



primelite
ALE/3

Advanced UV-LED Light Engine THREE

ALE/3 – Light Guide Coupled UV-LED Light Sources



Key Applications

- Perfect solution to replace 200 W mercury discharge lamps by LED technology
- Spot curing applications in the automotive, electronics, optoelectronics, pharma and other industries
- Wafer edge exposure (WEE) applications in semiconductor manufacturing
- Quality assurance and inspection (NDT)
- Life sciences applications

ALE/3 Solution Highlights

- Intensities up to 50,000 mW/cm²
- Optical output up to 15 Watts
- Monospectral (365, 385, 405, or 435 nm) and multispectral setups (365 and 405 nm) available
- Future-proof mercury-free light source with significant Cost of Ownership advantages
- Easy to integrate into new and existing setups with no external cooling required



primelite
Advanced Light Engines

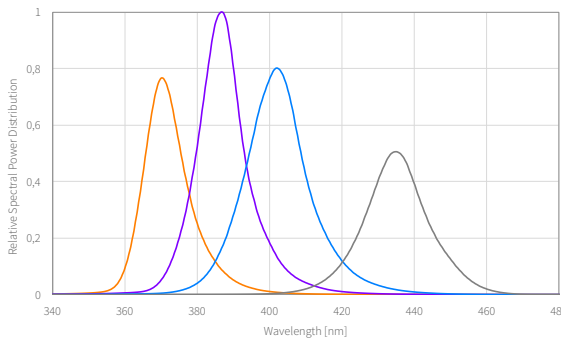
● MADE
● IN
● GERMANY

Enhanced Curing with Intensities of up to 50,000 mW/cm²

Potential Wavelength Combinations and Output Performance

ALE/3.1

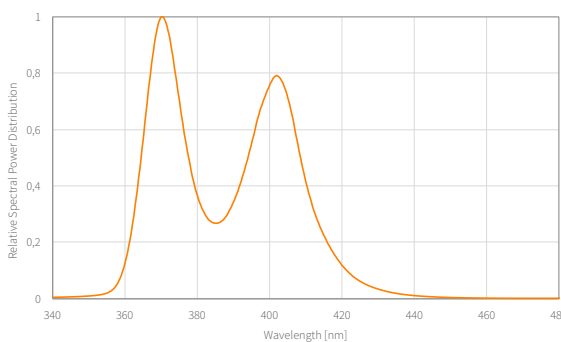
Single wavelength setups (365, 385, 405, or 435 nm)



Radiation output in mW	ALE/3.1		
	Ø5 mm	Ø6.5 mm AR	Ø8 mm
Light guide			
365 nm	7,000	11,000	13,000
385 nm	9,500	13,000	15,000
405 nm	9,500	13,000	15,000
435 nm	7,000	11,000	13,000
Intensity in mW/cm²	50,000	40,000	30,000

ALE/3.2

Dual wavelength setup (365 and 405 nm)

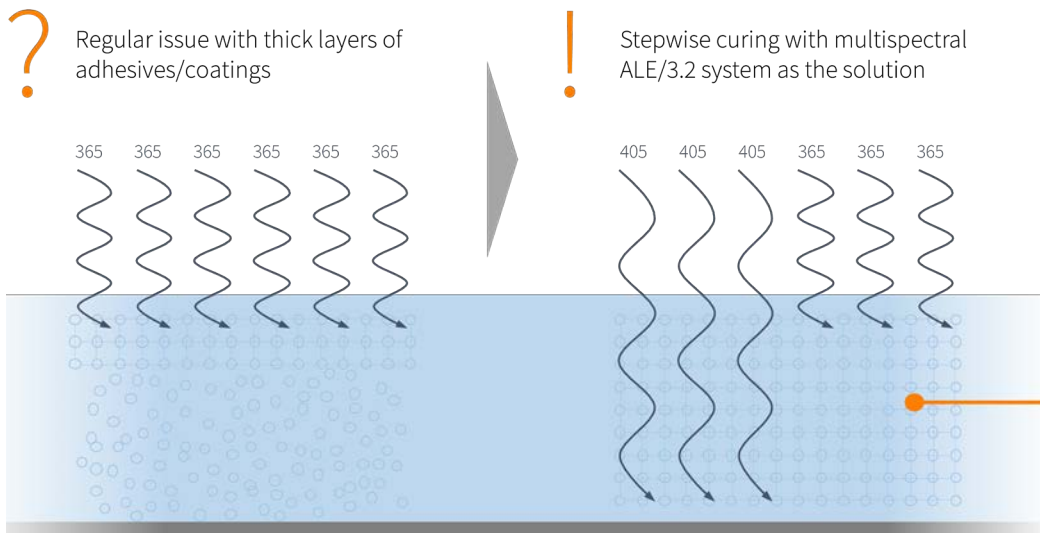


Radiation output in mW	ALE/3.2+	
	Ø6.5 mm AR	Ø8 mm
Light guide		
365 nm	6,000	7,000
405 nm	6,000	7,000
Total	12,000	14,000
Intensity in mW/cm²	35,000	30,000

CWL of emitters: 367.5±2.5 nm, 387.5±2.5 nm, 402.5±2.5 nm, and 435.0±2.5 nm
Initial output of LED: Full spectrum of each emitter measured at end of light guide (length 1.5 m); deviation of ±10% possible
Ø6.5 mm light guide with antireflective coating ("AR")

The Power of Multispectral Curing

Better Curing Results due to Flexible Broadband Exposure



The output of the ALE/3 easily matches and even outperforms 200 Watt mercury discharge lamps as well as other available UV-LED systems.

Usually, UV-LED systems are monochromatic, only featuring a narrow output spectrum. With the ALE/3 you can choose a dual-wavelength setup.

The ALE/3.2 with 365 and 405 nm is especially suited for advanced curing applications with thick layers of photosensitive material.

NUV radiation in the higher spectral ranges (405 nm) penetrates deeper into the adhesive, while shorter wavelengths (365 nm) cure the surface layer.

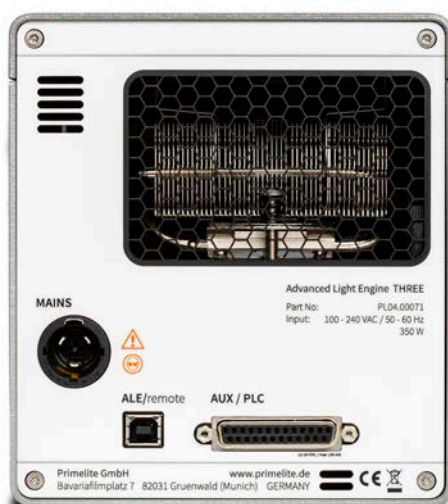
This leads to a higher degree of polymerization for increased bond strength.

Modular Technology Platform

System Properties and Specifications

Emitter options	<ul style="list-style-type: none">▪ Single wavelength (365, 385, 405, or 435 nm)▪ Dual wavelength (365 and 405 nm)▪ VIS/NIR setups (e.g., red, green, white) on request
Total radiation output	Up to 15 W
Output intensity	Up to 50,000 mW/cm ²
Numerical aperture	<ul style="list-style-type: none">▪ 0.6 / 70° (2α) using liquid light guide▪ Alternative output optics available
Control configurations	<ul style="list-style-type: none">▪ Individual wavelength power management and presets▪ High-resolution intensity adjustment (20-100%)▪ LED rise time <1 millisecond
Communication interfaces	<ul style="list-style-type: none">▪ Touch display▪ AUX: External switching device▪ USB and Ethernet (optional): ALE/remote (ALE PC-Software) and API command set▪ PLC: Discrete interface
Heat management	Active thermoelectric cooling
Dimensions (W H D)	14.5 cm X 16.5 cm X 34.0 cm (5.7" X 6.5" X 13.4")
Weight	6 kg (13.2 lbs)
Power supply input	110-240 VAC / 50-60 Hz / 350 W
Light Guide Options	<ul style="list-style-type: none">▪ Active core \varnothing [mm]: 5.0, 6.5 and 8.0▪ Single or multi-pole options▪ Standard length 1.5 m; custom sizes (0.5-20 m) available on request▪ Custom end fittings available on request▪ Use of fiber light guides also possible

Full spectrum radiation output measured at the end of light guide (standard length 1.5m) / $\pm 10\%$ deviation possible





Accessories for the ALE/3

Primelite Performance Optics

We offer single- and multi-pole liquid light guides, which are a perfect fit for our light guide coupled LED light source ALE/3. Our liquid light guides are German made, meeting the highest standards in terms of quality, durability, and efficiency. In addition to liquid light guides we also provide standard and customized homogenizing, condensing and focussing optics. All our Performance Optics are optimized for transmitting high-power radiation in the NUV (350-450 nm) spectral ranges. Liquid light guides for UVC or VIS are also part of our product portfolio.

Single-pole Liquid Light Guides

- Three different diameter sizes available: Ø5.0, 6.5, and 8.0 mm.
- Standard length of 1,500 mm. Other sizes between 500 and 20,000 mm on request.



Multi-pole Liquid Light Guides

- 2- and 4-pole liquid light guides available.
- Diameter size of light exit: Ø3.0 mm.
- Standard length of 1,500 mm. Other sizes on request.



Condensing/Focussing Optics

- Various condensing and focussing optics available for square, hex or round exposure.
- Additionally homogenizing light pipes for enhanced uniformity on request.



About Primelite

History and Guiding Principles

History

- Primelite GmbH was founded in Munich, Germany, in 2016 by a team of experienced engineers and managers.
- A prototype of our first high-power UV-LED light engine, the versatile, fiber-coupled ALE/1, was presented at the SEMICON Japan end of 2016. Series production started in 2017.
- In 2018, we added the ALE/1C to our product portfolio: A UV-LED exposure solution with standard-setting output performance, which you can directly integrate into semiconductor manufacturing equipment. Additional to that we have just recently developed and introduced an even stronger collimated exposure solution – the ALE/2.
- Providing superior value, we can now call some of the biggest names in the semiconductor, pharma, and automotive industries our customers.

Guiding Principles

- We have committed ourselves to develop advanced UV-LED light sources which are best-in-class solutions for our customers.
- Perfect quality is our aspiration: We design and manufacture our UV-LED systems in Munich, Germany. To achieve industry-leading product reliability, we rely on carefully selected suppliers of critical components. These include proprietary optics from semiconductor-grade glass and superior LED emitter technology.
- To stay way ahead of our competition, we continually advance our core know-how on optical and mechanical design. Additionally, improving our electronic hardware and software architecture is just as essential.
- We enable product innovation as well as fast-track development and product rollout by having a lean organization, deep market insight, customer-focus, and dynamic business culture at Primelite.

Europe & America

Primelite GmbH
Bavariafilmplatz 7
82031 Gruenwald
GERMANY

Contact us:
T +49 89 215 44 715
E hello@primelite.de
www.primelite.de

Asia Pacific

Primelite APAC Ltd.
88 Jervois Street
Sheung Wan
HONG KONG

Contact us:
T +852 3008 8200
E hello@primelite.com.hk
www.primelite.com.hk



primelite
Advanced Light Engines