



Photonic Curing and it's wide range of application

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How to reduce process time and improve parts quality by using photonic curing processes? Photonic curing is well known for soldering applications but has also advantage on new applications which are linked to coating and Lift-Off applications.

Merconics and NovaCentrix have enjoyed a strong partnership for many years, combining expertise in different markets, and the possibilities of using photonic curing to improve product quality and reduce process times.

Possible applications

Photonic curing uses a special high energy flash lamp, capable of curing, drying, and annealing surface coatings on temperature-sensitive substrates. It is also possible to cure metal inks to build up conductive traces on these same materials. With the ability to cure a wide range of different layers on optical components, one also sees advantages with process times being reduced. In addition to layer curing processes, printing is yet another application with this technology.

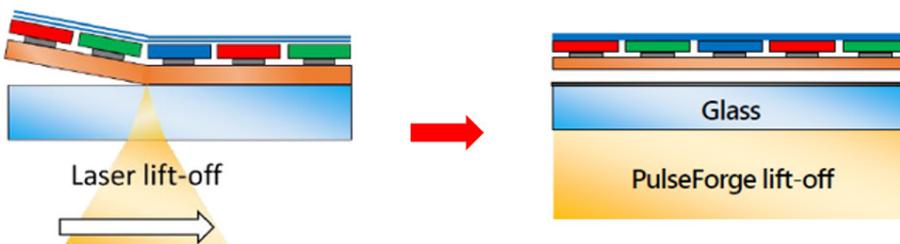
Which materials have been demonstrated?

Various materials processed on the PulseForge system:

- a-Si films
- Semiconductors for PV applications (CdTe, CIGS, perovskites, etc.),
- IGZO for displays
- PZT ceramics
- ITO processing
- Copper and Silver Inks
- All different kind of solder paste

PulseForge Lift-Off

The newly developed PulseForge Lift-Off process is having a huge advantage besides the current technology using a scanning laser beam to initiate the debonding process. With one pulse you can already delaminate a huge area which will reduce the stress within the device and will improve the processing time

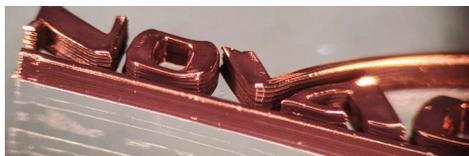


significantly.

PulseForge Printing

It is an emerging application from NovaCentrix for patterning high aspect ratio prints of a wide variety of functional inks or other materials and components in a rapid and non-contact technique. The printing is achieved using high power pulsed light and an engraved print plate.

Existing copper and silver high viscosity inks can achieve high aspect ratio pattern (~1) in a single print or super high aspect ratio pattern (>2) with multiple aligned printing. This can also achieve super thick prints (> 1.5 mm). Current best print resolution is < 25 µm pattern width with < 50 µm pitch. Aligned printing at such fine resolution requires sophisticated overlay techniques.



Think about the process between traditional screen printing and dispense printing process. PulseForge Printing has an advantage over the current technologies of screen printing and dispenses printing technologies in mass

production – namely it can produce thick and high aspect ratio patterns compared with screen and can be much faster and finer resolution than dispense.

With the mentioned application in this article merconics is working within the area of automotive, aerospace, consumer electronics, health monitoring, medical, solar, batteries and more just to mention the wide area of usage. The advantage of this application is always where you are working on sensors built on low meltpoint substrates. Besides this it can be used in all ways of soldering on flexible materials like batteries.

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<https://www.merconics.com>

Sources: merconics.

	Screen	Dispensing	Photonic Printing
Resolution (µm)	~ 50	~ 100	< 25
Viscosity (cps)	10k – 300k	1k – 300k	1k – 1M
Dry film thickness (µm)	3 - 150	20 - 150	3 – 3000
Aspect ratio	0.5	0.5	> 1
Variable print thickness	No	Yes	Yes
PCBs/hour	~ 250	~ 100	~ 2500
Non-contact	No	Yes	Yes

