

# Dymax ECE Series UV Light-Curing Lamps

## User Guide

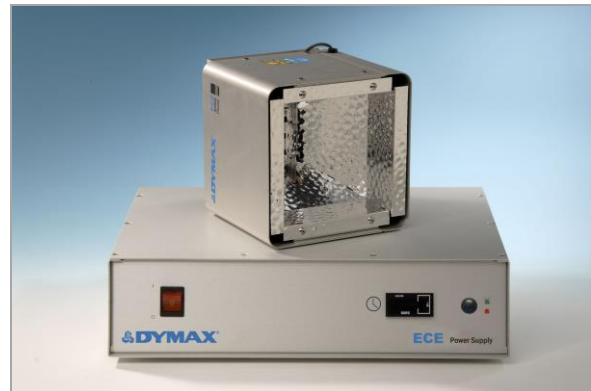
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### ECE 2000 & 5000 UV Light-Curing Flood Lamps

- Instructions for Safe Use
- Setup and Operation
- Maintenance
- Ordering Spare Parts and Accessories



ECE 2000 Flood Lamp



ECE 5000 Flood Lamp



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

Dymax manufactures industrial adhesives, light-curable adhesives, epoxy resins, cyanoacrylates, 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.

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# Introduction

## Introduction to the User Guide

This guide describes how to assemble, use, and maintain the Dymax ECE-series flood lamps 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](mailto: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](http://www.dymax.com)
- Dymax adhesive Product Data Sheets (PDS) on our website
- Material Safety Data Sheets (MSDS) 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 ECE-series flood lamp.*

## General Safety Considerations

All users of Dymax ECE 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 MSDS for each product. Dymax includes an MSDS with each adhesive sold. In addition, fluid product MSDS can be requested through the Dymax website.

## Safety Symbol Index

The following symbols are displayed on Dymax ECE series flood lamps and flood lamp accessories. Please see below for their meanings.



Refer to Equipment Manual



Gloves Required



Eye Protection Required



Warning!



Caution! Hot Surface



Warning! UV Light Hazard



Warning! Electrical Shock Hazard

## Specific Safety Considerations

Dymax ECE 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 ECE 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

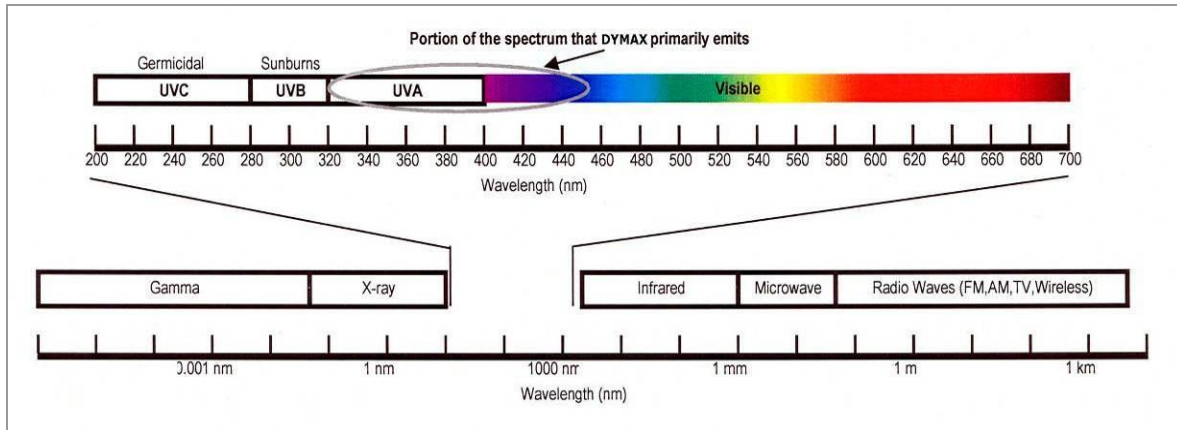
Each is described below.

### UV Exposure

Standard Dymax UV light-curing systems and bulbs have been designed primarily to emit UVA light (Figure 1). 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<sup>2</sup> (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<sup>2</sup> limit into perspective, cloudless summer days in Connecticut regularly exceed 3 mW/cm<sup>2</sup> 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. UV Spectrum**



## 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<sup>2</sup> 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<sub>2</sub>) split into oxygen atoms (O) and recombine with O<sub>2</sub> to create ozone O<sub>3</sub>. The current, long-term ozone concentration limit recommended by ACGIH, NIOSH, and OSHA is 0.1 ppm (0.2mg/m<sup>3</sup>).

## 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 ECE Series Flood Lamps

Dymax ECE series UV light-curing flood lamps are general-purpose units for the curing of UV light-curable adhesives, coatings, and inks. They have extensive use in a wide variety of applications such as bonding, potting, sealing, and encapsulating. These light sources are extremely unique in that they offer exceptional versatility and expandability.

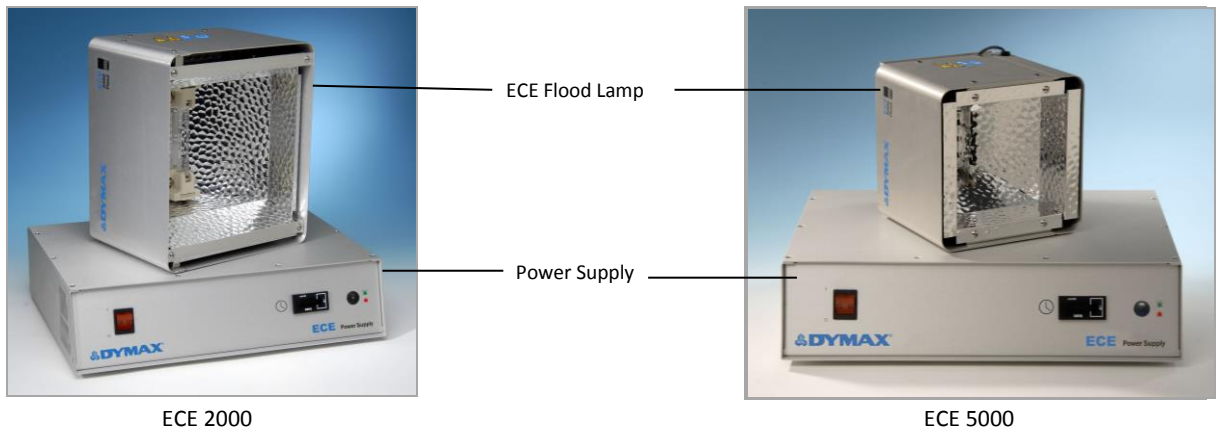
The design of these units has been carefully considered to allow the light source to be successfully utilized in a wide variety of manufacturing situations.

Each system 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. Each system can also be custom configured for mounting of the lamp/reflector assembly housing in a remote curing location and the power supply can be mounted several feet away within the easy reach of an operator. The lamp/reflector assembly housings have been designed with clean, unobstructed surfaces for maximum ease of installation in existing or specialized equipment.

Several lamp/reflector assembly housings can be mounted side-by-side in a linear configuration or a large area array. The power supplies can then be stacked and mounted remotely to provide consolidated operator control.

## System Components

**Figure 2. ECE UV Flood Lamp**



### ECE 2000

The Dymax ECE 2000 is a general purpose UV light-curing flood lamp with an effective curing area of approximately 8" x 8" (20.32 cm x 20.32 cm), making it ideal for batch processing or curing large areas.

### ECE 5000

The Dymax ECE 5000 is a general purpose UV light-curing flood lamp with an effective curing area of approximately 5" x 5" (12.7 cm x 12.7 cm). The unit is ideal for small batch processing of UV adhesives and potting compounds.

Comparatively, it provides more than twice the output intensity of an ECE 2000 flood lamp for faster curing capability and the additional ability to cure conformal coating resins.

### ECE Solid-State Power Supply

This power supply allows external electrical inputs and provides power to the ECE Flood Lamps. The power supply contains the on/off power switch and hour meter. 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 a 9-pin female connector. The solid-state power supply yields reliable and stabilized lamp 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 lamp providing longer, more reliable lamp life.



# Assembly and Setup

## Unpacking and Inspecting Your Shipment

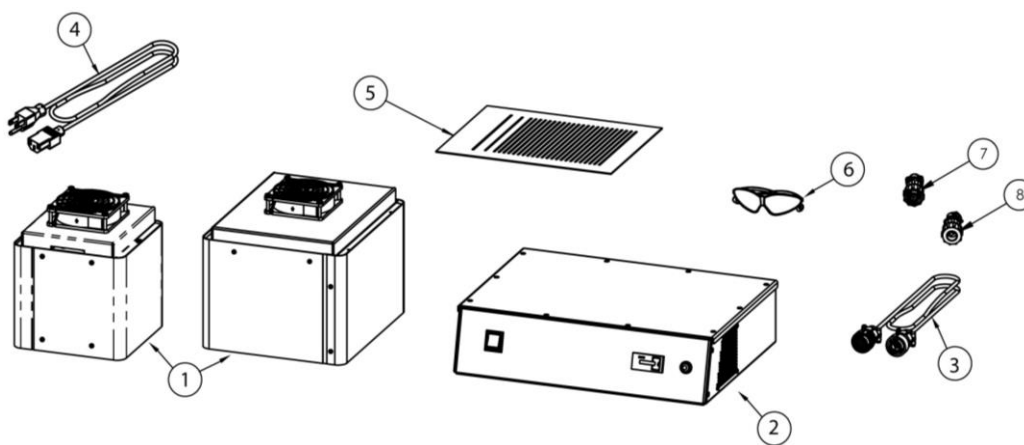
Your ECE series flood lamp arrived in one or two boxes. Inspect the boxes for damage and notify the shipper of box damage immediately.

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 ECE Series UV Light-Curing Flood Lamp

**Figure 3. ECE Series Flood Lamp Components**



- **ECE 2000 or 5000 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.
- **ECE Solid-State Power Supply (2)**
- **Interconnection Cable (3)** – Connects the power supply to the lamp/reflector assembly housing.
- **Power Cord (4)** – Dependent on model ordered. Available options listed below:
  - Standard 120V North American Power Cord (PN 40985 & 40925)
  - Type G Power Cord (PN 40995 & 40935)
  - No Power Cord (PN 40965 & 40915). For European customers, the appropriate power cord will be added)
- **Dymax ECE-Series UV Flood Lamps User Guide (5)**
- **UV Protection Goggles (6)**
- **Bypass Connectors (7 & 8)** – for the Light Shield (PN 41068) and Shutter (PN 41069)
- **Hex Wrench (Not Shown)**

# System Interconnection

**NOTE:** The only tool required for this procedure is 3/32" hex wrench which is provided with the unit.

1. Place the 400 Watt Bulb into the Lamp/Reflector Assembly Housing. Refer to the Bulb Replacement/Installation section of this manual for complete instructions.

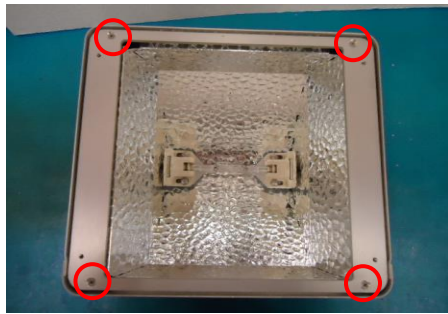


**WARNING!** It is important to wear protective gloves when installing the Glass UV Shield! Do not touch the Glass UV Shield with bare fingers! Fingerprints may etch into surface and cause light transmission loss!

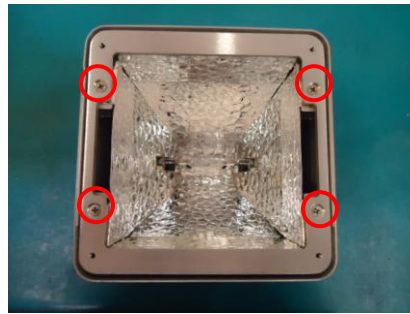
2. Place the Reflector Housing up-side down on a flat surface.
3. Loosen the four screws in the Filler Plate that hold the Reflector to the Housing.
4. Slide the Glass UV Shield under the Filler Plate and adjust it symmetrically over the Reflector Aperture.
5. Tighten the four screws (Figure 4).

**NOTE:** Do not over tighten the screws. Doing so may crack the Glass Shield.

**Figure 4. Reflector Filler Plate**



ECE 2000



ECE 5000

6. Position the Power Supply and Reflector Housing so that there is free air circulation around the sides. 12 inches (30.5 cm) of space is recommended. The Reflector may be mounted to a Dymax flood lamp accessory such as a Mounting Stand, Light Shield, or Shutter. See the connecting instructions in the user guide for the appropriate Dymax accessory.



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

*If using a Light Shield, do not position the Light Shield on top of the Power Supply (Figure 5). The ECE Flood Lamp System requires adequate air circulation. Setting up the system in such a configuration can result in damage to the equipment and unsafe operating conditions.*

**Figure 5. Unacceptable Mounting Configuration**



7. Secure the Reflector Housing in the designated operation location.
8. Connect one end of the Interconnect Cable to the J3 Receptacle on the Reflector Housing (Figure 6) and the opposite end to the J2 Lamp Power Receptacle on rear panel of the Power Supply.
9. Make sure that the other Dymax accessories, if any, are also properly connected and operational.

**NOTE:** Connections may vary if using a Dymax flood lamp accessory such as a mounting stand, light shield, or shutter. See the connecting instruction in the user guide for the appropriate Dymax accessory.

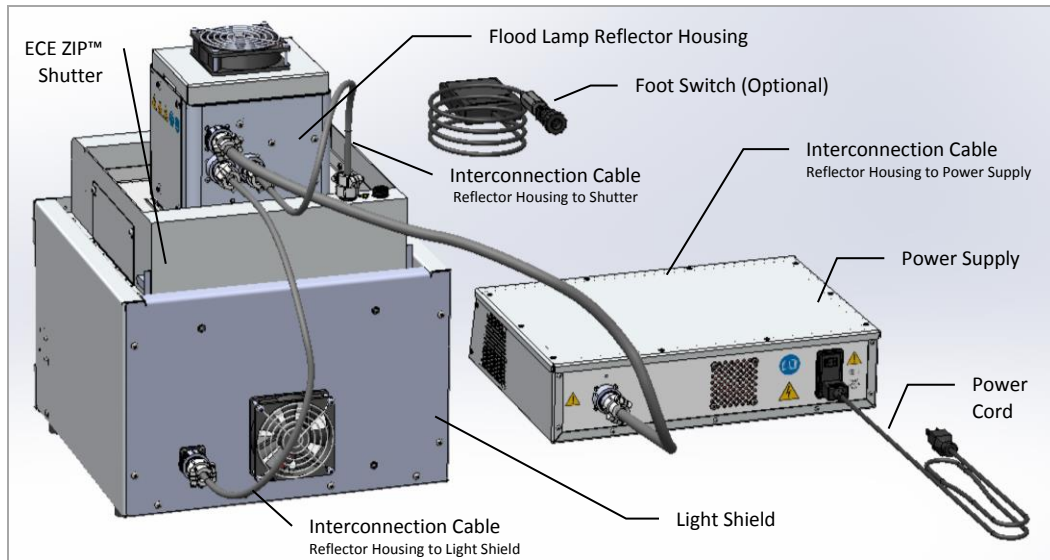
**Figure 6. Reflector Receptacles (Rear)**



#### Connections

- J3 connects to J2 on Power Supply
- J5 connects to a Light Shield or if no Light Shield is used, connect Bypass Connector (PN 41068)
- J4 connects to J1 on ZIP™ Shutter. If a ZIP™ Shutter is not used, connect Bypass Connector (PN 41069)

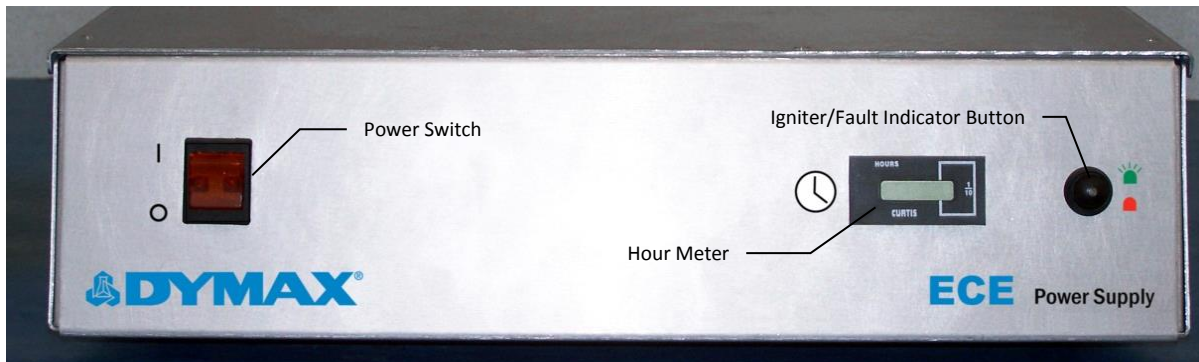
10. Plug the Power Cord into the Power Module located in the rear panel of the Power Supply (Figure 7) and plug the other end of the Power Cord into an external AC source.

**Figure 7. Interconnect Diagram for Typical ECE System Using ZIP™ Shutter and Light Shield**

## Operating the Flood Lamp

Turn the unit on by switching on the Main Power Switch on the rear of the Power Supply and then switching on the Power Switch on the front of the unit (Figure 8). The switch on the front of the unit will light up to indicate that the power is on, the Fans will run, but the flood lamp will remain off. To light the lamp, press the Lamp Igniter/Fault Indicator Button (Figure 8) on the right side of the front panel. The center of the button will illuminate green.

**NOTE:** While most lamps typically require less than 30 seconds to ignite, a new lamp may require extra time.

**Figure 8. Power Supply Front Panel**

After the lamp has ignited, allow five minutes for the lamp to reach its maximum output intensity.

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

These UV flood lamps are designed for continuous operation.

**NOTE:** *If the power is momentarily lost or the lamp is inadvertently shut off, or is shut off due to an over-temperature condition, 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 lamp is cooling. An operator will need to press the Igniter/Fault Indicator Button (Figure 8) to re-light the lamp when it has cooled sufficiently.*

Each time the lamp is turned on, it should operate for at least five minutes to allow complete ionization of elements inside the lamp. Failure to do this may result in failure of the lamp to restart. Refer to the troubleshooting section of this manual for more information.

## Cleaning and Maintenance

### Bulb Replacement Procedure

Every new 400 Watt ECE series UV light-curing flood lamp is supplied with a new bulb. When the bulb requires replacement, the following procedure must be followed:

Step 1. Turn the power switch off and disconnect the Power Supply from the electrical power source. Allow the entire assembly to cool for 15 minutes.

**CAUTION!** *The bulb operates at temperatures exceeding 500°C. Touching the bulb before sufficient cool down time is allowed will cause severe burns. Always wear safety eye wear while replacing bulb.*

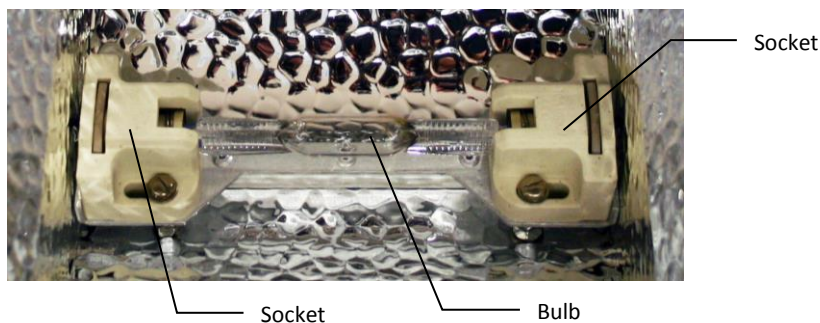
*Always use a soft, clean rag, paper towel, or gloves when handling the bulb. Skin oils left on the bulb will burn into the quartz, reducing output intensity. If the bulb is inadvertently touched, clean the bulb thoroughly with a soft, clean rag and alcohol.*

Step 2. If the flood lamp is attached to an accessory, carefully remove the lamp from the accessory and place it upside down on a work surface.

Step 3. If the Glass UV Shield is installed, remove the four flat head screws on the Reflector to release the Filler Plate. Gently remove the Filler Plate and the underlying Glass Shield.

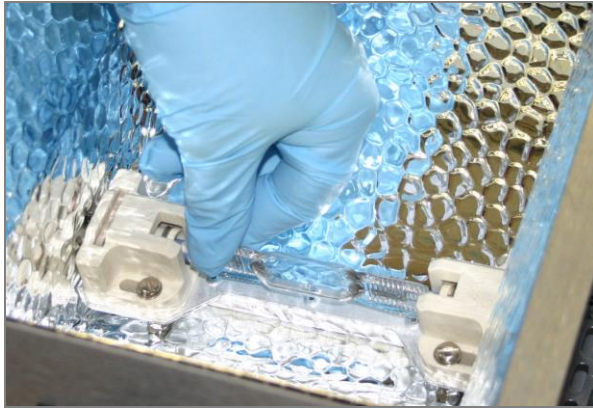
Step 4. Reach into the Reflector and grasp the flat area of Bulb at either end.

**Figure 9. Flood Lamp Bulb Installed**

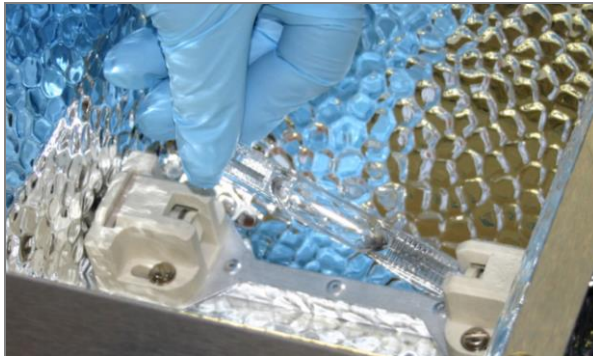


- Step 5. Lightly push the Bulb toward the Socket on the opposite end of the lamp so that the end being grasped can be lifted clear of the Socket.

**Figure 10. Push Bulb Towards Socket**



**Figure 11. Lift Bulb**



- Step 6. Install the new bulb by following Steps 4 & 5 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:*** The bulb has no polarity.

- Step 7. Record the serial number of the unit and the hour-meter reading in the Bulb History Record.
- Step 8. Replace the Lamp/Reflector Assembly Housing on the Mounting Stand by engaging the Mounting Bracket.
- Step 9. Secure the Thumbscrew when the Lamp/Reflector Assembly Housing is at the proper height.
- Step 10. Reconnect the Power Cord to the appropriate power source.
- Step 11. Turn the Power Switch on and allow the lamp to warm up for five minutes before using.

***NOTE:*** If the lamp does not ignite, refer to the troubleshooting section of this manual.

## Lamp Base Replacement Kit

Installation instructions:

1. Turn off the power.
2. Remove the Power Cord and Interconnect Cord from the unit.
3. Remove the Lamp/Reflector Assembly and place it on a clean, flat surface with the Lamp facing up.
4. Remove the Lamp (refer to Lamp Replacement Procedure).
5. Remove the Lamp/Reflector Assembly from the housing by removing the four screws, two on each side, from the Reflector.
6. Remove the two screws that hold the Igniter (located inside a blue fireproof sleeve) in place from the side of the unit. Remove the Igniter from the sleeve.
7. Loosen the screws and remove the wires from the Igniter at locations marked "N" and "La".
8. The black Teflon wire at location "N" will have to be clipped from the Lamp Base Wire and re-stripped.
9. Remove both Lamp Bases and install the new Lamp Bases from the Lamp Base Replacement Kit.
10. Take one of the Lamp Bases and crimp on a supplied Terminal (PN 35202). This wire will be installed in the "La" location on the Igniter.
11. The remaining Lamp Base Wire will be joined with the black Teflon® wire using the supplied Terminal (PN 35218). This wire will be installed in the "N" location on the Igniter.
12. Place the Igniter back into the blue Fireproof Sleeve and fasten it to the side of the Housing using the two screws that had been removed in Step 6.
13. Place the Reflector back into the Housing and fasten with the four remaining screws.
14. Place the Lamp back into the unit.

## Fuse Replacement Procedure

The ECE 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 6.3 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 degrees. The Fuse Retainer should be exposed and should be removed by pulling it straight out.
5. Slide out the blown Fuses and replace with new 6.3 Amp, slow-blow Fuses (PN 41098).

**CAUTION!** *It is important to replace this Fuse with the same 6.3 Amp rated, slow-blow type.*

6. Slide the Fuse Holder 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.

**Figure 12. Replacing Fuses**



## Cleaning

Periodically remove and clean the Glass UV Shield if installed. Follow Step 4 in the Bulb Replacement Procedure for removal. Clean with any standard glass cleaner or use isopropyl alcohol for heavy deposits. Reinstall the Glass UV Shield by following Step 2 of the Installation Procedure.

**NOTE:** *The Glass UV Shield loses its ability to transmit UV over time. This is due to “solarization” of the Glass UV Shield caused by the intense UV radiation. Cleaning can extend the useful life of the shield, but its transmission should be monitored periodically and replaced as necessary.*

Failure to regularly clean the Glass UV Shield will result in reduced UV output to the resin being cured, thereby increasing the time required to achieve optimum cure.

Periodically clean the Bulb and Reflector surfaces. A soft, clean, lint-free 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, lint-free cloth.*

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



# Troubleshooting

If your ECE flood lamp will not respond as expected, you can probably resolve the issue using the troubleshooting chart.

**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 Material Authorization (RMA). This number must be obtained from a Dymax Customer Service Representative.

**Table 1. Troubleshooting Chart for ECE Flood Lamps**

Problem	Possible Cause	Testing	Corrective Action
Lamp Will Not Ignite  or  Lamp 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 exists (both Lamp Bases should be replaced at the same time).
	Bulb beyond its useful life	Replace the Bulb with a Bulb that is good and re-test unit.	Replace the Bulb if defective (typical Bulb life = 2,000 hours).
	Power Supply Board failed	If a second ECE Flood Power Supply is available, connect it to the Reflector Housing and check for Bulb ignition.	If the lamp lights with the second Power Supply, call Dymax for a Return Merchandise Authorization (RMA). The Power Supply has failed.
	Igniter malfunctioned	If a second ECE Reflector Housing is available, connect it to the Power Supply and check for Bulb ignition.	If the lamp lights with the second Reflector Housing, call Dymax for an RMA. The Reflector Housing has failed.
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 a Fuse blows, the Power Supply is defective.	Call Dymax for an RMA. The Power Supply has failed.

**Table1 Continued. Troubleshooting Chart for ECE Flood Lamps**

Problem	Possible Cause	Testing	Corrective Action
UV Intensity Appears To Be Low	The Bulb is beyond its useful life	Use a Radiometer (ACCU-CAL™ 50) to measure actual output intensity. Consult manual for proper output.	Replace the Bulb if beyond the useful life.
	The Quartz Envelope on the Bulb is contaminated	Visually inspect the Bulb for signs of contamination (Quartz Envelope must be free from any contamination).	Clean the Bulb with a soft, lint-free cloth and isopropyl alcohol. The Bulb may have to be replaced if contamination is burned into Quartz Envelope.
	Surfaces of Reflector may be contaminated	Examine Reflector surface for contaminants (should be a clean, shiny surface).	Clean the Reflector with a soft, lint-free cloth and isopropyl alcohol or an equivalent.
	The Glass UV Shield is contaminated	Examine the UV Shield for signs of contamination.	Clean the UV Shield with a soft, lint-free cloth and isopropyl alcohol or an equivalent.

## Spare Parts and Accessories

Item	Part Number
<b>Fuses</b>	
Fuse, F 6.3 Amp	41098
<b>Glass UV Shield</b>	
Glass UV Shield for the ECE 2000	35899
Glass UV Shield for the ECE 5000	41067
<b>Personal Protection Equipment</b>	
Protective Goggles — Clear	35612
Protective Goggles — Gray (standard model included with unit)	35285
<b>Stands</b>	
Mounting Stand Kit, ECE 5000	38289
Mounting Stand Kit, ECE 2000	38290
<b>Lamps</b>	
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
<b>Miscellaneous</b>	
Bypass Connector, P5	41068
Bypass Connector, P4	41069
Light Shield	40785
Power Switch	36288

## Optional Accessories

Several optional accessories are available to enhance efficiency and operation of Dymax ECE series UV light-curing flood lamps. Contact your authorized Dymax distributor, manufacturing representative, or Dymax for more information on these options.

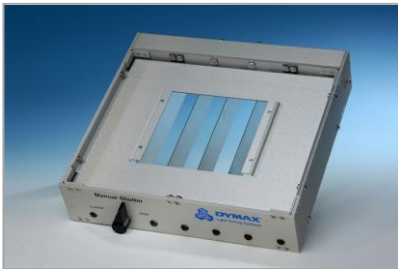


### UV Radiometer (PN 40550)

Dymax offers an ACCU-CAL™ 150 for monitoring the UV intensity of the ECE-Series Flood Lamps. This Radiometer is calibrated to measure UVA output (320-390 nm) wavelength.

Features include:

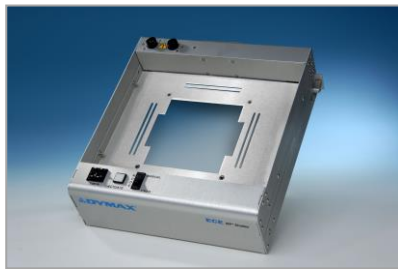
- Measures light intensity in  $mW/cm^2$
- Powered by AAA batteries (included)
- Stores in molded plastic case (included)



### Manual Louvered Shutter (PN 35572) & Electric ECE ZIP™ Shutter (PN 40885)

#### Safety Enhancing Timing Devices

The Dymax ECE ZIP™ Shutter (retractable) and the Manual Louvered Shutter allow timed light exposure, reduce heat on work area surfaces, and reduce operator exposure to UV light.



### ECE Light Shield (PN 40785)

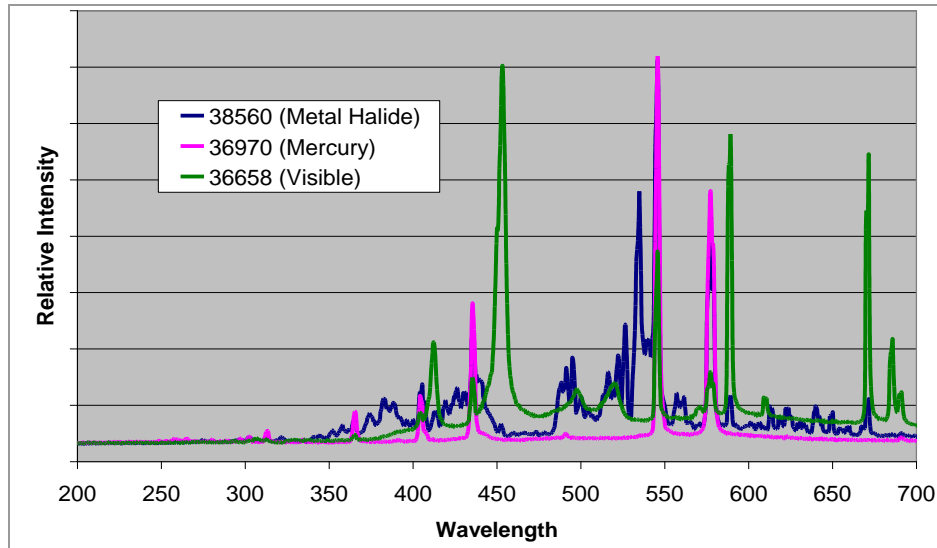
The Dymax ECE Light Shield is a complete enclosure with 360 degrees of shielding. The Light Shield features an UV-opaque acrylic window that filters out ultraviolet radiant energy and allows visible light to pass through so that objects can be observed during the curing process.



# Specifications

Property	Specification	
<b>Models</b>	ECE 2000	ECE 5000
<b>Part #</b>	<b>40965</b> No Power Cord* <b>40995</b> Asian Version (Type G Power Cord) <b>40985</b> North America Version (120V Power Cord)	<b>40915</b> No Power Cord* <b>40935</b> Asian Version (Type G Power Cord) <b>40925</b> North America Version (120V Power Cord)
<b>Typical Initial Output Intensity at UV-A* (365 nm)</b>	105 mW/cm <sup>2</sup>	225 mW/cm <sup>2</sup>
<b>Weight</b>	3.4 lbs. [1.5 kg]	2.7 lbs. [1.2 kg]
<b>Dimensions, W x D x H</b>	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]
<b>Power Supply Dimensions (approx.), W x D x H</b>	15.75" x 11.6" x 3.8" [39.9 cm x 29.5 cm x 9.65 cm]	
<b>Hour Meter</b>	99,999.9 hours (non-resettable)	
<b>Electrical Power Output</b>	400 Watts	
<b>Operating Temperature</b>	0 to 40°C	
<b>Storage Temperature</b>	-20 to 80°C	
<b>Operating Humidity</b>	0-90 % (non-condensing)	
<b>Main Voltage</b>	100 - 240 VAC +/-10% Single Phase	
<b>Line Frequency</b>	50-60 Hz	
<b>Current Consumption (max)</b>	@115 VAC      6.30A @230 VAC      3.15	
<b>Inrush Current (max)</b>	12.6 A / 2.2 ms	
<b>Electrical Regulation</b>	+/- 2.5% for effects of load, line, temperature	
<b>Output Protection</b>	Short circuit and overload protected	
<b>Auxiliary DC Outputs</b>	+24V, 1A available for lamp housing fan and shutters +/- 24V, ~0.5A and +6V unregulated	
<b>Bulbs</b>	400 Watt, metal halide (standard), 400 Watt, mercury vapor (optional), or 400 Watt, visible (optional)	
<b>Bulb Life</b>	2,000 hours (bulb ignition only)	
<b>Unit Warranty</b>	1 year from purchase; see warranty section for more information.	
<b>Certifications</b>	RoHS compliant	

\* The appropriate power cord is added for European customers.

**Figure 13. Spectral Outputs for Dymax 400 Watt Flood Bulbs**

## Definition of Terms

**Dose** – irradiance integrated over time, or Irradiance ( $\text{W}/\text{cm}^2$ ) x Time (s) = Dose ( $\text{Joules}/\text{cm}^2$ ).

**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.

**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  $\text{W}/\text{cm}^2$  or  $\text{mW}/\text{cm}^2$ .

**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 ( $\text{O}^3$ ) 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 $\text{\AA}$ ) – 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.

**Cautionary Statements Are Defined 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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**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 Dymax's 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.

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