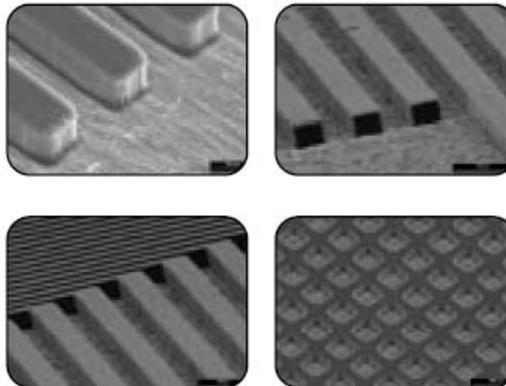


## Streamline Adds Two Paragon SM 20 Laser Direct Imaging Systems to its Arsenal of multiple Paragon 8800 LDIs:

### Streamline's experience and future with Laser Direct Imaging

Streamline Circuits Corporation of Santa Clara, Ca, continues its commitment to time critical, technically demanding printed circuit board manufacturing with its recent investment in Laser Direct Imaging (LDI). Adding to an already impressive list of high tech capable equipment are two [Paragon SM 20](#) imaging systems from [Orbotech](#). Laser Direct Imaging itself is at the forefront of PCB manufacturing technology. With the use of LDI, Streamline will eliminate nearly all silver and/or diazo film image processing, ensuring more accurate imaging registration, with better line clarity, and higher yields.

When Streamline purchased its first LDI machines, two Paragon 8800s, the machines were considered the highest technology offered in the PCB industry. At a through put rate of up to 140 prints per hour, even the most advanced of PCBs are imaged with complete efficiency and pin point accuracy. This includes inner and outer layers, flex PCBs, and soldermask. The 8800 uses a 24" (609 mm) wide-scan lens and a powerful solid state laser to be able to expose an entire panel in one scan. It also maintains a precise, "on-the-Fly" registration in which it locates the targets of the board, compares the targets' actual position to the CAM data, and then applies alignment and scaling factors during exposure. All of this is performed in one smooth motion as the panel moves to exposure. Thus, there is no need to stop the panel in order for the camera to acquire the target image, and thus cycle time is greatly reduced. The 8800 and SM 20 systems have adjustable resolution capability to over 10,000 dpi which helps over cover complex design features down to 25µm

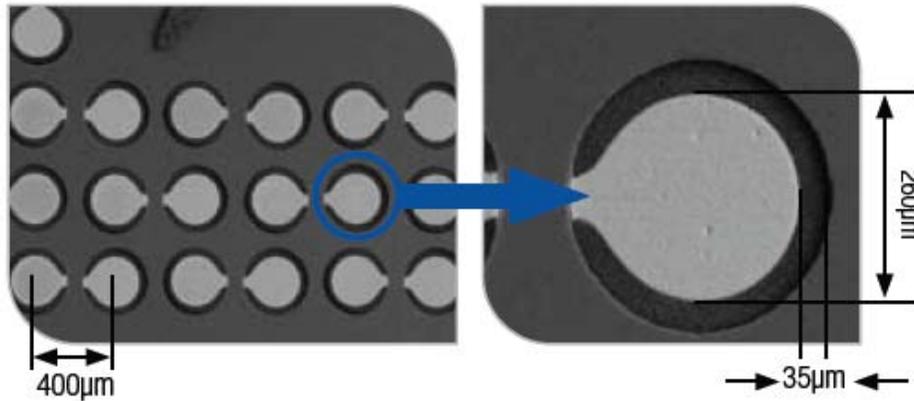


25µm features exposed by Paragon

The wide range of power settings from a low intensity of 8 millijoules per square centimeter ( $\text{mj}/\text{cm}^2$ ) to a high intensity of over 1800  $\text{mj}/\text{cm}^2$  for the 8800 (8 watt) and over 3500  $\text{mj}/\text{cm}^2$  for the SM 20 (16 watt) allow streamline to image virtually all types of UV sensitive media from the fastest LDI resist to conventional, resist including soldermasks, and do it extremely efficiently.

Streamline's two newly purchased Paragon SM 20s have the same capabilities as the 8800s, but add a few very important enhancements. The Paragon SM 20 has twice the power levels and an extremely high depth of focus of  $\pm 300 \mu\text{m}$  (12 mils) which will allow Streamline to conquer uneven surface topography found on etched outer layers often experienced in second image processes for selective finishes or during the soldermask process. The registration capabilities of

LDI are extraordinary and enable the customer to continue to push the limit of PCB technology.



The feed back capabilities will aid our continuing effort to hold tighter registration reducing the requirement hole to pad clearance needed in the current processes.

Streamline Circuits President Greg Halvorson comments on the LDI machines saying that they, “virtually eliminates film usage, reduces defects, and allows our company to continue to shorten cycle times in imaging, which is one of the most critical areas in manufacturing.” The company expects to receive and bring the SM 20s into play in as early as eight to ten weeks. Streamline considers it a necessity to be at the forefront of technology. By utilizing Laser Direct Imaging in the PCB manufacturing process, the company cannot only achieve that, but also upload its reputation of fulfilling orders at staggering speeds.

Streamline Circuits is a leading manufacturer of high quality Printed Circuit Boards offering Rigid, Rigid Flex and Multilayer Flex. We are committed to providing our customers the most advanced technology, quality and engineering support available. Streamline’s customers take advantage of these highly valued resources to develop a cost effective product in a time sensitive manner. These capabilities are critical for today’s technology driven customers. Streamline services communications, military & aerospace, industrial electronics, instrumentation and medical equipment markets, who need to get their quality products to market first.

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