



Rely on us.SM

UV LED Technology from Flint Group Narrow Web
The Future is bright – The future is now



FlintGroup
Narrow Web

UV LED – the Time is Now!

UV LED is an alternative curing technique to mercury lamp curing which is primarily used today to cure UV inks in the narrow web industry. Used already in many industrial applications, such as visible lighting, water purification, and wood coatings curing, LED technology has now crossed over into printing applications. UV LED curing is used regularly in UV inkjet, large format UV screen and UV sheet fed applications. UV LED is an abbreviation for UltraViolet Light Emitting Diode. It offers significant advantages over mercury lamp curing.

Curing Mechanism and Formulation

UV curing with a LED lamp occurs exactly the same way as when using a standard mercury lamp. The ink, coating or adhesive when exposed to the UV lamp undergoes a polymerization reaction.

The main difference between a standard mercury lamp, and a LED lamp is the wave lengths emitted from the lamps which are available for curing to take place. A standard lamp has a broad spectra of wavelengths which spread from UV-C through UV-B and UV-A and visible and infrared. This means that an ink or coating formulation can have a mixture of photoinitiators that cure over this range of wave lengths.

Today's commercial LED lamps for Narrow Web have a narrow wavelength range, with a peak around 385 - 395nm. Therefore the ink and coating technologies have been reformulated so that the reactivity and cure results meet printers requirement at this LED output. LED lamps also vary in irradiance output. In our industry, typical irradiance output is between 16 - 20 Watts/cm². However lower irradiance outputs can be used successfully depending on application and speed, etc.



Flint Group Narrow Web has close co-operation with all the leading suppliers of UV LED lamps, and we have tested and can verify that our EkoCure products cure exceptionally well with lamps from Phoseon, Air Motion System, GEW and IST. Qualification with other lamp manufactures is ongoing.

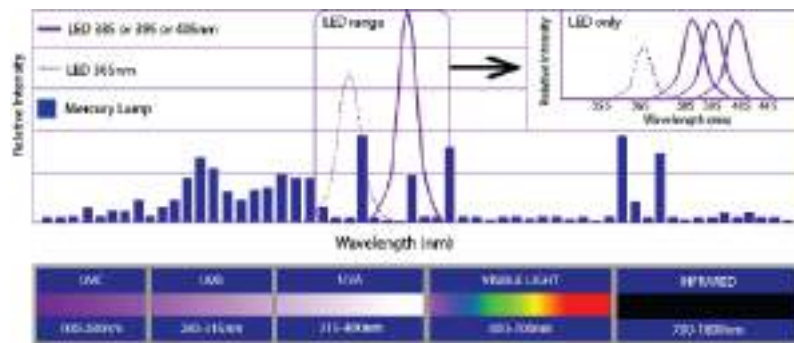


Image by kind permission of Phoseon

LED Curing and Systems Advantages

There are many advantages to using LED lamps. These can be split into performance, productivity and environmental advantages.

Performance advantages: Deeper and more reliable curing with LED

UV LED light with its high peak irradiance, and UV-A and visible light emission, provides a deeper penetrating light source. This enables better cure of thicker films (such as screen printing) and darker more opaque colours (such as blacks and opaque whites). Therefore, printers who do combination printing should be able to print at faster speeds with more assuredness of cure and adhesion. A LED curing process is much more in control than a mercury curing process which is very important for productivity and especially important when printing food packaging where low migration is a concern.

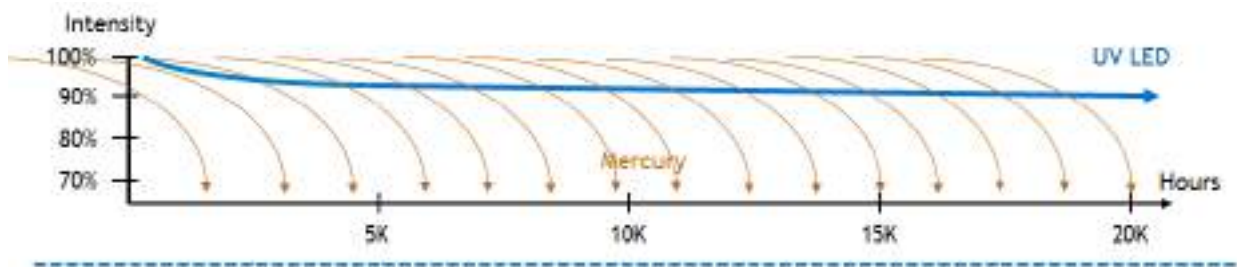


Image by kind permission of Phoseon

Productivity Advantages:

- Improved UPTIME – There is less press down time related to replacing mercury lamps and shutters/reflectors and press operators do not have to wait for lamp warm ups and cool downs.
- Reliable cure/higher productivity – Reliable curing allows for faster printing speeds and more combination printing.
- Energy Savings – UV LED lamps require ~ 50 - 80% less energy than conventional mercury lamps.
- Long Lifetime & Low Maintenance – UV LED lamps last over 20,000 – 50,000 hours of run time, over 10 x as long as mercury lamps. Therefore it require less maintenance.
- Expanded press capability - Heat sensitive/thin films can run on press without heat management. A LED lamp does not have infrared and thus does not create as much heat as mercury lamps do.

Environmental & Safety Advantages:

- Removes mercury from the process and there is no need to deal with hazardous waste disposal of lamps.
- Removes ozone generation since there is no UV-C light output from the lamp – ozone is a respiratory hazard and pollutant.
- Lamps are not as hot and thus are safer for the printer operators.
- Systems are much quieter, since exhaust blowers are not needed.
- The bright blue light emitted from the UV LED lamps is not recommended to look at, but unlike standard mercury lamp do not emit UV - C light which is dangerous to the eyes.

Flint Group Narrow Web Printing Inks for LED Cure



EkoCure™ F, UV LED flexo inks

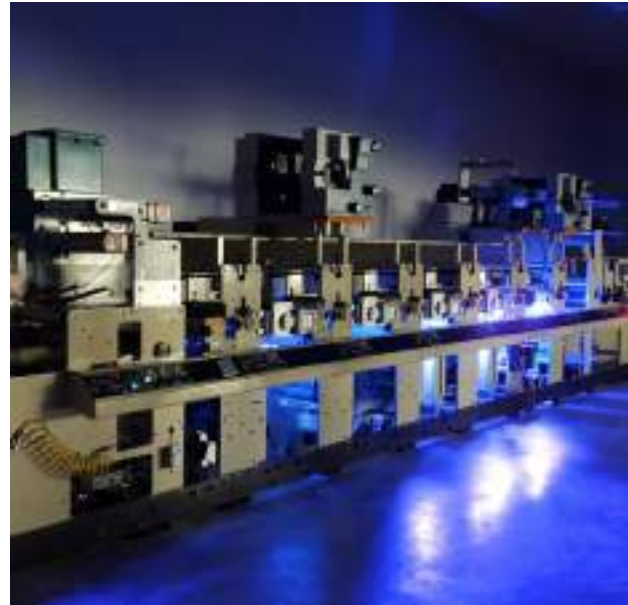
EkoCure F is a high performance UV Flexo multi-purpose ink:

- Is supplied press ready at optimal viscosity.
- Demonstrates excellent adhesion to a wide range of papers and synthetic films.
- Has high density and low dot gain to give excellent printability.
- Makes combination printing easier with LED technology as inks cure faster and better giving improved overall adhesion and intercoat adhesion.
- Is modelled after our existing technologies so it will be easy to substitute.
- Uses the same anilox rollers to achieve the same color densities and color matches vs. Flexocure Force.

EkoCure F is commercially available around the globe with 20+ converters using more than 400 lamps and getting the productivity and economic benefits of this technology.

You can learn more right here at Flint Group!

- **We can organize a press trial at Flint Group's Center for Technical Excellence or at a press OEM**
- **And let us help you set up a press trial at YOUR facility**



Ekocure range continued



EkoCure SN

High performance easy over-printable Opaque White UV LED curable screen ink, with excellent overprint performance with all print methods. Can be used in all rotary screen units and is suitable for a wide range of applications and substrates. Additionally we have a full range of over printable rotary screen colours.



EkoCure Metallic inks

One part press ready gold and silver inks formulated to bring highest metallic effect and improved curing / higher speeds. We also offer a VMP high foil effect LED silver that rivals solvent gravure performance.



EkoCure Coating and Adhesives

UV Flexo coatings and various adhesive technologies are available. The range of coatings includes gloss, matt, TTR and cast and cure. PSA adhesives, lamination and cold foil adhesives are also available. LED and cold foiling is a great combination as LED light cures very well thru the cold foils (better than mercury light).



EkoCure Whites™ for shrink applications



EkoCure™ IVORY and EkoCure EBONY

These products are our highest opacity white and most dense black in UV flexo print.



EkoCure™ ANCORA

For food compliant applications, our newest product offering. Talk with your local sales representative about your interest.

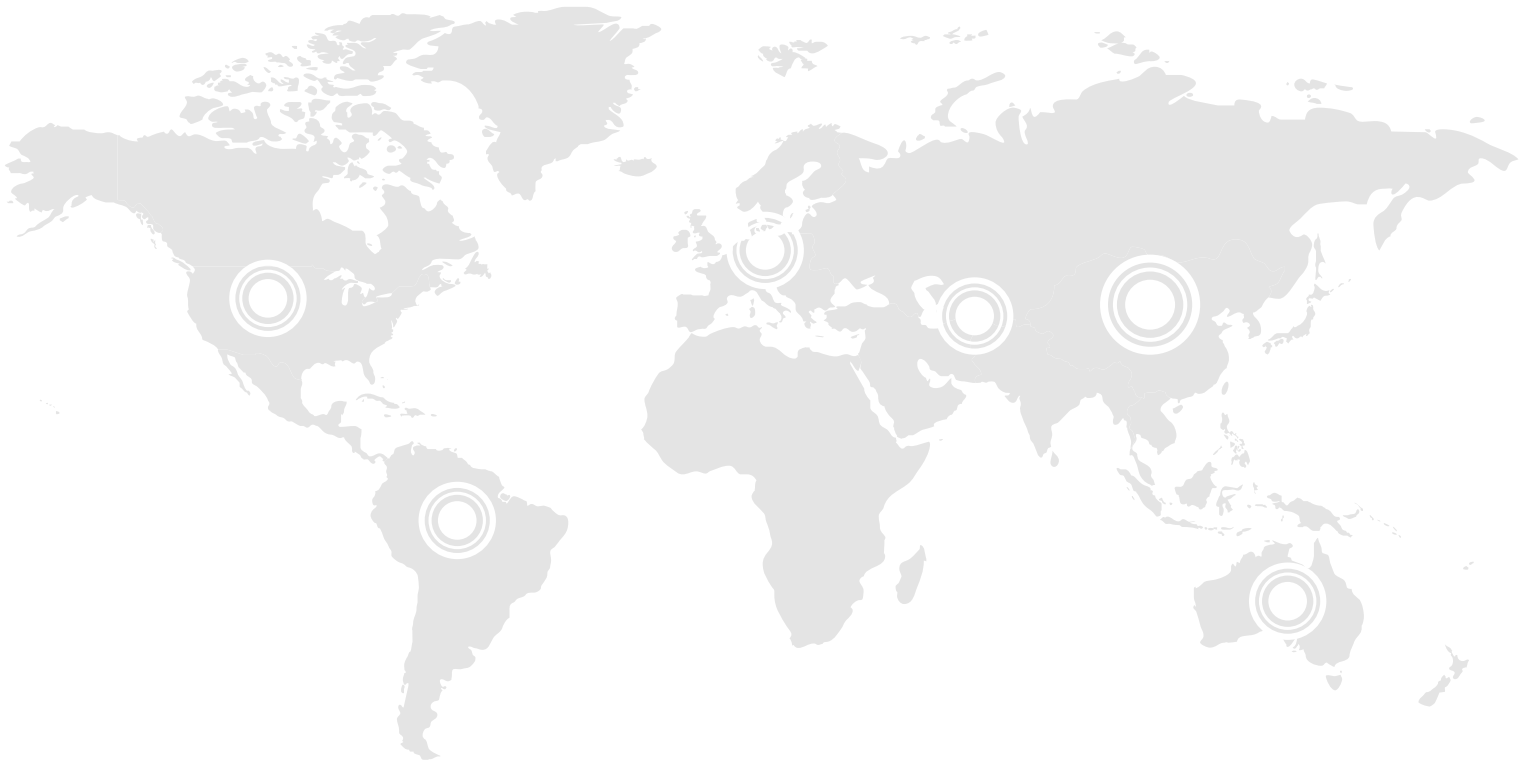
Global Reach - Local Focus

The experts of Flint Group Packaging and Narrow Web are constantly pushing the boundaries of innovation – developing products that address the current and future needs of our customers. Developmental milestones are extensive and innovation and continuous improvement are an essential, and natural, part of our culture.

Supported by a complete global network of world-class facilities, Flint Group experts provide an unrivalled understanding and technical expertise to its customers within the highly specialised market segments of Packaging and Narrow Web.

A motivated team continually provides market-leading **innovative products** supported by a **personalised service and outstanding technical support**. Flint Group offers the competitive edge printers need to deliver proven, superior, and economical solutions demanded by today's brand owners and consumers.

We provide our customers with on-site services through an experienced team of application and technical service professionals. Our experts utilise world class research and development laboratories along with their substantial know-how to create tailor made products and solutions to address specific requirements. Our aim is to improve print quality, but also provide press up-time and overall process efficiency improvements. We are well positioned to respond with effective solutions in every region around the world.



www.flintgrp.com

Flint Group is dedicated to serving the global printing and packaging industry. The company develops, manufactures and markets an extensive portfolio of printing consumables and printing equipment, including: a vast range of conventional and energy curable inks and coatings for most offset, flexographic and gravure applications; pressroom chemicals, printing blankets and sleeves for offset printing; photopolymer printing plates and sleeves, plate-making equipment and flexographic sleeve systems; pigments and additives for use in inks and other colourant applications; Flint Group also designs, develops and delivers web-fed digital colour presses for labels and packaging applications, document printing, as well as commercial printing as well as platemaking equipment for the newspaper industry and computer-to-plate (CtP) solutions for the commercial printing market; With a strong customer focus, unmatched service and support, and superior products, Flint Group strives to provide exceptional value, consistent quality and continuous innovation to customers around the world. Headquartered in Luxembourg, Flint Group employs some 7900 people. Revenues for 2015 were € 2.2 billion. On a worldwide basis, the company is the number one or number two supplier in every major market segment it serves. For more information, please visit www.flintgrp.com