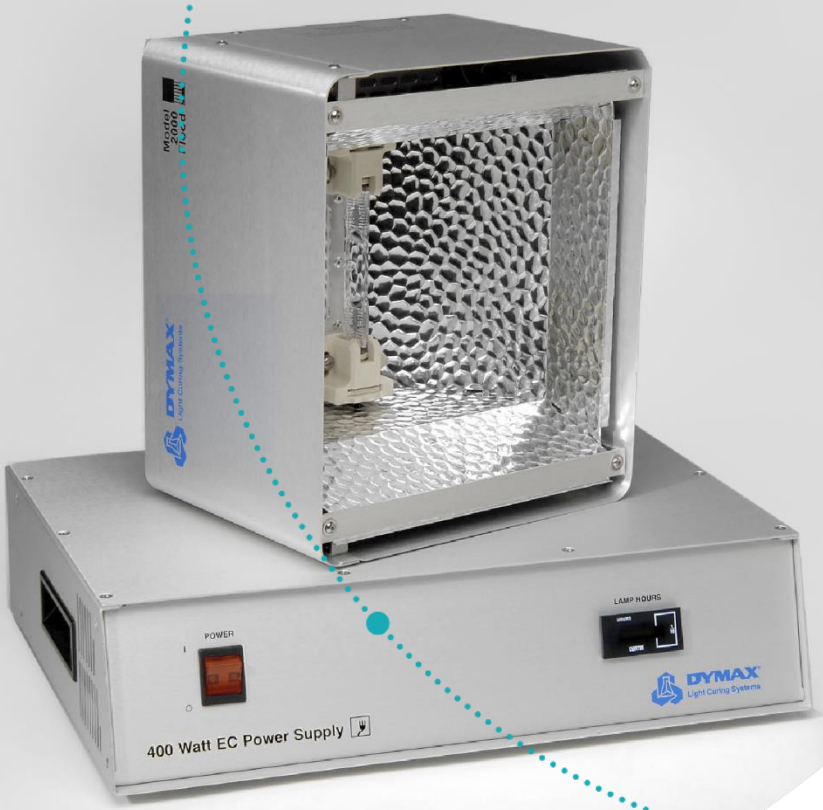


EC-Series Flood Lamps

For use with UVCS Conveyors
User Guide

DYMAX®

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 fluid 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 100% 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 by offering equipment trial rental and leasing programs to assist in such testing and evaluations. Data sheets are available for valve controllers or pressure pots upon request.

Contents

Introduction

This guide describes how to assemble, use, and maintain the Dymax EC-series flood lamps for UVCS-series conveyors safely and efficiently.

Intended Audience

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

Where to Get Help

Dymax Customer Support and Application Engineering teams are available in the United States, Monday through Friday, from 8:00 a.m. to 5:30 p.m. Eastern Standard Time. You can also email Dymax at info@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
- Material Safety Data Sheets (SDS) provided with shipments of Dymax adhesives

Safety

WARNING! *If you use a Dymax UV flood lamp without first reading and understanding the information in this user guide, injury can result from exposure to UV light. To reduce the risk of injury, read and ensure you understand the information in this user guide before assembling and operating an EC-series flood lamp.*

General Safety Considerations

All users of Dymax light-curing flood lamps 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, fluid product SDS can be requested through the Dymax website.

Specific Safety Considerations

Dymax EC-series flood lamps are designed to maximize operator safety and minimize exposure to UV light-curing energy. To use the unit safely, it must be set up and operated in accordance with the instructions in this user guide. Please also read and understand the safety considerations unique to UV light-curing systems as described below.

WARNING! *Looking directly at the UV light emitted by an EC flood lamp can result in eye injury. To prevent eye injury, never look directly at the high-intensity light and always wear protective goggles (provided).*

Dymax UV Light-Curing System Safety Considerations

Operators must understand these four concepts to use the UV light source safely:

- UV exposure
- High-temperature surfaces
- Ozone
- Bright, visible light

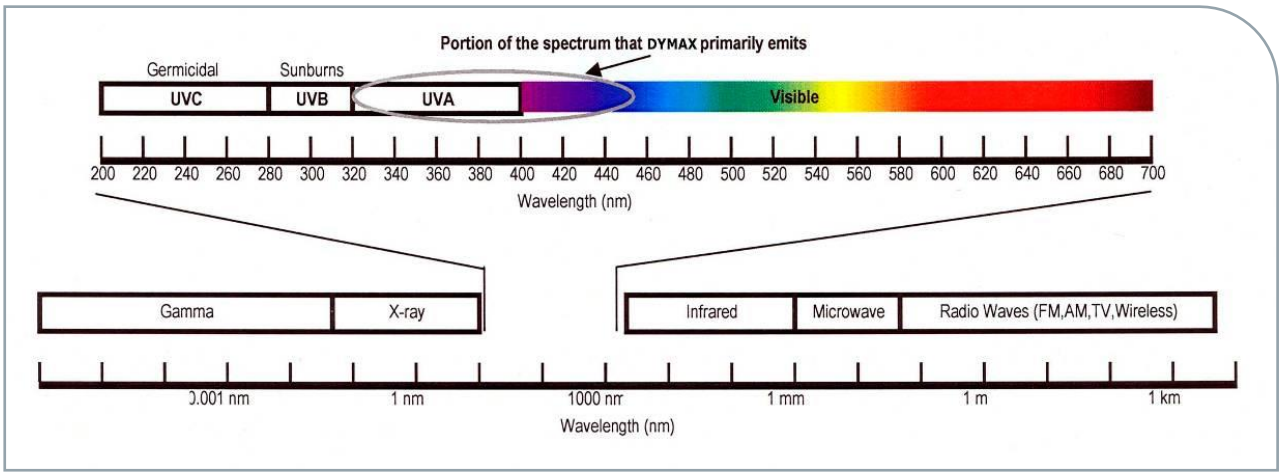
Each is described below.

UV Exposure

Standard Dymax UV light-curing systems and bulbs have been designed primarily to emit UVA light (**Error! Reference s ource not found.**). UVA light is generally considered the safest of the three UV ranges: UVA, UVB, and UVC. Although OSHA does not currently regulate ultraviolet light exposure in the workplace, the American Conference of Governmental Industrial Hygienists (ACGIH) does recommend Threshold Limit Values (TLVs) for ultraviolet light.

The strictest interpretation of the TLV (over the UVA range) for workers' eyes and skin is 1 mW/cm^2 (intensity), continuous exposure. Unless workers are placing bare hands into the curing area, it is unusual to exceed these limits. To put 1 mW/cm^2 limit into perspective, cloudless summer days in Connecticut regularly exceed 3 mW/cm^2 of UVA light and also include the more dangerous UVB light (primarily responsible for sun tans, sun burns, and skin cancer) as well.

Figure 1.
Spectrum of Light



Checking the Workstation

The human eye cannot detect "pure" UV light, only visible light. A radiometer should be used to measure stray UV light to confirm the safety of a UV light-curing process. A workstation that exposes an operator to more than 1 mW/cm^2 of UVA continuously should be redesigned.

Protecting Operators

Light-curing technology can be a regulatory compliant, "worker-friendly" manufacturing process when the proper safety equipment and operator training is utilized. There are two ways to protect operators from UV exposure: shield the operator and/or shield the source.

Shield the Operator — UV-Blocking Eye Protection - UV-blocking eye protection is recommended when operating UV light-curing systems. Both clear and tinted UV-blocking eye protection is available from Dymax.

UV-Blocking Skin Protection — Where the potential exists for UV exposure upon skin, opaque, UV-blocking clothing, gloves, and full-face shields are recommended.

Shield the Source of UV

Any substrate that blocks UV light can be used as a shield to protect workers from stray UV light. The following materials can be used to create simple shielding structures:

Rigid Plastic Film — Transparent or translucent/UV-blocking plastics (typically polycarbonate or acrylic) are commonly used to create shielding where some level of transparency is also desired.

Flexible Film — Translucent UV-blocking, flexible urethane films can be used to quickly create workstation shielding. This UV-blocking, flexible urethane film is available from Dymax, call for assistance.

Ozone

Standard Dymax bulbs (UVA type) generate an insignificant amount of UVC and therefore essentially no ozone. Some UV light-curing systems, like those used to cure UV inks, emit primarily “shortwave” (UVB and UVC) energy. Upon exposure to UVC light (specifically <240 nm), oxygen molecules (O_2) split into oxygen atoms (O) and recombine with O_2 to create ozone O_3. The current, long-term ozone concentration limit recommended by ACGIH, NIOSH, and OSHA is 0.1 ppm ($0.2 mg/m^3$).

High-Temperature Surfaces

Surfaces exposed to high-intensity curing lights will rise in temperature. The intensity, distance, exposure time, cooling fans, and the type/color of the surface can all affect the actual surface temperature. In some cases, exposed surfaces can reach temperatures capable of producing a burn or causing damage to a substrate. In these cases, care must be taken to ensure either a more moderate surface temperature or appropriate protection/training for operators.

Bright, Visible Light

The bright, visible light emitted by some UV light-curing systems can be objectionable to some workers and can cause eyestrain. Tinted eye protection and/or opaque/tinted shielding can be utilized to address this concern.

Summary

UV-light sources can be more “worker friendly” than many commonly accepted industrial processes, provided the potential concerns are addressed. Both the lower working temperature and lack of spurious frequency transmission that this system produces make it even more user friendly. Contact your Dymax representative for information regarding the proper use of Dymax light-curing systems.

Product Overview

Description of the EC Series Flood Lamps for UVCS Conveyors

Dymax Flood Lamps are designed for installation into Dymax UVCS-Series Light-Curing Conveyors. They have extensive use in a wide variety of applications such as bonding, potting, sealing, and encapsulating. These Flood Lamps are extremely unique in that they offer exceptional versatility and expandability.

Each unit is designed and shipped in a unitized configuration for easy bench-top mounting with all controls and functions right at the hands of the operator.

The Lamp/Reflector Assembly Housing can be mounted side-by-side in a linear configuration on Dymax Conveyors (Figure 2 & 3). The Power Supplies can then be stacked and mounted remotely to provide consolidated operator control.

Figure 2.
2000-EC Mounted Side-by-Side on Conveyor

Figure 3.
5000-EC Mounted Side-by-Side on Conveyor

Figure 4.
5000-EC Mounted on the SideCure Conveyor

System Components

ECE 2000

The Dymax 2000-EC Flood Lamp is a general-purpose UV light-curing system with an effective curing area of approximately 8" x 8" [20.3 cm x 20.3 cm]. The 2000-EC Flood Lamp is cooled by air flow through the Reflector from the Conveyor's Ventilation System.

ECE 5000

The Dymax 5000-EC Flood Lamp is a general-purpose UV light-curing system with an effective curing area of approximately 5" x 5" [12.7 cm x 12.7 cm]. Comparatively, it provides more than twice the output intensity of a Dymax 2000-EC Flood Lamp for faster curing capability and the additional ability to cure conformal coating resins.

Solid-State Power Supply

This power supply allows external electrical inputs and provides power to the Bulb located in the Lamp/Reflector Assembly Housing. The Power Supply contains the On/Off Power Switch and Hour Meter that are located on the front panel. The Power Supply also houses its own Cooling Fans and power distribution for optional accessories. The rear panel has an integrally fused AC Power Receptacle and an 8-Pin Female circular connector for supplying power to the Lamp Housing Assembly.

The solid-state Power Supply yields reliable and stabilized voltage in virtually any electrical system in the world. Other than ensuring a properly configured plug is employed, no other adjustment of settings is required. The Power Supply also conditions the electrical power to the Bulb providing longer, more reliable Bulb life.

This unit is RoHS Compliant.

Figure 5.
2000-EC for UVCS Conveyor

Figure 6.
5000-EC for UVCS Conveyor

Figure 7.
5000-EC for UVCS SideCure™ Conveyor

Assembly and Setup

Unpacking and Inspecting Your Shipment

Your EC series flood lamp arrived in one or two boxes. Inspect the 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 in an EC Flood Lamp

- **Reflector Assembly Housing** (1) - Contains the reflector, UV lamp (400 watt, metal halide. Optional visible or mercury vapor bulbs available), lamp sockets, high-voltage starter, and three circular connectors.
- **Solid-State Power Supply** (2)
- **Interconnection Cable** (3) – Connects the power supply to the lamp/reflector assembly housing.
- **Power Cord** (4) (North American Power Cord shown)
- **Dymax EC-Series UV Flood Lamps User Guide** (5)
- **UV Protection Goggles** (7)

System Interconnection

1. Place the 400 Watt UV Bulb into the Lamp/Reflector Assembly Housing (Figure 8). Refer to the Bulb Replacement/Installation Section of this manual.

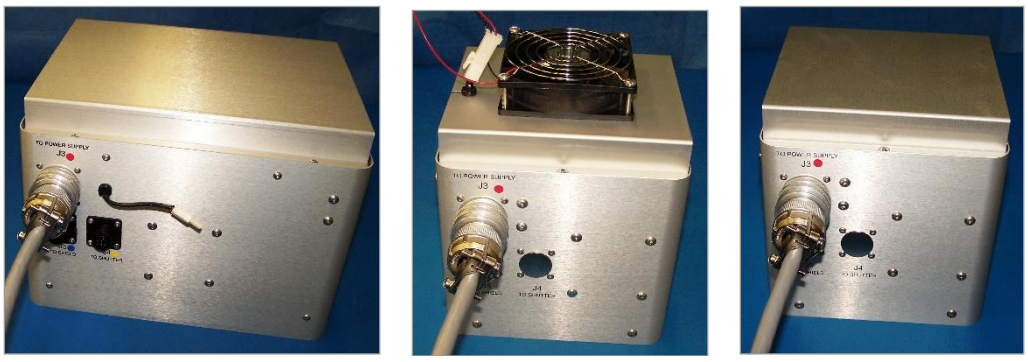
2. Position the Power Supply so that there is free air circulation around the sides. The Lamp/Reflector Assembly Housing should be mounted to a Dymax Conveyor as described in the Conveyor's technical manual.

   WARNING! *Always observe safety requirements when working with electrical equipment! Electrical hazard is present!*

3. Connect the Interconnect Cable to the J3 Receptacle on the rear of the Lamp/Reflector Assembly Housing (Figure 9).

Figure 8.
Bulb in Lamp/ Reflector

Figure 9.
Interconnect Cable in J3 Receptacle (From Left: 2000-EC, 5000-EC for SideCure™ Conveyors, and 5000-EC



4. Connect the opposite end of the Interconnect Cable to the Lamp Power Receptacle (Figure 10) on rear panel of the Power Supply.

5. Plug the AC Power Cord into the Power Module located in the rear panel of the Power Supply (Figure 10), and plug the opposite end of the AC Power Cord into appropriate external AC source.

Figure 10.
Power Supply, Rear Panel

Operation

Turn the unit on by pressing the Power Switch, located on the left of the front panel of the Power Supply. The switch will light up to indicate that the power is on.

NOTE: *While most Bulbs typically require less than 30 seconds to ignite, a new Bulb may initially require a slightly longer time.*

After the Bulb has ignited, allow 5 minutes to reach its maximum output intensity.

Bulb life is reduced approximately one hour each time it is started. To avoid premature Bulb deterioration, leave the unit on through breaks, short shutdowns, and lunch hours.

Dymax EC-Series Flood Systems are designed for continuous operation.

NOTE: *If the power is momentarily lost or the unit is inadvertently shut off, it must cool down before restarting. This may take 5-10 minutes depending on ambient conditions. The Power Supply may be left energized while the Bulb is cooling, and will re-ignite when it has sufficiently cooled.*

Each time the unit is turned on, it should operate for at least 30 minutes to allow vaporization of elements inside the Bulb. Failure to do this may result in unreliability in subsequent ignitions. Refer to the Troubleshooting Section of this manual for more information.

Temperature Control of 5000-EC Flood Lamps For UVCS Conveyors

Temperature control of the 5000-EC UVCS Reflector will result in improved Bulb (PN 38560) performance. Testing performed at Dymax shows that ideal Reflector temperature should be maintained between 115° F and 145° F. The instructions that follow show how to achieve these conditions.

New-production 5000-EC Flood Lamp Reflectors are shipped with one Temperature Control Plate and a Temperature Indicating Strip installed.

Temperature Control Plate Installation

1. Remove the top cover from the 5000-EC Flood Lamp Reflector by removing the two securing screws (Figure 11).
2. Unpack the two Temperature Control Plates and the Temperature Indicating Strip provided in the temperature control kit.
3. Install the Temperature Indicating Strip and one Temperature Control Plate (Figure 12).
4. Reinstall the Reflector Cover. Operate the Conveyor with the Reflector(s) installed for about one hour to allow temperatures to stabilize. Read temperature as indicated on the Temperature Indicating Strip.
    - If temperature is between 115° F and 145° F, optimum conditions have been achieved.
    - If Reflector temperature is below 115° F, remove the Reflector Cover and install the second Temperature Control Plate. If temperature is above 145° F, remove the Reflector Top and remove the Reflector Plate.

Figure 11.
5000-EC Securing Screws

Figure 12.
Temperature Control Plate and Temperature Indicating Strip, Installed

Cleaning and Maintenance

Bulb Replacement Procedure

Every new EC-Series Flood Lamp is supplied with a new 400 Watt Bulb. When the Bulb requires replacement, the following procedure must be followed.

1. Turn the Power Switch off.
2. Disconnect the Power Supply from the electrical power source.
3. Allow the Bulb to cool.

    CAUTION! *The Bulb operates at temperatures exceeding 500°C. Touching the Bulb before sufficient cooling may cause severe burns.*

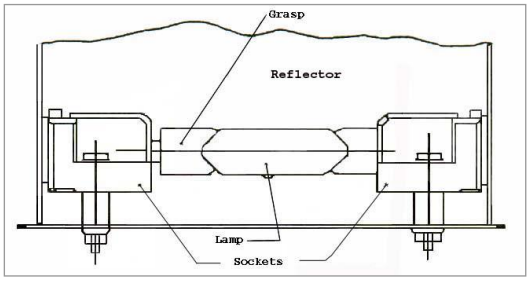
    Always wear safety eye wear while replacing Bulb.

4. Hold the Lamp/Reflector Assembly Housing securely and loosen thumbscrew on the Lamp/Reflector Assembly Housing Bracket. Lift the Lamp/Reflector Assembly Housing off the Mounting Stand and place upside down on a clean work surface.

5. Reach into the Reflector and grasp the flat area of Bulb at either end (Figure 13).

CAUTION! *Always use a soft, clean rag, clean paper towel, or gloves when handling the Bulb. Skin oils left on the Bulb will burn into the quartz, reducing output intensity. If the Bulb is inadvertently touched, clean the Bulb thoroughly with a soft, clean rag and alcohol.*

Figure 13.
Bulb in Reflector



6. Lightly push the Bulb toward the Lamp Socket on the opposite end of the Bulb so that the end being grasped can be lifted clear of the Socket as shown in Figure 14 and 15.

Figure 14.
Bulb Removal

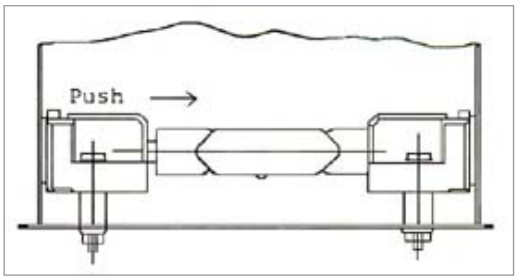
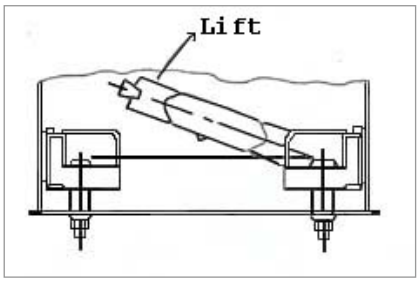


Figure 15.
Bulb Removal



7. Install the new Bulb by following steps 5, 6, and 7 in the reverse order.

IMPORTANT! *Install the Bulb such that the seal dimple on the bulge of the glass is facing towards the Reflector surface. Avoid touching the quartz tube with your fingers.*

NOTE: *Bulb has no polarity.*

8. Record the serial number of the unit and the Hour Meter reading in the Bulb history record.

9. Replace the Lamp/Reflector Assembly Housing on the Conveyor Cradle.

10. Secure the thumbscrew when the Lamp/Reflector Assembly Housing is at the proper height.

11. Reconnect the Power Cord to the appropriate power source.

12. Turn the Conveyor on by turning the Power Switch to the on position.

13. Allow at least 5 minutes for the Bulb to reach operating temperature before using.

NOTE: *If the Bulb does not ignite, refer to the Troubleshooting Section of this manual.*

Fuse Replacement Procedure

The EC-Series 400-Watt Power Supply utilizes two Line-Input Fuses. These Fuses are external and are located in the Power Cord Receptacle at the rear of the Power Supply Housing. The Fuses are 6.25 Amp, slow-blow Fuses.

WARNING! *Electrical shock hazard. Exercise extreme care when replacing Fuses. Make sure only qualified personnel perform Fuse replacement and that all Power Switches are off and the Power Cord is unplugged.*

Replacing External Fuses

1. Turn the Power Switch on the Power Supply off.
2. Unplug the Power Cord from the electrical source.
3. Unplug the Power Cord from the Power Cord Receptacle at the rear of the Power Supply Housing.
4. Place a small, flat-blade screwdriver into the notch at the top of the Plug Recess and pull the Fuse Cover downwards approximately 70°. The Fuse Retainer should be exposed and should be removed by pulling it straight out (Figure 16).

Figure 16.
Replacing Fuses in the Power Supply

5. Slide out the blown Fuses and replace with new 6.25 Amp, slow-blow Fuses.

   CAUTION: *It is important to replace this Fuse with the same 6.25 Amp rated, slow-blow type Fuse.*

6. Slide the Fuse Cover back into the Receptacle until it is fully seated, then rotate the cover upward until it latches.
7. Install the Power Cord and connect it to the electrical power source.
8. Turn the Power Switch on.

Cleaning

Periodically clean the Bulb and Reflector surfaces. A soft, clean cloth and any standard glass cleaner should be used. Heavier deposits may require cleaning with isopropyl alcohol.

CAUTION: *Cleaning the Reflector with a rough or dirty cloth will result in a dulled surface, thereby, reducing reflectance and decreasing UV output. Use only a soft, clean cloth.*

Any uncured resins spilled onto the system can be removed with isopropyl alcohol and a clean cloth.

Preventing Unit Overheating

Dymax EC-Series UV-Curing Flood-Lamp models do not possess an automatic shut-off capability in the event of the Lamp Reflector Assembly overheating. The Ignitor within an EC Lamp Reflector Assembly, under certain conditions, may overheat to a point where the Ignitor itself can melt, char, or smoke if the unit continues to operate while in an overheated condition. Adjacent materials and components, such as fiberglass insulation and insulated wiring, may show heat and/or smoke associated discoloration or degradation. The following checks will reduce the risk of overheating Ignitors within the Lamp Reflector Assembly:

1. Replace Bulbs at the recommended 2,000-hour service intervals, or before the intensity falls outside of the application requirements. A degraded or damaged Bulb increases the risk of arcing or can create an excessive current draw on the Ignitor which can raise the internal temperature of the Ignitor.

2. Dymax recommends that only Dymax-branded OEM Bulbs be used in the EC Lamp Reflector Assemblies. Some after-market or inferior quality Bulbs are built to different specifications which may deteriorate more rapidly, leading to an increased burden on the Ignitor, and associated internal temperature increase of the Ignitor.

3. Confirm that the Bulb orientation is correct and has been properly seated into the Lamp Sockets.

   A secure Bulb should not move freely in the Lamp Base. Lightly try to move the Bulb laterally, longitudinally, and rotationally to ensure the Bulb contact areas are fully seated with the Socket contacts.

   NOTE: *Always use a soft, clean lint free towel, clean paper towel, or gloves when handling the Bulb. Skin oils left on the Bulb will burn into the quartz, reducing output intensity. If the Bulb is inadvertently touched, clean the Bulb thoroughly with a soft, clean lint free towel and alcohol. Refer to the user manual enclosed within the unit for complete instructions.*

4. Inspect Lamp Sockets for any signs of arcing, physical, or heat-related damage, and replace if needed. Inspect closely, as the Lamp Sockets are ceramic and may have a hairline crack that may not be noticeable from afar.

   On the 5000-EC, the Lamp Socket is partially hidden by the Reflector material. The Reflector may be removed by the 4 Screws on the bottom of the unit to allow for a more detailed inspection.

5. For units that continually run hot, a cooling fan and skirt assembly (PN 38320) is available for installation on the lamps. The fan connects to the 24Vdc harness available on the reflector.

6. As with any machinery or equipment, general preventive maintenance should be performed to ensure the equipment continues to perform as intended. Wear components, such as Fans and Lamp Socket Assemblies, should be replaced routinely.

   - Lamp Socket Assemblies should be replaced every 4 Bulb changes.
   - Fans should be replaced every 5 years or 50,000 hours of ON time.

   For severe duty applications (e.g. units that are running under 24/7 operating conditions, or harsh ambient condition), replacements should be considered every 4 years, or 40,000 hours. Please contact a Dymax Repair Center for service needs.

7. Ensure that the Fan, on any fan-equipped model, is operating while the Lamp is in use.

   - If the Fan is not spinning, check to ensure that all electrical connections to the Reflector Head are secure and the Fan is getting power to run.
   - Confirm that the Fan is free of debris or contamination that could restrict air flow. Visible debris should be cleaned and removed.

- With the power turned OFF, check to ensure the Fan Blades can rotate freely.

8. For models without Fans, the unit relies on natural convection for cooling. The recommended installation is an upright position (energy emissions facing downward), to allow rising hot air to escape freely. Optional provisions for horizontal mounting can be acceptable, but inverted Lamps should be avoided.

   The installation requires unrestricted airflow in accordance to the user manual to minimize/eliminate entrainment and recirculation of hot air.

9. For EC units mounted on Conveyor Systems, ensure that the Conveyor Exhaust Blower is operating and adjusted properly to provide the sufficient air flow and cooling to the Lamps.

   Ensure that there is at least 6” of open space around all surfaces of the head, and that airflow is unrestricted to the top and bottom sides.

10. Measure and check the temperature of the EC unit’s outside sheet-metal surface to ensure the temperature is in the range of 115°F to 145°F. If the temperature is exceeding this value range, it may be an indication that the unit’s operating environment is not suitable, or the equipment requires further inspection of components.

    Temperature strips (PN 38694) can be purchased and adhered to the top side of unit if instrumentation to measure directly is not available to the user.

Troubleshooting

If your EC flood lamp is not responding as expected, you can probably resolve the issue using the troubleshooting chart.

NOTE: *Only qualified maintenance personnel should attempt the following procedures.*

NOTE: *When contacting Dymax, an authorized Dymax distributor, or manufacturer’s representative, be sure to know and provide the following:*

- Model number of equipment in question.
- Serial number of equipment in question.
- Product number of the adhesive in question (if applicable).
- Lot number of the adhesive in question (if applicable).

All returns to Dymax must be accompanied by a return authorization number (ran). This number must be obtained from a Dymax Customer Service Representative.

Table 1.
Troubleshooting Chart for EC Flood Lamps

Problem	Possible Cause	Testing	Corrective Action
Bulb Will Not Ignite or Bulb Flickers, Won't Maintain Operation	Improperly fastened connections	Visually inspect all connections to and from the Power Supply.	Secure all connections.
	Main Line Fuses blown	Remove Fuses from Power Receptacle and check with an Ohmmeter.	Replace Fuses, if defective.
	Corroded Lamp Bases	Visually inspect the Lamp Bases for any signs of corrosion.	Replace the Lamp Bases if corrosion exist (both Lamp Bases should be replaced at the same time).
	Bulb beyond useful life	Replace Bulb with (known) good Bulb and re-test.	Replace Bulb if defective (typical Bulb life = 2,000 hours).
	Power Supply Board failed	Check UV output voltage on power supply board. Set Oscilloscope to: 20ms/div 100V/div	Expected value 290-340 Vrms Square Wave. Replace Power Supply Board if defective.
	Igniter malfunctioned	Verify open circuit voltage from igniter. Set Oscilloscope to: 50us/div 1000V/div	Expected value 4-5 KV ignition pulse superimposed on the square wave. Replace if defective.
Unit Blows Input Fuse	Malfunction in the Power Supply Board	Remove power. Disconnect the Lamp/Reflector Assembly from the Power Supply. Replace the Fuse. Apply power. If Fuse blows, Power Supply is defective.	Replace the Power Supply Board.
UV Intensity Appears to Be Low	Bulb beyond its useful life	Use a Radiometer (Dymax ACCU-CAL™ 50) to measure actual output intensity. Consult manual for proper output.	Replace Bulb if beyond useful life (typical Bulb life = 2,000 hours).
	The Quartz Envelope on Bulb is contaminated	Visually inspect the Bulb for signs of contamination (the Quartz Envelope must be free from any contamination).	Clean the Bulb with a soft, lint-free cloth and isopropyl alcohol. Bulb may need to be replaced if contamination is burned into Quartz Envelope.
	Surfaces of the Reflector may be contaminated	Examine the Reflector surface for contaminants. It should be a clean, shiny surface.	Clean the Reflector with a soft, lint-free cloth and isopropyl alcohol, or equivalent.
Short Bulb Life	Bulb is overcooled (5000 UVCS and SideCure)	Verify that reflector temperature is between 115°F and 145°F.	Install ventilation control plates as described in this manual.
	Degraded Lamp Bases	Visually inspect both Lamp Bases and the electrical contacts on each end of the Bulb. The Lamp Base and the electrical contacts on each end of the Bulb should show no corrosion or evidence of arcing.	Replace Lamp Bases as described in this manual.

Spare Parts and Accessories

Item	Part Number
Fuses	
Fuse, F 6.25 Amp	35141
Personal Protection Equipment	
Protective Goggles — Clear	35612
Protective Goggles — Gray (standard model included with unit)	35285
Lamps	
Lamp, Metal Halide 400 Watt UV (Standard)	38560
Lamp, Mercury Vapor 400 Watt UV (Optional)	36970
Lamp, Visible 400 Watt (Optional)	36658
Lamp Base Replacement Kits	35979
Miscellaneous	
Cooling Fan Skirt Assembly	38320
Temperature Control Kit (5000 UVCS and 5000 UVCS SideCure)	38693
Power Switch	36288

Specifications

Table 2.
Flood Lamp Specifications

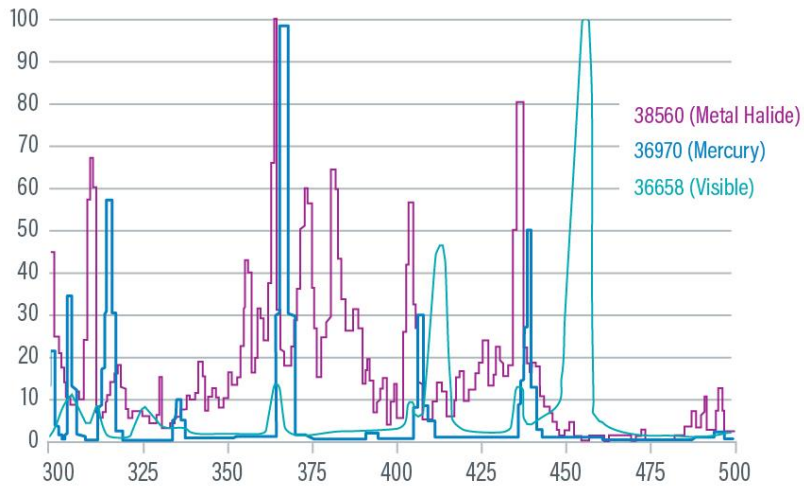
Property	Specification		
Models	2000-EC for use with UVCS Conveyors	5000-EC for use with SideCure Conveyors	5000-EC for use with UVCS Conveyors
Typical Initial Output Intensity at UV-A* (320-395 nm)	75 mW/cm^2	225 mW/cm^2	
Weight	3.4 lbs. [1.5 kg]	2.7 lbs. [1.2 kg]	
Dimensions, W x D x H	10.5" x 9.0" x 7.5" [26.7 x 22.9 x 19.1 cm]	6.75" x 6.75" x 8.0" [17.2 x 17.2 x 20.3 cm]	6.75" x 6.75" x 7.0" [17.2 x 17.2 x 17.8 cm]

* 2000-EC: Nominal intensity 2.1" below the Reflector; 5000-EC: Intensity 3" below bottom edge of Lamp/Reflector Assembly Housing. All measured with an ACCU-CAL™ 50 UV Radiometer calibrated and traceable to NIST.

Table 3.
Electrical Specifications

Property	Specification
Power Supply	
Power Outage Range	Factory set to 395 Watts
Operating Temperature	0 to 40°C
Storage Temperature	-20 to 80°C
Operating Humidity	0-80% relative humidity, non-condensing
Flood Lamps	
Main Voltage	90 - 264 VAC
Line Frequency	47-63 Hz
Current Consumption (max)	At 115 VAC 8A At 230 VAC 4A
Inrush Current (max)	30A
Rated Output Power	450 Watt maximum
Output Protection	Short circuit and overload protected
Auxiliary DC Outputs	+24V, 1A available for lamp housing fan and shutters +/- 24V, ~0.5A and +6V unregulated
Bulbs	**38560** 400-Watt, metal halide (standard) **36970** 400-Watt, mercury vapor (optional) **36658** 400 Watt, visible (optional)

Figure 17.
ECE Flood Lamp Spectral Output – 400-Watt Flood Bulbs



Definition of Terms

Brightness, also known as **Luminance** - Description of energy in the visible region of the spectrum (approximately from 400 to 700 nm) and recorded in photometric units. "**Intensity**" (see below) of visible light energy is called Illuminance.

Dose - irradiance integrated over time, or Irradiance (W/cm^2) x Time (s) = Dose ($Joules/cm^2$).

NOTE: *Watt is the power that gives rise to the production of energy at the rate of 1-joule (J) per second (s).*

Flood Lamp System - set of components arranged to generate, collect, condition and direct UV radiant energy to perform curing of engineering adhesives, coatings, and inks within a safe and controlled process. It includes a lamp housing and power supply and may also include a shutter, workstation, UV enclosure, Dymax light shield, and/or accessories.

Illuminance - Luminous flux (energy of visible light) incident per unit area and measured in **Lx** (lux) or **Lumen/cm²**.

Intensity - a measure of light energy over the unit of surface area (usually the surface at the specified working distance from the bottom of the reflector housing) in W/cm^2 or mW/cm^2.

Lamp - light source (bulb or burner) generating ultraviolet, visible, and infrared radiant energy from burning matter stimulated by electrical power conditioned by a proper power supply which is an integral part of a lamp. A light source is usually placed into a reflector (of various geometry) to increase light source efficiency by collecting and directing radiant energy of selected spectra (for a given curing process).

Ozone - oxidizing agent (O^3) produced by the action of ultraviolet radiant energy (below 185 nm) or electrical corona discharge of oxygen on air.

Ultraviolet (UV) - The invisible region of the spectrum just beyond the violet end of the visible region. Wavelength ranges in general from 1.0 to 400 nm. Dymax lamps (bulbs) do not radiate energy in deep ultraviolet; there are very minute amounts below 220 nm and practically nothing can be sensed below 200 nm. This is due to the use of ozone-blocking quartz bulb envelope (See Ozone).

Ultraviolet is used beneficially in various fields of industry and medicine. In order to standardize light sources used in medicine, the International Congress on Light, in Copenhagen in 1932, recommended dividing the ultraviolet spectrum into three spectral parts:

- **Ultraviolet A** (UV-A) - UV of long wavelength from within approximately 400 to 320 nm of the spectral band (4000 to 3200⊕) - predominately produced by Dymax flood lamps.
- **Ultraviolet B** (UV-B) - UV of medium wavelength from within approximately 320 to 280 nm - Dymax flood lamps produce some amount of their energy within this bandwidth.
- **Ultraviolet C** (UV-C) - UV of short wavelength below 280 nm (we say from 280 to 200 nm) – a large amount of this energy is present in the sunlight.

OSHA 1910.145: "Regulation of Accident Prevention Signs and Tags" defines the following headers as:

- **WARNING** – is used when there is a hazardous situation that has some probability of severe injury.
- **CAUTION** - is used to indicate a hazardous situation that may result in minor or moderate injury.
- **NOTICE** - is used to convey a message related directly or indirectly to the safety of personnel, or protection of property.

Warranty

From date of purchase, Dymax Corporation offers a one-year warranty against defects in material and workmanship on all system components (excluding lamp/bulb) 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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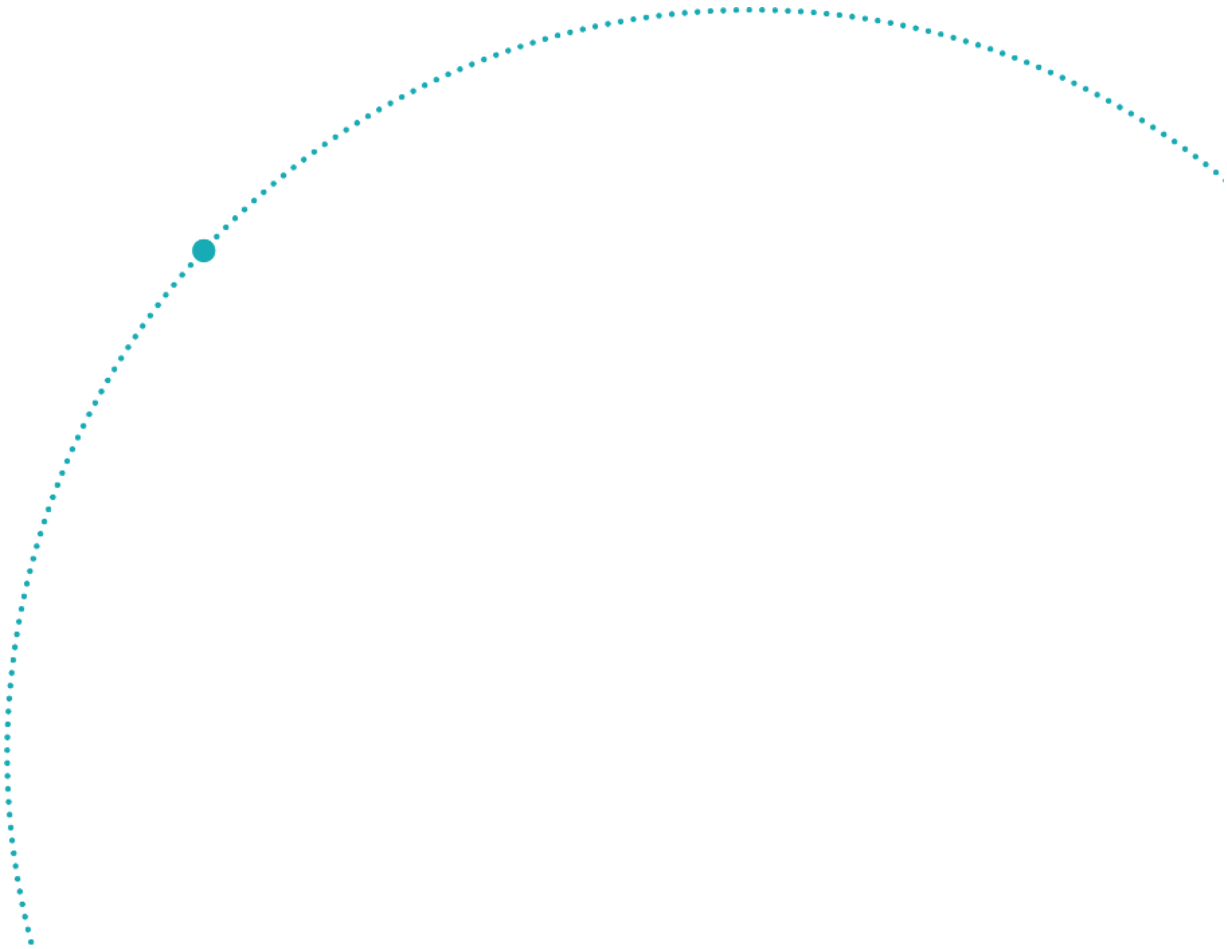

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