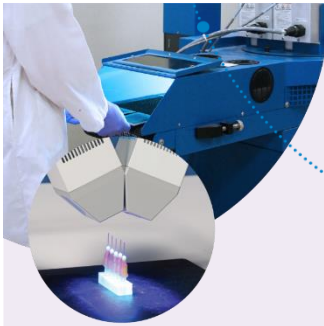
BlueWave® QX4 V2.0

LED Head
User Guide
Rev: A



About Dymax

UV/Visible Light-curable adhesives. Systems for light curing, fluid dispensing, and fluid packaging.

Dymax manufactures industrial, light-curable, epoxy, and activator-cured adhesives. We also manufacture a complete line of manual fluid dispensing systems, automatic dispensing systems, and light-curing systems. Light-curing systems include LED light sources, spot, flood, and conveyor systems designed for compatibility and high performance with Dymax adhesives.

Dymax adhesives and light-curing systems optimize the speed of automated assembly, allow for in-line inspection, and increase throughput. System designs enable stand-alone configuration or integration into your existing assembly line.

Please note that most dispensing and curing system applications are unique. Dymax does not warrant the fitness of the product for the intended application. Any warranty applicable to the product, its application, and use is strictly limited to that contained in the Dymax standard Conditions of Sale. Dymax recommends that any intended application be evaluated and tested by the user to ensure that desired performance criteria are satisfied. Dymax is willing to assist users in their performance testing and evaluation. Data sheets are available for valve controllers or pressure pots upon request.

Contents

Introduction

This guide describes how to set up, use, and maintain BlueWave® QX4 V2.0 LED heads safely and efficiently.

Intended Audience

Dymax prepared this user guide for experienced process engineers, technicians, and manufacturing personnel. If you are new to high-intensity LED light sources and do not understand the instructions, contact Dymax Application Engineering for answers to your questions before using the equipment.

Where to Get Help

Dymax Customer Support and Application Engineering teams are available by phone in the United States, Monday through Friday, from 8:00 a.m. to 5:30 p.m. Eastern Standard Time, and in Germany, from Monday through Friday, from 8:00 a.m. to 5:00 p.m. You can also email Dymax at info@dymax.com, or Dymax Europe GmbH at info_de@dymax.com. Contact information for additional Dymax locations can be found on the back cover of this user guide.

Additional resources are available to ensure a trouble-free experience with our products:

- Detailed product information on www.dymax.com
- Dymax adhesive product data sheets (PDS) on our website
- Safety data sheets (SDS) provided with shipments of Dymax adhesives

Safety

WARNINGS! *If you use this LED light source without first reading and understanding the information in this user guide, injury can result from exposure to high-intensity light. To reduce the risk of injury, read and ensure you understand the information in this user guide before assembling and operating the Dymax LED light source.*

To use the BlueWave QX4 V2.0 system safely, it must be set up and operated in accordance with the instructions given by Dymax. Using the system in any other manner will impair the protection of the system. Dymax assumes no liability for any changes that may impair the protection of the BlueWave QX4 V2.0 system.

General Safety Considerations

All users of Dymax LED light sources should read and understand this user guide before assembling and using the system.

To learn about the safe handling and use of light-curable formulations, obtain and read the SDS for each product. Dymax includes an SDS with each adhesive sold. In addition, SDS can be requested through our website.

Specific Safety Considerations

Dymax manufactures light source systems which produce ultraviolet and visible light spectra. These systems are designed to maximize operator safety and minimize exposure to light-curing energy. To use one of these units safely, it must be set up and operated in accordance with the instructions in this user guide.

NOTE: Dymax light-curing products are tested and follow compliance standards with IEC62471.

WARNING! *Looking directly at the high-intensity light emitted by the Dymax curing source can result in eye injury. To prevent eye injury, never look directly at the energy-emitting source and always wear appropriate protective goggles. To avoid accidental exposure, verify the curing energy target prior to activating a curing exposure cycle.*

WARNING! *UV energy is emitted from this product. Avoid eye and skin exposure to the unshielded product. Gloves, long sleeve clothing, and goggles should be worn when working near the UV energy source.*

WARNING! *Surfaces of light emission optics can be very hot after use. Do not touch the distal (light-emitting) end of any lightguide, lightguide-simulator optic, or the protective glass window of any flood curing system. Touching these surfaces can result in thermal burns. Please allow optic windows to cool for a minimum of 10 minutes before attempting to touch or service them.*

Product Overview

Description of the BlueWave QX4 V2.0 LED Head

BlueWave QX4 V2.0 LED heads are designed to provide precision light delivery in a small area at a close working distance. These are high intensity LED heads with output up to 23W/cm^2. They are available in 365, 385, and 405 nm and can be outfitted with 3-, 5-, or 8-mm diameter focusing lenses. LED heads and focusing lenses can be used in any combination and can be operated in constant or variable mode. The LED heads can be used as hand-held units or integrated into an automated manufacturing system allowing for maximum application flexibility.

Figure 1.
BlueWave QX4 V2.0 LED Heads

Features & Benefits

The Dymax BlueWave® QX4 V2.0 is engineered for precise performance and long service life.

Key features include:

- Compatible with a variety of UV and visible light-curable materials
- LED heads available in 365, 385, and 405 nm
- 3-, 5-, or 8-mm diameter focusing lenses for diverse spot sizes
- Intensity adjustable from 10% to 100%
- Wavelengths can be mixed to produce optimal cures
- Small diameter for precise light delivery at close working distances
- Compatible with Dymax MX-4E

Unpacking

Upon arrival, inspect all boxes for damage and notify the shipper of box damage immediately. Open each box and check for equipment damage. If parts are damaged, notify the shipper and submit a claim for the damaged parts. Contact Dymax so that new parts can be shipped to you immediately.

Check that the parts included in your order match those listed below. If parts are missing, contact your local Dymax representative or Dymax Customer Support to resolve the problem.

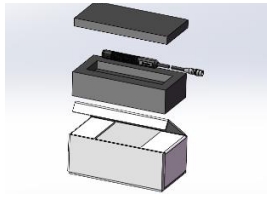
Parts Included

LED Head

- BlueWave QX4 V2.0 LED Head Assembly (RediCure, PrimeCure, or VisiCure, model as selected at time of purchase)
- BlueWave QX4 V2.0 LED Head User Guide

Figure 2.
Components of a BlueWave QX4 V2.0 – LED Head Assembly

88807/88808/88809



LED Heads & Lenses

Each BlueWave QX4 V2.0 LED head is made up of four main components: the handle, a collimating lens, a connection cable, and a connector. A focus lens (*sold separately*) should be added prior to use. The BlueWave QX4 V2.0 LED heads are available in three different wavelengths: 365 nm (RediCure®), 385 nm (PrimeCure®), and 405 nm (VisiCure®). LED head connection cables are 1 meter in length. Extensions cables (*sold separately*) can be used to increase the cable distance up to 10 meters.

Figure 3.
LED Head Components

**Sold Separately*

The wavelength of the LED head is noted on a label on the handle. Collimating and focusing lenses on each LED head are interchangeable, but the handle is unique to a specific wavelength.

Figure 4.
Color-Coded LED Heads

	Label	Wavelength	Part Number
	RediCure®	365 nm	88807
	PrimeCure®	385 nm	88808
	VisiCure®	405 nm	88809

Figure 5.
Focus Lenses (*Sold Seperately)*

Focus Lens	Part Number
Φ3 lens	81205
Φ5 lens	81206
Φ8 lens	81207

The focusing lenses indicate the spot sizes that are generated at a 5-mm working distance. The UV energy is focused on that spot and provides maximum output and uniformity of the spot.

As you change working distance, the intensity and spot size will change. It is best to review the product bulletin to ensure you are using the correct lens and working distance combination to achieve the target exposure.

If you are using larger working distances, you may have better results removing the focusing lens and using the collimating lens for spot generation.

Fixturing

If you are fixturing the LED head, do not cover the cooling fins, or overheating can result. We suggest clamping on the flat portion of the handle with non-marring screws or split ring clamps. We recommend using our mounting clamp kit (Figure 10) for optimal support.

Figure 6.
Fixturing Recommendations

Do Not Cover
Cooling Fins

Attach Fixture to the
Flat Section of the Handle

System Setup

BlueWave QX4 V2.0 LED heads are compatible with Dymax QX4 V2.0 Controllers and the MX-4E. Connect to these devices using the connector on the end of the cable. See MAN119 (BlueWave QX4 V2.0 System User Guide) and MAN107 (MX-4E System User Guide) for instructions on setting up with these devices.

Tests should be conducted prior to production to determine the time and light intensity required to fully cure your material.

The following approaches may be used to validate the curing process.

Set Exposure Time, Determine Intensity

Users can specify a cure time and, through empirical testing, determine the intensity required to achieve a full cure. As with any manufacturing process, it is advisable to incorporate a safety factor.

Set Intensity, Determine Exposure Time

Users can specify light intensity and, through empirical testing, determine the exposure time required to achieve a full cure. As with any manufacturing process, it is advisable to incorporate a safety factor.

Control

Process validation confirms a minimum acceptable intensity. Users can then choose to operate at full intensity (using the excess intensity as an additional safety factor) or adjust the output to a specific intensity level. To ensure consistent and repeatable process results, intensity levels should be monitored with a radiometer. This enables users to identify light intensity changes and take corrective action (either adjusting the light intensity or performing maintenance).

Specifications

Property	Specification		
LED Head	RediCure®	PrimeCure®	VisiCure®
Part Number	88807	88808	88809
Intensity Output*	16.9 W/cm²	22.9 W/cm²	22.0 W/cm²
Output Frequency	365 nm	385 nm	405 nm
Power Supply Input	100-240 V ~ 1 A, 50/60 Hz		
Cooling	Natural convection		
LED Head Dimensions	See Figure 8		
Weight	LED Head: 4.6 oz [130 g]		
Unit Warranty	1 year from purchase date		
Operating Environment	10 - 40°C, 0-80% relative humidity, non-condensing		

*Measured with 3-mm lens using Dymax ACCU-CAL™ 50-LED Radiometer, in spot mode at a distance of 5 mm.

Figure 7.
BlueWave QX4 V2.0 Spectral Output

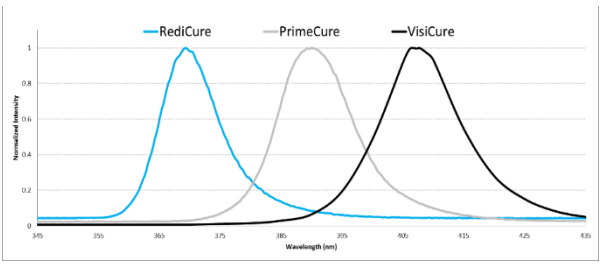


Figure 8.
Dimensions - LED Heads (PN:88807/88808/88809)

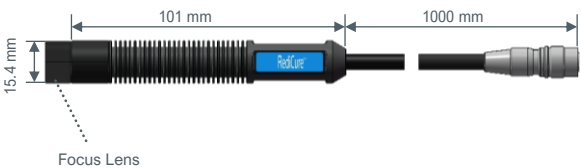


Figure 9.
Focus Lens Dimensions

Figure 10.
LED Head Mounting Stand

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Declaration of Conformity

Figure 11.
Declaration of Conformity - CE

DYMAX

EU Declaration of Conformity

Manufacturer:
Hanarey Chemicals (Shanghai) Co., Ltd.
No.111 Muhua Road, Fengxian District,
Shanghai, China 201507

Product description:	UV Spot Curing Device
Model name(s):	BlueWave QX4 V2.0 Controller BlueWave QX4 V2.0 Wand RediCure/ PrimeCure/ VisiCure

This product complies with the following relevant Union Harmonization Legislation:

Electromagnetic Compatibility Directive (2014/30/EU):
EN 61000-6-3:2007–A1:2011
EN IEC 61000-3-2:2019
EN 61000-3-3:2013–A1:2019
EN IEC 61000-6-1:2019
EN 61000-4-2:2009
EN 61000-4-4:2012
EN 61000-4-5:2014–A1:2017
EN 61000-4-6:2014
EN 61000-4-8:2010
EN 61000-4-11:2004+A1:2017

Low Voltage Directive (2014/35/EU):
EN 61010-1:2010–A1:2019
EN 62471 :2008

RoHS Directive 2011/65 EU (2015/863)
EN IEC 63000:2018

Declaration:
This declaration of conformity is issued under the sole responsibility of the manufacturer.
Signed for and on behalf of:

CE

Name	Date	Location
[signature]	*23.09.2021*	*Shanghai*

Authorized Signatory:
Kyle Zhu
Senior Manager, Equipment Development
Hanarey Chemicals (Shanghai) Co., Ltd.

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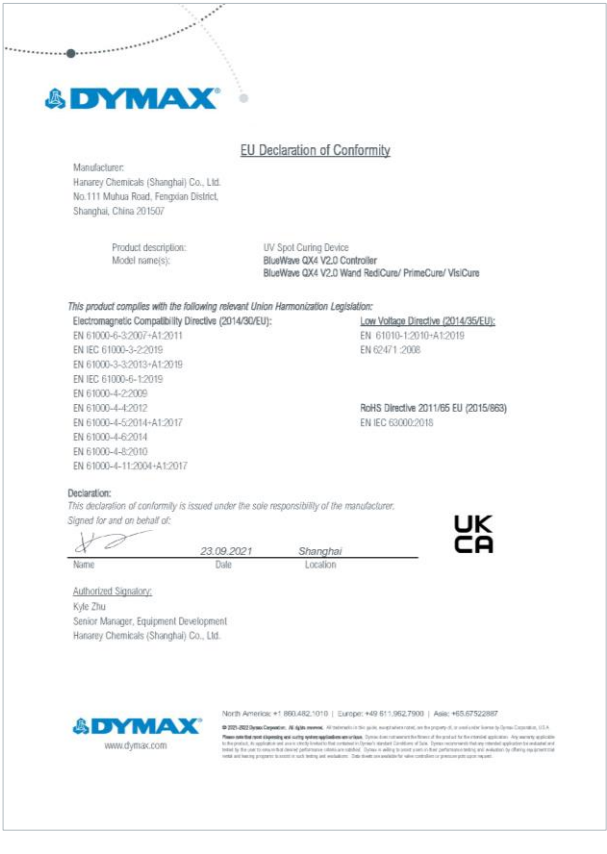
Please note that most dispensing and curing system applications are unique. [illegible]

Figure 12.
Declaration of Conformity - UKCA



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EN 61000-3-3:2013+A1:2019
EN IEC 61000-6-1:2019
EN 61000-4-2:2009
EN 61000-4-4:2012
EN 61000-4-5:2014+A1:2017
EN 61000-4-6:2014
EN 61000-4-8:2010
EN 61000-4-11:2004+A1:2017

Low Voltage Directive (2014/35/EU):
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RoHS Directive 2011/65 EU (2015/863)
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Declaration:
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UK CA

Name	Date	Location
	23.09.2021	*Shanghai*

Authorized Signatory:
Kyle Zhu
Senior Manager, Equipment Development
Hanarey Chemicals (Shanghai) Co., Ltd.

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Warranty

From date of purchase, Dymax Corporation offers a one-year warranty against defects in material and workmanship on all system components with proof of purchase and purchase date. Unauthorized repair, modification, or improper use of equipment may void your warranty benefits. The use of aftermarket replacement parts not supplied or approved by Dymax Corporation, will void any effective warranties, and may result in damage to the equipment.

IMPORTANT NOTE: *DYMAX CORPORATION RESERVES THE RIGHT TO INVALIDATE ANY WARRANTIES, EXPRESSED OR IMPLIED, DUE TO ANY REPAIRS PERFORMED OR ATTEMPTED ON DYMAX EQUIPMENT WITHOUT WRITTEN AUTHORIZATION FROM DYMAX. THOSE CORRECTIVE ACTIONS LISTED ABOVE ARE LIMITED TO THIS AUTHORIZATION.*

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Responsible party

Hanarey Chemicals (Shanghai)

Co., Ltd.

No.111 Muhua Road,

Fengxian District,

Shanghai, China 201507

Authorized representatives

North America:	Europe:	United Kingdom:	Asia & Pacific:
Dymax Corporation	Dymax Europe GmbH	Dymax	Dymax Asia Pacific Pte Ltd
318 Industrial Lane	Kasteler Str. 45	1b Hunts Grove Drive,	Block 5008, Ang Mo Kio Ave 5,
Torrington, CT 06790,	Geb. G359	Hardwick, Gloucester,	#05-03, Techplace ‖
USA	Wiesbaden, Germany	Gloucestershire, GL2	Singapore 569874
	65203	4BH United Kingdom	

Notes:
Hanarey global sales representatives take the obligations of importers also.

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