



Advanced UV-LED Light Engine THREE

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



Key Applications

- + Perfect solution to replace legacy 200 W mercury discharge lamps in UV curing applications
- + Precision spot curing in high-volume manufacturing
- + Wafer Edge Exposure (WEE)
- + Non-Destructive Testing (NDT)
- + MedTech illumination

ALE/3 UV-LED Light Source Highlights

- + Up to 15 Watts of optical output
- + NUV, VIS, NIR setups (narrow and broadband)
- + LED process stability and TCO benefits
- + Field-replaceable LED Modules
- + Easy to integrate into new and existing setups
- + Zero-maintenance thermo-electric cooling
- + No mercury! Save and future-proof LED light source
- + Quality made in Germany

ALE/3 UV-LED Light Sources Replace Conventional Spot Curing Lamps

Broadband Spectra Showcase and Output Performance

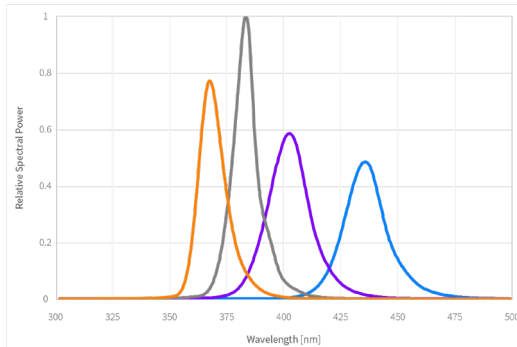
ALE/3.1

Narrowband setups:

365, 385,
405, or 436 nm

Applications:

- + Automotive
- + Electronics
- + Optics
- + HVM Applications



Radiation [mW]	ALE/3.1		
Light Guide Active Core	Ø5.0	Ø6.5	Ø8.0
CWL 365 nm	7,000	11,000	13,000
CWL 385 nm	9,500	13,000	15,000
CWL 405 nm	9,500	13,000	15,000
CWL 436 nm	7,000	11,000	13,000
Intensity* [mW/cm ²]	48,000	39,000	30,000

*Maximum values

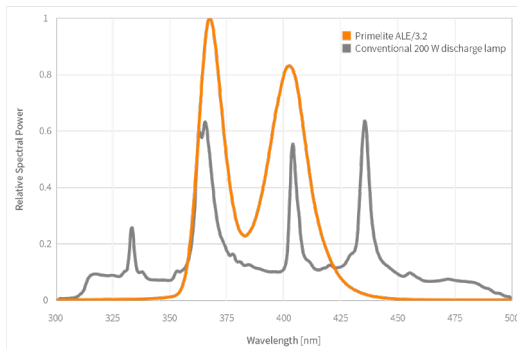
ALE/3.2

Broadband setup

365 - 405 nm

Applications:

- + Medical / Pharma
- + Curing of thick adhesive layers and coatings



Radiation [mW]	ALE/3.2		
Light Guide Active Core	Ø5.0	Ø6.5	Ø8.0
CWL 365 nm	4,000	6,500	7,500
CWL 405 nm	3,500	6,000	7,000
Broadband	8,000	13,000	15,000
Intensity [mW/cm ²]	41,000	39,000	30,000

Mercury Discharge Lamp (200 W Type)

CWL 365 nm	2,000	3,000	3,000
CWL 405 nm	1,500	2,300	2,300
Broadband	5,500	8,000	8,000
Intensity [mW/cm ²]	28,000	24,000	16,000

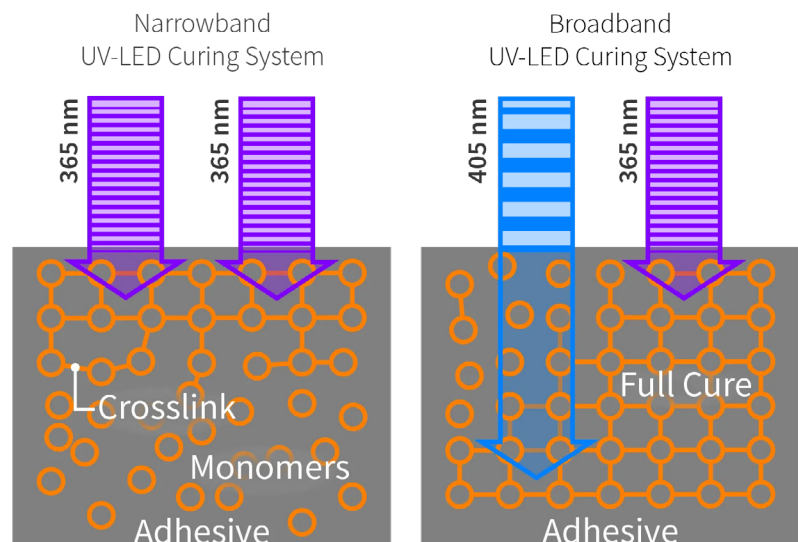
CWL of emitters: 367.5±2.5 nm, 387.5±2.5 nm, 402.5±2.5 nm, and 435.0±2.5 nm. Full spectrum of each emitter measured at end of light guide (length 1.5 m); deviation of ±10% possible. Ø6.5 mm light guide with antireflective coating.

Benefits of Broadband UV Curing

Deep Cure, Perfect Surfaces

While longer wavelengths penetrate much deeper into the UV adhesive, powerful radiation around 365 nm is often needed for tack-free surfaces. A drawback of using 365 nm exclusively is that curing speeds on the surface of photosensitive material are so fast, potentially blocking radiation from traveling further into the bonding layer and preventing a complete cure.

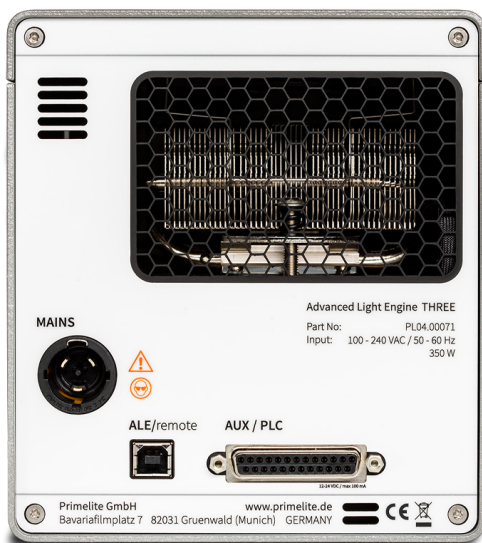
Because Primelite's Advanced Light Engine THREE performs superbly in all NUV spectral ranges, a multi-step exposure is an interesting approach. To produce both a fully cured bonding layer and a perfect surface, you could start exposing in higher wavebands (e.g., 405 nm) and finish your shot with high-intensity lower wavebands around 365 nm.



ALE/3: Excellent Performance in Its Most Compact Form

System Properties and Specifications

Emitter Options	NUV Narrowband: 365 / 385 / 405 / 436 nm NUV Broadband: 365 - 405 nm VIS Narrowband: 470 / 520 / 620 / 660 / 690 nm NIR Narrowband: 730 / 770 / 810 / 850 / 970 / 1,050 nm
Numerical Aperture	NA 0.6 ($2\alpha \sim 70^\circ$)
Output Control	<ul style="list-style-type: none"> + Individual LED power management and presets + High-resolution intensity adjustment (10 - 100%) + LED rise time under 1 millisecond
Communication interfaces	<ul style="list-style-type: none"> + Touch display + Discrete PLC interface (TTL) + AUX (debounced) + USB (serial) + Ethernet / Modbus (optional)
Thermal Management	Integrated thermo-electric cooling
Dimensions (W H D)	14.5 X 16.5 X 34 cm (5.7 X 6.5 X 13.4")
Weight	6 kg (13.2 lbs)
Power Supply	110-240 VAC / 50-60 Hz / 350 W
Light Guide Options	<ul style="list-style-type: none"> + Liquid and fiber light guides + Single and multi-pole options + Active core Ø5.0, Ø6.5, and Ø8.0 mm + Standard length 1.5 m; custom lengths 0.5 - 20 m + Custom end fittings available on request





Accessories for the ALE/3

Performance Optics

We offer single- and multi-pole liquid LED Light Guides that perfectly fit our UV-LED Light Engine ALE/3. Our LED Light Guides are made in Germany, meeting the highest quality, durability, and efficiency standards. In addition to LED Light Guides, we also provide standard and customized homogenizing, condensing, and focussing optics, which can be an economical add-on to improve exposure uniformity or efficiency of the whole optical setup.



Single-pole Liquid Light Guides

- + Three active core sizes: Ø5.0, Ø6.5, and Ø8.0 mm
- + Standard length: 1.5 m; custom lengths of 0.5 to 20 m available on request



Multi-pole Liquid Light Guides

- + 4-pole LED Light Guides
- + Active core: Ø3.0 mm
- + Standard length: 1.5 m; other length available on request



Condensing / Focussing Optics

- + Standard condensing and focussing LED Light Guide adapters available
- + Custom optics available on request