



BlueWave[®] MX-250 LED Flood-Curing System **High-Intensity Curing System with Expansion Capabilities**

Dymax's 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	<ul style="list-style-type: none"> Quickly cures a variety of materials
Very high uniformity across entire cure area over a wide range of working distances	<ul style="list-style-type: none"> 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 patterns
LED emitters available in 365, 385, or 405 nm wavelengths	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Improved user interface Curing programs can be easily entered, stored, and recalled when needed
MX Series controllers can be utilized to power both MX-250 and MX150 emitters	<ul style="list-style-type: none"> Prior MX-150 customers can upgrade the software in the controller to also run MX-250 emitters. Provides greater flexibility to switch between LED Spot and Flood curing configurations.
Instant on-off	<ul style="list-style-type: none"> No warm-up period More energy efficient
Efficient LED temperature management and system monitoring	<ul style="list-style-type: none"> Maximized continuous operation without overheating Comfortable hand-held operating temperature Temperature monitoring assures maximum LED life
Remote I/O interface	<ul style="list-style-type: none"> 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.

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.

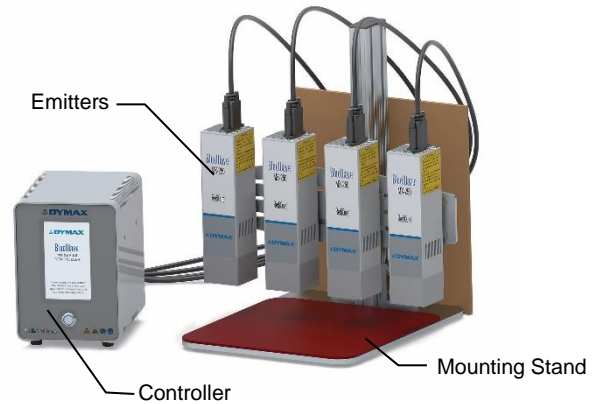
Materials			Recommended Applications
Adhesives		✓	Medical device (catheter, needles, tube set, facemask) assembly; glass bonding (stemware, furniture, etc.); automotive headlamp assemblies; camera module assemblies; appliance assembly; speaker assembly; optical display bonding
Conformal Coatings		✓	Printed 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.

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		
	2-Channel	4-Channel
BlueWave® MX-Series Controller/Power Supply*	43185 North American Power Cord	43182 North American Power Cord
	43186 Asian Power Cord (Type G)	43183 Asian Power Cord (Type G)
	43184 No Power Cord**	43181 No Power Cord**
BlueWave® MX-MIM*	43299 Machine Interface Module Only	
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)	
Accessories		
Interconnect Cables	42287 2-Meter Interconnect Cable Assembly	
	42889 5-Meter Interconnect Cable Assembly	
	43010 10-Meter Interconnect Cable Assembly	
	43011 20-Meter Interconnect Cable Assembly	
Mounting Stands, Brackets, and Shielding	42390 Emitter Mounting Stand	
	42909 Single Emitter Mounting Kit	
	43070 MX Emitter Stand – Includes LED Stand 41268 and 43019 Kit for up to 4 Emitters	
	43019 MX Emitter Stand Kit – Attaches to Stand 41268 and Holds up to 4 Emitters	
	41268 BlueWave® LED Mounting Stand with Acrylic Back Shield	
	41395 Three-Sided Acrylic Shield - Works with Stand 41268	

* Interconnect cables to connect controller to emitters and foot pedals sold separately.

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

ACCU-CAL™ 50-LED Radiometers



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.

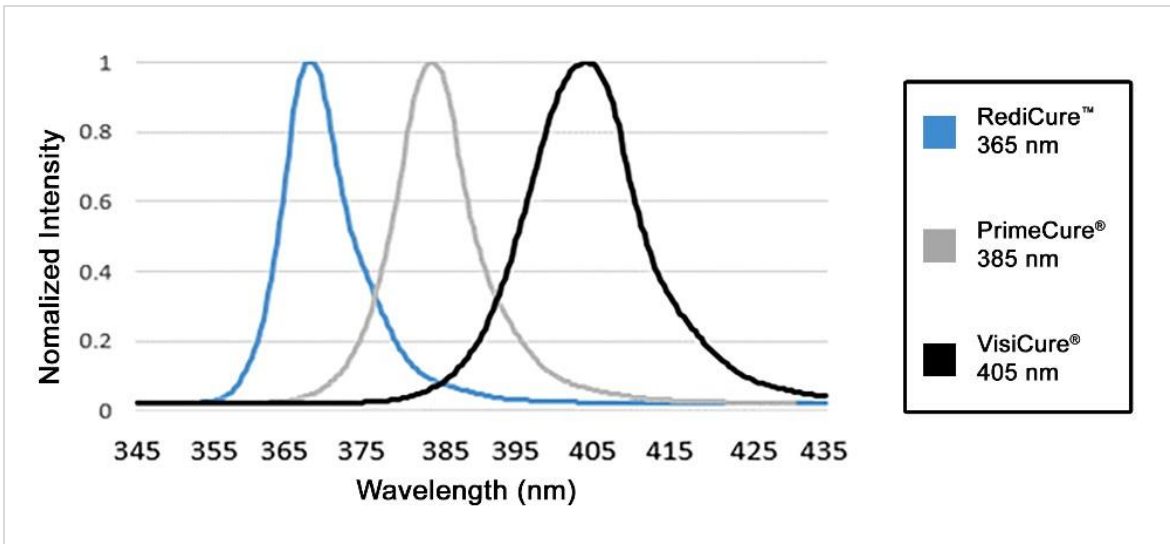
40505 ACCU-CAL™ 50-LED Radiometer Kit
Compatible with LED Spot, Flood, and Line Pattern Systems

System Specifications

Property	Specification		
MX-250 Emitter	RediCure®	PrimeCure®	VisiCure®
Output Frequency	365 nm	385 nm	405 nm
Intensity Output*			
At Array Surface	684 mW/cm ²	955 mW/cm ²	1,090 mW/cm ²
At 25 mm Working Distance	255 mW/cm ²	355 mW/cm ²	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		

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

Figure 1. BlueWave® MX-250 Emitter Spectral Output Chart



System Intensity

Figure 2. BlueWave® MX-250 Emitter Intensity vs. Distance

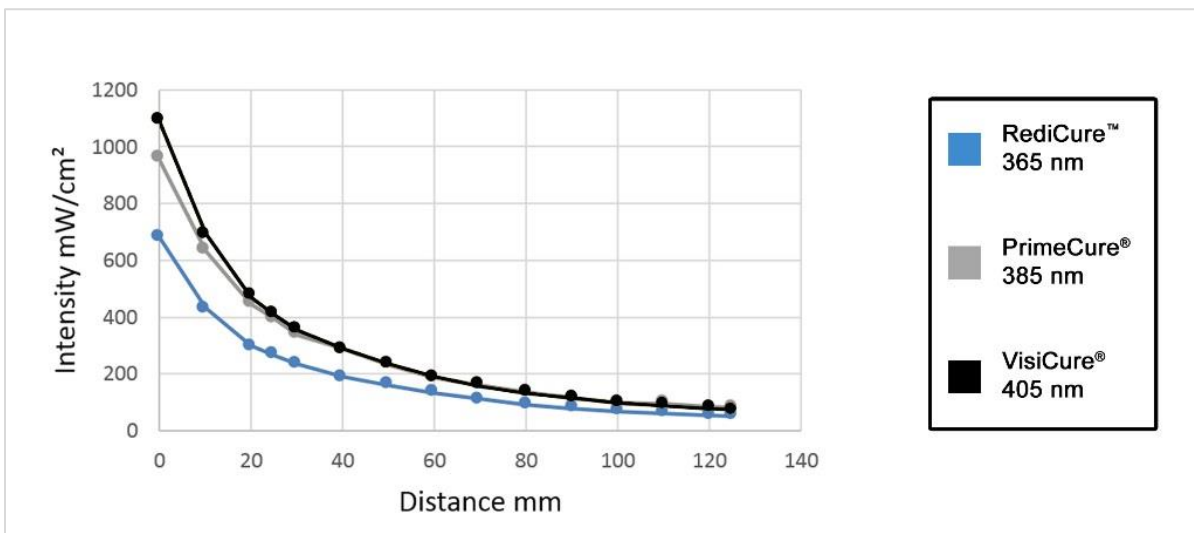
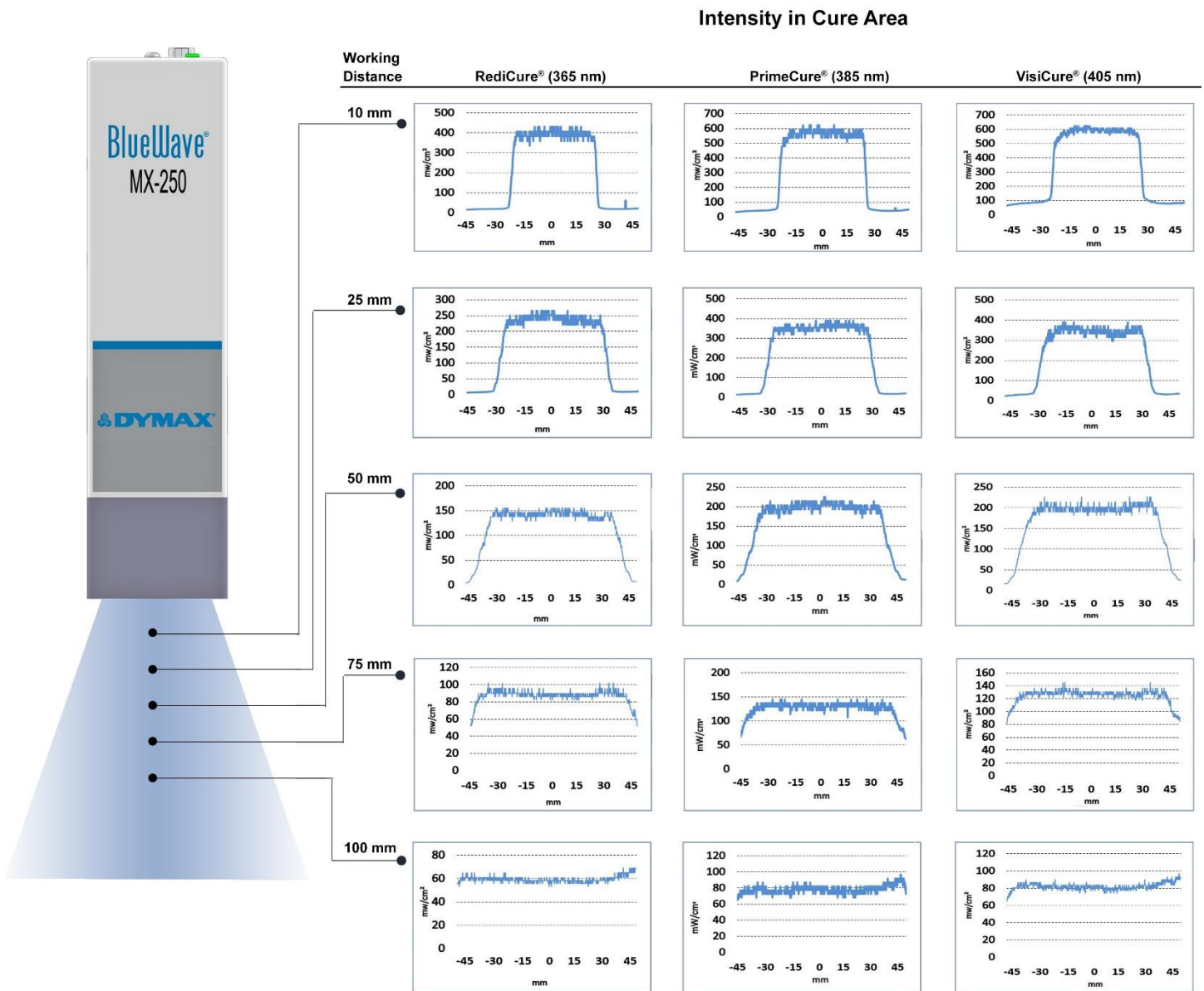


Figure 3. BlueWave® MX-250 Emitter Intensities at Various Working Distances*



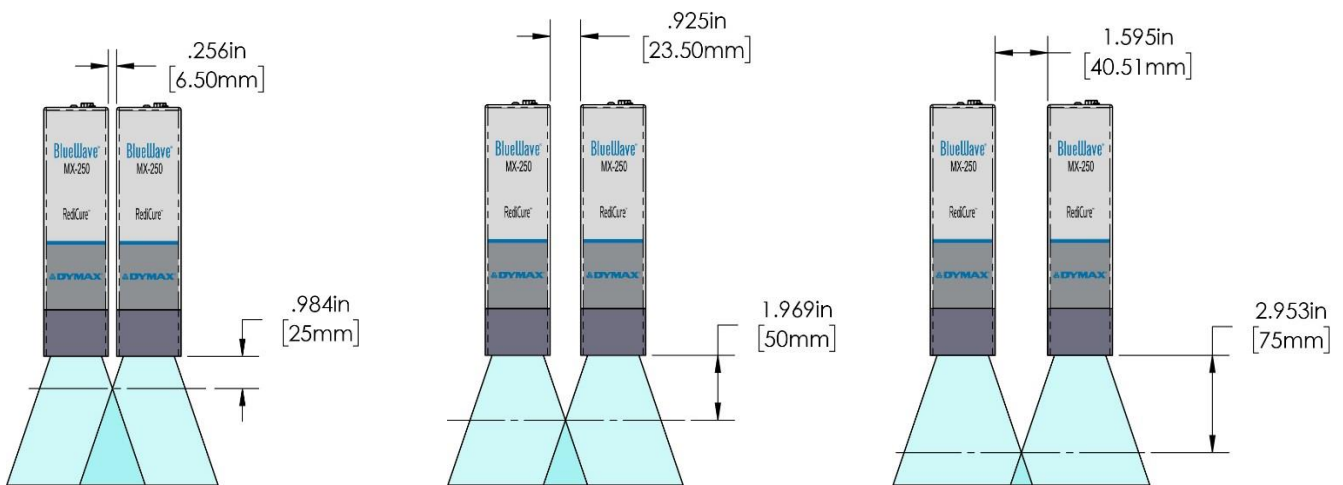
* Curing area data taken using Fuji UV Light Distribution Mapping System. Output intensity measured using a Dymax ACCU-CAL™ 50-LED radiometer in flood-lamp intensity mode.

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
25 mm	6.5 mm
50 mm	23.5 mm
75 mm	40.5 mm



Intensity Response at 25-mm Mounting Gap

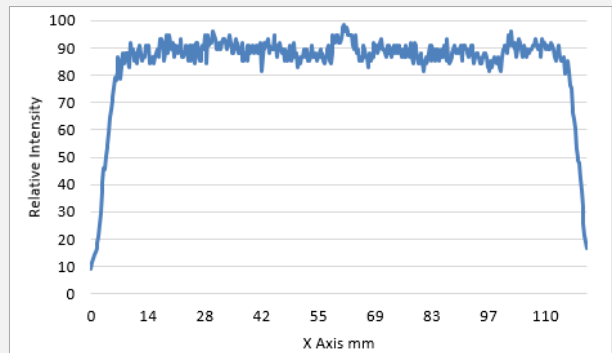
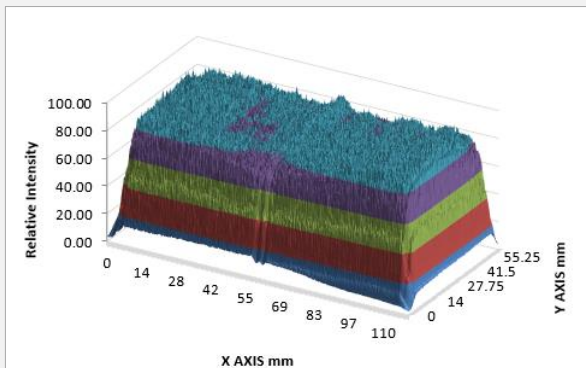
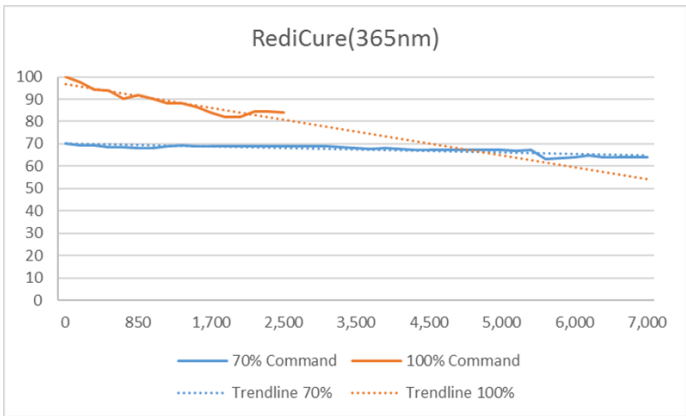


Table 2. MX-250 Emitter Curing Area vs. Working Distance

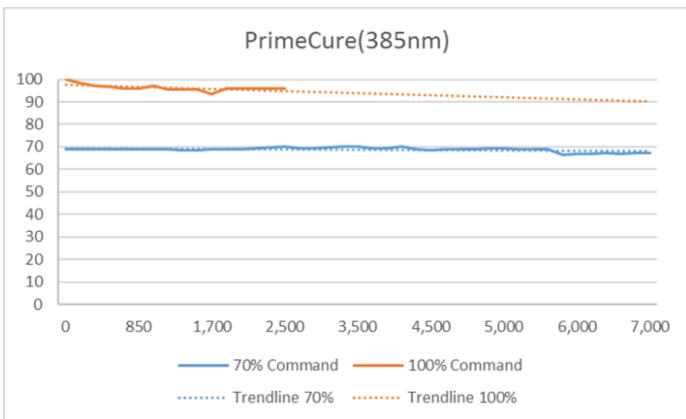
Working Distance	Curing Area
10 mm	45 mm x 45 mm
25 mm	50 mm x 50 mm
50 mm	75 mm x 75 mm
75 mm	90 mm x 90 mm
100 mm	110 mm x 110 mm
125 mm	125 mm x 125 mm

Degradation/Life Testing

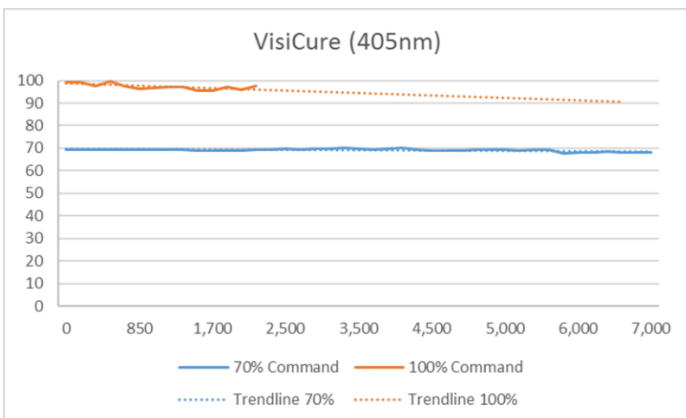
Unlike broad-spectrum lamps, LED curing systems do not have bulbs that require regular replacement. Instead, LED curing systems operate with high-intensity LEDs. The instant on/off functioning of LEDs greatly increases the life of these LED systems. Long-term life testing of BlueWave® MX-250 systems 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.



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



- 100% Intensity resulted in a 1.6% degradation per 1,000 hours
- 70% Intensity resulted in a 0.2% degradation per 1,000 hours



- 100% Intensity resulted in a 2.2% degradation per 1,000 hours
- 70% Intensity resulted in a 0.3% degradation per 1,000 hours

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



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PB058 12/2/2019

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