

## Illumina LED UV Curing Solution

### PRODUCT BROCHURE

Transform your label production with Illumina

## Transform your flexo press with the Illumina LED UV retrofit system

Illumina is Fujifilm's new, patented LED UV curing system, in combination with the company's new high performance LED UV inks, that allows any traditional UV or water-based flexo press to be converted to LED UV curing to deliver far-reaching improvements to label production on a narrow web press. These include huge increases to productivity, significant quality improvements, greater application versatility, cost and material savings, and a reduced impact not only on the working environment, but on the environment as a whole.

Illumina takes advantage of the very latest, high power but low heat LED UV curing technologies, along with Fujifilm's renowned ink expertise, to deliver an ultra-reliable curing system with none of the disadvantages of higher power and higher temperature, UV lamps.

### **Productivity and quality improvements**

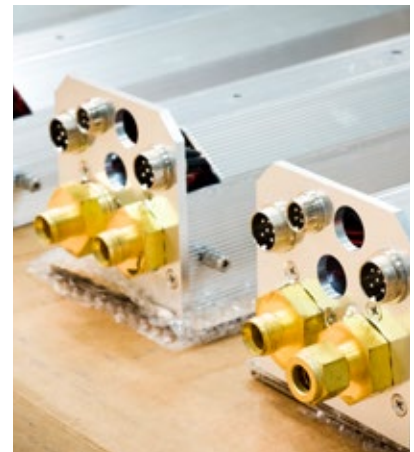
Thanks to the much lower operating temperature of the Illumina LED UV curing system, productivity and quality improvements are significant. Not only can press speeds be increased, but job set up and make ready times are much lower. Add to that improvements to the reliability of production, with much lower press down time, productivity gains are significant. Quality also becomes more consistent as the impact of the heat from the UV lamps is removed, with better registration and less substrate stretching.

### **Savings in energy, materials, labour and waste**

Due to the dramatic reductions in power required for the UV lamps, huge cost savings can be made across the production process. The energy savings are the most significant, but material usage and waste are also reduced, and the lower maintenance required to support the LED UV curing system results in a much lower number of replacement parts, and lower labour costs.

### **Environmental improvements**

The cool running LED UV curing system has significant benefits on both the working environment, and the environment as a whole. Energy use is drastically reduced, VOCs are eliminated, and the lower amounts of materials used and waste produced all benefit the environment. The working environment for operators is also improved, with many undesirable factors eliminated, including heat from the conventional UV lamps, noise and even the smell.





# Improve your productivity dramatically

The Illumina system allows you to maximise your productivity in three ways. The result is that it is often possible to significantly increase your production speeds by up to 50% on standard materials.

## Higher raw press running speeds

The Illumina system allows you to increase press speeds by 30-50% compared to a conventional UV system, with comparable press speeds on PS labels increasing from 70 – 100m/min on a conventional UV press, to 120-170m/min with Illumina.

## Reduced down-time due to maintenance

The preventative maintenance of the Illumina system is almost eliminated due to the following factors:

1. Thanks to the inherent reliability of the LED UV system, with LED UV lamps typically lasting 20 times longer than mercury UV lamps, breakdowns and lengthy delays in production are significantly reduced. Simple weekly checks to ensure that the LED UV lenses remain clean to maintain efficiency are all that is required.
2. The Illumina system has an instant start meaning that no 'warm up' and 'cool down' periods are required, saving up to 30 minutes per press per day.
3. Finally, the cool running LED UV construction, coupled with the increased LED UV dosage of the patented domed lens design, means distilled water at room temperature can be used for the cooling process, eliminating condensation issues and increasing the reliability of the water circulation system.

## Shorter job setups and make readies

Shorter make ready times, potentially 1 to 2 hours per press per day, are possible thanks to the fact that there is no material distortion due to heat, meaning make readies can be done at crawl speeds. Improved substrate stability also results in a more controlled ramp up to production speeds. Finally, it is often possible to achieve the required colours much faster with Fujifilm's high performance LED UV inks.

The low temperature operation of the Illumina retrofit system is particularly useful for older non-servo driven flexo presses where it is more difficult to control the tension and registration of the substrate. This is a particular problem during job setup. Even heat sensitive self-adhesive materials, such as polyethylene, can distort and mis-register under the heat produced from conventional UV systems. This problem is even more critical for unsupported thin gauge materials such as shrink film. Time, substrate and ink wastage can all be reduced as make ready times are reduced, and press registration is maintained from setup to production speeds with no substrate distortion or stretching.

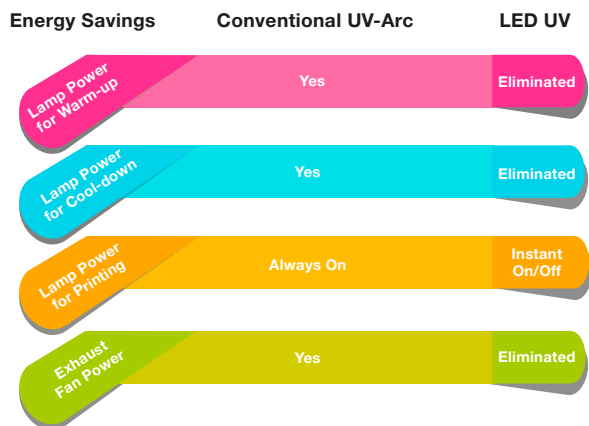
The added problem of some papers shrinking under hot conventional UV lamps, means that the Illumina system's lower temperature can give similar dimensional control and cost benefits when printing paper. Newer presses, however, can also benefit from these factors due to the increased control of materials through the press.

# Huge savings in energy, materials, labour and waste

The energy savings made possible by using the Illumina system are significant, due to the use of the very latest, patented lower power LED UV technology, but savings can be made in other areas of production to reduce the cost of label production.

## Up to 90% reduction in energy use

Illumina can deliver up to a 90% reduction in energy use, resulting in huge cost savings (see below).



## Significant material savings and less waste

Material savings and waste are significantly reduced:

- Better press registration means less material waste
- Make readies at lower speeds and more controlled ramp to up to production speeds mean less substrate and ink wastage
- Typical job make readies use 60% less material

## Labour savings

Significant labour savings are possible as productivity & quality improvements mean less time is spent managing production, and the more reliable system minimises maintenance.

### Lower maintenance reduces costs

Lower maintenance reduces the cost of replacement parts (see diagram, right).

Illumina's modular design also allows small individual modules to be replaced, rather than the full LED strip.

Lower Maintenance Costs	Conventional UV-Arc	LED UV
Lamp Replacement Schedule	1,000 Hours	20,000+ Hours
Lamp Shutters	Yes	Eliminated
Reflectors	Yes	Eliminated
Spare Parts and Repair Labour	Yes	Reduced





## Significant environmental benefits

The cool running LED UV curing system has significantly less impact on the environment, thanks to extensive energy and material savings, and allows the press operator's working environment to also be improved. Once installed, it is therefore possible to promote the strong environmental benefits of the Illumina LED retrofit system to retailers and brand owners to differentiate yourself from the competition.

### Environmental improvements

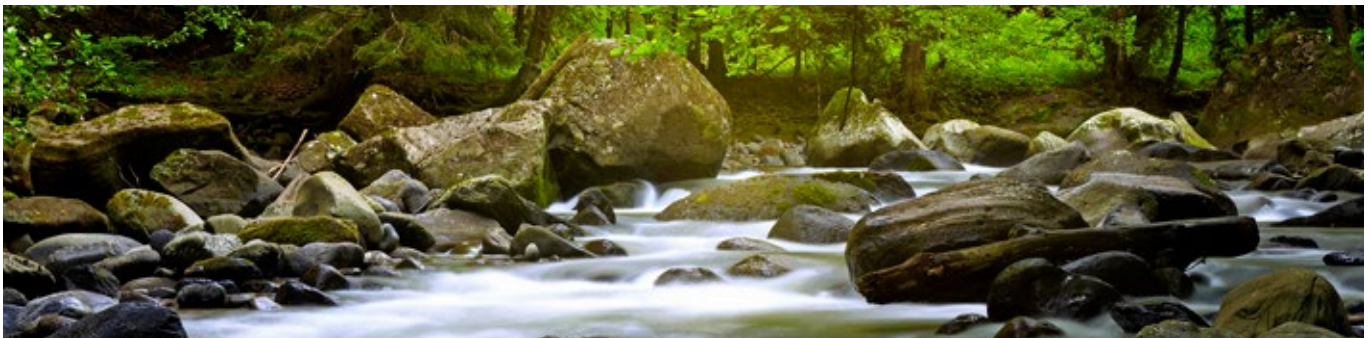
The cool running LED UV curing system has a much lower impact on the environment:

- Huge reductions in energy use
- Lower pollution and elimination of VOCs
- Make readies at lower speeds and more controlled ramp up mean less substrate wastage
- Mercury used in UV lamps and disposal of bulbs eliminated
- Significant reduction in machine footprint

### Improved working environment

Many undesirable environmental factors are eliminated on the production floor:

- No heat from conventional UV lamps
- No noise from extraction units
- No potential health issues from VOCs
- No odour from the UV curing process



## Improve the quality and versatility of production

The inherent low temperature operation of Illumina means it is also possible to improve the quality of label production, and simplify some production techniques such as cold foiling and lamination, as well as convert shrink sleeve, thin gauge and heat sensitive materials with no chill rollers.

- Registration is better as low temperature curing eliminates the distortion of thin filmic materials.
- Improvements in substrate tension control and shrinkage using Illumina, also greatly improve embellishment processes such as cold foiling and lamination. Because it is easier to maintain the tension of thin foils during application and release, foil registration and control are better, making the cold foiling process much easier.
- These "lower temperature advantages", can also be important for lamination. More tension control, and the reduced distortion of the thin laminating films, can reduce stresses in the finished laminated label, reducing label curl which may occur during die-cutting or label application.

# How the Illumina LED UV curing system works

Fujifilm is unique in being the only supplier able to offer both a state-of-the-art LED curing system and a high performance LED ink range to the label and packaging industry. This is critical to the way Illumina works, as the LED lamp system and ink range have been developed and tuned together to ensure optimal performance so that they can deliver the maximum benefits.

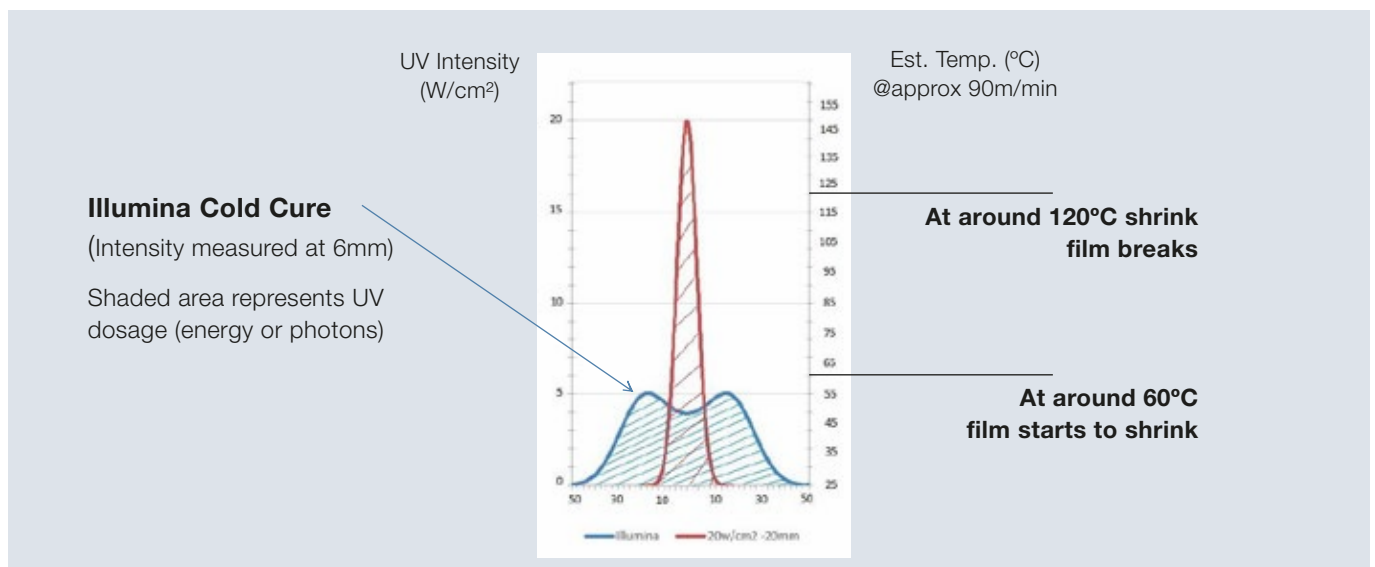
## Unique LED beam profile

The Illumina system takes advantage of the latest state-of-the-art LED technologies to deliver unprecedented power at low temperatures. The Illumina dosage (blue shaded area in the diagram below) is 27% greater due to the inherent double peak irradiance and longer time profile or 'dwell time'. This results in a faster curing process for printing at higher speeds and/or with less input power.

Illumina 'Cold Cure' LED technology generates much less heat (55°C compared to 145°C) which has three major benefits:

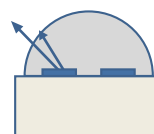
1. It is cool enough to ensure heat sensitive films don't shrink. This means you can print shrink sleeves or other heat sensitive substrates on any conventional press without adding expensive chill systems.
2. The life of an LED chip is greatly increased, as a rise of 10°C in the LED UV chip temperature will cause a lifetime drop of around 10,000 hours.
3. The water circulation system only requires distilled water at room temperature with no need for additional coolants. This eliminates condensation near the lamps and extends the life of the chiller.

Overall, the Illumina LED curing system uses up to 90% less energy to run the press than conventional UV, and around 50% less energy than conventional LED UV curing systems.

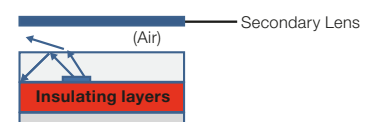


## Unique patented domed lens design

In addition the unique patented 'domed design' of the LED chip increases output by up to 44%. This is because the domed design significantly reduces the internal reflection of UV light, meaning the system can run at a lower power setting ensuring slower chip degradation.



**Illumina AS-LED (no air gap)**  
Domed lens design without reflection loss



**Conventional UV-LED**  
Over 40% UV light reflected back



# Illumina – the most powerful LED UV curing system available

Illumina represents the most powerful LED UV curing system on the market, new or retrofit. Patented LED technology delivers up to 44% more energy towards the substrate, resulting in faster curing. The more efficient design of Illumina is proven to take full advantage of Fujifilm's high performance LED ink system.

Illumina also provides the longest operating lifetime of any LED curing technology. Higher efficiency combined with the patented heat dissipation system dramatically reduces chip degradation over time. The result is a lamp life expectancy that's more than 20 times the lifetime of traditional UV mercury lamps.

## How Illumina LED UV drives down operating costs

The LED UV cure is an instant on/off process, dramatically lowering the energy usage and stress on lamp bulbs experienced in conventional 'always-on' UV mercury lamp curing. LED UV also eliminates the costs generated by cooling air blowers, ozone extraction and heat makeup systems.

## Faster LED UV curing results in faster production speeds

Faster LED UV curing means you can run at faster press speeds, and Illumina sets a new standard for flexo printing speeds on standard paper and film stock. The retrofit is also fast and worry-free. The compact design of the Illumina system easily fits on most flexo presses at any width. Plus, Illumina's compact housing can be mounted on any flexo press without adding an extra roller as required by other LED retrofit systems.

## High performance LED UV ink system

Fujifilm's LED UV ink system represents the widest product portfolio on the market today. Included in the range are:

- 4-colour or 7-colour expanded gamut process colours
- A complete set of colours utilizing a highly accurate formula database
- A range of whites including:
  - o Standard opaque white
  - o High opacity white
  - o Shrink sleeve first-down white
- Metallics, including a range of golds and silvers
- Cold foil and laminating adhesives
- Wide range of varnishes and coatings
- Fluorescents
- Additional colours with advanced lightfast pigmentation
- A full range of Rotary Screen inks



# Summary

Energy savings	Conventional UV-Arc	LED UV
Lamp power for warm-up	Yes	Eliminated
Lamp power for cool-down	Yes	Eliminated
Lamp power for printing	Always on	Instant on/off
Exhaust fan power	Yes	Eliminated
Air conditioning	Yes	Reduced
Maintenance savings	Conventional UV-Arc	LED UV
Lamp replacement schedule	1,000 hours	20,000+ hours
Lamp shutters	Yes	Eliminated
Spare parts	Yes	Reduced
Maintenance labour	Yes	Reduced
Environmental improvements	Conventional UV-Arc	LED UV
Mercury lamp disposal	Yes	Eliminated
Ozone (VOC's) produced	Yes	Reduced
Exhaust fan noise	Yes	Eliminated
Heat build up	Yes	Eliminated
Air conditioning	Yes	Reduced
Stray UV light	Yes	Reduced
Footprint of power and chiller units	Yes	Reduced
Productivity improvements	Conventional UV-Arc	LED UV
Thin/ heat sensitive substrates	Yes, with chill rollers	Yes, without chill rollers
Setup waste	Yes	Reduced
Setup time	Yes	Reduced
Web breaks due to lamp heat	Yes	Reduced
Time to warm-up/ cool-down	Yes	Eliminated

Please contact your local Fujifilm partner or visit [www.fujifilm.eu/print](http://www.fujifilm.eu/print)



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