

## FE-225 LED Flood-Curing System

High-Intensity, Large Area System for Speed, Depth, and Fullness of Cure



- Three wavelength emitters available - 365, 385, & 405 nm
- Over 2 W/cm<sup>2</sup> intensity (depending on wavelength)
- Large 5" x 5" curing area
- Control two emitters at once with two channel controller
- 7" touch screen interface
- PLC activation and control
- LED curing technology - no warm-up period, cooler curing environments, and many other advantages
- Standard recipe storage for program recall

The FE-225 is a high intensity flood-curing system that delivers true, high-irradiance LED light for high speed, depth, and fullness of cure. For the user who needs to flood cure a large area, this system provides the best cure by combining intensities of over 2 W/cm<sup>2</sup> with a 5" x 5" (127 mm x 127 mm) curing area and high uniformity.

The FE-225 is comprised of a controller and up to two LED emitters. The controller features a 7" touch screen with an intuitive, easy to use interface. It can be activated, controlled, and remotely monitored by PLC, and also store programs and parameters for repeatable processes. The controller also continuously monitors the health of the emitters and controller, and reports faults directly to the controller screen.

A single controller can operate up to two emitters to save on cost and space. Extra emitters can be used to increase the area of light delivery or to use multiple wavelengths to extend application flexibility. Users will also appreciate the enhanced quality of life provided by our quiet, efficient operation. A variable speed fan keeps noise to a minimum, while also minimizing heat emission.

### System Configuration

The FE-225 offers maximum flexibility as it can be coupled with a full suite of accessories and used as a bench-top system or be integrated into conveyors and larger machines.

# System Features & Benefits

Features	Benefits
High intensity: over 2 W/cm <sup>2</sup>	High total irradiance for quick curing
Large 5" x 5" (127 x 127 mm) curing area	Efficiently cure large spaces and pieces
Excellent uniformity	Real 5" x 5" curing area Eliminates dead zones in conveyor applications
One controller operates up to two channels	Provides maximum application flexibility Reduces installation footprint
Emitters are available in 365, 385, or 405 nm wavelengths	Compatible with a variety of UV and visible light-curable materials Wavelengths can be mixed to produce optimal cures
Fully programmable with storage capability	Intensity can be set from 10-100% on each emitter Timer mode from 0.1 to 999 seconds Manual, timed and PLC operation modes Store up to 16 programs
Instant on-off	No warm-up period More energy efficient
PLC interface with multi-channel I/O	Easily incorporated into automated systems Full monitoring and diagnostics
Enhanced 7" touch screen HMI	Easy to use, navigate and program



# Compatible Materials & Applications

The FE-225 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 FE-225 can be considered as a curing system.

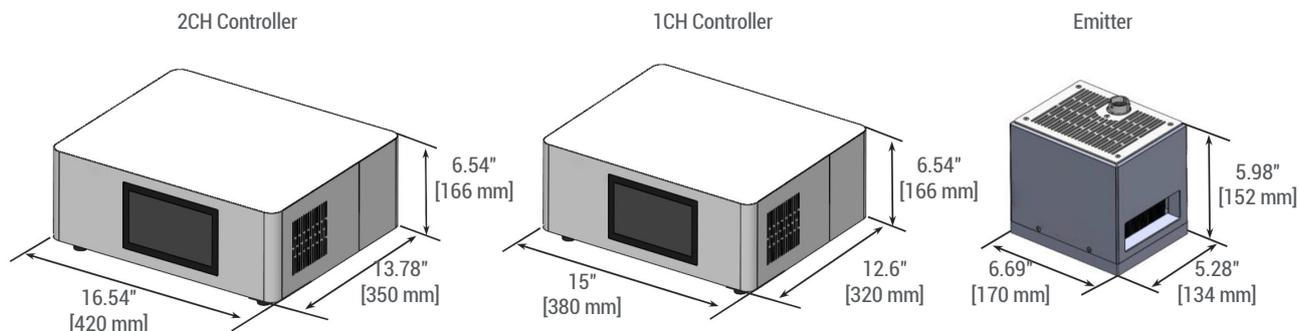
Materials		
<b>Adhesives</b>		Medical device (catheter, needles, tube set, facemask) assembly; glass bonding (stemware, furniture, etc.); automotive headlamp assemblies; camera module assemblies; appliance assembly; speaker assembly; optical display bonding
<b>Conformal Coatings</b>		Printed circuit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

\* Materials cured with FE-225 to be evaluated in customer application to their performance requirements.

# System Specifications

Property	Specification		
Emitter Output Frequency	365 nm	385 nm	405 nm
Intensity Output	1.7 W/cm <sup>2</sup>	2.1 W/cm <sup>2</sup>	2.0 W/cm <sup>2</sup>
Curing Area	5" x 5" (127 mm x 127 mm)		
Power Requirements	100-240 V ≈ 10 Amps, 50-60 Hz		
Cooling	Air cooled		
Dimensions (W x H x L)	1-CH Controller: 15" x 12.6" x 5.8" (380 mm x 320 mm x 165 mm) 2-CH Controller: 16.5" x 13.8" x 5.8" (420 mm x 350 mm x 165 mm) Emitter: 6.7" x 5.3" x 6.4" (170 mm x 134mm x 162 mm)		
Weight	1-CH Controller: 28.2 lbs. (12.8 kg) 2-CH Controller: 43.7 lbs. (19.8 kg) Emitter: 8.8 lbs. (4 kg)		
Unit Warranty	1 year from purchase date		
Operating Environment	10 to 40°C (50°F to 104°F) 0-80% relative humidity, non-condensing 2000-meter max. altitude		
Shipping and Storage Conditions	Temperature: -20°C to +50°C Humidity 10-80% RH, non-condensing Ship via standard ground, ocean or air freight		

Figure 1. FE-225 Dimensions



# Emitter Performance

Figure 2. FE-225 Emitter Spectral Output Chart

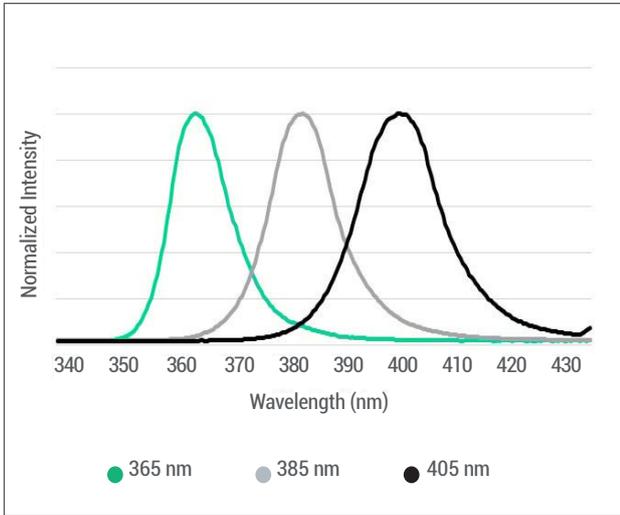


Figure 3. FE-225 Intensity Over Working Distance

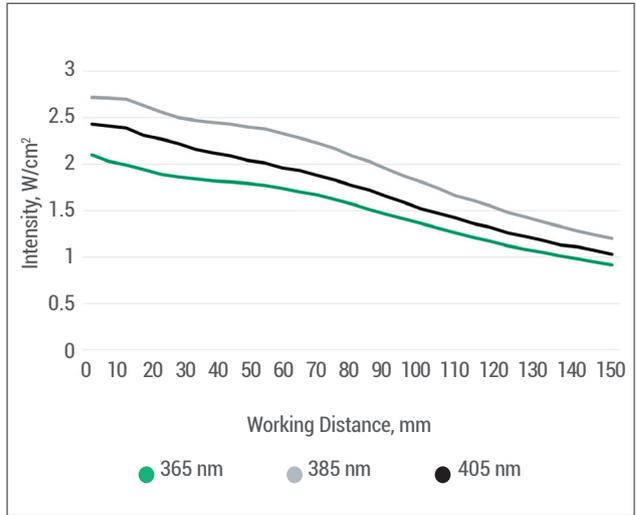
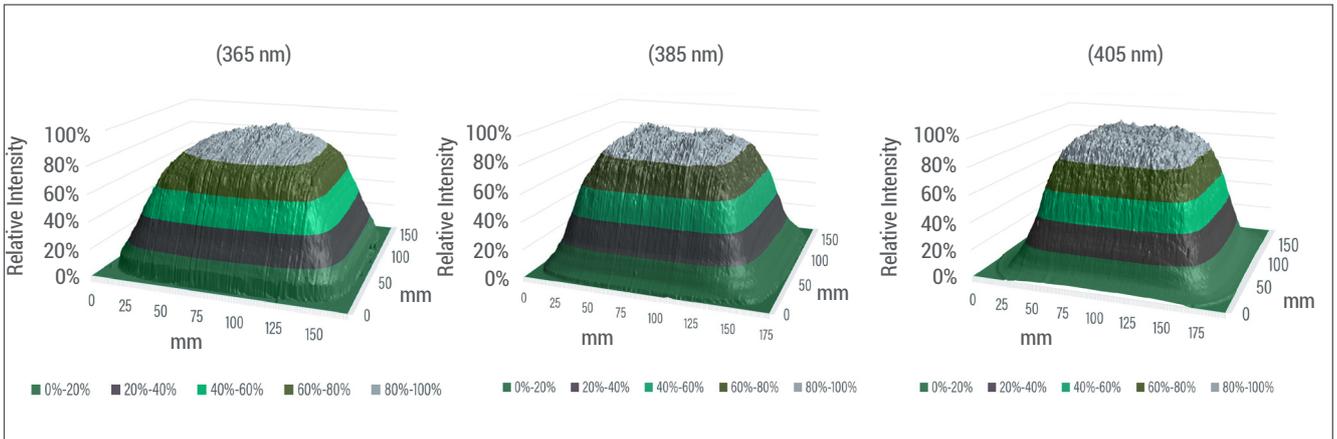


Figure 4. Uniformity/Intensity, 100% Intensity, 25-mm Working Distance



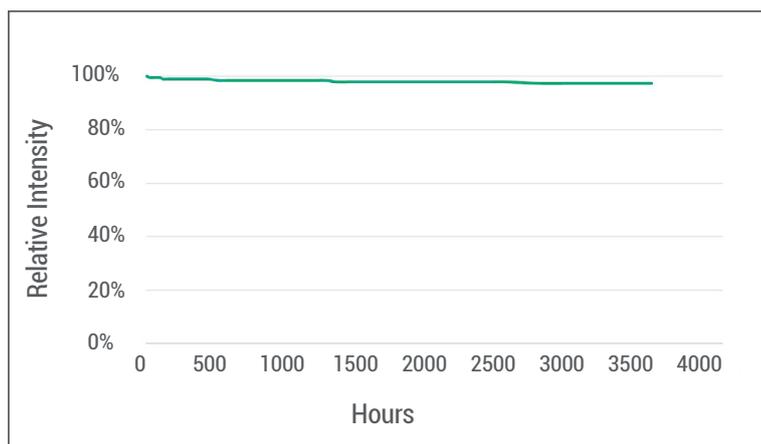
NOTE: Curing area data taken using Fuji UV Light Distribution Mapping System.

# Degradation/Life Testing

LED curing systems use high intensity LEDs which do not require regular replacement, unlike broad-spectrum lamps. At Hanarey, we provide high quality, reliable LEDs, which experience minimal degradation over long periods of use. Long-term life testing of FE-225 systems was conducted for 3,500 continuous hours at 100% intensity.

As noted in the graphs below, LED degradation was found to be very low for the FE-225 with less than 1% per 1,000 hours for all wavelengths. Our high intensity emitters can often lengthen their lifetime by running at intensities below 100%. To extend lifetime even further, LEDs can be turned on and off instantly, with no warm-up period. Contact us for additional details on setting up an LED curing process for maximum throughput and LED die life.

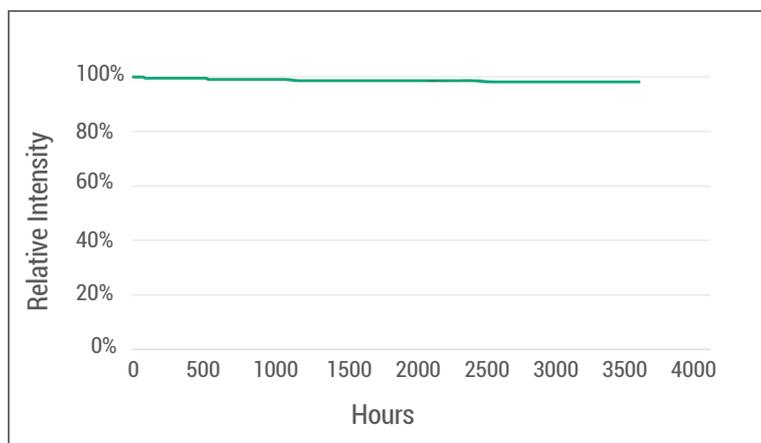
Figure 5. LED Degradation Testing - 365 nm



### 365 nm Emitters

- 100% Intensity resulted in a 0.13% degradation per 1,000 hours

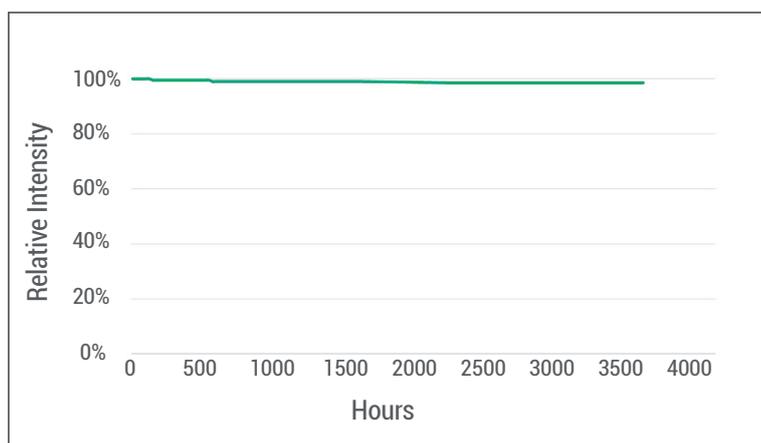
Figure 6. LED Degradation Testing - 385 nm



### 385 nm Emitters

- 100% Intensity resulted in a 0.17% degradation per 1,000 hours

Figure 7. LED Degradation Testing - 405 nm



### 405 nm Emitters

- 100% Intensity resulted in a 0.58% degradation per 1,000 hours

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

# Ordering Information

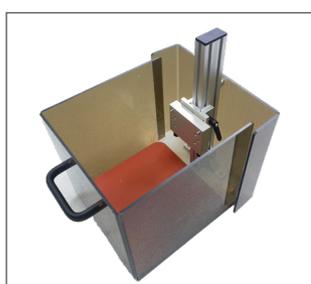
A complete FE-225 system features multiple options for configuring a complete system. The controller is available in 1- and 2-channel variants. The emitter is available in 365, 385, and 405 nm wavelengths. Accessories noted in this bulletin can be added for specific applications. The units are warranted against defects in material and workmanship for one year from the date of purchase.

	Part Number
<b>Controllers</b>	
1 Channel Controller	86615
2 Channel Controller	86614
<b>Emitters</b>	
365 nm	86611
385 nm	86612
405 nm	86613
<b>Accessories</b>	
Interconnect Cables (2 m)	84311 Type I & L
Light Shield (360° shielding. Swing-up door and slide-out shelf.)	88845
3-Sided Acrylic Shield	81016
Mounting Stand with Acrylic Back Shield (Includes mounting carriage PN 60036)	88844
ACCU-CAL 50-LED Radiometer Kit Note: The intensity of the FE-225 can be measured using flood-lamp intensity mode for initial process and operational setup.	40505

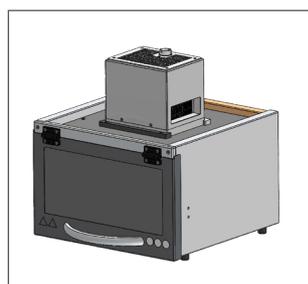
\*For European customers, the appropriate power cord will be added.



3-Sided Acrylic Shield PN 81016



Mounting Stand PN 88844



Light Shield PN 88845  
(Shown with Emitter)



Connection Cables  
(Type I & L)



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Please note that most curing system applications are unique. Hanarey does not warrant the fitness of the product for any intended application. Any warranty applicable to the product and use is strictly limited to that contained in Hanarey standard Conditions of Sale published on our website. Hanarey recommends that any intended application be evaluated and tested by the user to ensure that desired performance criteria are satisfied. **HPB002 11/21/2024**