. Higher circuit speeds require lower line impedances. This demands materials with a low dielectric constant. Today's low-k dielectric materials are soft causing chipping and delamination when singularized with conventional diamond saws. Paladin short-pulse, high-power UV lasers cut the low-k epitaxial layers chipping-free with high speed and µm precision.

Stereolithograpy for Rapid Prototyping and Rapid Manufacturing

This novel technique rapidly creates complex, 3-dimensional parts from a photopolymer resin directly from a CAD file without any mechanical machining or chemical processing.
Compared to the usually applied Q-switch laser the quasi-cw Paladin allows for higher resolution, finer contours and smoother surfaces.



Scheme of a laser stereolithography setup

Today Paladin is applied in a multitude of different applications. However, the potential of this exciting

product has not yet been fully exploited. Do you have
a delicate application and are looking for ways to process? Then do not hesitate and contact us. Dr. Torsten Rauch, Product Manager of the Paladin line, is looking forward to discussing with you the possibilities of our technology.

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About Coherent, Inc.

Founded in 1966, Coherent, Inc. is a world leader in providing laser-based solutions to the commercial and scientific research markets.

To find out more about Coherent, visit our website at www.coherent.fr
or call 01 69 85 51 45.

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