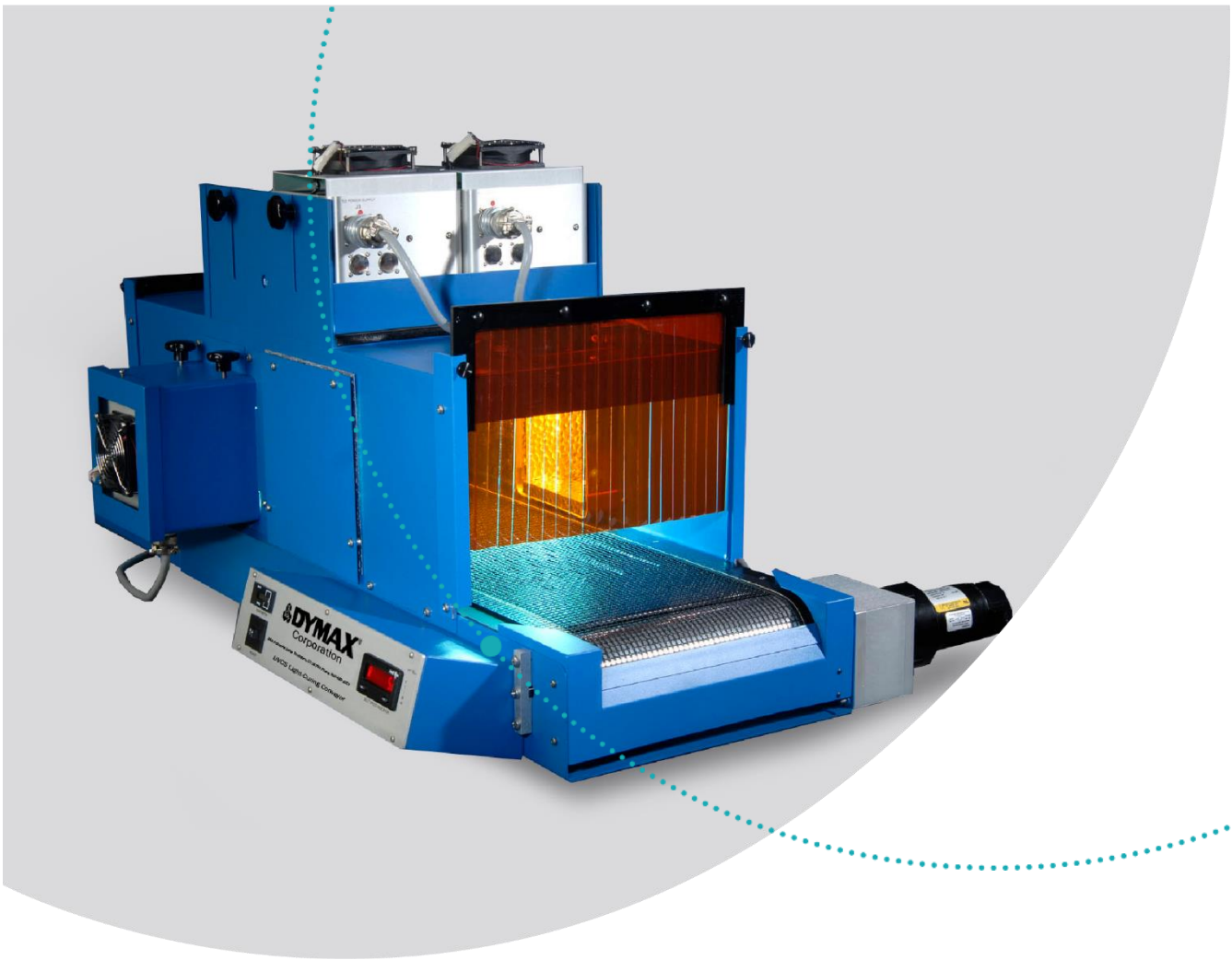


UVCS SideCure

UV Light-Curing Conveyor
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 UVCS SideCure Conveyor System 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 curing 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 (MSDS) provided with shipments of Dymax adhesives

Safety

WARNING! *If you use a Dymax light-curing conveyor 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 a Dymax conveyor system.*

To use this light-curing 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 system.

General Safety Considerations

All users of Dymax equipment should read and understand this user guide before assembling and using the equipment.

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 our website.

Specific Safety Considerations

Dymax light-curing conveyors are designed to maximize operator safety and minimize exposure to UV light. To use the conveyor safely, it must be set up and operated in accordance with the instructions in this user guide.

Equipment is designed to be used when properly set up, with components correctly connected, and operated in accordance with relevant instructions. Design was developed to maximize operator safety and minimize exposure to UV.

CAUTION! *Always wear UV eye protection or face shield, when working near UV light!*

Safety Recommendations

- Use eye protection or a face shield approved for complete UV protection.
- Long-sleeved shirts or a lab coat are recommended to protect the arms, and the use of UV opaque gloves to protect the hands.

Dymax UV Light-Curing System Safety Considerations

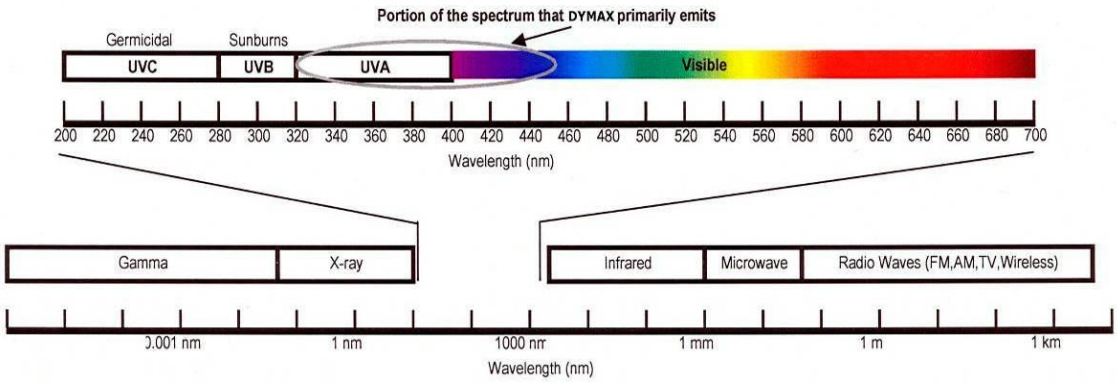
Dymax UV light-curing technology has been used successfully for over 30 years. The fast cure, one-component nature of our UV light-curing technology has made it the process of choice for many manufacturers requiring a "cure on demand" assembly process. Operators must understand these four concepts to use the UV light source safely: UV exposure, high-temperature surfaces, ozone, and bright, visible light.

UV Exposure

Standard Dymax UV light-curing systems have been designed primarily to emit UVA energy (Figure 1). UVA energy is generally considered the safest of the three UV ranges: UVA, UVB, and UVC. Although OSHA does not currently regulate UV 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 allows continuous exposure up to 1 mW/cm^2 (intensity). Unless you are placing bare hands into the curing area, it is unusual to exceed these limits. To put 1 mW/cm^2 limit into perspective, a cloudless summer day will typically 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.
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^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 or blind corners:

Sheet Metal — Sheet metal (aluminum, steel, stainless steel, etc) should be coated black or black anodized to minimize reflection of UV and visible light toward operators.

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. These rigid plastic films are available either clear or tinted.

Flexible Film — 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.

High-Temperature Surfaces

Surfaces exposed to high-intensity curing lights may rise in temperature. The intensity, distance, exposure time, cooling fans, and composition of the surface can all affect the rise in 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.

Ozone

Standard Dymax lamps (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).

Bright, Visible Light

The bright, visible light energy emitted by UV light-curing systems can cause eye strain if proper eye protection or shielding is not used. The proper use of tinted eye protection and/or opaque/tinted shielding can be utilized to reduce eye strain and address this concern.

Summary

UV light sources can be more “worker friendly” than many commonly accepted industrial processes, provided the potential concerns are addressed. Contact your Dymax representative for information regarding the proper use of Dymax UV light-curing systems.

Product Overview

Description of the UVCS SideCure Conveyor System

The Dymax UVCS SideCure UV light-curing conveyor system is designed to provide reliable and consistent processing of UV reactive adhesives and coatings.

Standard features include a Direct Drive Motor, an integrated Cooling System, and a UV-Resistant Belt.

The SideCure is designed for bench or table-top operations. The self-contained Cooling System and integral UV-Light Shielding allow it to be placed virtually anywhere space permits.

Dymax UV light sources are capable of curing a wide variety of UV light-curable adhesives, coatings, and inks. They have extensive use in a variety of applications such as bonding, potting, sealing and encapsulating. These light sources offer exceptional versatility and expandability to accommodate most process demands.

The SideCure Conveyor is designed to accommodate several different Top Lamp arrangements to provide the maximum functional flexibility. The necessary Lamp Adapter Plates and Spacers are included with the Conveyor.

Figure 2.
UVCS SideCure Conveyor System

Unpacking and Setup

Unpacking and Inspecting Your Shipment

When your conveyor arrives, inspect any boxes for damage and notify the shipper immediately of box damage.

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 the UVCS SideCure Conveyor

- **UVCS SideCure Conveyor**
- **5000-EC UVCS SideCure Lamps** (number of lamps is dependent on the model ordered) - A lamp/reflector assembly housing which contains the reflector, UV lamp, lamp bases, and a high-voltage starter. A 400 Watt metal-halide UV lamp (PN 38560) is standard. Optional mercury-vapor (PN 36970) or visible-spectrum (PN 36658) lamps are available upon request.

- **Solid-State Power Supply for the 5000-EC Lamps** – A solid-state lamp power supply that allows external electrical inputs and provides power to the lamp located in the lamp/reflector assembly housing. The power supply contains the On/Off power switch and hour-meter that are located on the left side of 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 a 14-pin female amp connector.

  The solid-state lamp power supply yields reliable and stabilized lamp voltage in virtually any electrical system in the world. No other adjustment or settings are required other than ensuring a properly wire-configured plug is employed to the system. The power supply also conditions the electrical power to the lamp providing longer, more reliable lamp life.

- **Connection Cable** – Connects the power supply to the lamp/reflector housing assembly.

- **Power Cord**

- **UVCS Lamp Adapter Plates**

- **UV Goggles -** Two pairs

- **Dymax UVCS SideCure Conveyor System User Guide**

Lamp Installation and System Interconnect

NOTE: *Refer to the Dymax UVCS Lamp manuals for detailed Irradiator and Power Supply information.*

1. Uncrate and assemble the Conveyor's optional Mounting Cart if applicable.

2. Uncrate the Conveyor and remove the protective coverings. Place the Conveyor on a convenient work surface or on the Mounting Cart if purchased.

3. Unpack the 5000-EC UVCS Lamp System(s). Each Lamp System includes a Power Supply, Reflector Assembly, 400-Watt Bulb, Amp Connector Cord, and Power Cord (Figure 3).

   Figure 3.
   5000-EC UVCS Lamp System

4. Install the Bulb into the Reflector Housing (Figure 4) ensuring that the bulb is properly seated.

5. Attach the Connector Cord to the back of each Reflector (Figure 5).

   Figure 4.
   Bulb Installed in Reflector Housing

   Figure 5.
   Lamp Reflector Housing

6. Install the Lamp/Reflector Housing Assemblies into the Conveyor's Upper Lamp Support Housing. Up to four Lamp/Reflector Housing Assemblies may be installed in the Upper Lamp Support Housing. Adapter Plates are provided with the Conveyor for each possible arrangement.

7. When the Lamps are installed, adjust the position of the Support Housing and tighten the four Securing Knobs (Figure 6).

Figure 6.
Upper Lamp Support Housing with Two Lamps – Three Possible Configurations

8. Install the Lamp/Reflector Housing Assemblies onto the Lamp Support Brackets on the front and rear side of the Conveyor (Figure 7). Install the Light Shields over each Lamp Support Bracket (Figure 8). Adjust the Lamp position as desired and then tighten the two Lamp Securing Knobs.

Figure 7.
Reflector Installed in Lamp Support Bracket

Figure 8.
Lamp Support Bracket with Light Shields

9. Attach the Connector Cable leading from each Reflector to the rear of each Power Supply (Figure 9). Connect the Conveyor's Power Cord to a 120 Volt AC power source (230V AC for 230-Volt units). Connect each Power Supply's Power Cord to a 95-260 Volt AC power source.

Figure 9.
Power Supply, Rear Panel

Figure 10.
Speed Controller Knob

10. Turn the Conveyor on by means of the Power Switch.

11. Adjust the Belt speed by turning the Speed Control Knob (Figure 10). The Belt speed will be indicated on the Speed Display Indicator.

12. When the Conveyor is operating and the Belt is in motion, turn each Power Supply on. Allow five minutes for the Bulbs to reach full output intensity.

13. After several hours of Conveyor operation, verify that the Lamp Reflector temperatures are satisfactory. Add or remove Temperature Control Plates to achieve satisfactory Reflector temperatures.

Conveyor Operation

1. Install all safety accessories to protect operator from UV-light emissions.

2. Apply power to the Conveyor and turn it on.

3. Using the Speed Controller Knob (Figure 10), adjust the speed for the desired setting.

   NOTE: *The digital readout for speed is in feet per minute.*

4. If any adjustments are needed for the Belt alignment, refer to the maintenance section of this manual.

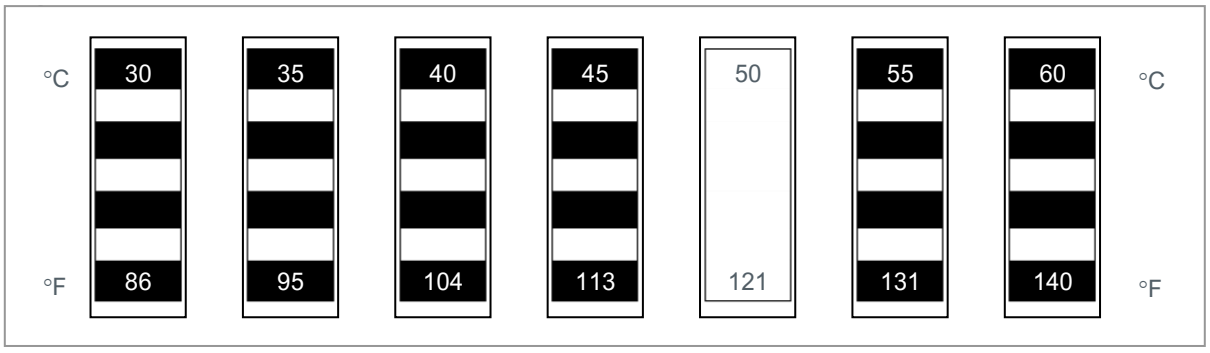
5. Adjust the height of the Lamps to the desired distance.

6. Once all the settings (speed and lamp height) have been properly set, the Conveyor is ready for operation.

7. Apply power to the Lamps and turn them on.

8. A Temperature Indicator Strip is attached to the Reflector Housing of each Lamp. The optimum operating temperature is from 115° F to 145° F, 0-80% relative humidity, non-condensing. Figure 11 shows a typical Temperature Indicator Strip reading a representative temperature.

Figure 11.
Typical Temperature Indicator Strip Reading



NOTE: *The Conveyor must be operating and the Conveyor Belt must be in motion before the Lamps are turned on. This prevents Belt overheating and damage that can result if the Belt is stationary when the Lamp is running.*

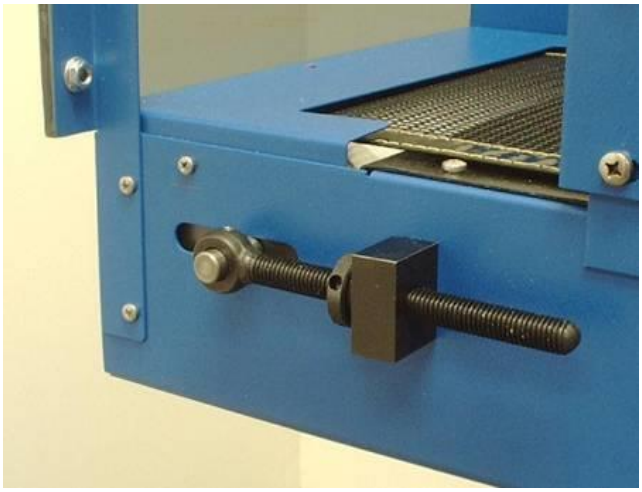
Maintenance

Belt-Tracking Adjustment

All Dymax UVCS Conveyors are factory adjusted to provide proper tracking of the Belt. Should further adjustments become necessary, this is done via two knurled Adjustment Knobs located at the input end of the Conveyor (Figure 12). To adjust tracking, simply tighten the side to which the Belt is tracking.

NOTE: *Do not over tighten the Belt. This will lead to accelerated degradation of the Belt.*

Figure 12.
Belt-Tension Adjustment Knob



Conveyor Belt Replacement

1. Remove the Pinch Guard from the Motor side of the Conveyor by removing the two M4x8 Screws (Figure 13) on the front side of the Conveyor and the M4x25 Screw (Figure 15) from the motor drive side of the Conveyor. Remove the motor box cover (Figure 14) to obtain access to the M4x25 Screw.

Figure 13.
M4x8 Screws

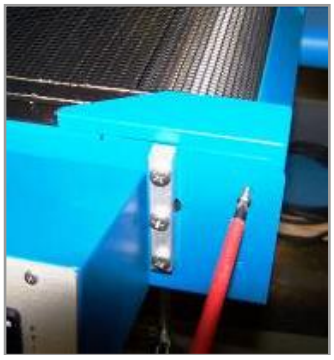


Figure 14.
Remove Motor Box Cover

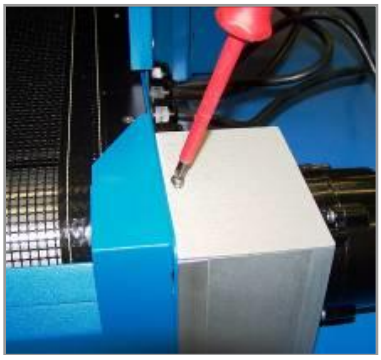


Figure 15.
M4x25 Screw

2. Remove all tension from the Belt by fully backing off the Belt-Tension Adjustment Knobs (Figure 12).

3. Position the Belt Splice to the end of the Conveyor (Figure 16). Remove the Fiberglass Rod that ties the ends of the Belt together (Figure 17). Remove the Belt.

4. Run the new Belt around the Conveyor Frame (Figure 18).

5. Install the Fiberglass Rod through the Belt Loops.

6. Apply some adhesive to both ends of the Fiberglass Rod to prevent it from moving during Conveyor operation (Figure 19).

Figure 16.
Spliced End of Belt

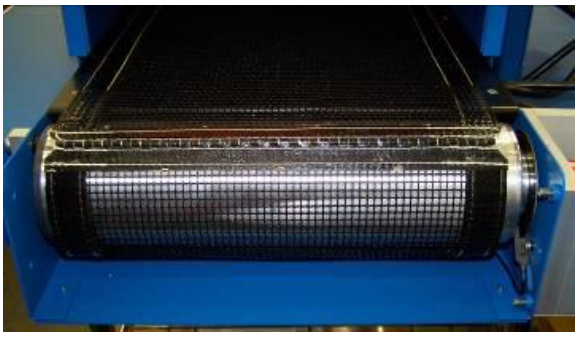
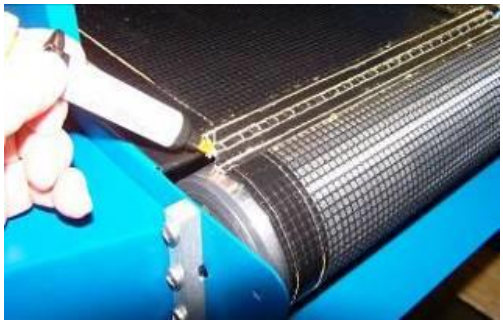


Figure 17.
Fiberglass Rod

Figure 18.
Replacing Belt

Figure 19.
Applying Adhesive



7. Finger tighten the Belt-Tension Knobs (Figure 12) to remove excess slack from the Belt. The Belt should be loose enough to be moved across the two Rollers by hand when the Conveyor is not running.

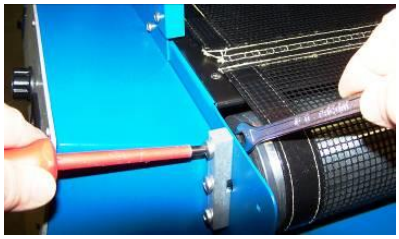
   CAUTION! *Excessive tightening of the Belt will result in early Belt failure. Since the two Conveyor Rollers have a crown in the middle, only minimum tightening is necessary.*

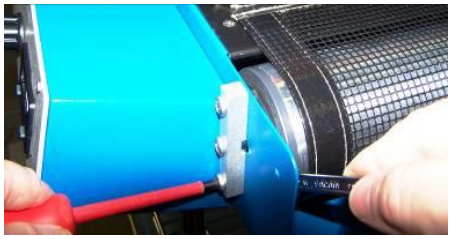
8. Start the Conveyor and adjust the Belt-Tensioning Knobs until the Belt runs in the center of the loading end of the Conveyor. The Belt should be able to be stopped by hand when the Conveyor is running. If stopping the Belt stalls the Conveyor Motor, the Belt is too tight and must be loosened.

9. When the Belt runs in the center of the Loading End, observe the Belt's position at the Motor End. If the Belt runs too far to one side on the Motor End, adjust the Motor Pulley as follows:

   - Turn the Conveyor off.
   - Remove Belt tension by loosening the two Belt-Tensioning Knobs.
   - Loosen the two Drive-Roller Shaft-Support Fasteners (Figure 20), located on the front of the Conveyor Frame, enough to slightly move the Shaft Assembly.

Figure 20.
Loosening Drive-Roller Shaft-Support Fasteners





- Move the Shaft Assembly slightly to realign the Drive Roller and center the Belt. Tighten the bolts when adjustment is complete (Figure 21).

Figure 21.
Tightening Drive-Roller Shaft-Support Fasteners

- Turn the Conveyor on and adjust the Belt-Tension Knobs (Figure 12) until the Belt is properly tightened. Make sure that the Belt runs in the center of the Conveyor on both the Loading and Unloading Ends. Repeat this step as necessary to align the Belt.

- Reinstall the Pinch Guards on both ends of the Conveyor (Figure 22). This step is critical to Belt-Speed Sensor operation. The Pinch Guard on the Unloading End of the Conveyor contains a Shield for the Sensor to prevent damage if the Belt contacts it while operating.

Figure 22.
Installing Pinch Guard (front & back)

Troubleshooting

CAUTION! *Only qualified maintenance personnel should attempt the following procedures.*

Table 1.
Troubleshooting Chart for Dymax Lamp Assemblies

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 Fuse blown	Remove Fuse from Power Receptacle and check with an Ohmmeter.	Replace Fuse 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 useful life	Replace Bulb with new Bulb and re-test unit.	Replace Bulb if defective (typical life = 2,000 hours).
	Power Supply Board Failed	Check UV output voltage on power supply board. Set Oscilloscope to: 20ms/div 100V/div	Replace Power Supply Board if defective.
	Igniter Malfunctioned	Verify open circuit voltage from igniter. Set Oscilloscope to: 50us/div 1000V/div	Replace if defective.
Unit Blows Input Fuse	Malfunction in the Power Supply Board	Remove power. Disconnect the Lamp/Reflector Housing Assembly from the Power Supply. Replace the Fuse. Apply power. If the Fuse blows, the Power Supply is defective.	Replace the Power Supply Board.
UV Intensity Appears to Be Low	Bulb beyond its useful life	Use a Radiometer to measure actual output intensity. Consult Radiometer Manual for proper output.	Replace Bulb if defective (typical life = 2,000 hours).
	Quartz Envelope on Lamp contaminated	Visually inspect the lamp for signs of contamination (Quartz envelope MUST be free from ANY contamination).	Clean the Lamp with a soft, lint-free cloth and isopropyl alcohol. Lamp 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 Reflector with a soft, lint-free cloth and isopropyl alcohol or equivalent.
	Reflector temperature is too low	Verify Reflector temperature is between 115°F and 145°F as measured at the Temperature Indicator on top of the Reflector Housing.	Add or remove Reflector Ventilation Plates as necessary to achieve proper temperatures.

Table 2.
Troubleshooting Chart for the SideCure Conveyor

Problem	Possible Cause	Testing	Corrective Action
Conveyor Not Operating	Main Line Circuit Breaker deployed	Toggle Power Switch off, then on.	Find out why Breaker is deploying
	Improperly Fastened Connections	Check all connections.	Properly fasten Power Cord.
	Fuses for Motor Controller blown	Remove Fuses from Fuse Holders (located in the left side of Control Box of unit) and check with an Ohmmeter.	Replace, if defective.
	Belt is hung up	Inspect the Belt for any signs of a mechanical bind.	Resolve bind and continue operation.
	Tension Too Low on Belt (Power Switch lights and Motor turns but Belt does not move)	Verify the operation of the Drive Shaft and Drive Rollers.	Use the Tracking Adjustment Knobs to increase the Tension on the Belt. Both Knobs will have to be turned the same amount to not affect the alignment.
Belt Tracks to One Side	Belt Adjustment Knobs are out of position	Visually inspect the Belt. The Belt will track to one side.	Tighten the Adjustment Knob (the one located on the side to which the Belt is tracking towards) until Belt tracks straight. Only minor adjustments should be made at one time.

Spare Parts and Accessories

Item	Part Number
Conveyor Spare/ Replacement Parts	
Circuit Breaker, 115 VAC, Small Fan 5A	39128
DC Motor Speed Indicator Sensor	39136
Fuse 1.5 Amp	39187
Gear Motor Assembly, 90 VDC	39285
Hour Meter	35981
Mesh Belt	39134
Motor Controller, Speed 120/230 VAC	40179
Side Lamp Opening Cover Plate Kit	40555
Speed Controller Knob	36143
Top Fan, 115 volt	37570
Top Fan, 230 volt	37569
Lamp Spare/ Replacement Parts	
Bulb, Metal-Halide 400 Watt UV (Standard)	38560
Bulb, Mercury-Vapor 400 Watt UV (Optional)	36970
Bulb, Visible Spectrum 400 Watt (Optional)	36658

Specifications

Table 3.
Physical Specifications

Property	Specification
Model	UVCS SideCure
Cure Width	6"-12" (152 mm - 305 mm)
Number of Lamps	Up to eight
Type of Lamp	Dymax 5000-EC UVCS SideCure lamps
Motor Drive	Direct
Belt Speed	1-27.5 FPM (0.304 - 8.36 m/min.)
Belt Speed Display	Red digits, 1 decimal place
Lamp Focus Adjustment	2.1" - 4.5" (53.3 mm - 114 mm)
Maximum Parts Height	7" (177.8 mm)
Exhaust System	2 external fans

Table 4.
Electrical Specifications

Property	Specification
Conveyor Voltage Requirements	115 or 230 VAC, 50 or 60 Hz
Conveyor Current Requirements	1.6 Amp (115V), 0.9 Amp (230V)
Lamp/Power Supply	
Input Voltage	90-132/180-265 (auto-select)
Input Frequency	47-63 Hz
Fusing	6.25 Amp (externally accessible)
Output Power	
Rated	400 Watt
Start Up Current	3.6 ARMS (for rated load)
Current Regulation vs. Line Voltage	2%
Starter	Zumtobel ZRM6-ES
Lamp	400 Watt, metal halide (standard) 400 Watt, mercury vapor (optional)

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 Luminance.

Bulb - Light source 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).

Dose - Irradiance integrated over time, or Irradiance (W/cm^2) x Time (s) = Dose ($Joules/cm^2$). Watt is the power that gives rise to the production of energy at the rate of 1-joule (J) per second(s).

Intensity - a measure of light energy over the unit of surface area (usually surface at the specified working distance from the bottom of a reflector housing) in W/cm^2 or mW/cm^2. For the UV portion of light, this measure is often called in literature "irradiance", i.e. radiant energy arriving at a point on a surface per unit area.

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

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.
- **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 nm to 400 nm. Dymax Bulbs (burners) 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 an ozone blocking quartz bulb envelope (See Ozone).

1. **Ultraviolet A** (UV-A) - UV of long wavelength from within approximately 400 nm to 320 nm of the spectral band (4000 to 3200⊕) - predominately produced by Dymax flood lamps.
2. **Ultraviolet B** (UV-B) - UV of medium wavelength from within approximately 320 nm to 280nm - Dymax flood lamps produce some amount of their energy within this bandwidth.
3. **Ultraviolet C** (UV-C) - UV of short wavelength below 280nm (we say from 280 nm to 200 nm) – a large amount of this energy is present in the sunlight.
4. **Visible** - Light that can be seen 400 nm - 700 nm.

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.*

Index

www.dymax.com

Americas
USA | +1.860.482.1010 | info@dymax.com

Europe
Germany | +49 611.962.7900 | info_de@dymax.com
Ireland | +353 21.237.3016 | info_ie@dymax.com

Asia
Singapore | +65.67522887 | info_ap@dymax.com
Shanghai | +86.21.37285759 | dymaxasia@dymax.com
Shenzhen | +86.755.83485759 | dymaxasia@dymax.com
Hong Kong | +852.2460.7038 | dymaxasia@dymax.com
Korea | +82.31.608.3434 | info_kr@dymax.com

PN 39779 MAN021 11/3/2021