



BlueWave® MX-250 LED Flood-Curing System

High-Intensity Curing System with Expansion Capabilities

- Available with three wavelength emitters - 365, 385, & 405 nm
- Very high uniformity across entire cure area over a wide range of working distances
- One controller controls up to 4 emitters
- Ability to group emitters together for large curing patterns
- Controller has touchscreen interface with full keyboard
- Has the ability to save curing programs so they can be easily recalled

The BlueWave® MX-250 LED curing system, provides manufacturers with the curing flexibility of past systems but with expansion capabilities. The unit is comprised of two main parts, a controller with an easy-to-use touchscreen interface and a uniquely designed, high-intensity LED emitter. The LED emitter provides better uniformity and more consistent curing-energy emissions than traditional flood-curing systems over a 50 mm x 50 mm curing area. Curing energy is created using a micro-processor-controlled LED chip set in the emitter. Multiple systems can be grouped together to create larger curing pattern matrixes as needed.

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) and providing additional flexibility with the size and pattern of the active curing area. Users also have endless set up flexibility, as this system can be set up as a bench-top unit, or for automated curing processes, the emitter can be easily mounted to robotic arms or further from the controller without fear of intensity losses.



System Features & Benefits

Features	Benefits
High intensity	• Quickly cures a variety of materials.
Very high uniformity across entire cure area over a wide range of working distances	• Consistent dosage over entire cure area minimizes variation in bond line cure characteristics • Allows for the ability to cure small batches of parts under cure area simultaneously. • Ability to group emitters together for large curing pattern
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 results
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 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
MX-series controllers can power any of the MX emitters	• Customers can upgrade the software in the controller to run other MX emitters. • Provides greater flexibility to switch between LED spot and flood curing configurations.
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
Remote I/O 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 curing systems generate curing energy using high-intensity LEDs in lieu of conventional arc lamp technology. The relatively narrow frequency band of energy emitted by LEDs results in cooler curing environments and 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.

Ordering Information

A complete BlueWave MX-250 system features a controller/power supply and LED emitter. Emitters are available in 365, 385, and 405 nm wavelengths. Accessories noted below can be added for specific applications. Components are sold separately. Units are warranted against defects in material and workmanship for one year from date of purchase.

Part Numbers				
System Components				
LED Emitters	42806	BlueWave® MX-250 Emitter, RediCure® (365 nm)		
	42807	BlueWave® MX-250 Emitter, PrimeCure® (385 nm)		
	42808	BlueWave® MX-250 Emitter, VisiCure® (405 nm)		
2-Channel Controller*	43185	North American Power Cord	43186 Asian Power Cord (Type G)	43184 No Power Cord**
4-Channel Controller*	43182	North American Power Cord	43183 Asian Power Cord (Type G)	43181 No Power Cord**
BlueWave® MX-MIM*	43299	Machine Interface Module		
Interconnect Cables	43453	12-Inch Interconnect Cable Assembly		43010 10-Meter Interconnect Cable Assembly
	42287	2-Meter Interconnect Cable Assembly		43011 20-Meter Interconnect Cable Assembly
	42889	5-Meter Interconnect Cable Assembly		
Accessories				
Stands and Shielding	42390	Single Emitter Mounting Stand		
	42909	Single Emitter Mounting Kit		
	43070	MX Emitter Stand – Holds up to 4 Emitters and Includes an Acrylic Back Shield		
	43019	MX Emitter Stand Kit – Converts the BlueWave® LED Mounting Stand (41268) to an MX Emitter Stand (43070)		
	41395	3-Sided Acrylic Shield - Works with Stand 43070		
	60868	Dual Emitter Mount for MX Controller		
Radiometer	40505	ACCU-CAL™ 50-LED Radiometer Kit - Compatible with LED Spots, Floods, and Line Pattern Systems		
	The typical intensity output degradation rate of the unit when run at 100% power and a 100% duty cycle is approximately 8% 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 of the BlueWave MX-250 can be measured with a standard ACCU-CAL™ 50-LED radiometer using flood-lamp intensity mode.			

* Controllers sold without interconnect cables or foot pedals.

** The appropriate power cord will be added for European customers.



MX Multiple Emitter Stand with
Acrylic Back Shield



Single Emitter Mounting Stand



Multiple Emitter Mounting Kit

System Specifications

Property	Specification		
Output Frequency	RediCure - 365 nm	PrimeCure - 385 nm	VisiCure - 405 nm
Intensity Output* at Array Surface 25-mm Working Distance	RediCure - 684 mW/cm ² RediCure - 255 mW/cm ²	PrimeCure - 955 mW/cm ² PrimeCure - 355 mW/cm ²	VisiCure - 1,090 mW/cm ² VisiCure - 375 mW/cm ²
Power Supply Input	100-240 VAC ≈ 2.5 A, 50-60 Hz		
LED Timer	0 to 999 seconds		
Timer Resolution	0.1 Seconds		
LED Activation	Foot pedal, LCD touch screen, or PLC		
Cooling	Air cooled		
Dimensions (H x W x D)	7.9" x 1.97" x 1.97" (20.06 cm x 5 cm x 5 cm)		
Weight	1.64 lbs. (0.74 kg)		
Unit Warranty	1 year from purchase date		
Operating Environment	10-40°C, 0-80% humidity, non-condensing		

* Measured using a Dymax ACCU-CAL™ 50-LED Radiometer.

Figure 1. BlueWave MX-250 Emitter Dimensions

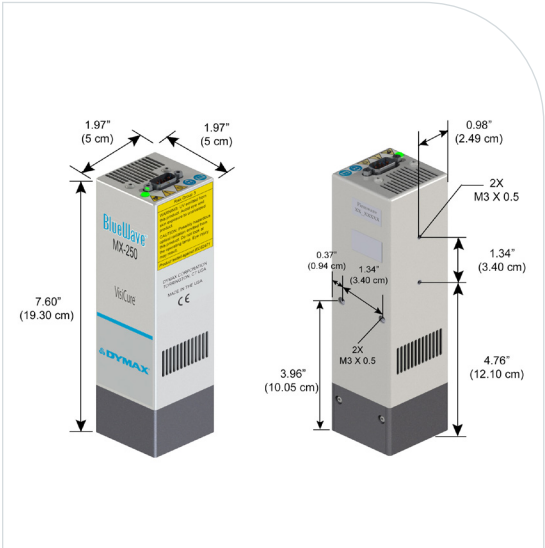
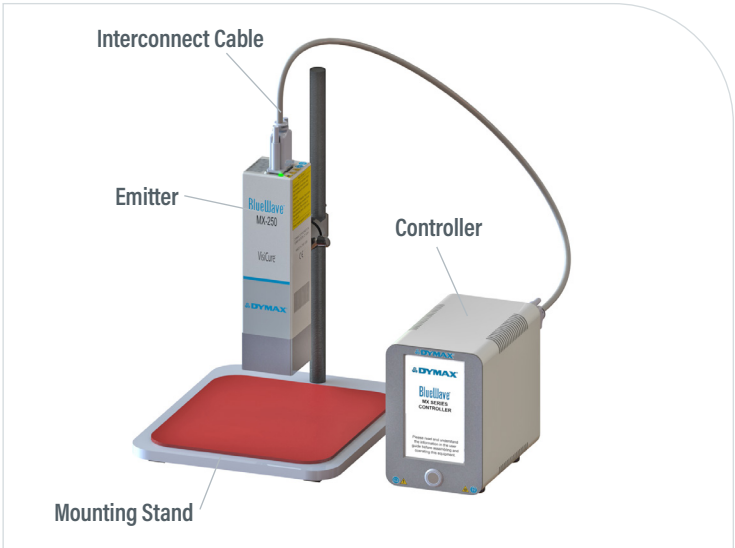


Figure 2. BlueWave MX-250 System Components



Emitter Performance

Figure 3. BlueWave MX-250 Emitter Spectral Output Chart

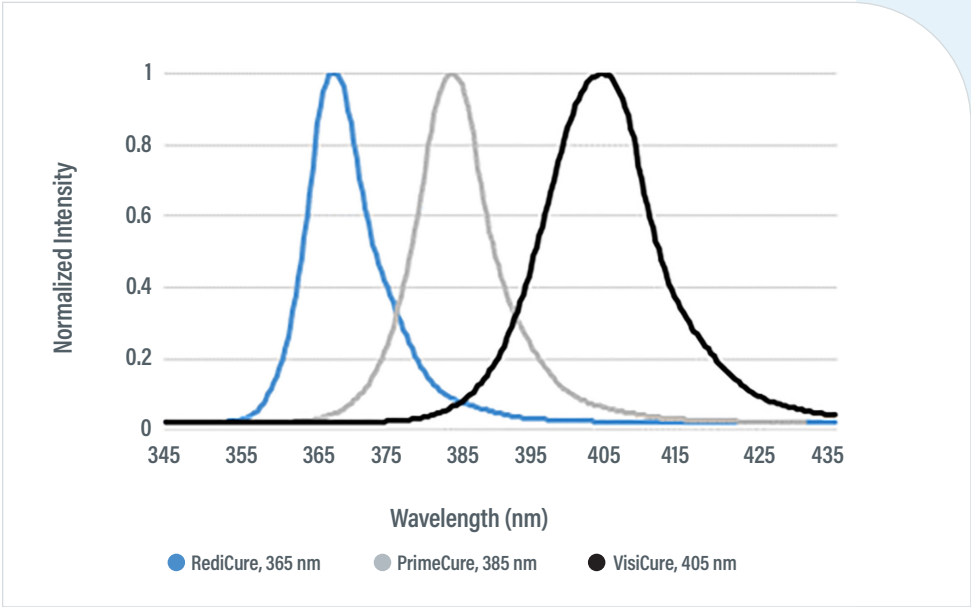


Figure 4. BlueWave MX-250 Emitter Relative Intensity vs. Distance

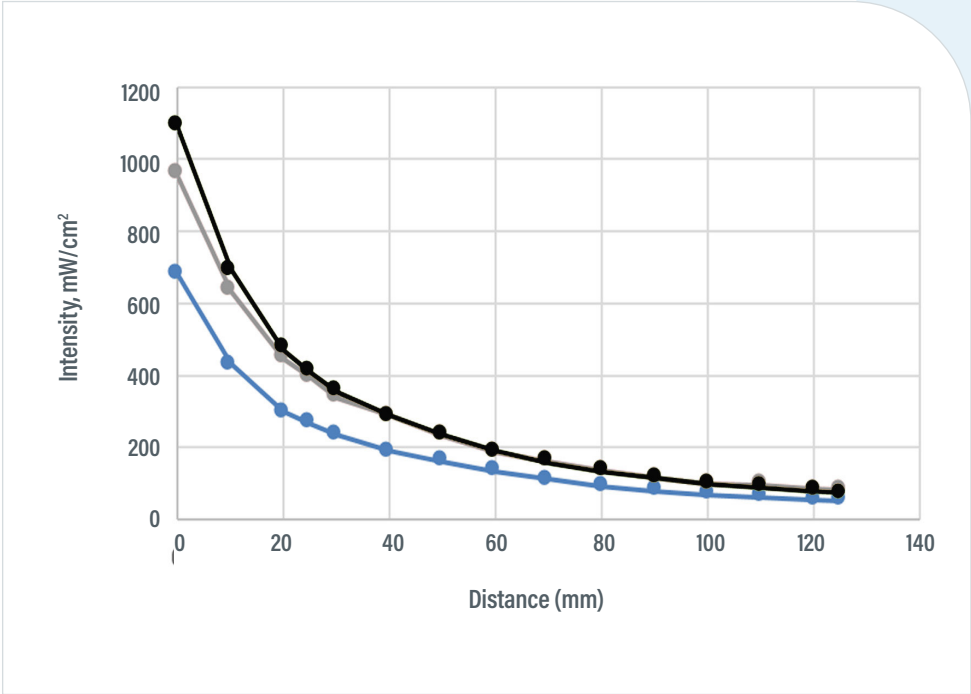
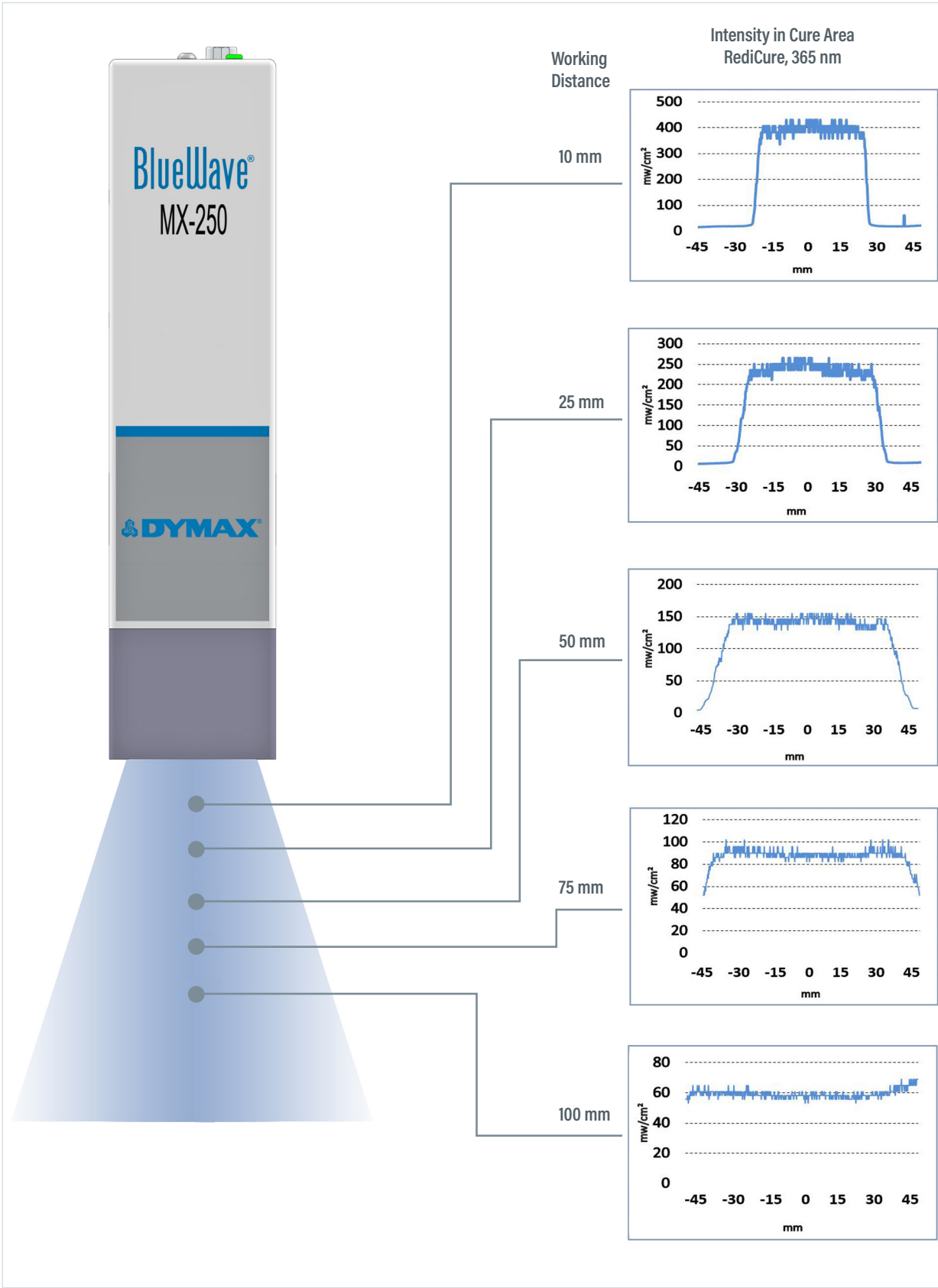


Figure 5. Intensities at Various Working Distances

Note: Curing area data taken using Fuji UV Light Distribution Mapping System. Output intensity measured using a Dymax ACCU-CAL™ 50-LED radiometer in flood-lamp intensity mode.

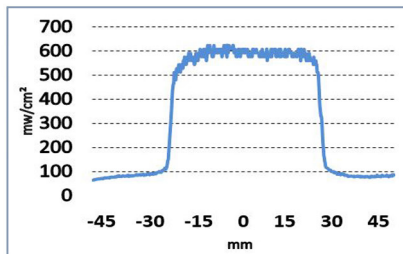
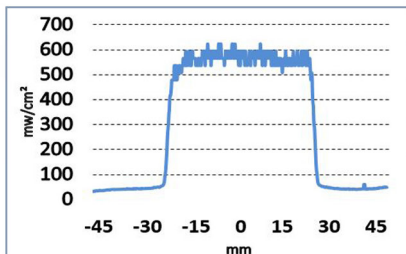


Working
Distance

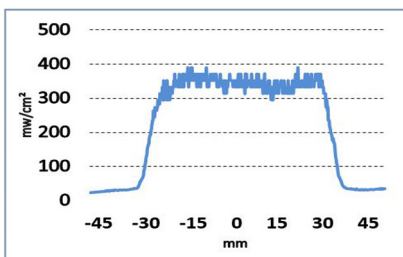
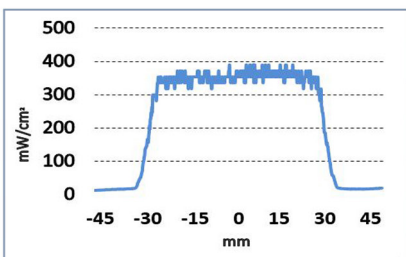
Intensity in Cure Area
PrimeCure, 385 nm

Intensity in Cure Area
VisiCure, 405 nm

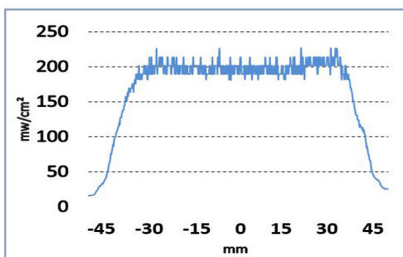
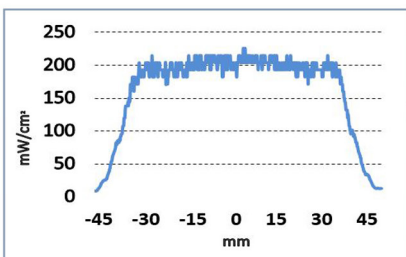
10 mm



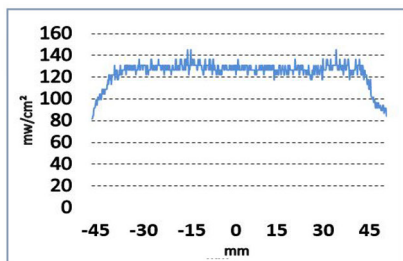
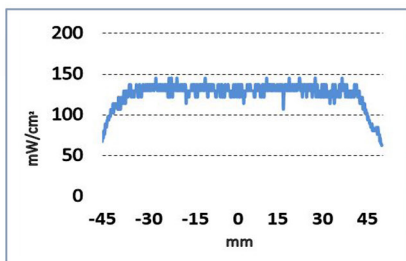
25 mm



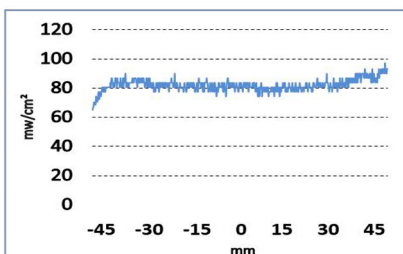
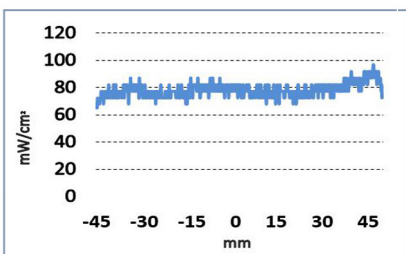
50 mm



75 mm



100 mm



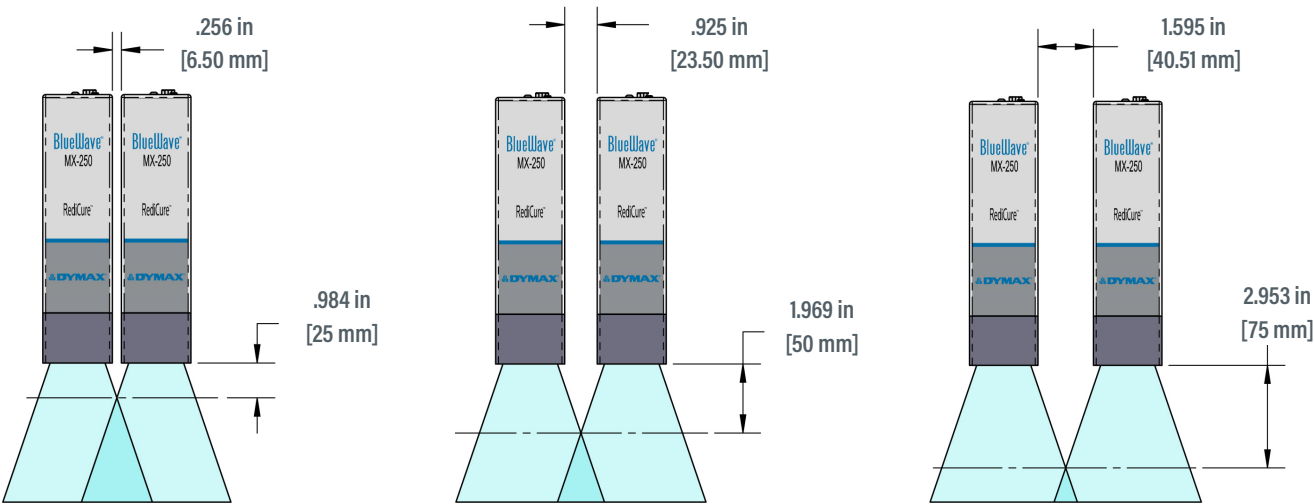
Multi-Array Uniformity

The following graphs illustrate the BlueWave MX-250's high uniformity when multiple arrays are positioned next to each other. This is especially important in conveyor applications to ensure a consistent cure across the entire substrate. We recommend positioning emitters 1 mm apart with vents on the two outside units facing out.

Table 1. Mounting Gap vs. Intensity Response for BlueWave MX-250 LED Flood with Two RediCure Arrays (Mounted Face-to-Face)

Distance	Uniform Response Gap
25 mm	6.5 mm
50 mm	23.5 mm
75 mm	40.5 mm

Figure 6. Uniformity at Various Working Distances – RediCure Emitters (365 nm) Mounted Side-By-Side



Intensity Response at 25-mm Mounting Gap

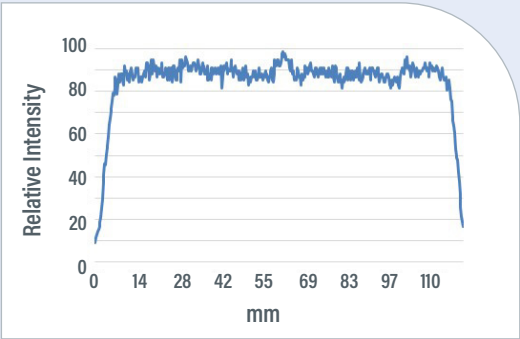
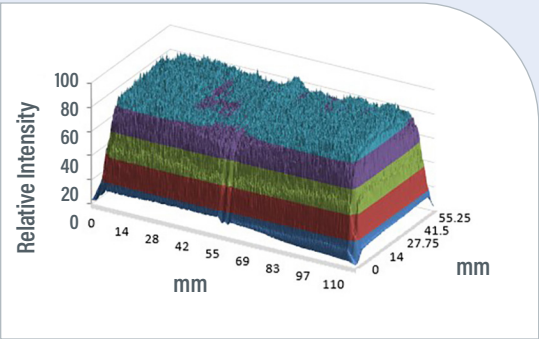


Table 2. BlueWave MX-250 Emitter Curing Area vs. Working Distance

Working Distance	Curing Area
10 mm	45 mm x 45 mm
25 mm	50 mm x 50 mm
50 mm	75 mm x 75 mm
75 mm	90 mm x 90 mm
100 mm	110 mm x 110 mm
125 mm	125 mm x 125 mm

Degradation/Life Testing

Unlike broad-spectrum lamps, LED curing systems do not have bulbs that require regular replacement. Instead, LED curing systems operate with high-intensity LEDs. The instant on/off functioning of LEDs greatly increases the life of these LED systems. Long-term life testing of BlueWave MX-250 systems was conducted for 2,500 continuous hours at 100% intensity and 7,000 continuous hours at 70%. As noted in the graphs below, LED degradation is relatively low over long-range testing and noticeably reduced at 70% Intensity levels. Contact Dymax Application Engineering for additional details on setting up an LED curing process for maximum throughput and LED die life.

RediCure (365 nm) Emitters

- 100% Intensity resulted in a 6.4% degradation per 1,000 hours
- 70% Intensity resulted in a 1.3% degradation per 1,000 hours

Figure 7. LED Degradation Testing - RediCure

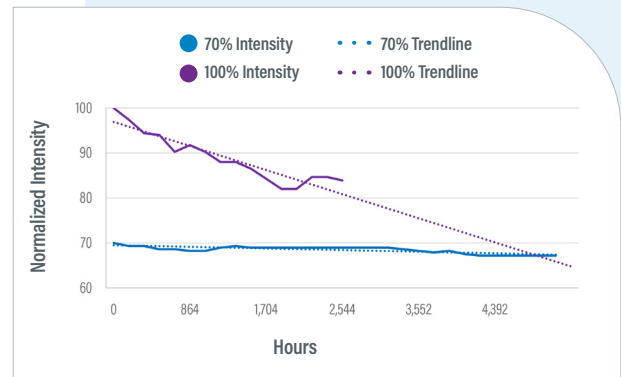


Figure 8. LED Degradation Testing - PrimeCure

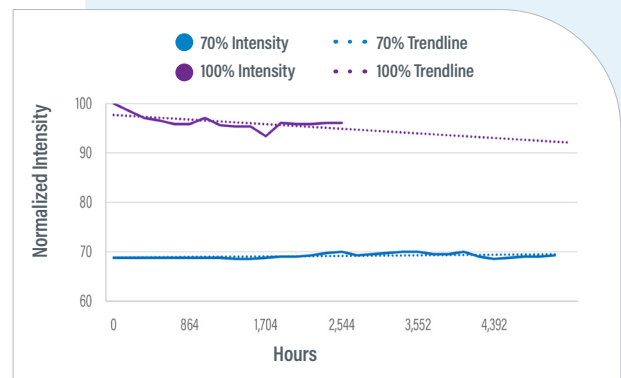
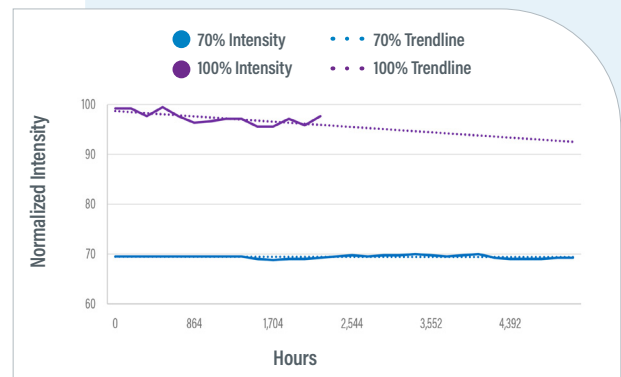


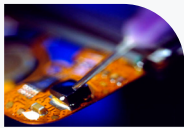
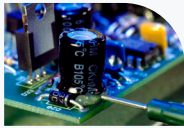
Figure 9. LED Degradation Testing - VisiCure



Note: Testing conducted at 70°F +/-3°F and 30% +/-10% Relative Humidity

Compatible Materials & Applications

The BlueWave MX-250 is ideally suited for a number of applications in the medical, consumer electronics, automotive, aerospace and defense, optical, and appliance industries. The chart below displays some of the materials commonly used in those industries and where the BlueWave MX-250 can be considered as a curing system.

Materials		
Adhesives		✓ Medical device (catheter, needles, tube set, facemask) assembly; glass bonding (stemware, furniture, etc.); automotive headlamp assemblies; camera module assemblies; appliance assembly; speaker assembly; optical display bonding
Conformal Coatings		✓ Printed circuit board protection in aerospace avionics, automobiles, appliances, and consumer electronics; camera module assembly; electric vehicle battery management systems
Potting Compounds		✓ Tamper proofing; potting electrical connectors, switches, and sensors; cable potting; medical potting*
Maskants		✓ Surface protection for turbine blades and rotorcraft components during processing; protection for surfaces during metal finishing processes; protection of orthopaedic parts during processing; protection of PCB components for consumer electronics, automotive electronics, avionics, and medical electronics; protection for surfaces during metal finishing processes*
Encapsulants		✓ Chip encapsulation on PCBs used in automobiles, plane and helicopter control panels, consumer electronics, appliance, and medical diagnostic equipment*
Ruggedization Materials		Flex circuit reinforcement; wire tacking; ball grid array (BGA) ruggedization; Videos graphics arrays (VGA) ruggedization; shock absorption; underfill alternative*

✓ BlueWave MX-250 compatible with this material

* Materials cured with BlueWave MX-250 to be evaluated in customer application to their performance requirements.

