Loctite® 98760 UV Curing Conveyor

Part Number 1241543
# TABLE OF CONTENTS:

<table>
<thead>
<tr>
<th>Section</th>
<th>Page No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Warnings and Precautions</td>
<td>2, 3</td>
</tr>
<tr>
<td>2. Safety Considerations</td>
<td>4</td>
</tr>
<tr>
<td>3. Introduction</td>
<td>5</td>
</tr>
<tr>
<td>Purpose of Manual</td>
<td>5</td>
</tr>
<tr>
<td>Purpose of Equipment</td>
<td>5</td>
</tr>
<tr>
<td>Unpacking</td>
<td>5</td>
</tr>
<tr>
<td>4. Installation</td>
<td>6</td>
</tr>
<tr>
<td>5. Operation</td>
<td>7</td>
</tr>
<tr>
<td>Explanation of Controls</td>
<td>7</td>
</tr>
<tr>
<td>Start Up</td>
<td>7</td>
</tr>
<tr>
<td>Curing Parts</td>
<td>8</td>
</tr>
<tr>
<td>Idle Time</td>
<td>8</td>
</tr>
<tr>
<td>Shut Down</td>
<td>8</td>
</tr>
<tr>
<td>6. Maintenance</td>
<td>9</td>
</tr>
<tr>
<td>Cleaning Lamp and Reflector</td>
<td>9</td>
</tr>
<tr>
<td>Removing the Lamp</td>
<td>9</td>
</tr>
<tr>
<td>Installing the Lamp</td>
<td>10</td>
</tr>
<tr>
<td>7. Repair Services</td>
<td>10</td>
</tr>
<tr>
<td>8. Troubleshooting</td>
<td>11</td>
</tr>
<tr>
<td>9. Spare Parts</td>
<td>11</td>
</tr>
<tr>
<td>10. Accessories</td>
<td>11</td>
</tr>
<tr>
<td>11. Specifications</td>
<td>11</td>
</tr>
<tr>
<td>12. Schematics and Diagrams</td>
<td>12</td>
</tr>
<tr>
<td>Plan View of Conveyor (Fig. 1)</td>
<td>12</td>
</tr>
<tr>
<td>Conveyor Side Elevation (Fig. 2)</td>
<td>13</td>
</tr>
<tr>
<td>Conveyor End Elevation (Fig. 3)</td>
<td>14</td>
</tr>
<tr>
<td>Electrical Schematic (Fig. 4)</td>
<td>15</td>
</tr>
<tr>
<td>Lamp Replacement (Fig. 5)</td>
<td>16</td>
</tr>
<tr>
<td>13. Loctite Equipment Warranty</td>
<td>17</td>
</tr>
</tbody>
</table>

Information in this manual is subject to change without notice
1. Warnings and Precautions

- The Loctite® 98760 UV Curing Conveyor (hereafter called Conveyor) has been designed to operate safely used sensibly and in accordance with the instruction given in the manual.

- **OBSERVE ALL WARNINGS AND PRECAUTIONS. READ AND UNDERSTAND** all instructions in the manual before attempting to install and operate this equipment.

- **DO NOT USE** the equipment for other than intended use.

- **ALWAYS WEAR** protective eyewear, gloves and clothing as recommended in this manual or Material Safety Sheet(s).

- **ALWAYS READ** the Material Safety Data Sheet(s) before using adhesives, solvents, or any other chemicals in this equipment. **COMPLY** with **All WARNINGS and Safety INSTRUCTIONS AS STATED.**

- **NEVER** alter or modify any part or this equipment. Doing so could result in a malfunction.

- **CHECK** the equipment regularly and repair or replace worn or damaged parts immediately.

- **PROPERLY GROUND** all electrical components as recommended in the manual or technical data.

- **ALWAYS KEEP HANDS and FINGERS** away from moving parts to reduce the risk of injury.

- **Curing lamp contains Mercury**
- **Do not put in trash**
- **Recycle or dispose as hazardous trash**
1. Warnings and Precautions, cont.

ULTRAVIOLET LIGHT AND OZONE

- The Conveyor produces intense ultraviolet (UV) light, which can cause serious burns to the skin and eyes. The light is similar to that which causes sunburn but is much stronger. Like sunburn, UV burns of the eyes or skin are not felt until several hours after the burn occurs.

- The Conveyor is shielded to contain the UV light. The user is responsible to both adjust and maintain this shielding.

- Operators and others working near the Conveyor shall always wear UV safety glasses (Loctite part No. 97210). If necessary the operator and others working near should use suitable gloves, clothing, or other devices to protect exposed skin from both direct and first bounce reflected light from the Conveyor.

- A secondary hazard is the ozone (O³) that is generated by the reaction of the UV light with the oxygen in the air. Use this equipment with adequate ventilation. See “Safety Considerations”

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Curing lamp contains Mercury
Do not put in trash
Recycle or dispose as hazardous trash

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RETAIN THIS MANUAL FOR FUTURE REFERENCE.
2. Safety Considerations

SHIELDING-WARNING
Ultraviolet light can cause severe burns to the eyes and skin. Do not look at the light without protective eye shielding such as Loctite® UV safety glasses, part no. 97210, or equal. In addition to the glasses, protective clothing and gloves should be worn, if needed.

ULTRAVIOLET LIGHT SAFETY
If properly used in a well-designed system, UV light is completely safe. The primary hazard is burns, due to exposure to the UV light source. Unlike thermal burns, which are felt immediately, UV burns are not felt for several hours. Protection from lamp energy is necessary to prevent both UV and thermal burns.

The safest UV process has no direct light visible to the operators. Operator exposure to first bounce reflected light should also be avoided. Most materials absorb UV rays. Cloth, glass, plastic, wood, and metal can be used for shielding. Because the lamps generate infrared and visible light as well, the shield in close proximity to the lamp must be fireproof, opaque, and resistant to UV degradation.

Total shielding may not be possible, since parts must enter and leave the system. Protective clothing, gloves and glasses should be worn if shielding is not complete. Exposure levels can be measured with an UV meter. Meters are available from Henkel, as the Loctite® UV A/B Light Radiometer Dosimeter Part No. 1390323.

OZONE SAFETY
A secondary hazard is Ozone (O₃). Ozone is generated by the reaction of UV light of wavelength <240 nanometers with atmospheric oxygen. The current threshold limit value (TWA) for ozone (as given in the 1999 edition TLVs® and BEIs® by ACGIH) ranges from 0.05 ppm to 0.1 ppm (parts per million) depending on operator work rate.

There are several techniques for monitoring ozone concentrations. One of the simplest is equipment supplied by National Draeger, Inc., of Pittsburgh, PA. Their devices employ a direct-reading, disposable detection tube that is capable of measuring ozone concentrations of 0.05 ppm to 14 ppm.

THERMAL SAFETY
A third safety concern with medium-pressure light source is heat. The quartz sleeve of the UV lamp must be maintained at between 600°C. and 800°C. to vaporize the mercury in the lamp. In addition, UV lamps generate significant amounts of energy in the infrared region. Infrared radiation heats all nearby objects. Protection from the lamp energy is necessary to prevent thermal burns.

ELECTRICAL SAFETY
The power supply enclosure contains a high voltage transformer. This unit should be serviced only by qualified electricians or by Henkel Service Technicians.
3. Introduction

PURPOSE OF THIS MANUAL

The purpose of this manual is to provide installation, operating and maintenance instructions for the Conveyor. It is important to read this manual carefully before attempting to either install or operate this equipment.

PURPOSE OF THE ULTRAVIOLET CURING CONVEYOR

The Conveyor is used to cure Loctite® Light Cure adhesives and coatings on customer parts on a production basis. The conveyor has a medium pressure mercury arc lamp, which produces high-intensity ultraviolet (UV) energy.

The unit has the following features:

- Six-inch long lamp mounted parallel to belt travel.
- Power supply for the lamp with two (2) settings (150 or 300 watts per inch) for lamp input power.
- Six-inch wide metal wire belt.
- Variable-speed drive for the belt.

UNPACKING

1. Visually inspect the shipping carton for visible damage.
2. Report any shipping carton damage to the freight carrier.
3. Carefully open the carton and remove the equipment taking care not to lose any separately packaged parts such as the Ultraviolet Lamp.
4. Unpack the equipment and inspect for shipping damage.
5. Report any equipment damage to the freight carrier.
6. Save the packaging for safe storage or future shipping.
7. The package includes the following items.
   - (1) Ultraviolet Curing Conveyor
   - (1) Ultraviolet Lamp packaged separate
   - (1) Pair UV Safety Glasses
   - (1) Pair Cotton Gloves
   - (1) Instruction Manual
4. Installation

Do not connect the Conveyor to the electrical power until all installation steps are complete.

1. Place the Conveyor on a workbench within 5 feet of a 120-volt, 60-hertz single-phase electrical outlet fused for 20 amps.

2. Locate the Conveyor so that there is at least 6 inches of free space both at each end and above the unit. This allows free airflow to the cooling fans.

3. Install exhaust ducting (customer supplied) to remove the conveyor exhaust cooling air from the work area. The UV lamp in the Conveyor produces a small amount of Ozone (O₃) during operation. The cooling fans move approx. 200 CFM of room air through the Conveyor. This cooling air must be ducted away from personnel.

4. Make sure that the Conveyor is disconnected from electrical power source.

5. Remove the reflector assembly from the conveyor (see pg. 9 for instructions).

6. Install the UV lamp into the reflector (see pg. 10 and pg. 16 fig. 5 for instructions).

7. Replace the reflector assembly with the installed UV lamp into the conveyor (see pg. 10 for instructions).

8. Plug the Conveyor power cord into a suitable electric outlet.

9. The Conveyor in now ready for start up.
5. Operation

Explanation of controls (see Fig. 2 page 12).

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>1. Control Power On/Off</td>
<td>(2) position Push-Button Switch</td>
<td>Applies power to the unit. Lights the “Control Power” pilot light (in switch), starts the fans and conveyor belt.</td>
</tr>
<tr>
<td>2. UV Lamp On/Off</td>
<td>(2) position Push-Button Switch</td>
<td>Applies power to the UV Lamp. Lights the “UV Lamp” pilot light (in switch)</td>
</tr>
<tr>
<td>3. Lamp Intensity</td>
<td>(2) position Selector Switch</td>
<td>Selects UV Lamp input power of 150 or 300 watts per inch.</td>
</tr>
<tr>
<td>4. 150 WPI</td>
<td>Pilot Light</td>
<td>Lights when UV Lamp input power level of 150 watts per inch is selected.</td>
</tr>
<tr>
<td>5. 300 WPI</td>
<td>Pilot Light</td>
<td>Lights when UV Lamp input power level of 300 watts per inch is selected.</td>
</tr>
<tr>
<td>6. Exposure Time Control</td>
<td>Rotary Potentiometer</td>
<td>Used to adjust belt speed</td>
</tr>
<tr>
<td>7. Exposure Time Indicator</td>
<td>F.P.M. Meter</td>
<td>Shows belt speed in feet per minute (FPM)</td>
</tr>
<tr>
<td>8. Elapsed Time Indicator</td>
<td>Hour Meter</td>
<td>Records use time of UV lamp.</td>
</tr>
</tbody>
</table>

START UP

- Adjust the door openings at inlet end of the curing section to the minimum clearance above the part being cured. This will reduce UV light escaping from the curing section to the minimum.
- Press the “on” portion (green button) of the “Control Power” switch. The Control Power pilot light will illuminate. The cooling fans will start. The Conveyor belt will start. The UV lamp must be started in the 300 watts per inch power level.
- Set the “Lamp Intensity” selector switch to the 300 watts per inch position. Press the “on” (green button) of the “UV Lamp” switch. The 300 WPI pilot light will illuminate. Power will be supplied to the UV Lamp.
- The UV Lamp will take 3 to 4 minutes to reach full intensity.
- After the UV Lamp reaches full intensity it may be switched to the lower power level, if required.
5. Operation, cont.

CURING PARTS

There are two (2) settings on the Conveyor that determine the amount of UV energy that is delivered to a specific part located at a specific side-to-side location on the belt.

1. The belt speed as set by the “Exposure Time Control”.
2. The “Lamp Intensity” as determined by the 150 or 300-watts per inch UV lamp input power setting.

Once an acceptable cure has been achieved on a part, both the “Exposure Time Control” and “Lamp Intensity” settings should be recorded. In addition, a measurement of both total energy (also called dosage with units of Joules/cm² or watt seconds/cm²) and UV peak irradiance (also called power density with units of watts/cm²) should be taken and recorded.

- The Loctite® UV A/B Light Radiometer Dosimeter (P/N 1390323) is a suitable UV meter to measure both the UV peak irradiance. The Loctite® UV A/B Light Radiometer Dosimeter measures UV energy in the range of 320 nanometers to 390 nanometers (the UVA region).

IDLE TIME

Avoid frequent on-off cycling of the UV lamp because this will reduce the useful life of the lamp. If the Conveyor will be idle for only a short time, a lunch break for example, set the “Lamp Intensity” to the 150 watts per inch setting. When resuming production, set the “Lamp Intensity” to the desired power level.

SHUT DOWN

- Set the “Lamp Intensity” selector to 300 watts per inch.
- Press the “off” (red) portion of the “UV Lamp” switch.
- Wait 5 minutes for the UV lamp to cool then press the “off” (red) portion of the “Control Power” switch.
- After the lamp has been turned off, the mercury must condense before the lamp will restart. This will take about 5 minutes.
6. Maintenance

GENERAL NOTES

To insure maximum light output from the lamp and reflector, both components must be clean. Dirt on the lamp and reflector will reduce ultraviolet intensity by absorbing ultraviolet energy and turning it into unwanted infrared energy. Lamps and reflectors should be cleaned monthly or more often if conditions require. Lamps shall be handled only when they are cool. Use clean cotton gloves when handling the lamp. Using bare hands will leave skin oils on the lamp, which when heated during operation, will etch the lamp. The etched areas will then make hot spots on the lamp, reducing lamp life and UV output.

CLEANING THE LAMP AND REFLECTOR

Clean the UV lamp and reflector using a soft, clean, lint-free cotton cloth dampened with isopropyl alcohol. After cleaning, wipe dry with a soft, clean, lint-free cotton cloth.

REMOVING AND INSTALLING THE LAMP

(See illustration Fig. 5 on page 16.)

1. Disconnect the Conveyor from electrical power source.
2. If the Conveyor has been in use, wait at least 15 minutes for the lamp to cool.
3. Wear clean cotton gloves when handling the lamp itself.
4. Removing the lamp:
   a. Disconnect the power cable from the reflector assembly by loosening the lock ring and removing the four (4) pin plug from the socket.
   b. Remove the four (4) thumbscrews holding the reflector assembly to the top of the light chamber.
   c. Lift the reflector assembly up and out of the light chamber.
   d. Position the reflector assembly so that the reflector is uppermost and set the reflector assembly on a flat surface.
   e. Using an 11/32-inch nut driver, remove lamp leads from the high-voltage terminals. Remove the lamp leads only; do not remove the high-voltage cables.
   f. Using a ¼-inch flat blade screwdriver, remove the two (2) screws holding the metal, ring shaped air diffuser to the reflector end. There is a diffuser at each end of the reflector.
   g. Using a #2 phillips screwdriver, loosen the two (2) screws holding the top bracket to the lamp holder. There is a bracket at each end of the lamp.
   h. Pivot both top brackets out of the way, and wearing clean cotton gloves, remove the lamp.

Curing lamp contains Mercury
Do not put in trash
Recycle or dispose as hazardous trash

INSTALLING THE LAMP

3. Wearing clean cotton gloves, place a metal diffuser over each end of the lamp.
4. Wearing clean cotton gloves, place the lamp into the stationary lamp holder seats.
5. Pivot both top brackets so that the slots engage the screws and using a #2 Phillips screwdriver, tighten the two (2) screws holding each top bracket.
6. Using a ¼-inch flat blade screwdriver, install the two (2) screws holding the metal. Ring shaped air diffusers to the reflector ends.
7. Using an 11/32-inch nut driver, attach lamp leads to the high-voltage terminals.
8. Position the reflector assembly in the light chamber.
9. Install the four (4) thumbscrews holding the reflector assembly to the top of the light chamber.
10. Connect the power cable to the reflector assembly and tighten the connector lock ring.
11. Connect the Conveyor to electrical power source.
12. The Conveyor is ready to restart.

7. Servicing/Repair

Repair Services are available from Henkel. Visit the Loctite Equipment Website at:

http://equipment.loctite.com/service/

to learn about all of the services that Henkel provides or contact our Equipment Services department at:

Ph: 860-571-5174
Email: equipment-customerservice@loctite.com
8. TROUBLESHOOTING

<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>POSSIBLE CAUSE</th>
<th>REMEDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cure speed declines.</td>
<td>A. Lamp has reached end of useful life.</td>
<td>A. Replace lamp.</td>
</tr>
<tr>
<td></td>
<td>B. Lamp dirty.</td>
<td>B. Clean lamp. (See Maintenance and Service Section).</td>
</tr>
<tr>
<td></td>
<td>C. Reflector dirty.</td>
<td>C. Clean reflector.</td>
</tr>
<tr>
<td>Slow cure with new lamp.</td>
<td>A. Lamp not reaching full output intensity.</td>
<td>A. Check input line voltage</td>
</tr>
<tr>
<td></td>
<td>B. Reflector blackened.</td>
<td>B. Clean reflector</td>
</tr>
<tr>
<td>Lamp does not light.</td>
<td>A. Connector cable not fully inserted.</td>
<td>A. Plug connector cable into lamp unit socket.</td>
</tr>
</tbody>
</table>

9. Recommended Spare Parts

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Quantity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>983091</td>
<td>1</td>
<td>6” UV lamp</td>
</tr>
<tr>
<td>8901805</td>
<td>1</td>
<td>Belt</td>
</tr>
<tr>
<td>8901808</td>
<td>1</td>
<td>Exit Light Curtain</td>
</tr>
</tbody>
</table>

10. Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>97210</td>
<td>UV Protective Glasses</td>
</tr>
<tr>
<td>1390323</td>
<td>UV A/B Light Radiometer Dosimeter</td>
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11. Specifications

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<tbody>
<tr>
<td>Input power required</td>
<td>120 volt, 1 phase, 60 hertz, fused for 20 amps</td>
</tr>
<tr>
<td>Power consumption @ 300 WPI setting</td>
<td>Approx. 2200 watts</td>
</tr>
<tr>
<td>Dimensions (approx.)</td>
<td>54.25 in. L max x 30.13 in. W x 33.81 in. H max.</td>
</tr>
<tr>
<td>Weight</td>
<td>80 pounds</td>
</tr>
<tr>
<td>Conveyor length</td>
<td>54.25 inches</td>
</tr>
<tr>
<td>Belt</td>
<td>304 stainless steel wire</td>
</tr>
<tr>
<td>Maximum weight of all parts on belt</td>
<td>3 pounds</td>
</tr>
<tr>
<td>Belt speed range (min/max)</td>
<td>3-30 feet/minute</td>
</tr>
<tr>
<td>Maximum part height/width</td>
<td>6.0/6.0 inch</td>
</tr>
</tbody>
</table>
12. Schematics and Diagrams

Fig. 1
Plan View of Conveyor
12. Schematics and Diagrams, cont.

Fig. 2
Conveyor Side Elevation
12. Schematics and Diagrams, cont.

Fig. 3
Conveyor End Elevation
12. Schematics and Diagrams, cont.
Fig. 4
Electrical Schematic
12. Schematics and Diagrams, cont.

Fig. 5
Lamp Replacement
13. Henkel Equipment Warranty

Henkel expressly warrants that all products referred to in this Instruction Manual for the Loctite 98760 UV Curing Conveyor (hereafter called “Products”) shall be free from defects in materials and workmanship. Liability for Henkel shall be limited, as its option, to replacing those Products which are shown to be defective in either materials or workmanship or to credit the purchaser the amount of the purchase price thereof (plus freight and insurance charges paid therefor by the user). The purchaser’s sole and exclusive remedy for breach of warranty shall be such replacement or credit.

A claim of defect in materials or workmanship in any Products shall be allowed only when it is submitted in writing within one month after discovery of the defect or after the time the defect should reasonably have been discovered and in any event, within (12) months after the delivery of the Products to the purchaser. This warranty does not apply to perishable items, such as UV lamp, belt, fuses, etc. No such claim shall be allowed in respect of products which have been neglected or improperly stored, transported, handled, installed, connected, operated, used, or maintained. In the event of unauthorized modification of the Products including, where products, parts or attachments for use in connection with the Products are available from Henkel, the use of products, parts or attachments which are not manufactured by Henkel, no claim shall be allowed.

No Products shall be returned to Henkel for any reason without prior written approval from Henkel. Products shall be returned freight prepaid, in accordance with instructions from Henkel.

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