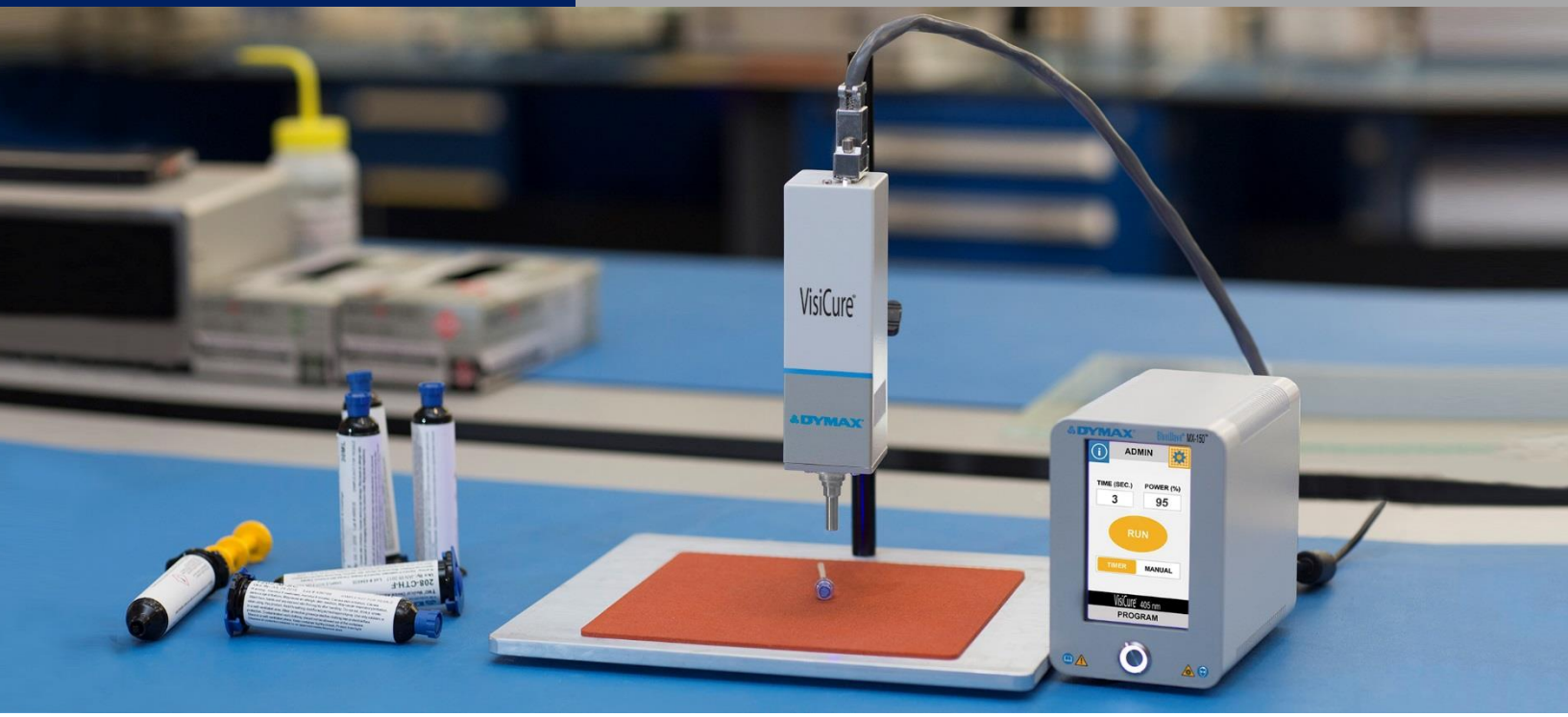
DYMAX®

BLUEWAVE® MX-150 PRODUCT BULLETIN



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BlueWave® MX-150 LED Spot-Curing System

High-Intensity Curing System with the Flexibility of Multiple Systems

The BlueWave® MX-150 curing system provides manufacturers with the curing flexibility they need, in a smaller, more efficient design. The unit is comprised of two main parts, a controller with an easy-to-use touchscreen interface and a high-intensity LED emitter which is uniquely designed to offer higher, more consistent curing intensity than traditional spot-curing systems. Curing energy is created using an LED chip in the emitter, unlike traditional spot-cure systems, where it is located in the controller. Locating the LED chip at the point-of-cure provides more consistent curing by addressing potential intensity loss caused by the use of long or bent lightguides.

With this new design, the system can be truly tailored to users' curing needs – allowing them to choose from three different wavelength LED emitters (365, 385, or 405 nm) so optimal cures are achieved. Users also have endless set up flexibility; for automated curing processes, the emitter can be easily mounted to robotic arms or further from the controller without fear of intensity variations. When used as a bench-top curing system, the unit can be paired with a stand and shielding or a lightguide can be connected to the system for specialized applications.

System Features & Benefits

Features	Benefits
High Intensity of up to 40 W/cm^2	• Quickly cures a variety of materials
LED emitters available in 365, 385, or 405 nm wavelengths	• Compatible with a variety of UV and visible light-curable materials • Wavelength flexibility allows co-optimization of adhesive and curing system for optimal cure
LED chip located in the emitter, not the controller	• Consistent intensity • Mounted emitter saves the cost of lightguides • Eliminates potential intensity loss from long or bent lightguides • Easily mounted to robotic arms with no intensity variation • Emitter can be mounted closer to application, while the controller remains close to the operator
Admin and Production Modes	• Production Mode for simple on/off operation • Curing programs can be saved and easily recalled • Units can be password protected so only the Production Mode can be accessed by workers
Touch screen with full keyboard	• Improved user interface • Curing programs can be easily entered, stored, and recalled when needed
Compatible with 3- and 5-mm lightguides with Wolf Connector	• Utilizes standard/readily available lightguides
Instant on-off	• No warm-up period • More energy efficient
Efficient LED temperature management and system monitoring	• Maximized continuous operation without overheating • Comfortable hand-held operating temperature • Temperature monitoring assures maximum LED life • Checks presence of lightguide or other delivery optic
PLC interface	• Easily incorporated into automated systems

Admin and Production Modes

Admin mode fully unlocks the device and allows for setting curing time and intensity cycles. Each individual curing cycle can be entered and saved as a program and recalled when needed. The production mode is designed for simple operation by manufacturing personnel. Settings and access to admin mode can be password protected using the full QWERTY keyboard.

LED Light-Curing Technology

Dymax LED spot-curing systems generate curing energy using high-intensity LEDs instead of conventional metal-halide or mercury-arc lamps. The relatively narrow frequency band of energy emitted by LEDs results in cooler substrate temperatures compared to traditional UV-style lamp systems, making them ideal for curing thermally sensitive materials. Dymax LED-curing systems offer many energy and cost-saving benefits, such as no warm-up period, lower energy consumption, no bulbs to change, and more consistent frequency and intensity output for better process control. Visit www.led.dymax.com for more information on LED light-curing technology.

Ordering Information

A complete BlueWave® MX-150 system features a controller/power supply and LED emitter. Emitters are available in 365, 385, and 405 nm wavelengths. Lightguides and other accessories noted below can be added for specific applications. Components are sold separately

Units are warrantied against defects in material and workmanship for one year from date of purchase.

PART NUMBERS		
System Components		
BlueWave® MX-150 Controller/Power Supply	**42378** North American Power Cord **42379** Asian Power Cord (Type G) **42380** No Power Cord	Note: Controller packages include a 2-meters long interconnect cable used to connect the controller to the emitter. If a longer length is needed, a second interconnect cable can be ordered separately to extend that distance without impacting performance.
LED Emitters**	**42336** RediCure™ (365 nm) **42337** PrimeCure™ (385 nm) **42338** VisiCure® (405 nm)	
Lightguides and Optics		
Lightguides*	**36619** Single-Pole Lightguide, 3-mm x 1,000 mm **37043** 2-Pole Liquid-Filled Lightguide, 3-mm x 1,000 mm **37044** 3-Pole Liquid-Filled Lightguide, 3-mm x 1,000 mm **35101** Single-Pole Lightguide, 5-mm x 500 mm **35102** Single-Pole Lightguide, 5-mm x 1,000 mm **36238** Single-Pole Lightguide, 5-mm x 1,500 mm **38998** Single-Pole Lightguide, 5-mm x 2,000 mm	
Lightguide Simulators**	**36987** Lightguide Simulator, 5-mm Diameter	
Angled Terminators	**39029** 60° Angled Terminator for 3-mm Lightguide **38042** 60° Angled Terminator for 5-mm Lightguide **39030** 90° Angled Terminator for 3-mm Lightguide **38049** 90° Angled Terminator for 5-mm Lightguide	
Optics	**41148** Adjustable Taper Focusing Lens (5 mm)	
Accessories		
Stands & Shielding	**42390** Emitter Mounting Stand **41395** Three-Sided Acrylic Shield **42426** Emitter Holder Assembly Bracket	
Radiometers	**40505** ACCU-CAL™ 50-LED Radiometer Kit for LED Spots, Floods, and BlueWave® QX4®	

* All standard Wolf entrance-fitting lightguides will physically couple to this system, but only configurations listed above have been tested and verified to be fully functional.

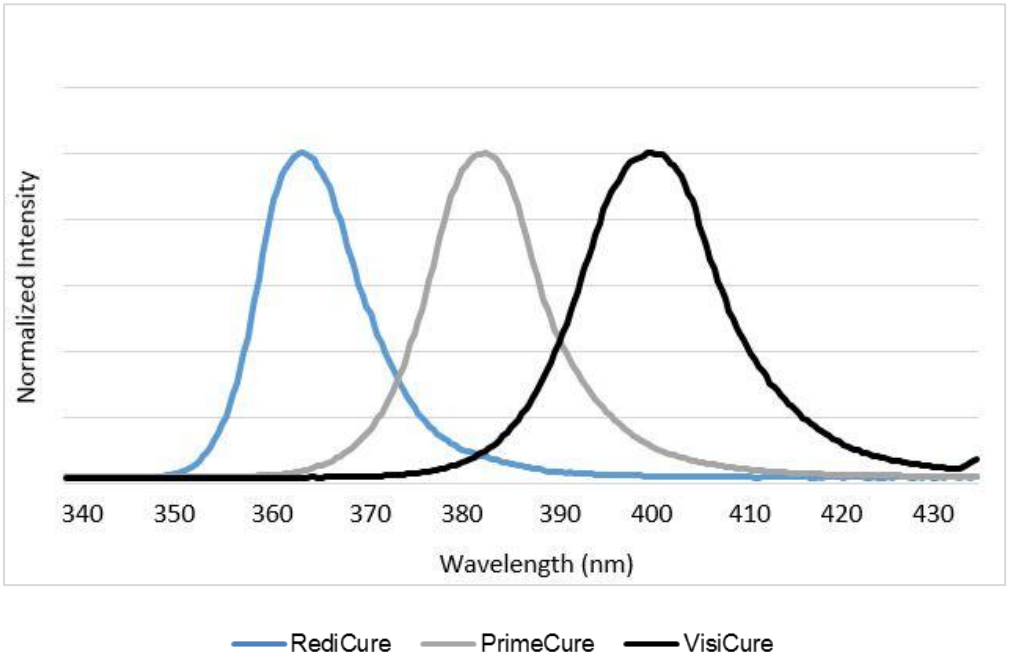
** 5-mm lightguide simulator comes with every emitter.

System Specifications

Property	Specification		
MX-150 Emitter	RediCure™	PrimeCure™	VisiCure®
Output Frequency	365 nm	385 nm	405 nm
Intensity Output*	24 W/cm^2	38 W/cm^2	36 W/cm^2
Power Supply Input	100-240V≈ 2.5A, 50-60Hz		
LED Timer	0 to 999 seconds		
LED Activation	Foot pedal, LCD touch screen, or PLC		
Cooling	Air cooled		
Dimensions (H x W X D)	Controller: 5.77" x 3.74" x 6.26" (14.6 cm x 9.5 cm x 15.9 cm) Emitter: 7.9" x 1.97" x 1.97" (20.06 cm x 5 cm x 5 cm)		
Weight	Controller: 2.6 lbs. (1.18 kg) / Emitter: 1.4 lbs. (0.64 kg)		
Unit Warranty	1 year from purchase date		
Operating Environment	10-40°C		

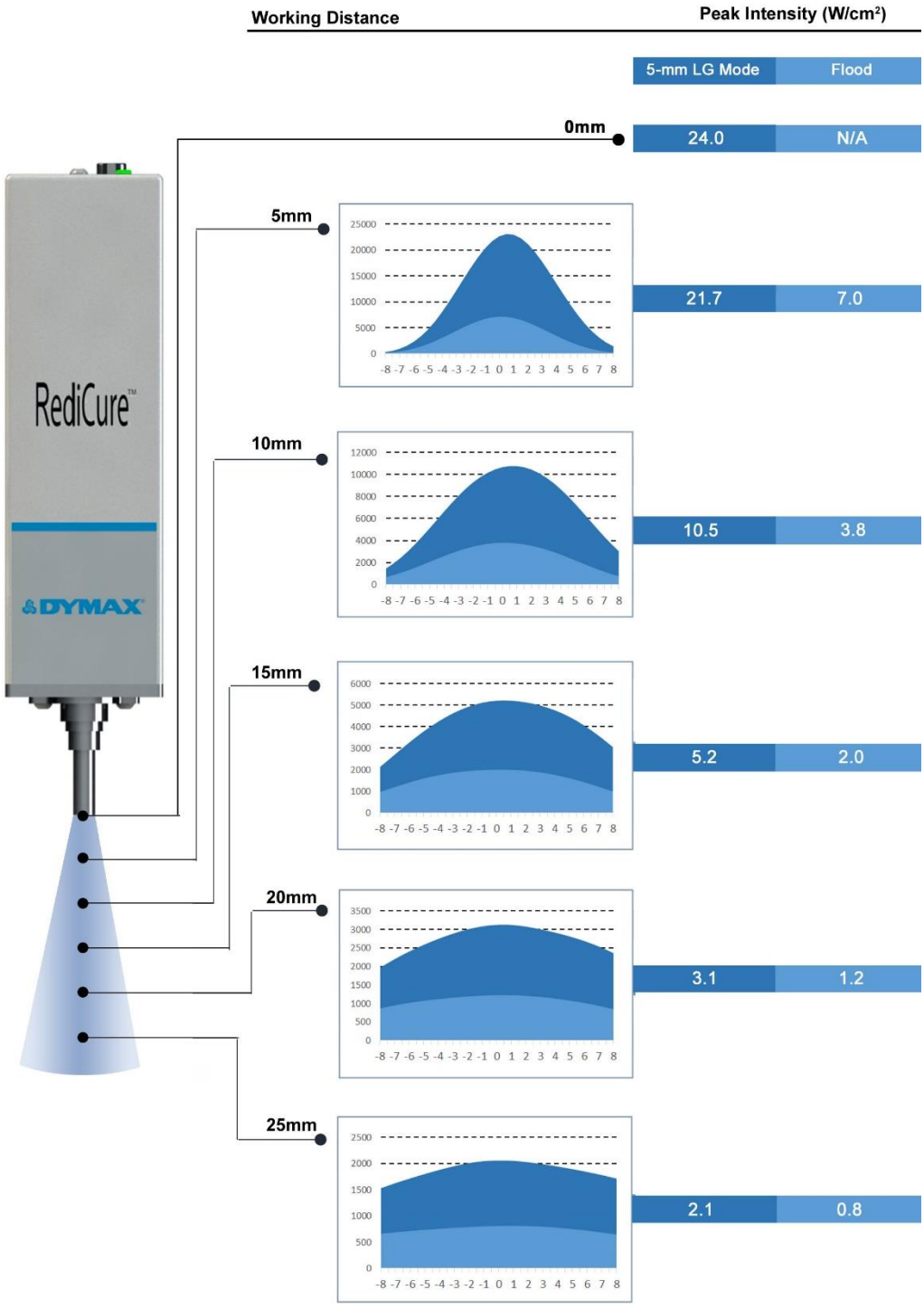
* Measured using a Dymax ACCU-CAL™ 50-LED Radiometer at a distance of 0 mm.

Figure 1. BlueWave® MX-150 Spectral Output Chart



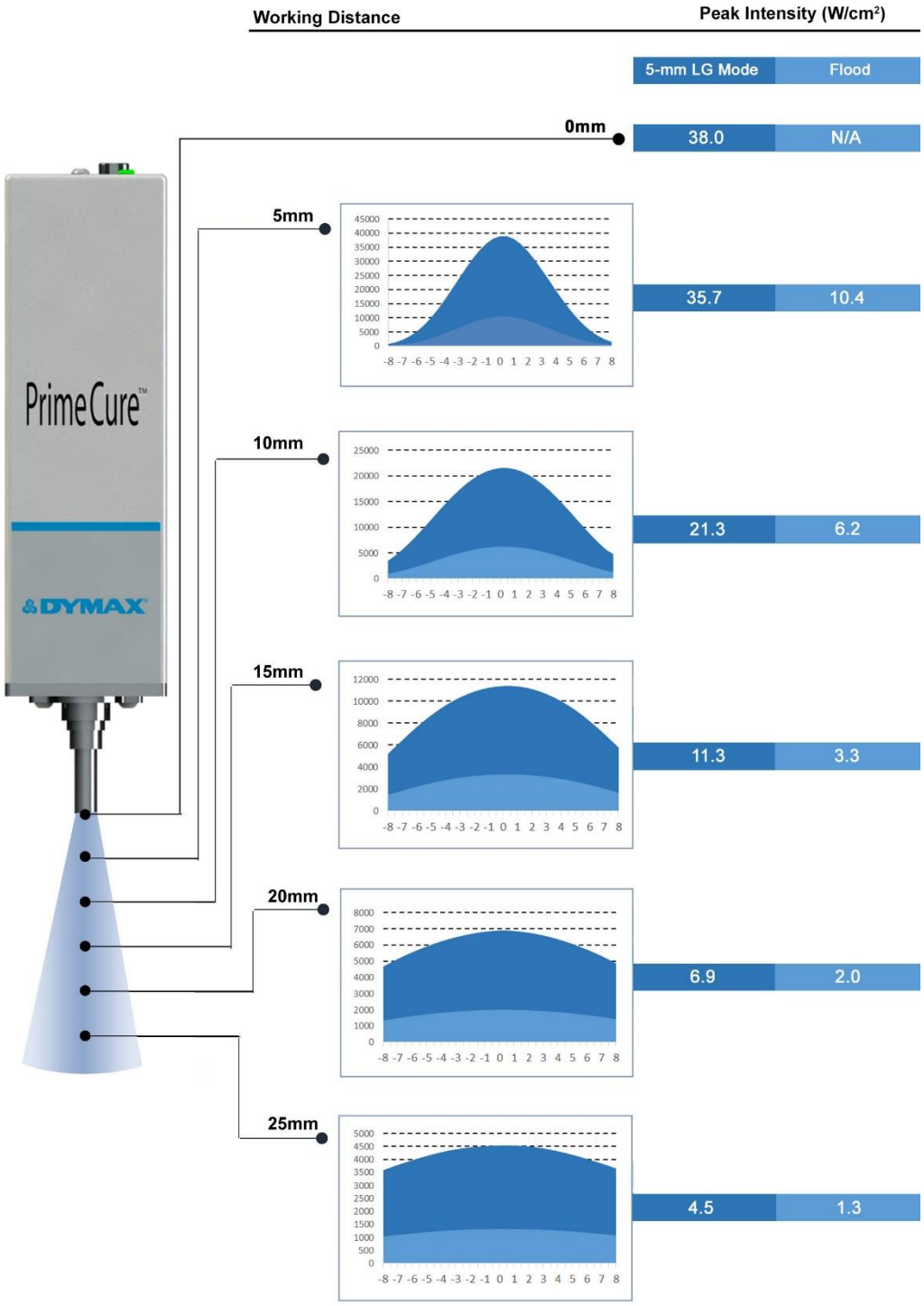
System Intensity Using Emitters

Figure 2. RediCure™, 365 nm - Intensity at Various Working Distances
Measured with an ACCU-CAL 50-LED in both 5-mm lightguide (LG) and flood source modes*



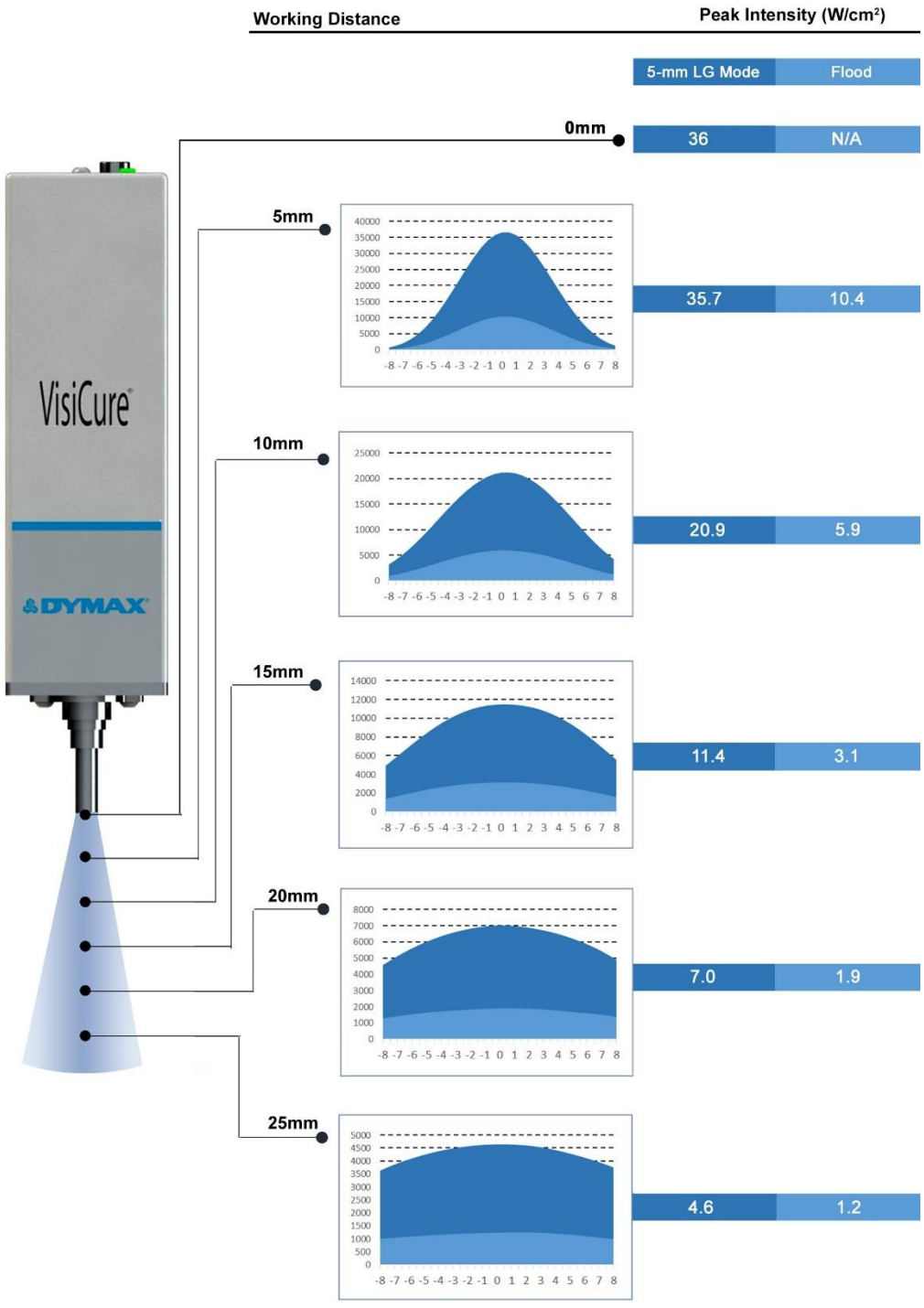
* Dymax recommends using the 5-mm lightguide source mode on the ACCU-CAL™ 50-LED, when measuring at 0 mm with the provided adapter in the ACCU-CAL kit. If measurements are made at greater working distance, Dymax recommends using the flood mode source for measurements. For convenience, both numbers are provided in this chart.

Figure 3. PrimeCure™, 385 nm - Intensity at Various Working Distances
Measured with an ACCU-CAL 50-LED in both 5-mm lightguide (LG) and flood source modes*



* Dymax recommends using the 5-mm lightguide source mode on the ACCU-CAL™ 50-LED, when measuring at 0 mm with the provided adapter in the ACCU-CAL kit. If measurements are made at greater working distance, Dymax recommends using the flood mode source for measurements. For convenience, both numbers are provided in this chart.

Figure 4. VisiCure®, 405 nm - Intensity at Various Working Distances
Measured with an ACCU-CAL 50-LED in both 5-mm lightguide (LG) and flood source modes*



* Dymax recommends using the 5-mm lightguide source mode on the ACCU-CAL™ 50-LED, when measuring at 0 mm with the provided adapter in the ACCU-CAL kit. If measurements are made at greater working distance, Dymax recommends using the flood mode source for measurements. For convenience, both numbers are provided in this chart.

Optional Lightguide Configuration

Dedicated optics are not necessary to accommodate larger irradiation areas such as an 8-mm diameter spot. These larger areas can be achieved by increasing the distance between the emitting end of the standard 5-mm optic to ~10 mm.

Figure 5. BlueWave® MX-150™ with 5-mm Lightguide Simulator, Measured 10 mm from the Surface of the Radiometer

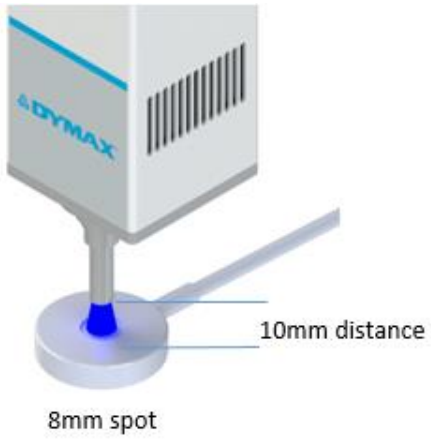
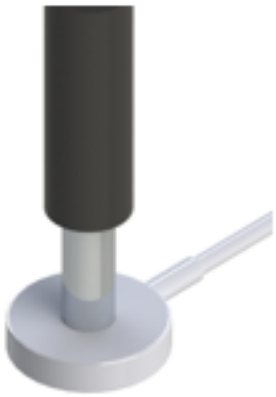


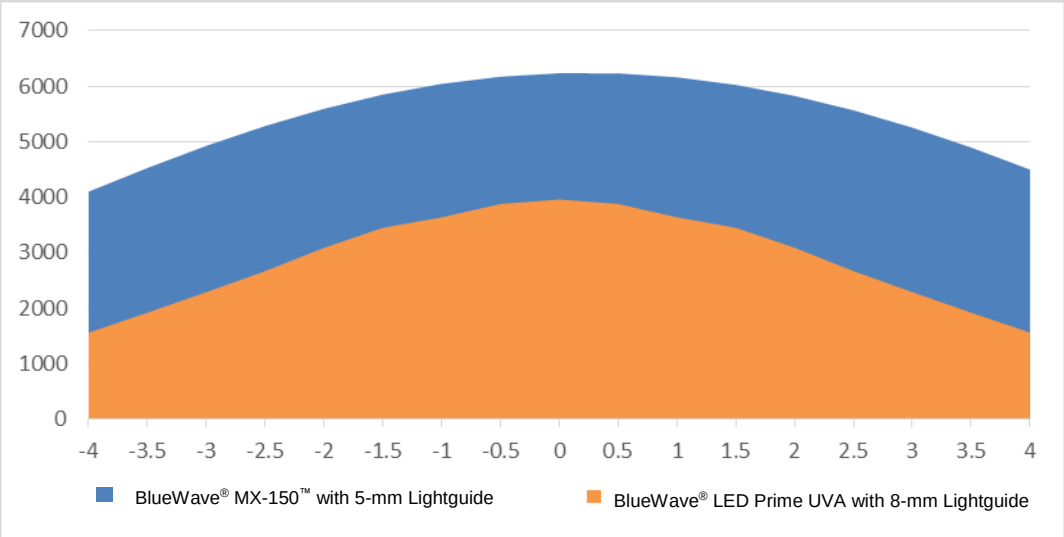
Figure 6. BlueWave® LED Prime Using a 8-mm Lightguide, Measured Directly on the Surface of the Radiometer



Both cover the same target cure area, however, the new BlueWave® MX-150™ provides a much higher intensity, see chart below.

Figure 7. Intensity Comparison

Intensity Measured with ACCU-CAL™ 50-LED



The system can be outfitted with a 3 or 5-mm Wolf-style lightguide. A 5-mm lightguide/simulator couples perfectly with the 5-mm aperture of the LED chip (Figure 8) while a 3-mm lightguide only transfers part of the UV light emitted by the LED chip (Figure 9), resulting in lower efficiency. See the intensity chart on the next page for more information.

Figure 8. Aperture with 5-mm Lightguide

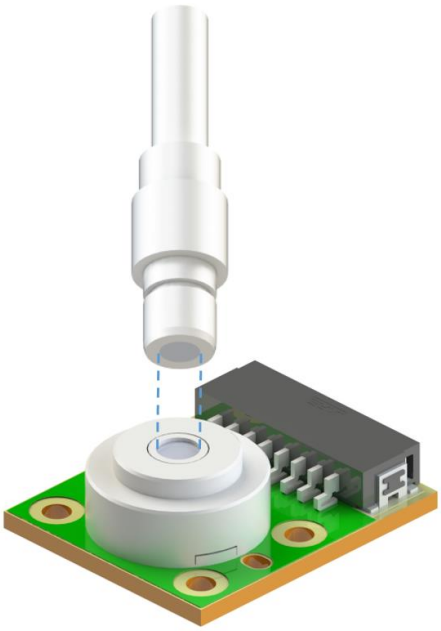
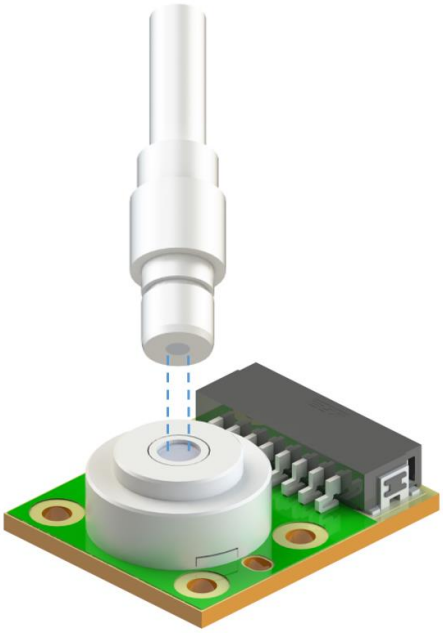


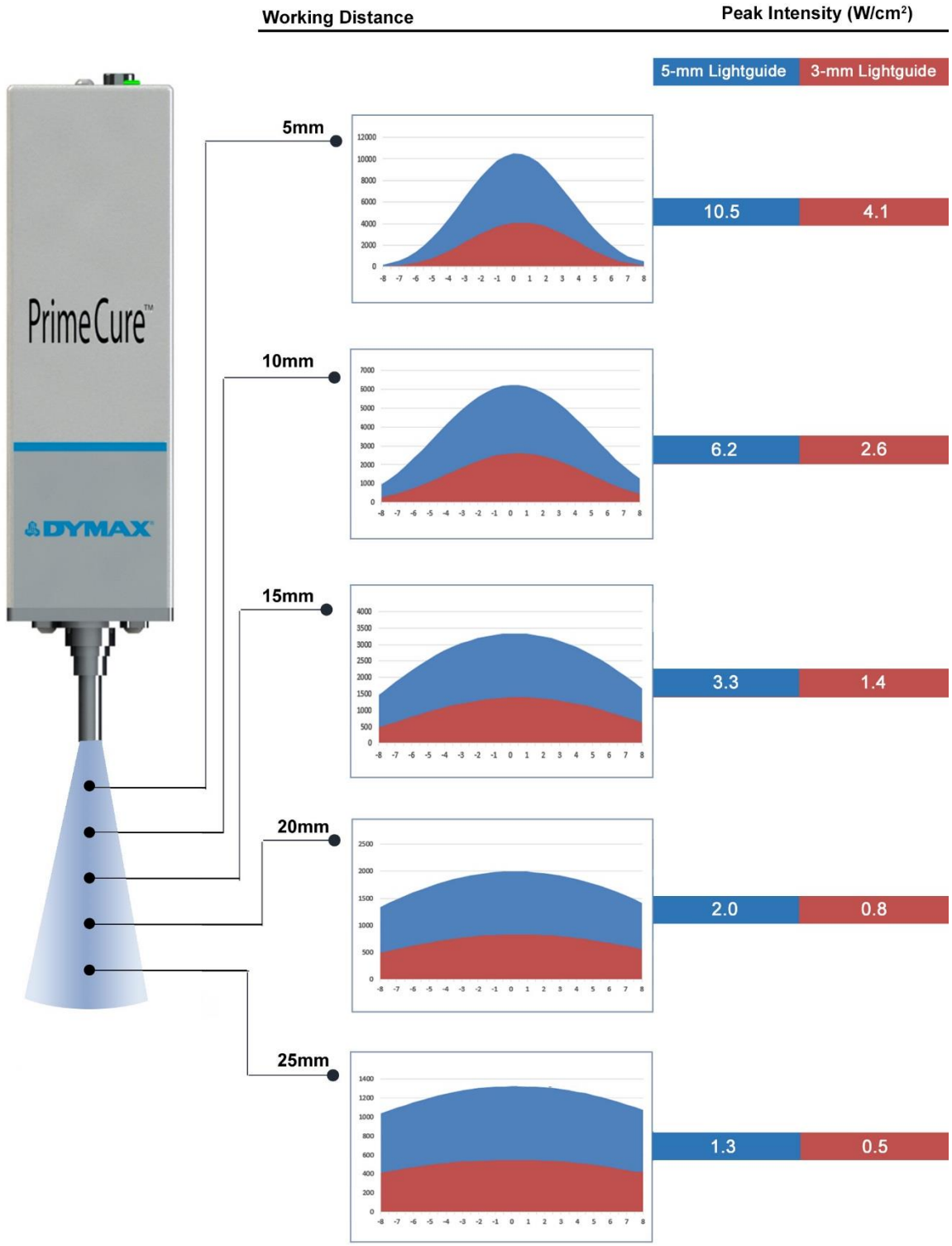
Figure 9. Aperture with 3-mm Lightguide



The high intensity of the BlueWave® MX-150™ can be illustrated by comparing a 3-pole lightguide (PN 37044) to a single-pole lightguide on a Dymax BlueWave® LED Prime UVA or BlueWave® LED VisiCure® unit. The intensities of each of the 3 poles on the BlueWave® MX-150™ is higher in intensity than a single-pole lightguide on those units:

	Average Intensity, W/cm²	
	BlueWave® MX-150 with 3-Pole Lightguide	**BlueWave® LED Prime with Single-Pole Lightguide**
RediCure™, 365 nm	15	N/A
PrimeCure™, 385 nm	24	15
VisiCure®, 405 nm	22	15

Figure 10. PrimeCure™, 385 nm - Intensity with a 3- or 5-mm lightguide at Various Working Distances
Measured with an ACCU-CAL 50-LED in flood mode.



* PrimeCure™ shown for illustrative purposes. Expect similar performance with the VisiCure® and RediCure™ systems. For more specific data at various working distances and optics, please consult with Dymax Application Engineering.

Accessories

Angled Terminators

Angled terminators can be attached to 3 and 5-mm liquid lightguides to provide significant value when delivering curing energy to hard to reach and semi-hidden bond lines.

- Compact, cost effective design
- Available in 60° and 90° versions
- Easy to connect to the BlueWave® MX-150™ emitter
- Optimized energy delivery
- Possible for curing in motion and dynamic curing
- Better uniformity with three lightguide terminators or a tri-furcated lightguide, as compared with a bi-furcated lightguide
- Easily mounted to fixture with close working distance

Part Number	Size	Angle	Approximate Loss
39029	3 mm	60°	35%
38042	3 mm	60°	35%
39030	5 mm	90°	30%
38049	5 mm	90°	30%

Figure 11. 5-mm, 90° Terminator (PN 38042)

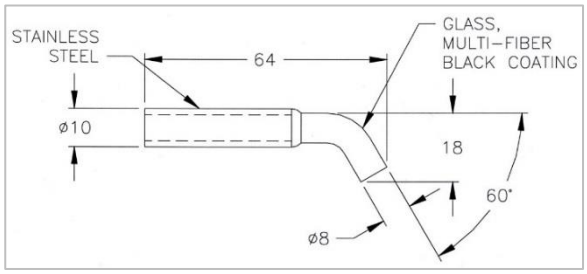


Figure 12. 5-mm, 90° Terminator (PN 38049)

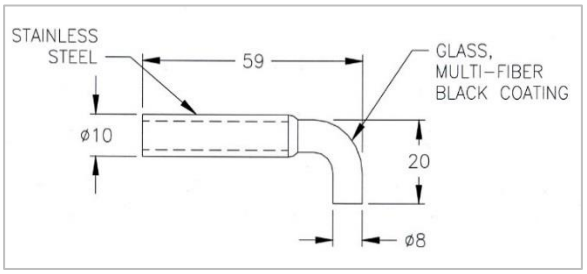
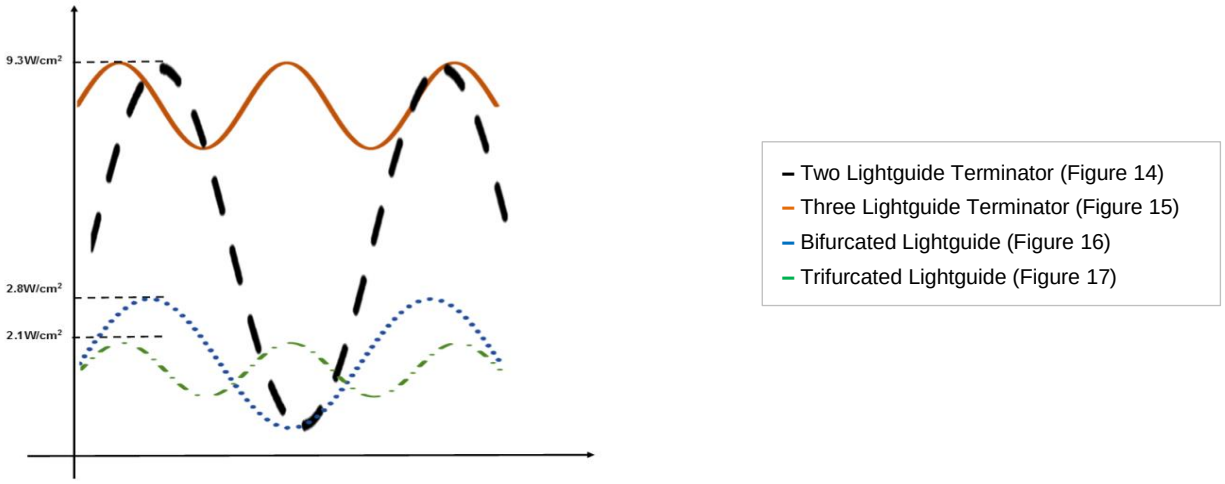


Figure 13. Typical Uniformity on the Perimeter of the Cylindrical Curing Target*



* The uniformity and intensity vary with the diameter of the curing target and working distance. The intensity is measured using the PrimeCure™ and ACCU-CAL™ 50-LED with flood mode, at 0-mm working distance.

Figure 14. Two Lightguide Terminators

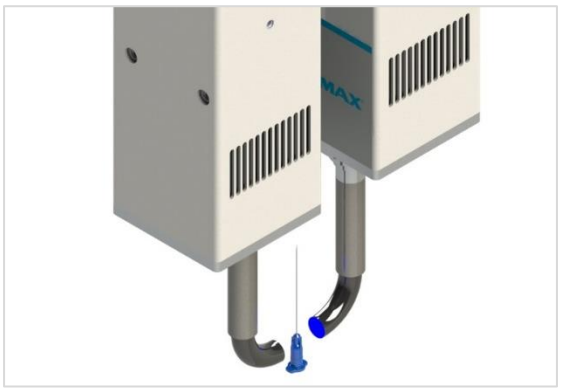


Figure 15. Three Lightguide Terminators

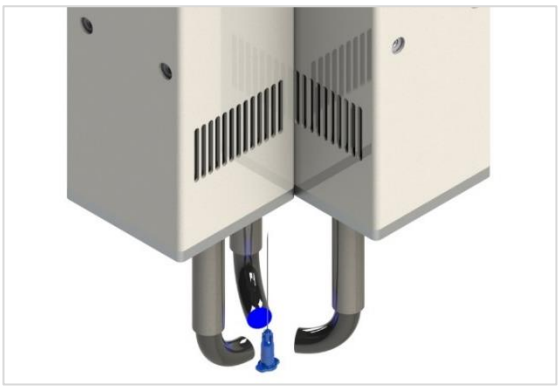


Figure 16. Bifurcated Lightguide

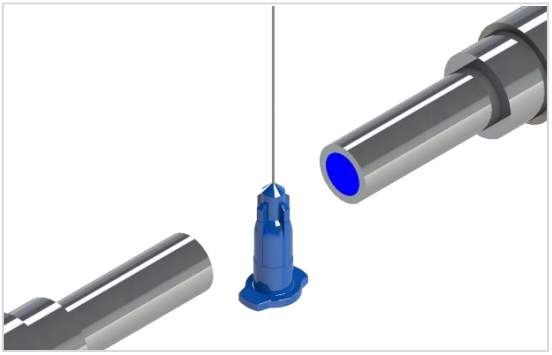


Figure 17. Trifurcated Lightguide

Radiometers

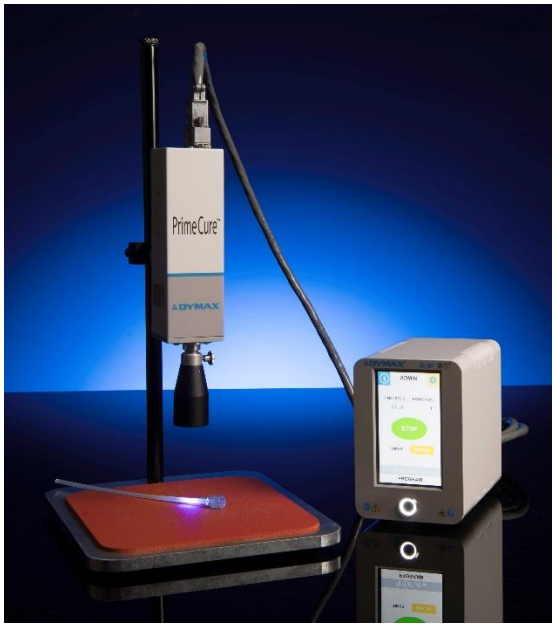
The typical intensity output degradation rate of the unit when run at 100% power and a 100% duty cycle is approximately 7% per 1,000 hours of run time. As with any type of energy source, environmental and operating conditions will have a direct effect on actual degradation rates. Intensity on the BlueWave MX-150 can be measured with a standard ACCU-CAL™ 50-LED. For applications with lightguides, the appropriate standard lightguide adapters should be used and "Lightguide" mode should be selected in the "Source-Mode" section of the optometer. For flood applications, the ACCU-CAL™ 50-LED can be used in flood mode.

Figure 18. ACCU-CAL™ 50-LED

Adjustable Taper Focusing Lens

The adjustable taper focusing lens (PN 41148) can be attached to the BlueWave® MX-150™ to provide a focused and adjustable curing area. Uniformity is increased at a distance of 10-20 mm, while intensity is maximized at a 40-50 mm working distance.

Figure 19. Adjustable Taper Focusing Lens with Dimensions



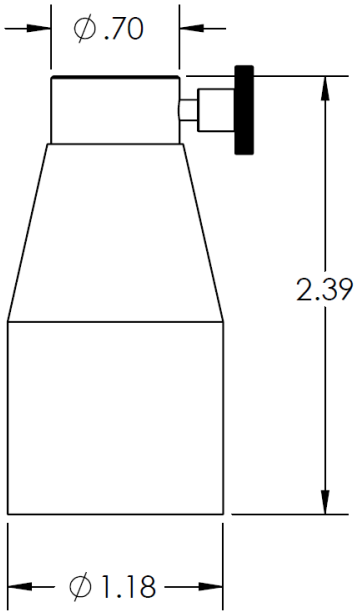
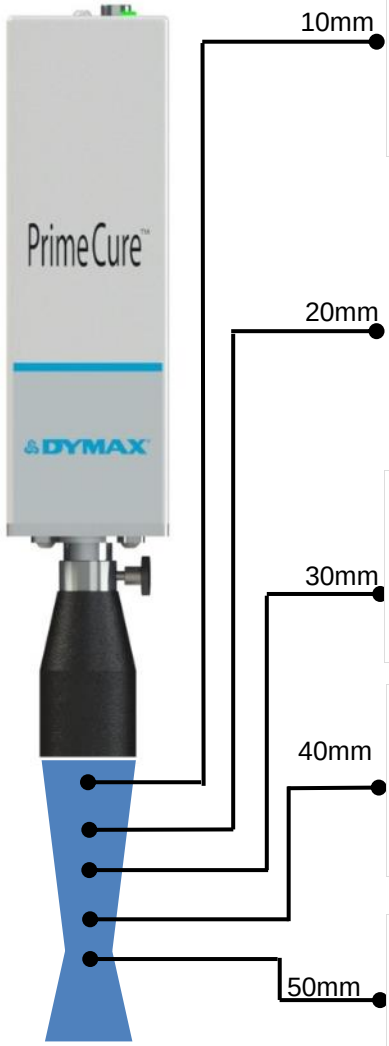


Figure 20. Intensity Measurements, BlueWave MX-150 PrimeCure™ Outfitted with Adjustable Taper Shoulder Focusing Lens (PN 41148)

Measured with an ACCU-CAL 50-LED in flood source modes*



Working Distance	Spot Size	Lateral Uniformity	Peak Intensity (W/cm²)
10mm	Ø14mm	81%	2.1
	Ø14mm	80%	2.1
	Ø14mm	85%	2.1
20mm	Ø12mm	70%	2.9
	Ø13mm	68%	2.7
	Ø15mm	64%	2.5
30mm	Ø12mm	43%	4.1
	Ø13mm	51%	3.6
	Ø15mm	47%	3.0
40mm	Ø11mm	37%	4.8
	Ø13mm	37%	4.3
	Ø16mm	33%	3.6
50mm	Ø12mm	29%	4.9
	Ø13mm	37%	4.5
	Ø15mm	35%	3.8

* Dymax recommends using the flood mode source for measurements. The units of the X-axis in the charts are millimeters (mm). The spot size varies with both the distance of the emitter and the focus change of the lens. By referring this chart, the best combination of spot size, uniformity and intensity can be obtained by adjusting the emitter distance and focus of the lens.

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