Natgraph

LED OR ELECTRONIC UV?

Screenprinting The Future 4·5·6 October 2011

WHICH IS THE FUTURE OF UV CURING FOR SCREENPRINTING?

LED OR ELECTRONIC UV?

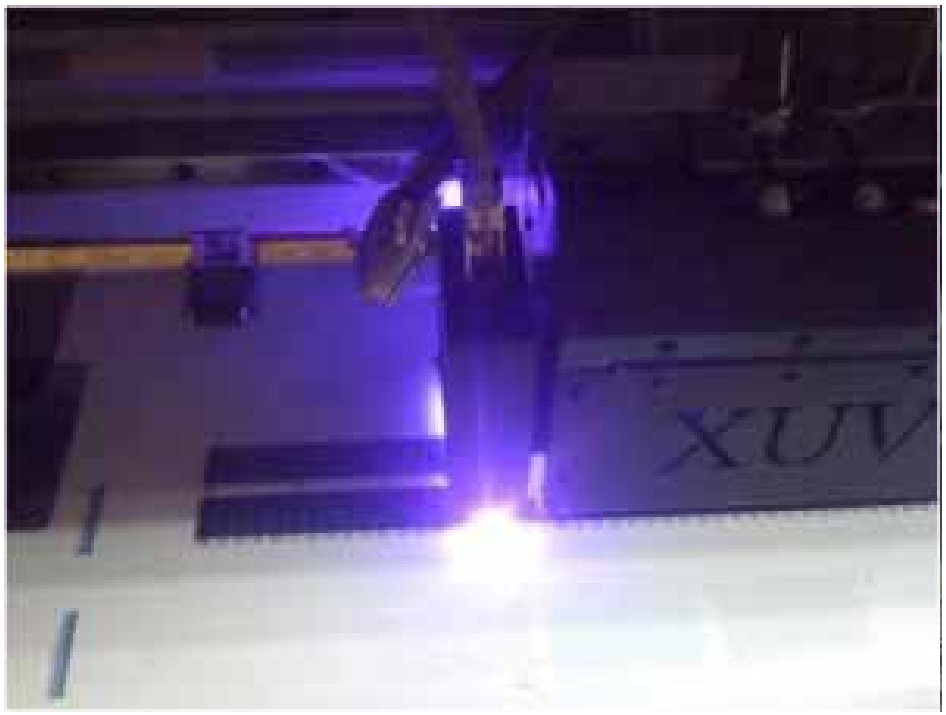
Todays subject - Why?

- Weekly question?
- What about LED curing?
- Success in Digital!
- Success? in Offset
- So, what about screen?

WHICH IS THE FUTURE OF UV CURING FOR SCREENPRINTING?

LED OR ELECTRONIC UV?

LED! – A part of all our lives



- Pro-LED climate
- LED is successful in so many varied applications
- LED technology is becoming ‘normal’
- Its ‘benefits’ are taken for granted and widely used
- But, UV Curing is not the same as other applications!

WHICH IS THE FUTURE OF UV CURING FOR SCREENPRINTING?

LED OR ELECTRONIC UV?

Common UV Curing Systems

- Conventional UV (Discharge lighting using Arc Lamps and Transformers) 15 – 20% efficient
- LED UV (using LED lamp arrays and dedicated power supplies) 15 – 20% efficient
- Electronic UV (Discharge lighting using Arc Lamps and Electronic Power Supplies) 20 – 25% efficient

WHICH IS THE FUTURE OF UV CURING FOR SCREENPRINTING?

LED OR ELECTRONIC UV?

Conventional UV Curing – Brief Description

- Established, mature and reliable technology
- Transformers or ballasts needed to provide high voltages to Arc lamps
- Minimal control of power levels (70% or 100%), normally at 120watts/cm
- Ozone gas and heat need to be extracted

WHICH IS THE FUTURE OF UV CURING FOR SCREENPRINTING?

LED OR ELECTRONIC UV?

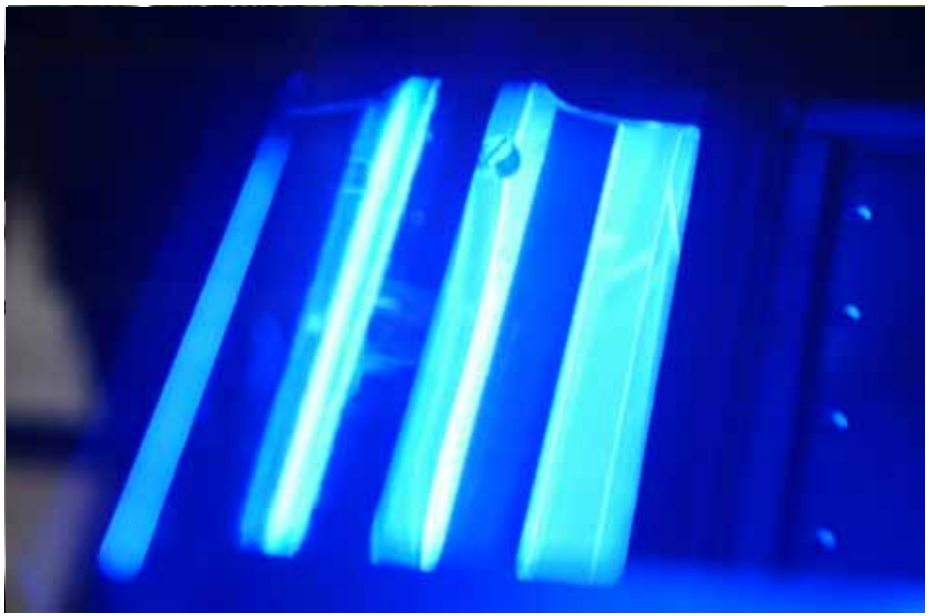
LED UV Curing – Brief Description

- Very new and still rapidly developing technology
- Electronic Power supplies provide low voltages to LED lamp arrays
- Wide control of power levels (25% to 100%) of high claimed power levels
- No Ozone gas emitted, but water chiller required to remove heat

WHICH IS THE FUTURE OF UV CURING FOR SCREENPRINTING?

LED OR ELECTRONIC UV?

Electronic UV Curing – Brief Description

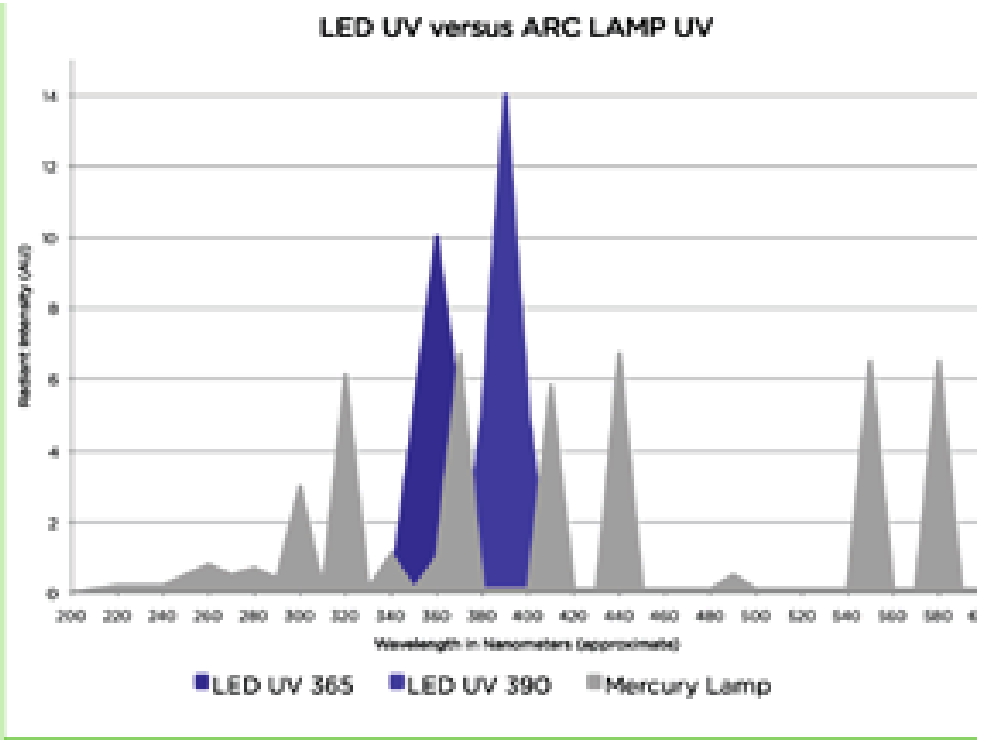


- Newish, highly efficient and still developing technology
- Electronic Power supplies to provide high voltages to Arc lamps
- Wide control of power levels (25% or 100%), normally at 170watts/cm
- Ozone gas and heat still need to be extracted

WHICH IS THE FUTURE OF UV CURING FOR SCREENPRINTING?

LED OR ELECTRONIC UV?

Spectral outputs and power levels

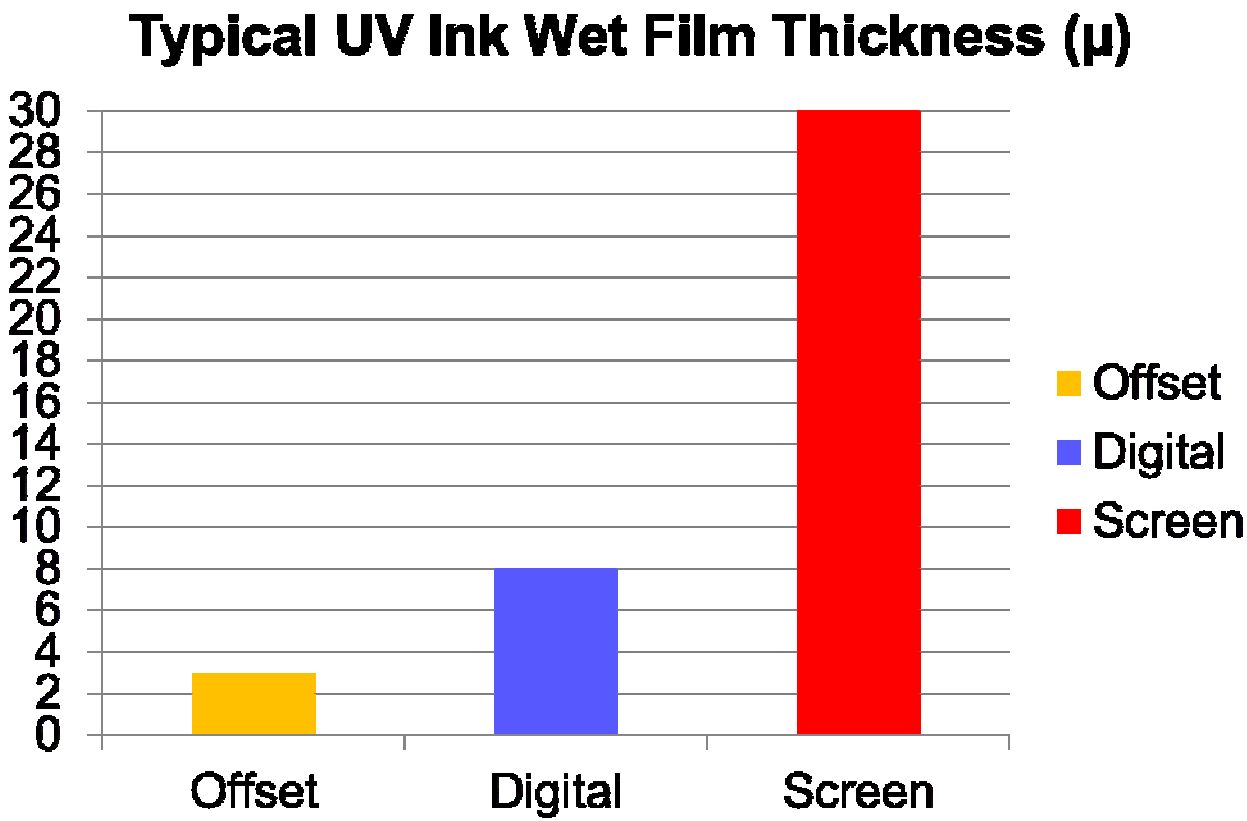


- LED emits UV light with a narrow band, (375, 385, 395 & 405nm)
- Conventional UV has wide spectral outputs (from 230 – 560nm)
- LED irradiance is typically measured only 3mm away?
- Conventional UV irradiance is measured 40mm away!

WHICH IS THE FUTURE OF UV CURING FOR SCREENPRINTING?

LED OR ELECTRONIC UV?

Wet Film Thickness - Comparison



WHICH IS THE FUTURE OF UV CURING FOR SCREENPRINTING?

LED OR ELECTRONIC UV?

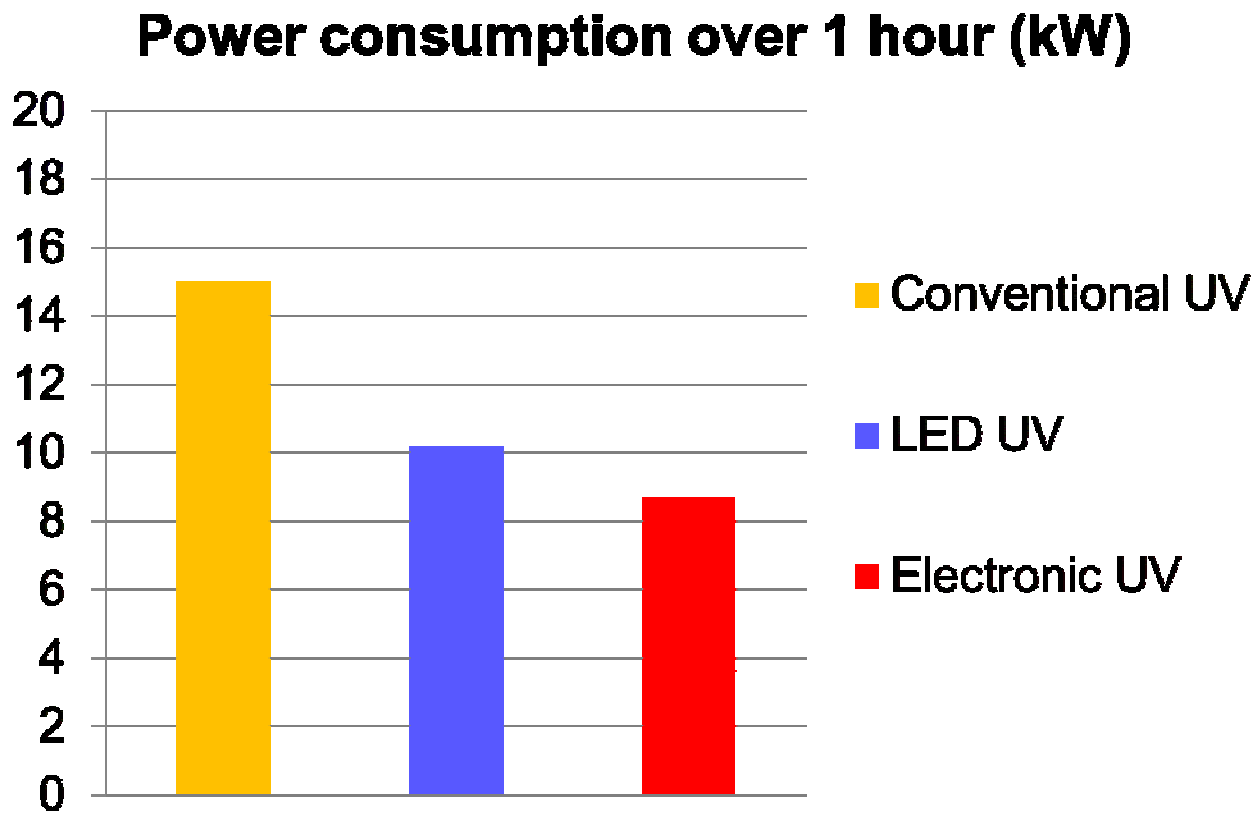
Optimum features of an ideal UV system?

1. Lowest possible energy use = economy of operation?

WHICH IS THE FUTURE OF UV CURING FOR SCREENPRINTING?

LED OR ELECTRONIC UV?

Comparison of 110cm UV Dryer (1 lamp)



WHICH IS THE FUTURE OF UV CURING FOR SCREENPRINTING?

LED OR ELECTRONIC UV?

What features does an ideal UV require?-

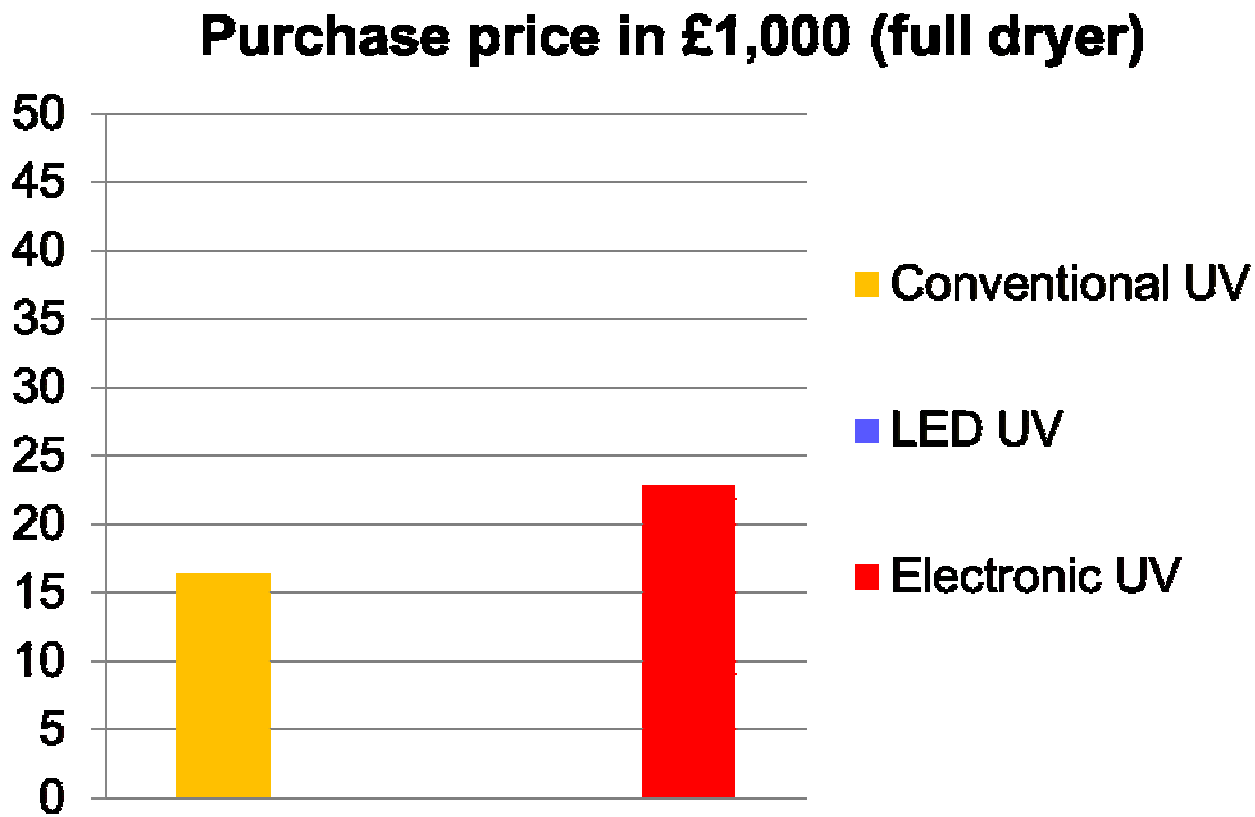
1. Lowest possible energy use = economy of operation?

2. Investment = Equipment purchase price?

WHICH IS THE FUTURE OF UV CURING FOR SCREENPRINTING?

LED OR ELECTRONIC UV?

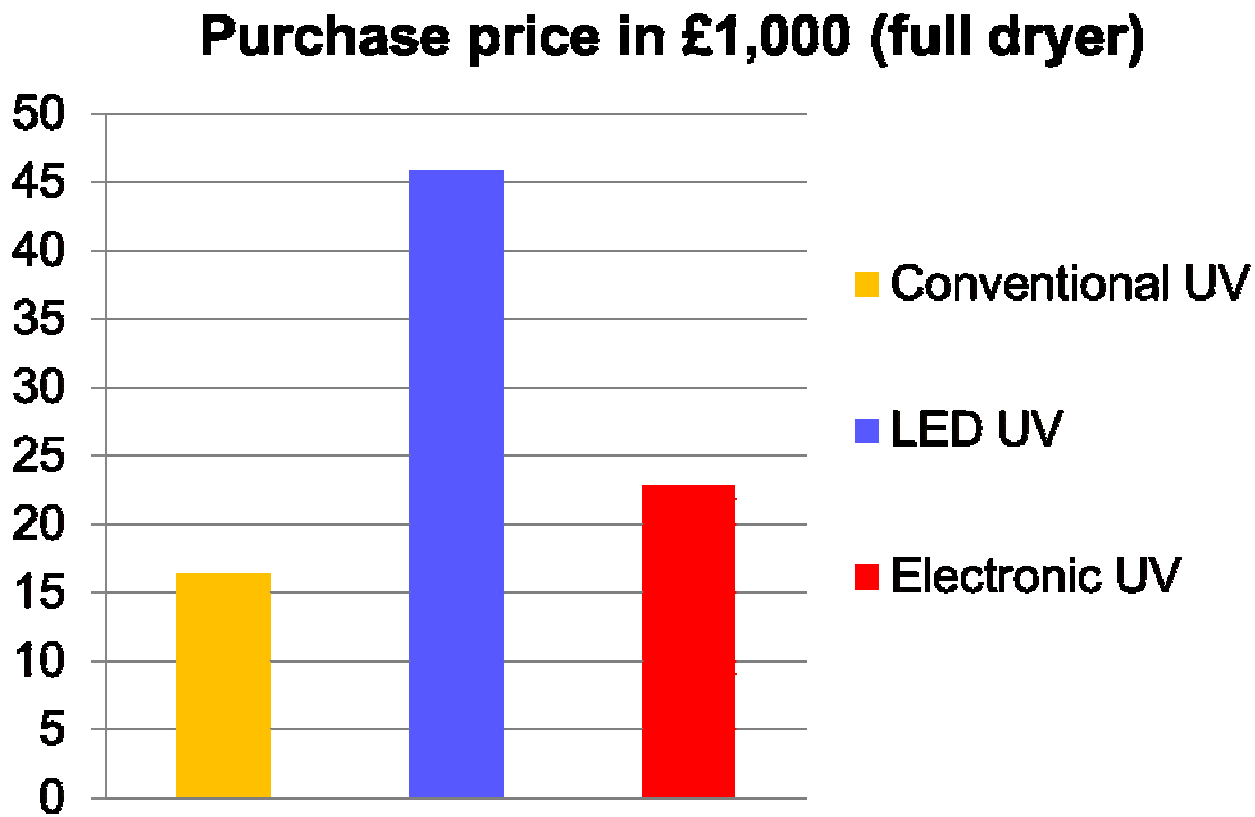
Comparison of 110cm UV Dryer (1 lamp)



WHICH IS THE FUTURE OF UV CURING FOR SCREENPRINTING?

LED OR ELECTRONIC UV?

Comparison of 110cm UV Dryer (1 lamp)



WHICH IS THE FUTURE OF UV CURING FOR SCREENPRINTING?

LED OR ELECTRONIC UV?

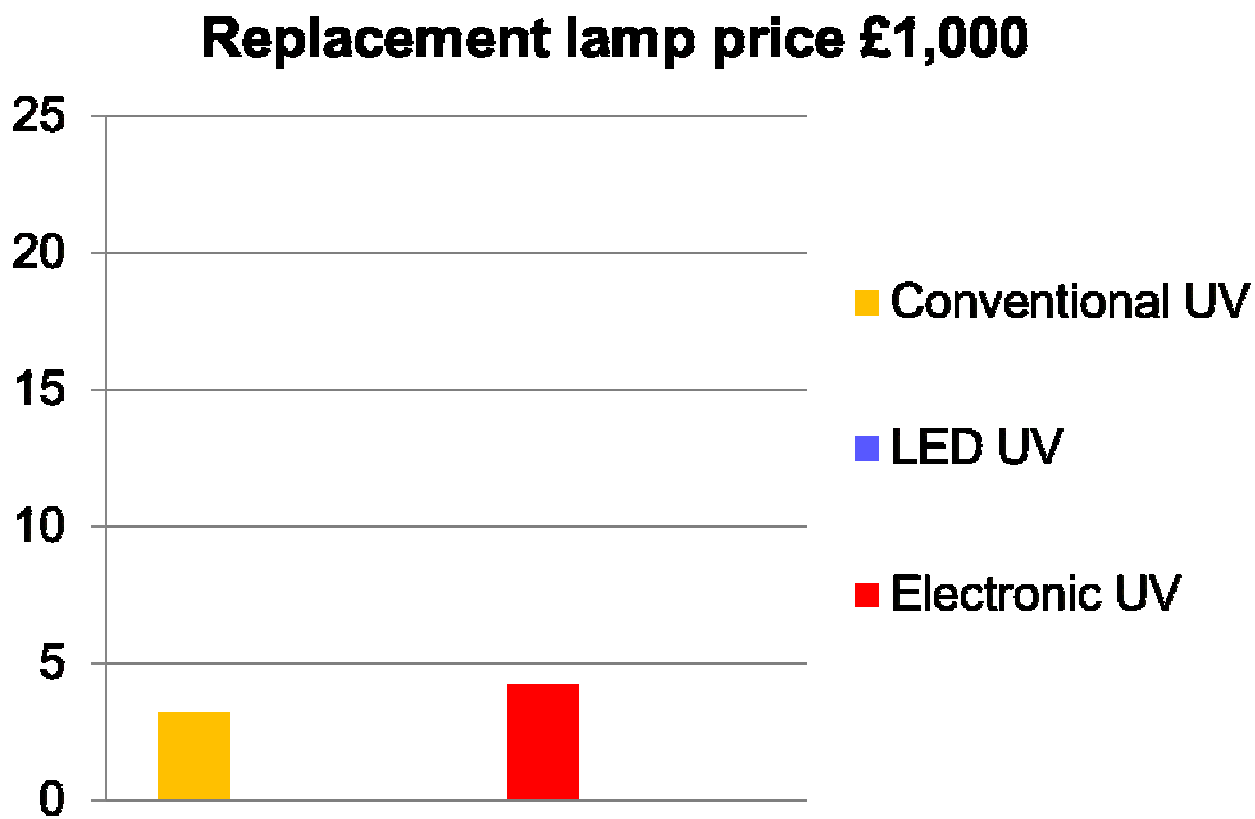
What features does an ideal UV require?-

1. Lowest possible energy use = economy of operation?
2. Investment = Equipment purchase price?
3. Cost of consumables = Replacement lamps (20,000 hours for LED??)

WHICH IS THE FUTURE OF UV CURING FOR SCREENPRINTING?

LED OR ELECTRONIC UV?

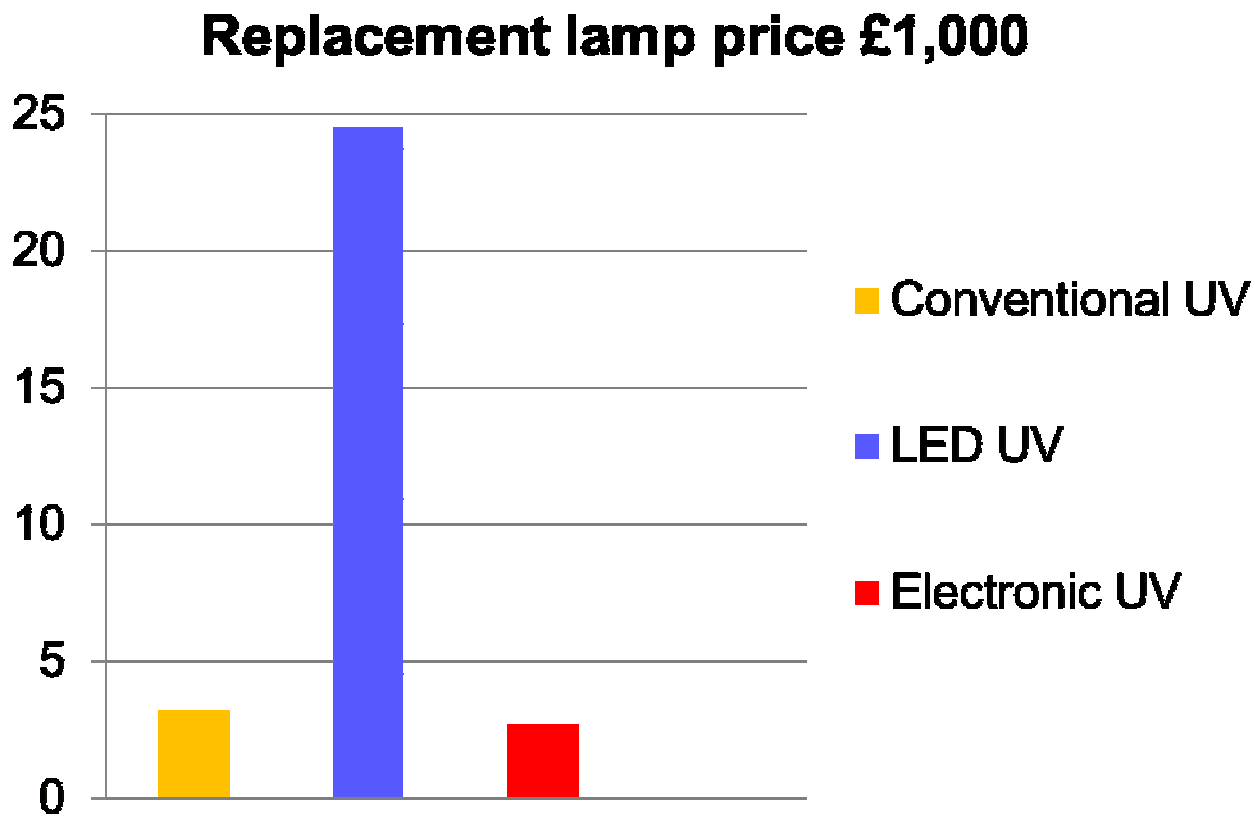
Comparison of 110cm UV Dryer (1 lamp)



WHICH IS THE FUTURE OF UV CURING FOR SCREENPRINTING?

LED OR ELECTRONIC UV?

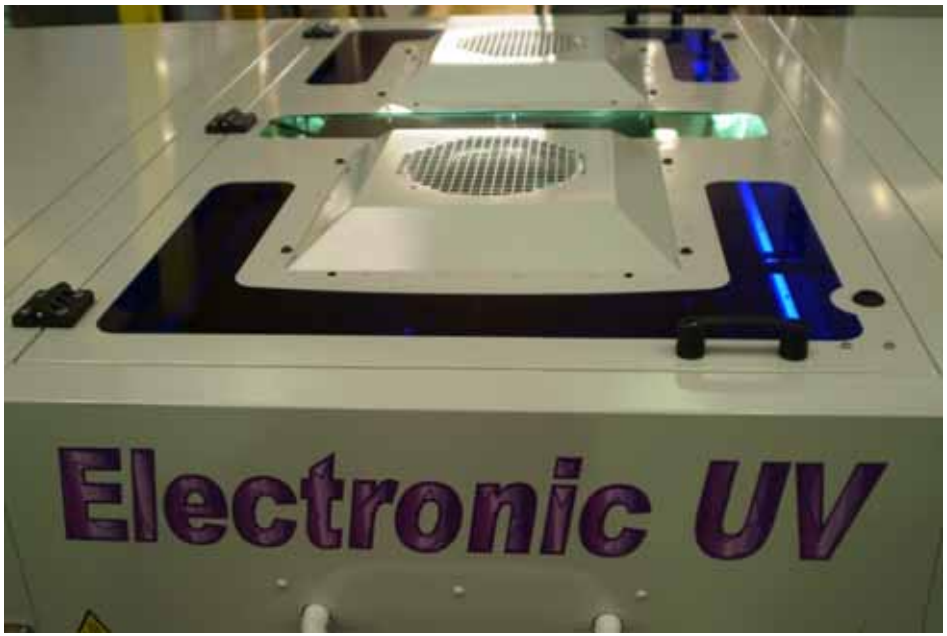
Comparison of 110cm UV Dryer (1 lamp)



WHICH IS THE FUTURE OF UV CURING FOR SCREENPRINTING?

LED OR ELECTRONIC UV?

The winner is – Electronic UV!



- Uses less energy
- Lower purchase price
- More efficient use of electrical power
- Vastly lower lamp costs
- Requires a smaller power supply
- Can run Mercury or Iron lamps without modification

WHICH IS THE FUTURE OF UV CURING FOR SCREENPRINTING?

LED OR ELECTRONIC UV?

LED UV – What next?

- Increase in power?
- Lowered capital cost?
- Increased lamp life?
- Reduced replacement lamp costs?
- Ink systems designed to cure with lower energy?

WHICH IS THE FUTURE OF UV CURING FOR SCREENPRINTING?

Natgraph's conclusion

- LED UV Curing for screen is not yet a viable proposition for sheet fed screen printing
- Except for very special applications with dedicated chemistry, high value products or space issues
- So, watch this space!

Thank you – Any Questions?

WHICH IS THE FUTURE OF UV CURING FOR SCREENPRINTING?