

## BlueWave® MX-275 UV LED Curing System

### High-Intensity UV LED Flood-Curing System with Line Pattern Emitters

- Available with three wavelength emitters - 365, 385, & 405 nm
- High-intensity, line pattern emitters that can be placed side-by-side to create larger curing patterns
- One controller controls up to 4 emitters
- Controller has touchscreen interface with full keyboard
- Has the ability to save curing programs so they can be easily recalled

The BlueWave® MX-275 curing system is a high-intensity UV LED flood-curing system. Light energy is delivered in a line pattern instead of the traditional round spot or rectangular flood curing patterns. A single BlueWave MX-275 emitter provides a 5 mm x 50 mm curing area, but when paired with a multichannel controller, up to four emitters can be used to produce a curing area as large as 5 mm x 200 mm.

BlueWave MX-275 system emitters are available in three different wavelengths: 365, 385 and 405 nm. As with other emitters from the MX product family, the BlueWave MX-275 can be set up as a bench-top unit, on an array stand to create extended line patterns, or installed on automated curing processing equipment for maximum flexibility. Emitters can be paired with BlueWave® MX-Series Multichannel Controllers or the BlueWave® MX-MIM Machine Interface Module for use in automated systems.



# System Features & Benefits

Features	Benefits
<b>High intensity</b>	<ul style="list-style-type: none"><li>• Quickly cures a variety of materials.</li></ul>
<b>Scalability</b>	<ul style="list-style-type: none"><li>• The 5 mm x 50 mm cure area can be scaled up by placing emitters side-by-side to provide a large, continuous band of UV LED energy</li><li>• BlueWave MX-Series Multichannel Controllers can be utilized to add emitters and grow with your application*</li><li>• Rows of emitters can be used for staged cure cycles</li></ul>
<b>Very high uniformity across entire cure area over a wide range of working distances</b>	<ul style="list-style-type: none"><li>• Consistent dosage over entire cure area minimizes variation in bond line cure characteristics</li><li>• Allows for consistently curing batches of parts for maximum productivity</li><li>• Well suited for conveyor applications where products move under the light source.</li></ul>
<b>LED emitters available in 365, 385, or 405 nm wavelengths*</b>	<ul style="list-style-type: none"><li>• Compatible with a variety of UV and visible light-curable materials</li><li>• Wavelength flexibility allows co-optimization of adhesive and curing system for optimal cure results</li></ul>
<b>Instant on-off</b>	<ul style="list-style-type: none"><li>• No warm-up period</li><li>• More energy efficient</li></ul>
<b>Efficient LED temperature management and system monitoring</b>	<ul style="list-style-type: none"><li>• Maximized continuous operation without overheating</li><li>• Temperature monitoring assures maximum LED life</li></ul>

\*Controller software upgrade may be required for compatibility

## 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.

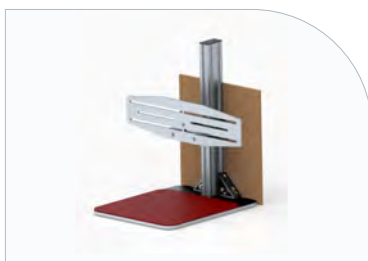
## Ordering Information

A complete BlueWave MX-275 system features a controller/power supply and LED Emitter. BlueWave MX-275 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.

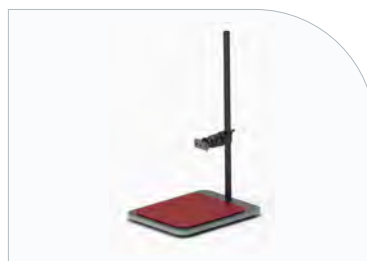
Part Numbers			
<b>System Components</b>			
<b>Line Pattern Emitters</b>	43094	BlueWave® MX-275 Emitter, RediCure® (365 nm)	
	43098	BlueWave® MX-275 Emitter, PrimeCure® (385 nm)	
	43102	BlueWave® MX-275 Emitter, VisiCure® (405 nm)	
<b>2-Channel Controller</b>	43185	North American Power Cord	43186 Asian Power Cord (Type G)    43184 No Power Cord**
<b>4-Channel Controller</b>	43182	North American Power Cord	43183 Asian Power Cord (Type G)    43181 No Power Cord**
<b>BlueWave® MX-MIM</b>	43299	Machine Interface Module	
<b>Interconnect Cables</b>	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	
<b>Accessories</b>			
<b>Stands and Shielding</b>	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	
<b>Radiometer</b>	40505	ACCU-CAL™ 50-LED Radiometer Kit for LED Spots, Floods, and BlueWave® QX4	
		The typical intensity output degradation rate of the unit when run at 100% power and a 100% duty cycle is approximately 8% per 2,000 hours of run time based on worse case wavelength. 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-275 can be measured with a standard ACCU-CAL™ 50-LED radiometer using flood-lamp intensity mode for initial process and operational setup.	

\* 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
<b>Output Frequency</b>	RediCure - 365 nm    PrimeCure - 385 nm    VisiCure - 405 nm
<b>Intensity Output* at 10-mm Working Distance 25-mm Working Distance</b>	RediCure - 1,460 mW/cm <sup>2</sup> PrimeCure - 1,870 mW/cm <sup>2</sup> VisiCure - 1,750 mW/cm <sup>2</sup> RediCure - 960 mW/cm <sup>2</sup> PrimeCure - 1,220 mW/cm <sup>2</sup> VisiCure - 1,100 mW/cm <sup>2</sup>
<b>Cooling</b>	Air cooled
<b>Dimensions (H x W X D)</b>	Controller: 5.14" x 7.19" x 7.35" (13.1 cm x 18.3 cm x 18.7 cm) Emitter: 7.9" x 1.97" x 1.97" (20.06 cm x 5 cm x 5 cm)
<b>Weight</b>	Controller: 2.6 lbs. (1.18 kg) / Emitter: 1.64 lbs. (0.74 kg)
<b>Unit Warranty</b>	1 year from purchase date
<b>Operating Environment</b>	10-40°C, 0-80% relative humidity, non-condensing

\* Measured using a Dymax ACCU-CAL™ 50-LED Radiometer with 3-mm aperture set to corresponding light measurement mode. This is preliminary intensity data for reference, tests using flood mode without an aperture will yield different results.

Figure 1. BlueWave MX-275 Emitter Dimensions

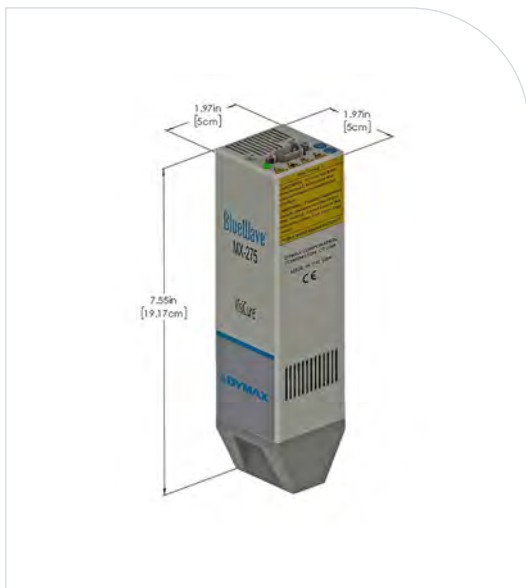
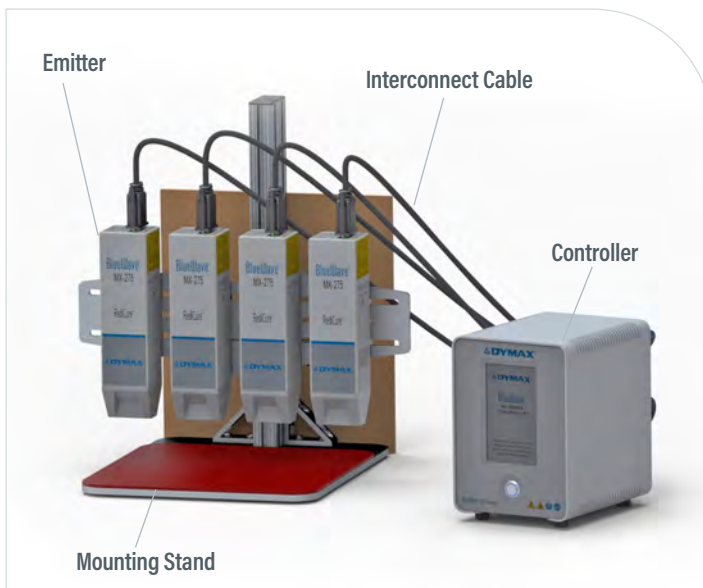


Figure 2 BlueWave MX-275 System Components



# Emitter Performance

Figure 3. BlueWave MX-275 Spectral Output Chart

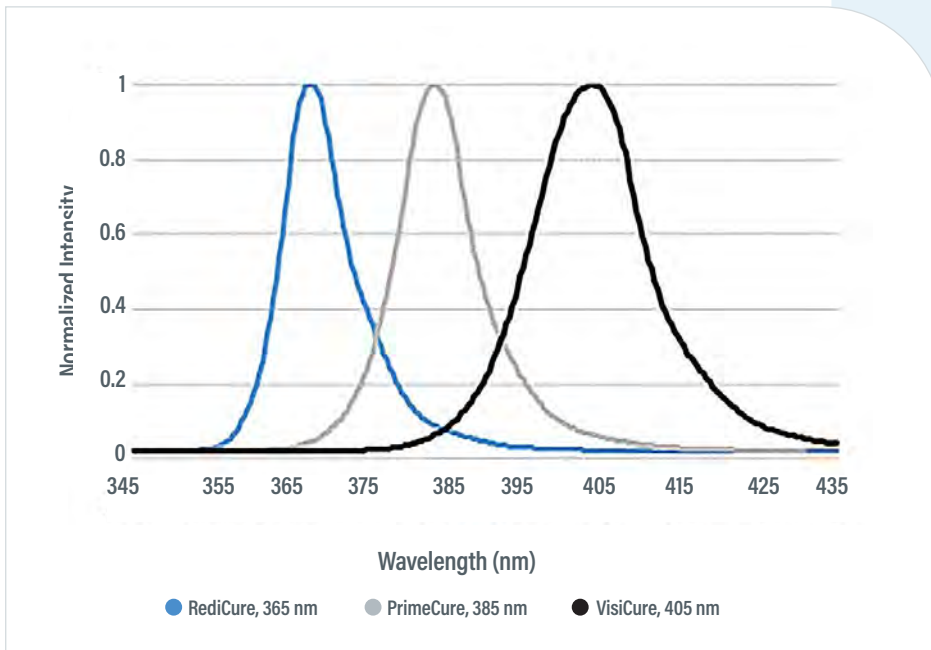
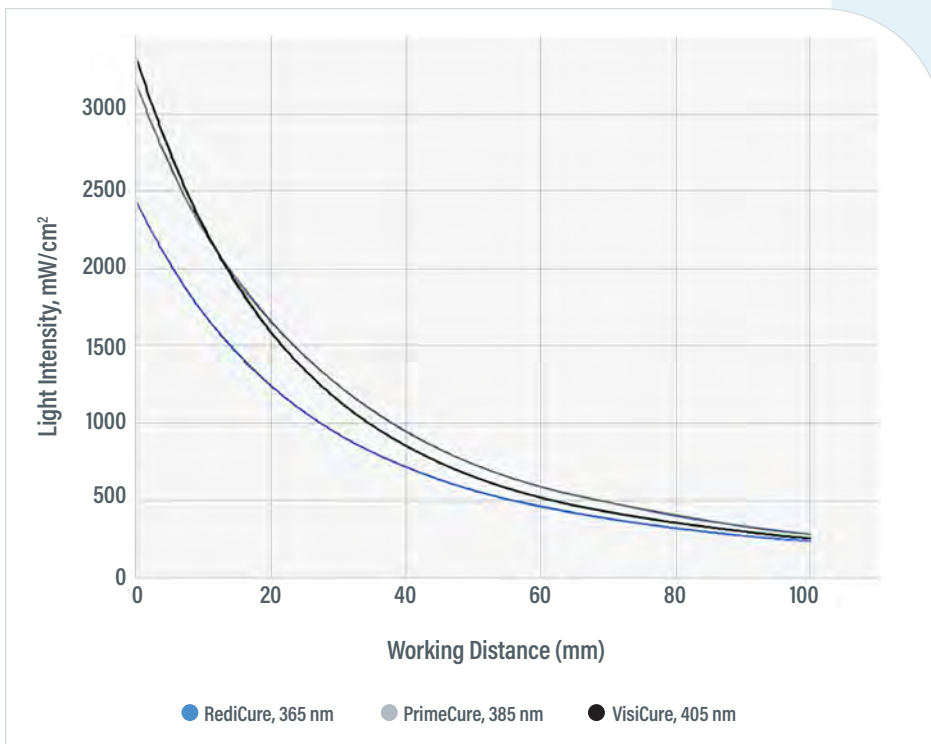


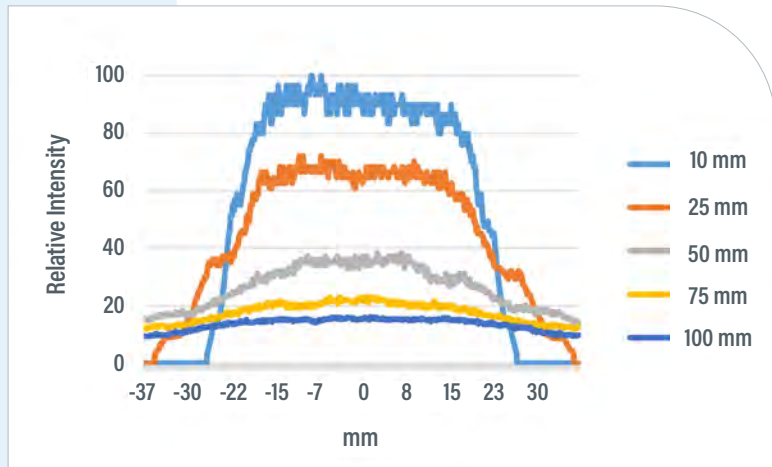
Figure 4. BlueWave MX-275 Emitter Relative Intensity vs. Distance



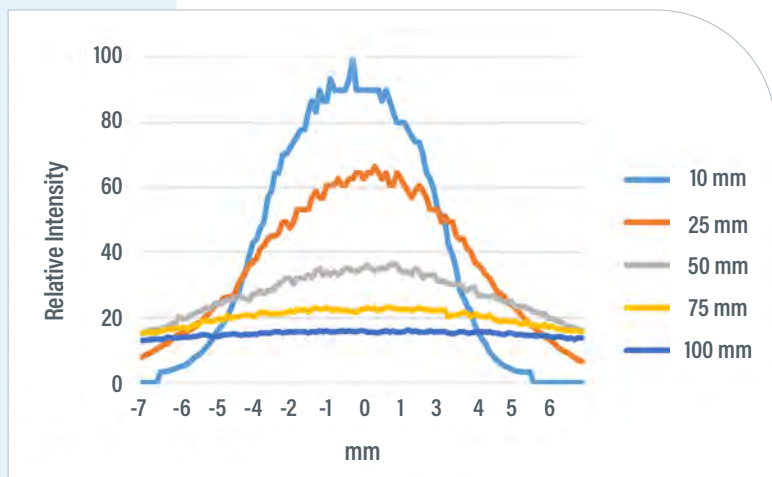
**Figure 5. Uniformity at Various Working Distances - RediCure Emitter, 365 nm**

Note: Curing area data taken using Fuji UV Light Distribution Mapping System. Output intensity normalized using a Dymax ACCU-CAL™ 50-LED Radiometer with 3-mm aperture prototype.

Front

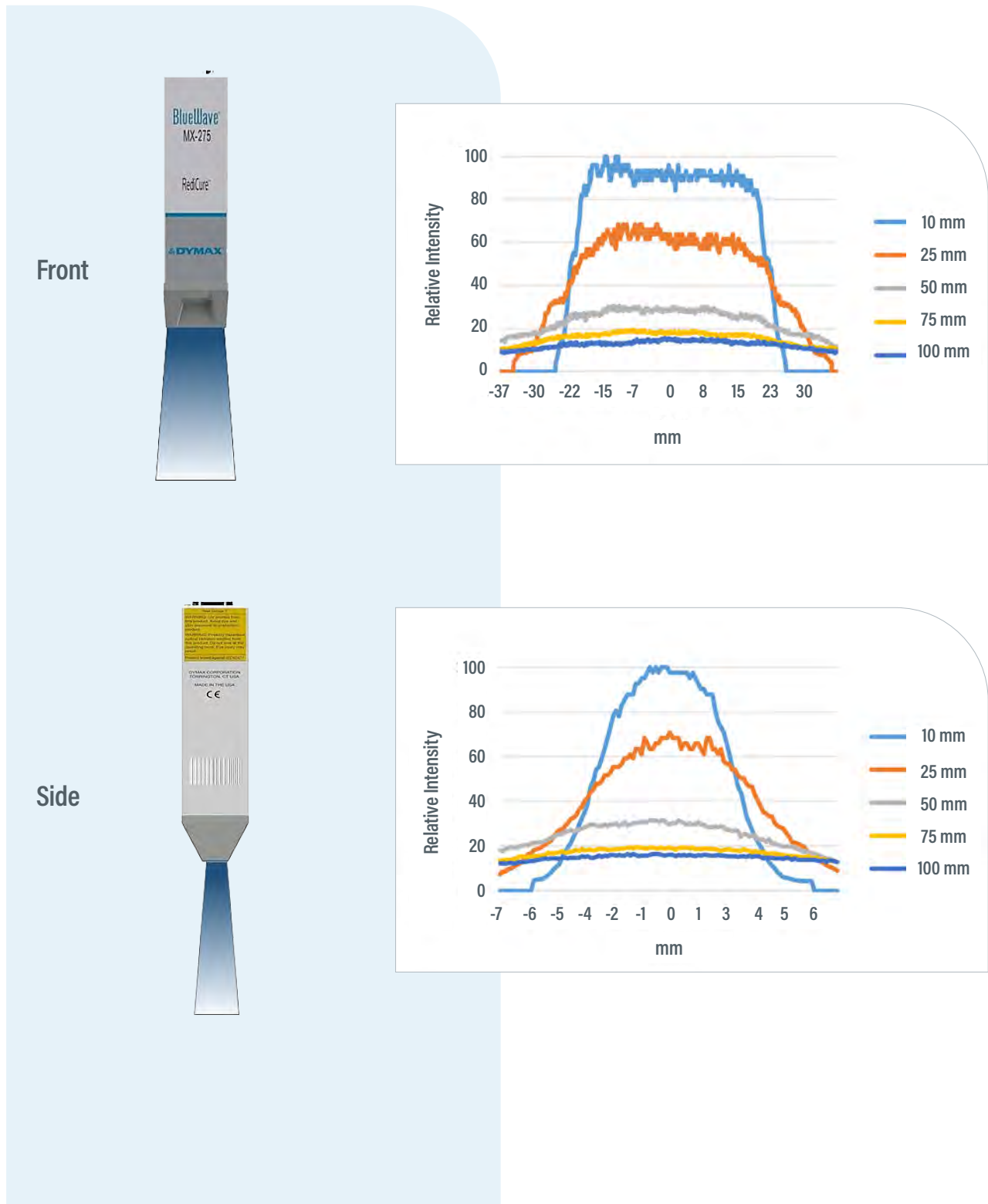


Side



**Figure 6. Uniformity at Various Working Distances - PrimeCure Emitter, 385 nm**

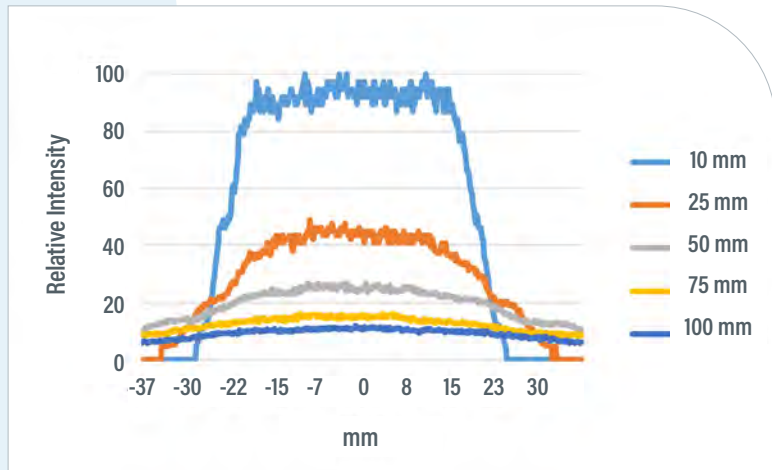
Note: Curing area data taken using Fuji UV Light Distribution Mapping System. Output intensity normalized using a Dymax AC-CU-CAL™ 50-LED Radiometer with 3-mm aperture prototype.



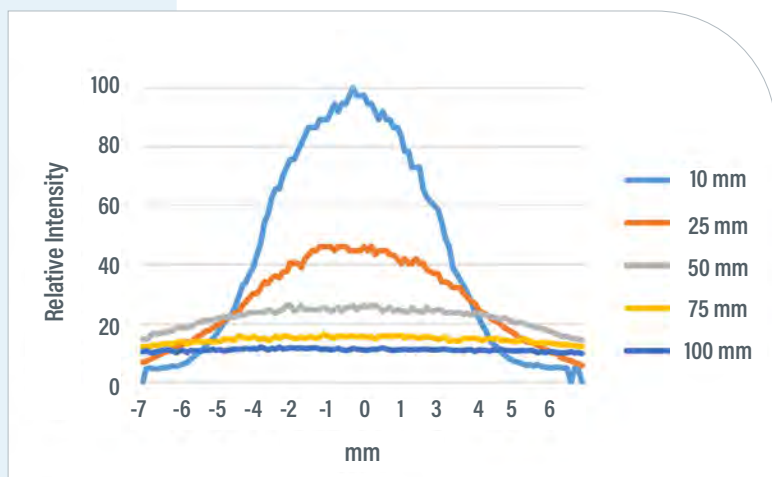
**Figure 7. Uniformity at Various Working Distances - VisiCure Emitter, 405 nm**

Note: Curing area data taken using Fuji UV Light Distribution Mapping System. Output intensity normalized using a Dymax AC-CU-CAL™ 50-LED Radiometer with 3-mm aperture prototype.

Front



Side





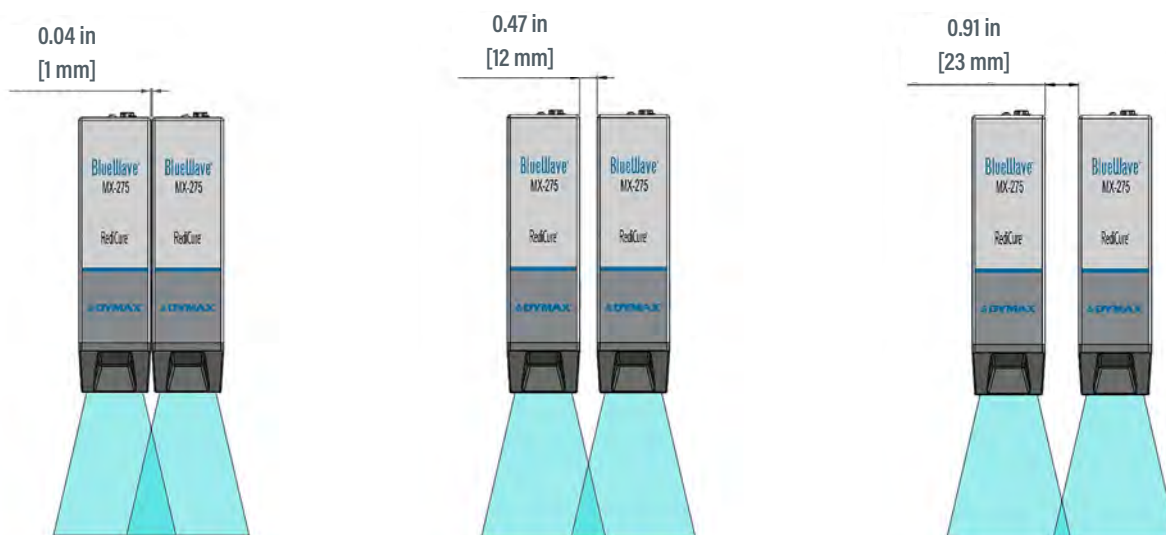
# Multi-Emitter Performance

The following graphs illustrate the BlueWave MX-275's performance when multiple emitters are positioned next to each other. We recommend positioning emitters a minimum of 1 mm apart with vents on two outside units facing out.

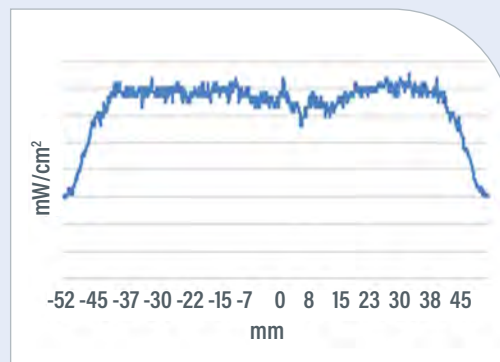
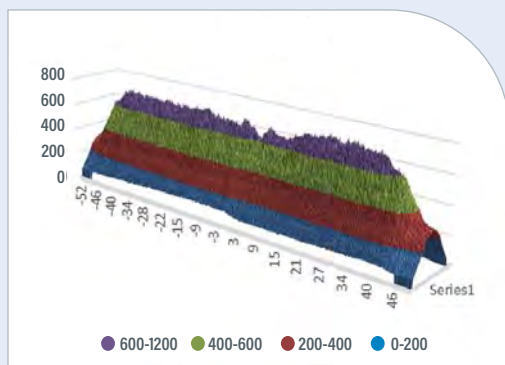
Table 1. Mounting Gap vs. Intensity Response for with two RediCure Arrays Side-By-Side

Working Distance	Uniform Response Gap
25 mm	1 mm
50 mm	12 mm
75 mm	23 mm

Figure 8. Uniformity at Various Working Distances - RediCure Emitters (365 nm) Mounted Side-By-Side



Intensity Response at 25-mm Working Distance 1-mm Mounting Gap

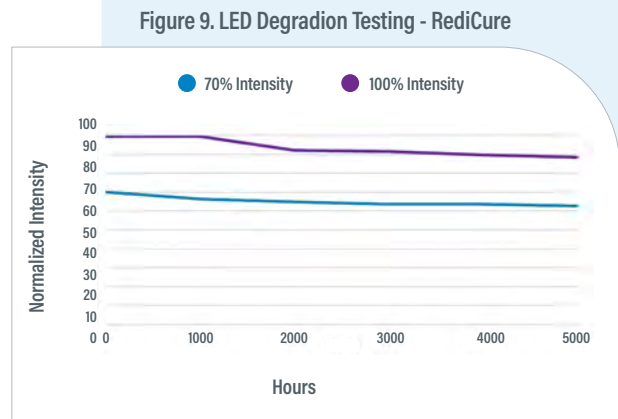


# Degradation/Life Testing

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-275 systems was conducted for 5,000 continuous hours at 100% and 70% intensity. As noted in the graphs below, LED degradation was found to be low for all emitter wavelengths and intensities. Degradation for all emitter types was noticeably reduced at commanded intensity level of 70% versus a full 100% intensity setting and should be considered for process applications requiring longevity of the emitters in production. Contact Dymax Application Engineering for additional details on setting up an LED curing process for maximum throughput and LED die life.

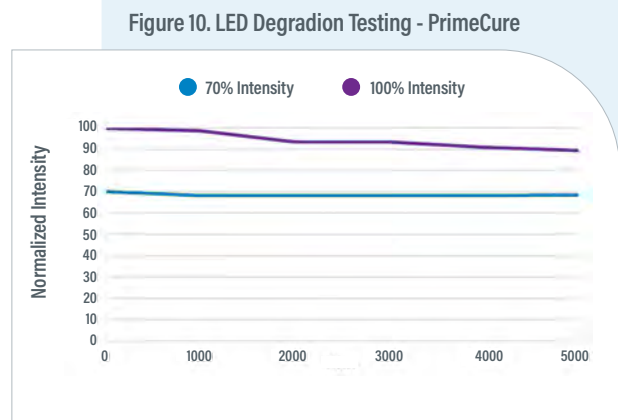
## RediCure (365 nm) Emitters

- 100% Intensity resulted in a 2.28% degradation per 1,000 hours
- 70% Intensity resulted in a 1.45% degradation per 1,000 hours



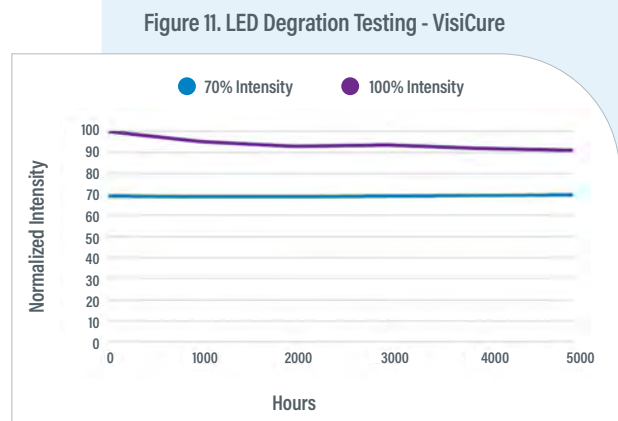
## PrimeCure (385 nm) Emitters

- 100% Intensity resulted in a 2.09% degradation per 1,000 hours
- 70% Intensity resulted in a 0.27% degradation per 1,000 hours



## VisiCure (405 nm) Emitters







- 100% Intensity resulted in a 1.79% degradation per 1,000 hours
- 70% Intensity resulted in a 0.00% degradation per 1,000 hours



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

# Compatible Materials & Applications

The BlueWave MX-275 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-275 can be considered as a curing system.

Materials	
<b>Adhesives</b>	 <p>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</p>
<b>Conformal Coatings</b>	 <p>Printed circuit board protection in aerospace avionics, automobiles, appliances, and consumer electronics; camera module assembly; electric vehicle battery management systems</p>
<b>Potting Compounds</b>	 <p>Tamper proofing; potting electrical connectors, switches, and sensors; cable potting; medical potting*</p>
<b>Maskants</b>	 <p>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*</p>
<b>Encapsulants</b>	 <p>Chip encapsulation on PCBs used in automobiles, plane and helicopter control panels, consumer electronics, appliance, and medical diagnostic equipment*</p>
<b>Ruggedization Materials</b>	 <p>Flex circuit reinforcement; wire tacking; ball grid array (BGA) ruggedization; Videos graphics arrays (VGA) ruggedization; shock absorption; underfill alternative*</p>

\* Materials cured with BlueWave MX-275 to be evaluated in customer application to their performance requirements.

