

Maintaining UV Curing Equipment

The Critical Practice of Keeping your Valuable
Equipment in Peak Operating Condition



UVPS[®]
UV PROCESS SUPPLY, INC.

1229 W. Cortland St.
Chicago IL 60614-4805 USA
1-800-621-1296 • 773-248-0099
FAX: 1-800-99FAXUV • 773-880-6647
info@uvps.com • www.uvprocess.com
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Maintaining UV Curing Equipment Manual

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INTRODUCTION

Preventative maintenance is a critical component of any successful maintenance plan. Perhaps more important than the repair of broken equipment is the work of keeping this equipment in proper operating condition. An effective preventative maintenance program evaluates the entire manufacturing process in which UV curing equipment is used in order to stay one step ahead of breakdowns and shutdowns.

The best way to avoid losing valuable production time and learning by one's mistakes is to establish a periodic, ongoing maintenance program. Such a program periodically checks the features of equipment which, if not maintained, would result in the shutdown of your production line. Many of today's UV curing equipment has been designed with "safety interlock" systems, each of which is designed to stop the entire curing unit as soon as a specific problem develops. Depending on the specific design, the machine may or may not tell you why it shut itself down, and you may still be faced with a list of variables which will have to be checked to reveal the problem. In any case, the ability to service the machine quickly and efficiently is critical. Just as getting the machine running again is important, so too is maintaining the equipment so that it does not shut down in the first place.

UV curing equipment components that require ongoing maintenance are listed below. Note that these items may not apply to all equipment and processes and is not an exhaustive list. Maintenance items include:

1. UV Lamps
2. Reflectors
3. UV Filter Material
4. Ballasts, Condensers and other electrical components
5. Conveyor Belts and Drive Assemblies
6. Shutter Assemblies
7. Cooling Systems
 - a. Air Filters
 - b. Air Blowers
 - c. Water Hoses
 - d. Water Jackets
 - e. Water Pumps, etc.

All of the above components require periodic cleaning and replacement. Each manufacturer has a schedule for you to follow. For example, some may specify a reflector change at each lamp change; others may tell you to change the reflector every other time you change the lamp. Some printers use an all-in-one cartridge system that contains both the lamp and reflector. With such systems, users can remove the cartridge and insert a new one into the assembly housing when the lamp is no longer suitable for curing. The lamp and reflector are combined, negating the need to decide whether to replace 1 or both.

The frequency of use of the equipment is a major factor in determining the type of maintenance program established. A machine that is running part of one shift will naturally require different attention than one running 24-hours a day.

UV LAMP MAINTENANCE

Most manufacturers say that a lamp's average life span is 1000 hours, plus or minus 200 hours. Some substrates require 100% output from the lamps for printed images to cure properly. Frequent job runs

on such materials may reduce the effective life of the UV lamps. Conversely, high-volume work with less demanding substrates, such as fabrics and papers, can prolong the usefulness of the curing lamps because they may not require that the lamps be operated at full power. In such cases, a simple hour measurement isn't sufficient. Periodic UV measurement using a radiometer would give a more accurate representation of a UV lamp's output and available "life." (*For a complete description and breakdown of the types of radiometers and which one may best suit your needs, please review our "How to Select A Radiometer" manual.*)

When a radiometer indicates a problem, it can be with the lamp, the reflectors, the UV filters (if present), or something emanating from the power supply. Checking these components can generally be done by a simple visual inspection, but preventive maintenance would render even this inspection unnecessary. Preventative maintenance avoids unnecessary downtime because performing this inspection would require the lamps to cool down for a long time before they can be inspected and then restarted. This could mean more than an hour of production time lost unnecessarily.

Lamps have a finite life in which to deliver required dose levels. Lamps beyond this life (and those with a dirty lens) will deliver a reduced dose. Lamps may seem to be functioning correctly after 1000 hours because deterioration occurs gradually. Lamps will ultimately fail if they're not replaced. A hazy or cloudy area in the center of the lamp is sure sign of complete failure.

Lamp maintenance must consider several variables. These variables will determine how frequently the lamps should be changed or inspected. The production usage or "time on" will have an effect on the lamp life. Most UV curing units have meters which measure the length of time that has accumulated. This time does not reflect high power versus low power but only when current has passed through the lamp. In order to properly track lamp degradation, a maintenance log must be kept regarding the use and performance of each lamp. Lamp suppliers usually have a pro-rated guarantee which is valuable if the lamp dies soon after purchase. Proper record keeping will verify the fact that a new lamp was defective.

Quantifying lamp output may be unnecessary if you simply monitor hours of lamp operation and stick to the manufacturer's lamp-replacement guidelines. But you still need to take steps to optimize lamp life. One way is to make sure the lamps are idle when the printer is not in use. The printer's operating software, which allows you to vary lamp intensity to best match the substrate with which you're working, may enable you to select the time of inactivity that must elapse before the printer automatically powers down its curing system (also known as sleep mode).

Precise workflow management is another way to make lamps last longer. Keeping the lamps powered up and in use once they're activated is more effective in terms of longevity than switching them on and off throughout the day. Every strike of the lamp degrades it faster than just pure runtime. If you want to get the longest lamp life, you need to queue your jobs in your RIP to make sure the printer is constantly fed.

Keeping UV lamps cool also helps to prolong their life. Heat generated in the UV-curing assembly is managed by air flow generated by fans or blowers. The quartz plate that protects the curing assembly must be tended to routinely. Ink overspray, dust, and other substances will otherwise accumulate on the plate and cause UV and IR light to actually reflect back into the assembly, creating excessive amounts of heat.

Very large UV lamps will sometimes sag in the middle as a result of the heat generated by the lamp during operation. The extra large size of the lamp will cause the lamp to be out of focus as the

overall distance between the lamp and the reflectors will have changed. This will show up only in the middle of the exposure area and should also be periodically checked with a radiometer.

Lamp maintenance must also consider the fact that the spectral output may change over a period of time. This means it is possible for a lamp to be on without it producing the proper energy to effectively cure a reactive ink or coating. The change in spectral output is a variable that should be monitored, since the result can be products produced with uncured or partially cured inks or coatings. This problem is hard to detect, yet quite troublesome when the spectral change produces only a slight change in the cure. A small change may only affect the coating's physical properties, such as adhesion, intercoat adhesion, or long-term effects associated with outdoor weatherability or embrittling. These slight changes could produce enormous problems that don't make themselves known until after the end product is in the customer's hands. A critical goal of a preventative maintenance program is to catch changes in spectral output before they become a problem.

There are other problems associated with UV lamps which have an effect on the processing but are not as critical as the ones already discussed. During the installation of the lamp and cleaning of the reflectors, it is possible to get foreign matter on the lamp. This will have an effect on the transmission of light. The oil from a fingerprint will etch itself into the quartz, presenting problems. First, the etched area will not transmit light as a clear section of the lamp. This may not appear to be significant on a large lamp, but a one-inch fingerprint is a big percentage of a 12-inch lamp. In addition to a reduction of light transmission, the area etched will weaken the quartz itself and increase the possibility of breakage. This is especially of concern for lamps which operate at high pressures, such as capillary lamps. This breakage may occur during the machine's operation or even while handling.

Dirt collects on the lamp from other sources as well. It is recommended that lamps be cleaned before installation to ensure there is nothing on the quartz. A soft, lintless wipe-- such as the Webril Hand Pads (J006-030), wetted with Lamp/Reflector Cleaning Solution (A002-019) should be used. If the cloth is not clean or an improper cleaning solution is used, a thin film of foreign matter may accidentally be applied to the lamp. When the lamp is later used, the lamp's heat will slowly darken the thin film on the surface. This darkening will, over time, reduce the amount of UV energy that will be transmitted and effect the cure of the ink or coating. This problem would be detected by a radiometer, as well as by periodic inspections.

UV MEASUREMENT

A proper maintenance program can avoid these problems by identifying where the problem exists *before* a production run. Lamp maintenance must go beyond "is it on?" So how can you detect a decline in curing-system performance before total lamp failure? The most basic route many users take is to handle the prints. If a print comes out properly cured, it often has a nice, hard, plastic-like surface. When lamps start to reach the end of their life, there tends to be a slight difference. More scientific methods include measuring UV output with a radiometer or an on-line active UV measurement system.

The periodic use of a radiometer will establish, monitor, and measure the level of energy the lamps are producing. The frequency of radiometer measurements depend on each shop's requirements. At the start of a maintenance program, frequent measurements will allow the operator to document the performance of a unit and how that performance changes over time. It would also be helpful to test the spectral output periodically throughout a production run to ensure ongoing consistency. It is possible to equip a UV unit with onboard intensity sensors that indicate the potential of a problem

automatically. This type of active measurement system (as opposed to a passive, occasional measuring system) provides the most accurate, feature rich data(LM-9000).

Unlike screen-printing UV curing systems, on which lamp output can often be easily measured with a radiometer, inkjet curing systems don't lend themselves to basic pass-through radiometry. In many cases, there simply isn't room for a measurement probe to be inserted between the printhead assembly and substrate path. Additionally, most UV inkjets are designed so that the curing lamps only achieve full operating power when the printheads are activated. For these circumstances, alternative UV measurement tools are available.

For a more objective method than the finger smudge technique to measure your inkjet's curing system performance, one option is to use the adhesive-backed UV FastCheck Strips (N010-002). These unique UV intensity measurement strips react to UV exposure by changing color. Such strips can be affixed to substrates and run through the printer at various stages of lamp life, beginning when lamps are new and repeated periodically thereafter until lamp output becomes unsuitable. Note the hours of lamp use that have passed with each test strip and save them for reference. Later, when you want to test another lamp's output, you simply run a new strip through the system and compare its color with those of your original samples to determine approximately how many hours of lamp life have expired.

REPLACEMENT PARTS

A thorough maintenance program will include a replacement lamp plan. Since you will never know when a lamp will burn out, it is necessary to keep an inventory of replacement lamps. The best system is to maintain one lamp for each lamp in service. This will protect against many problems that may arise, as well as have on hand the lamps required for a scheduled change. Maintaining one lamp in reserve for every one in use may be too costly. The minimum number of lamps would then be determined by several variables. The type of lamp or its popularity will indicate whether there are a variety of replacement lamps which can be used while a very specific lamp may be available only from one source or may have to be specially made to order. A general rule that will provide good support protection and minimum inventory is one lamp for each lamp in service on the most active machine and 50% of the lamp requirements for the set of lamps in the next three machines. This quantity of lamps in inventory is substantially cheaper than the dollars lost per hour in a down production line, not to mention time lost tracking down a replacement.

High voltage will have effects on connector terminals over a period of time. When changing lamps, the terminals should be inspected and replaced on a regular basis. Each equipment manufacturer has his own design for lamp connections and some will require more frequent attention than others. Connector terminals should be replaced at the very first sign of deterioration.

The regular maintenance inspections should also include reflector evaluation. How clean are the reflectors? Dirty reflectors will cut down cure efficiency in a very dramatic way. Depending on the cooling design and airflow within the particular machine, varying amounts of foreign materials may collect on the reflectors. These materials may result from volatiles releasing from the substrate, from the ink or coating, or may even be the ink or coating itself (depending on the individual formulation). With some ink or coatings, a 10% reduction of UV energy will result in a much greater reduction of cure speeds.

A substrate which is being printed or coated may react to the heat generated by the UV lamps so that it releases small amounts of material from within itself. The result may be a very minute release that eventually deposits itself on the reflectors. The smallest amount of this deposit should be of concern, yet it would never be noticed except over a long period of time. To guard against this accumulation, cleaning of the reflectors should be done on a regular basis with a soft, lintless wipe-- such as the Webril Hand Pads (J006-030), wetted with Lamp/Reflector Cleaning Solution (A002-019). It is important to leave nothing on the lamps or reflectors which may darken with heat and reduce the transmitted energy. The reflectors themselves (U004-001) need only be changed when they are damaged or soiled beyond cleaning. This should be done when the slightest amount of interference is noticed. Use of a radiometer will also indicate when a reflector is in need of cleaning or replacement.

Another source of UV curing problems is the power supply. Power to the UV curing system must match the specific needs required of each component. Should there be any alteration in the amount of power provided to the entire system, some (or all) components may fail at their designated tasks. In order to check and monitor whether power is properly flowing throughout the system, an electrical measurement device, such as the Digital Multimeter (M015-009) should be used to measure the power throughout the UV curing system. Measurements of actual capacitance need to be taken and compared with the rated system capacitance. Detailed logs on these measurements should be maintained. Ballasts, condensers and other electrical components can malfunction at any time. As such, it is difficult to prepare for such circumstances. The availability of replacement parts should be researched if a replacement inventory is not maintained.

Other maintenance procedures should be established depending on specific types of equipment. Some equipment is air cooled and requires air filters which need to be replaced. Others are water cooled and are usually tied into a safety interlock system so that if the wafer flow is below a specific level, the entire machine will shut down. If a heat exchanger is used to conserve water, there would be several maintenance items within the system that, if not followed, could shut down an entire line. These other support areas should not be forgotten or treated as any less important than any other maintenance procedure. Water jacketed lamps require some special attention as the cleanliness of water jackets is important as well as the clarity of the water. This type of cooling system requires some additional attention which can also be monitored by a radiometer. (Note that the radiometer will only indicate reduction of energy and will not pinpoint the exact cause.) If the system has a heat exchanger, there would be a water deionizer which would have to be maintained. If not, materials in the water would collect on the interior of the quartz water jackets, reducing effective UV transmission.

One must also be aware that foreign materials can collect on the outside of the jacket. If an ink or coating contains volatiles, when it passes under the exposing area the volatiles may collect on the cooler surfaces of the water jackets. This material will build up over time and reduce the energy output.

Some equipment may have shutters that should be inspected as often as possible. These devices tend to operate many times per shift and are mechanical, increasing the opportunities for breakdown. Replacement for each of the wearing parts should be on hand at all times.

Conveyorized systems require similar maintenance attention as conventional dryers. The belt needs to track properly, must be set at the right tension, and be checked for tears, rips and frays. Repairs should be made with materials which will not be affected by UV light or by continuous exposure to ozone. This limits what can be used. Therefore, it is recommended that a belt be replaced (B002-001) rather than repaired when problems arise.

Periodically, all electrical connections, wires and water hoses should be checked. UV units tend to have extreme conditions of heat, UV light, and ozone. Each of these conditions will deteriorate the integrity of the internal components. Any replacements or repairs to these parts should be made with materials whose specifications will withstand the extremes in a UV unit environment.

CONCLUSION

In summary, the most critical component of a successful maintenance program is a preventative maintenance routine that is adhered to faithfully and includes attention to all of the variables. Measure often, keep detailed logs, and learn from your mistakes. Your diligence will pay off in the long run.

TROUBLESHOOTING

Problem

System delivers uneven cure

Finished pieces fail to cure at previously acceptable production speeds

Reflectors are pitted and/or discolored

Reflector has melted or burned

Reduced curing speed when new reflectors are installed

Lamp shuts down

Power supply overheats

Lamp will not start

Solution

- Clean reflectors and lamp.
- Check to ensure reflectors haven't warped. If they have, replace reflectors.
- Replace lamp(s).
- Ensure there is even cooling across the lamp.

- Check UV output with radiometer. Replace lamps if output has dropped to unacceptable levels.
- Inspect lamp and reflector. Clean or replace if necessary.
- Replace lamp(s).
- Check capacitors.

- Replace reflector.
- Decrease interval between cleaning cycles.
- Increase fan size/capacity.

- Replace reflector.
- Check fan(s) to ensure they are functioning.
- Remove any impediments to air flow and vent ports.
- Increase fan size/capacity.

- Verify focus length is as specified.
- Ensure protective film has been removed from reflector surface.
- Check capacitors.

- Replace lamp with one that meets power supply specifications.
- Check lamp connections for possible short.

- Remove any impediments to air flow and vent ports.
- Replace lamp with one that meets power supply specifications.

- Check incoming power.
- Check lamp connections.
- Inspect or replace fuses, wiring, and breakers
- Replace lamp(s)
- Check capacitors



DISKURE 365 RADIOMETER

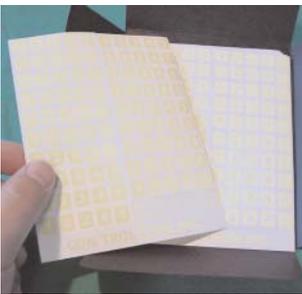
The CON-TROL-CURE® Diskure 365™ radiometer is our most economical pass-through radiometer for measuring UV radiation levels in high intensity, high energy curing environments. It is a UV dose measuring instrument small enough (5.5" / 140 mm diameter x .5" / 13mm height) for use in most UV curing ovens. A sensor on one side is exposed to the UV source and the other side contains a digital LCD which displays direct energy readings in mJ/ cm².

The aluminum housing can withstand exposure to oven temperature as well as intense vibration and shock. This durability makes the Diskure 365 ideal for measuring UV light energy in harsher environments such as photosensitive resist exposure systems, web processing equipment, print plate exposure systems and most UV curing ovens. Special filters and photodiodes absorb the visible as well as the IR portion of the light, so that measurements are made only on the required spectral region. After exposure, the radiometer's LCD shows the total UV measured in mJ/cm² to which the unit was exposed.

SPECIFICATIONS:

- Weight: 17.6 lbs (500 g)
- Spectral Range: 250-410nm
- Accuracy: +/-10%
- Measuring Range: 0-5,000mW/cm²
- Heat Resistance: 158°F / 70°C (long exposure duration)
- Calibration Requirements: Every 12 months depending on use
(average use: once a day; heavy: 3-5 times/day)

PART NUMBER	DESCRIPTION
M007-091	DISKURE 365 RADIOMETER



UV FASTCHECK STRIPS

CON-TROL-CURE®'s UV FastCheck™ Strips are simple, reliable, and easy to use indicators of accumulated UV light dosage. They are the first product that can be used to determine levels of UV dose with a simple, visual inspection due to the 5 separate color changing zones. Each of the 5 zones begin to change color after a specific amount of UV dose has been received. First the "1" zone begins turning from yellow to blue. Then each subsequent color zone starts to change colors when its specific chemistry has received the proper amount of UV to activate its color change.

The versatility of this unique UV measurement tool allows users to measure a significant range of UV doses. FastCheck Strips measure UV doses from 0mJ/cm² to greater than 5,000mJ(5J)/cm². As well, due to their paper-thin profile and thermal stability, they can be used in all applications where a radiometer is not possible, including: Web printing, Sheet Fed printing, Exposure Verification of exposed products, 3-D curing, and personal UV exposure level testing.

The FastCheck Strips' clearly identifiable color change enables users to visually differentiate the dose differences. UV FastCheck Strips can be further coupled with a handheld colorimeter to measure the dose even more precisely. As well, we have prepared a comparative dose chart for the FastCheck Strips (N010-003) so that each tested FastCheck Strip can be correlated to the millijoules of UV energy that each color pattern represents. NOTE: This chart is comprised of actual exposed FastCheck Strips.

FEATURES:

- FastCheck Strips measure the entire UV spectrum
- Accurate visual determination of UV dose made possible
- Monitor UV dose in difficult-to-access curing environments
- Detect UV lamp degradation and equipment failures
- Provide the user with periodic assurance that their UV source is performing to expectations
- Greater rate of color change provides clearer, more precise UV dose determination
- Determine the dose profile in the 3D curing chambers or across wide webs to ensure even cure
- Measure the dose of sunlight in outdoor curing applications
- Evaluate and compare multiple UV light sources

SPECIFICATIONS:

- Available in packages 200 Strips (10 sheets of 20 adhesive backed Strips per sheet)
- UV FastCheck Strips Dimensions: 1/2"H x 2-1/8"W (13mm x 54mm)

PART NUMBER	DESCRIPTION
N010-002	UV FASTCHECK STRIPS
N010-003	UV FASTCHECK CHART



NEW UV INTENSITY LABELS

This photochromic intensity indicator is a reliable, low cost, simple, in-house method of monitoring UV intensity. When exposed to UV, the yellow labels undergo a gradual color change from yellow to blue that is directly related to the energy value received.

Made from the same exclusive material as the UV FastCheck Strips, the New UV Intensity Labels have the same color changing principle as the Strips, but they have only 1 color changing square. The New UV Intensity Labels have a sensitivity range that is 5 times greater than the product they have replaced, the old UV Intensity Labels (N010-001).

The dramatic improvements over the old Intensity Labels include:

- Much greater color shift
- More stable, repeatable and consistent color change
- Not subject to increasing color changes at elevated temperatures

The adhesive backed label is placed on a sample product or substrate and processed to proper cure rate. The color deviation can easily be measured with a densitometer or by comparing the colors to test labels created to known operating standards to determine lamp failure or processing inconsistency. If used on a regular basis, they can detect equipment problems at an early enough stage to prevent lengthy shut-downs. Daily tests can easily indicate a step by step calibration for an accurate reference within each batch. The use of a Digital Tachometer can help insure repeatable results.

FEATURES:

- New UV Intensity Labels measure the entire UV spectrum
- Accurate visual determination of UV dose made possible
- Monitor UV dose in difficult-to-access curing environments
- Detect UV lamp degradation and equipment failures
- Provide the user with periodic assurance that their UV source is performing to expectations
- Greater rate of color change provides clearer, more precise UV dose determination
- Determine the dose profile in the 3D curing chambers or across wide webs to ensure even cure
- Measure the dose of sunlight in outdoor curing applications
- Evaluate and compare multiple UV light sources

SPECIFICATIONS:

- New UV Intensity Labels are available in packages of 990 labels (9 sheets of 110 labels per sheet.)
- New UV Intensity Labels Dimensions: ¾"H x 1"W (19mm x 25mm).

PART NUMBER	DESCRIPTION
N010-005	NEW UV INTENSITY LABELS



RAD CHECK UV MEASUREMENT SYSTEM

By producing a linear, numerical benchmark of UV and EB system performance, the CON-TROL-CURE® Rad Check™ UV Measurement System provides repeatable evaluation results over extended periods of use. Incorporating a UV/EB-detection dosimeter and disposable UV and EB sensitive flexible test strips, the Rad Check system does not require outside calibration to ensure consistency.

Designed for web offset, flexo, 3-D screen and other systems incorporating inaccessible UV and high energy EB curing systems, the Rad Check test strip is the only UV dosage measurement device which can be passed completely through rollers, wrapped around cylindrical objects, or measure high EB dosages. Each test strip contains a UV/EB sensitive compound which is destroyed upon exposure to a UV light or EB energy source. After exposing the test strip, the density of the remaining compound can be measured by the Rad Check Dosimeter, which produces a numerical value reflecting energy received. This numerical value can be used to compare against jobs of similar characteristics for evaluating lamp degradation and system performance. 2 models available: the 800 for high intensity systems and the 300 for low intensity systems.

TEST STRIP SPECIFICATIONS:

- Dose Levels: Test Strip 300: UV: 0-300 mJ/cm²; EB: 0-35 Mrad
Test Strip 800: UV: 0-1400 mJ/cm²; EB: TBD
- Range: 320-380nm
- Packaging: 100 strips/pack

PART NUMBER	DESCRIPTION
M007-078	RADCHECK 300 DOSIMETER
M007-081	RADCHECK 800 DOSIMETER



MICRO PUCK RADIOMETER

The CON-TROL-CURE® Micro Puck™ is a unique instrument that enables UV measurement in extremely difficult to access environments. Compact UV sensors make it possible to measure UV Dose even in most confined UV curing units. The Micro Puck system consists of two parts: a hand-held base unit with a display and a UV sensor. Simply plug the sensor into the base unit to view the measured results. The Micro Puck is available in four different measuring ranges: UV-A, UV-B, UV-C, or Full UV.

While the Micro Puck reads from only one sensor, a multi sensor compatible base unit is also available. The Micro Puck Multi, can accommodate up to 8 sensors that read from the same base unit. This system can combine sensors from different UV spectral ranges, allowing for full spectrum, 3-D UV evaluation. The sensors are available as either a rectangular or a round model. Both sensors work with both base units and are available in each of the 4 different UV measuring ranges.

SPECIFICATIONS:

- Spectral Range: UV-A, UV-B, UV-C, or Full UV
- Max. Power Input: 0 to 5,000 mW/cm²
- Display Range: 0 to 1,999 mJ/cm² (standard) or 0 to 19,990 mJ/cm² (x10 type)
- Power Source: 2 x 2,000 hrs 3.6 V Lithium Battery
- Sensor Max. Temp.: 110°C (230°F) for up to 10 seconds
- Dimensions of Reader: 5.5" x 3" x 0.4" (140 x 75 x 10mm)
- Dimensions of Sensor: Rectangular: 1.5" x 0.6" x 0.5" (40 x 15 x 12mm)
Round: Diameter 1.5" x 0.35" (40 x 9mm)
Round: (only Full UV sensor) Diameter 1.5" x 0.25" (40 x 6mm)

PART NUMBER	DESCRIPTION
M007-130	MICRO PUCK FULL UV RADIOMETER
M007-131	MICRO PUCK UV-A RADIOMETER
M007-132	MICRO PUCK UV-B RADIOMETER
M007-133	MICRO PUCK UV-C RADIOMETER
M007-135	MICRO PUCK MULTI FULL UV RADIOMETER
M007-136	MICRO PUCK MULTI UV-A RADIOMETER
M007-137	MICRO PUCK MULTI UV-B RADIOMETER
M007-138	MICRO PUCK MULTI UV-C RADIOMETER



UV-MICROLOG D AND UV-MICROLOG 6 RADIOMETER

The CON-TROL-CURE® UV-MICROLOG D™ is an extra thin (only 1/4" flat) self-contained UV data logging radiometer. This revolutionary unit is perfect for fitting into UV curing systems that bulkier models cannot. Contained in its sleek case is a sophisticated microprocessor that measures UV Intensity (mW/cm²), UV Dose (mJ/cm²), and Temperature.

The resulting measurements can be viewed 2 ways: either numerical results via the on-board display or downloaded through a USB computer link. Once the measured data is downloaded to a computer, you are then able to show a graphical representation of the UV Intensity Profile, the Peak Intensity, the Total Dose, and Temperature. Auto-Off function and special data acquisition software is included with each unit.

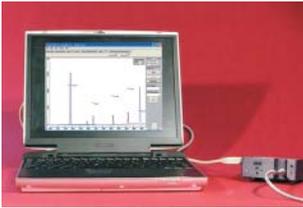
This unit is available with the LCD as shown to the left (M007-106), or without. The UV-Microlog 6™ (M007-107), the unit that is without an LCD, connects to a computer to display its readings.

SPECIFICATIONS:

- Spectral Range: UV 230 - 400 nm
- Max. Power Input: 0 to 5,000 mW/cm²
- Measuring Period: 30 sec.
- Sampling Rate: 0.005 sec (200/sec)
- Display: LCD, 2 lines x 16 digits
- Power Source: 2 x long life 3.0 V Lithium Battery
- Power Consumption: 20 µA
- Battery Service Life: 2,000 hrs
- Dimensions: 4.5" x 2.5" x 0.25" (117 x 64 x 6mm)
- Weight: 3 ounces (85 g)

While on the conveyer belt, the UV-Microlog radiometers can withstand 110°C (230°F) for up to 10 seconds. The housing temperature should not exceed 45°C (113°F).

PART NUMBER	DESCRIPTION
M007-106	UV-MICROLOG RADIOMETER D
M007-107	UV-MICROLOG RADIOMETER 6

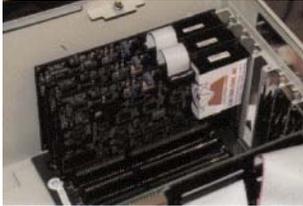


LM-9000 UV LAMP MONITOR

CON-TROL-CURE provides an entire line of solutions to determine critical information on UV Lamp conditions while the lamp is operating within the curing application. The CON-TROL-CURE® LM-9000™, the flagship of this technology, is a highly modular, computer-based, full spectrum UV data acquisition and management system providing both real-time display and data storage of UV Lamp output characteristics. Our exclusive Optical Probe and Fiber Optic sub-systems will allow permanent sensor placement inside the curing zone, reflector housing, or even directly on the lamp.

1) The LM-9000 Instrument is available in 2 forms:

- The Internal LM-9000 Instrument is a PC card (ISA or PCI Bus), mounted directly inside the PC.
 - The External LM-9000 Instrument is housed in an impact resistant case connected to the PC's USB port.
- Both units allow direct connection of the UV enhanced Fiber Optic Cable to the PC, bringing the full spectrum of UV light (200nm to 450nm, other ranges available on special order) into the system. The incoming "Light Sample" is broken up into individual wavelengths and reflected onto a CCD array containing 2000 individual sensors. Data from each sensor (and wavelength) is then displayed by the computer and maintained in an MS-SQL DataBase. Multiple lamp configurations can be created by incorporating the additional card units and adding additional instrument units to the system.



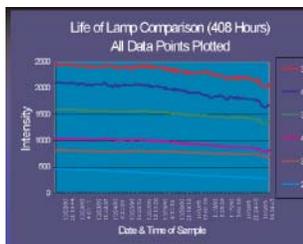
2) The LM-9000 Lamp Monitor Software is Windows compatible featuring real-time display of the wavelength intensity distribution between 200 and 450 nanometers sampled every 5 seconds, selective wavelength monitoring, and a saved baseline display. The LM-9000 captures all the performance characteristics of your UV Lamp output throughout the course of each job, not just when the operator pushes a button. The LM-9000 even saves information for later, so you can keep process and machine settings, job characteristics and system state information to help duplicate the exact conditions that job required. "Events" for selected wavelengths can be defined to alert operators of changes in lamp intensity.



3) The Basic Optical Probes are available as small as 1/4" diameter by 3/4" long, intrude only 3/8" into the curing system, and are easily installed inside the curing zone, anywhere around the lamp. Using a proprietary lens system that interface with the connecting Fiber Optic cabling, Basic Probes will withstand up to 400°C, and come in 4 levels of Optical Attenuation, designed to address very high UV light levels when used in High Energy (300+ watt) lamp systems.



4) The connecting Fiber Optic Cabling is designed for industrial applications and is specially UV enhanced to transmit all the UV energy in the 200nm - 450nm range without loss of signal. Jacketed and encased within a flexible stainless steel covering, the Fiber is designed to function at up to 300°C continuous operation and will not solarize over long term UV exposure. Cables feature easy installation on industrial processing equipment without fear of damage to the fiber. Cables are available in 2 meter, 10 meter, and in Custom lengths.



Do you need multiple lamp and multiple system monitoring capabilities? What about process control interfacing with the LM-9000 to make production line control a reality? Visible light and UV monitoring capacity is available, making control of other aspects of product creation possible.

LM-9000 SYSTEM FEATURES:

- Continuous Monitoring of Lamp Energy
- Full Spectral Range Sensitivity From 200-450nm Range
- Selective Wavelength Monitoring
- Full Capabilities At Any Intensity with No Wattage Limitations
- Automatic Calibration At Startup
- Completely Modular Component Designs
- Single or Multiple Lamp Configurations Are Available
- Simultaneous Multi-Lamp Monitoring And Event Storage Capabilities
- Choice of View Angle To the Lamp
- No Environmental Barriers To Probe Installation: Temp 400°C Max.
- Probes May Be Installed Anywhere Around The Lamp, or Anywhere Along It
- Small Probe Profile: 1/4" (6 mm) Diameter, 3/8" intrusion into curing area
- Focal Plane Positioning using the Optional Right Angle Probe
- Long Range Positioning of Central Station to Monitored Lamps
 - Up To 20 meters from Central Station (Longer Ranges Are Available)
- Selective Sampling By Hour, Minute, Day, Week or Month
- History of Lamp Performance With:
 - Full Range Data Storage
 - Maintains All Lamp Operation Information
 - Records All Lamp Operating Parameters
 - Event Data Storage By Job, Skid, Hour, Day, Operation, Operator, Machine
 - Event Recording By Critical Wavelength / Critical Energy Level



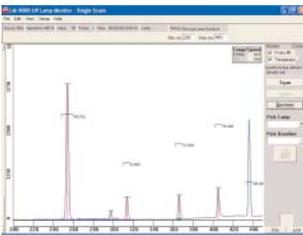
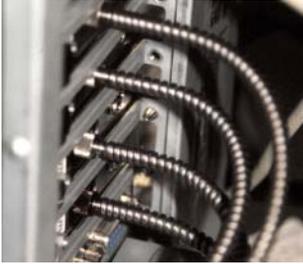


LM-9000 UV LAMP MONITOR (cont.)

- Completely Software Controlled by Windows

LM-9000 DATA COLLECTION FEATURES:

- Lamp Data:
 - Date & Time of Lamp Installation
 - Lamp Serial Number (for tracking)
 - Number of Hours On (in use) and Number of Lamp Starts
 - Peak Irradiance at Each Wavelength
 - Baseline Performance of New Lamp
- Process Data:
 - Operating Temperature, Power and Speed Settings
 - Output Energy Events
 - User Defined Data Collection
- Data Storage:
 - Lamp & Job Baselines
 - Lamp & Job Description Information
- Data Reporting Capabilities:
 - ISO-9000 Level Reporting
 - Lamp Performance Over Time
 - Process Data Reports On Demand
 - Ink/Coating, Job, Lot & Skid
 - I/O Interfacing Options for Extended Process Controls and Data Logging
- Optional Accessories
 - Computer
 - Light, Medium & Heavy - Duty Probes,
 - Probe & Fiber Optic Lengths
 - Temperature Monitoring Sensors
 - Visible Spectrum Optical Bench 200-1000nm
 - Modular System Expansion for Additional Lamps or Probes



PART NUMBER	DESCRIPTION
LM-9000	LM-9000 SYSTEM



SILVER LINE RADIOMETER

The CON-TROL-CURE® Silver Line™ Radiometers are rugged, probe-style UV measurement devices. These simple-to-operate radiometers measure UV Intensity (mW/cm²).

The Silver Line radiometers have 2 resolution settings. The "x1" setting displays UV intensities from 0 to 19.99 mW/cm², while the "x10" setting displays from 0 to 199.90 mW/cm². The rugged metal-housed sensor is capable of withstanding high temperatures and moderate shock. While exposed to the heat of UV curing lamps, the Silver Line radiometer probe can withstand 110°C (230°F) for up to 10 seconds. The temperature of the housing should not exceed 45°C (113°F). Auto Off function.

The Silver Line series offers 4 models, each measuring a different UV wavelength:

- UV-A (315 - 400nm)
- UV-B (280 - 315nm)
- UV-C (230 - 280nm)
- Full UV (230 - 410nm)

SPECIFICATIONS:

Max. Power Input:	Sensor input to 1,000 W/cm²
Display:	LCD, 4 digits
Range x1:	0 - 19.99 mW/cm²
Range x10:	0 - 199.90 mW/cm²
Power Source:	9V Battery
Dimensions (housing):	5.5"H x 2.75"W x 0.5"D (140 x 70 x 13mm)
Dimensions (sensor):	1.6"Diameter x 0.4"D (40 x 10mm) - 1m length
Weight:	200 g

PART NUMBER	DESCRIPTION
M007-150	SILVER LINE UV-A RADIOMETER
M007-151	SILVER LINE UV-B RADIOMETER
M007-152	SILVER LINE UV-C RADIOMETER
M007-153	SILVER LINE FULL UV RADIOMETER



R3 PROBE RADIOMETER

The CON-TROL-CURE® R3 Probe™ UV Radiometer is an affordable electro-optic UV measuring instrument. It is battery-operated, portable, extremely light-weight, and easy to use. It is designed to measure and display peak UV intensity in hard-to-reach curing chambers (such as narrow web presses) in order to evaluate system performance.

With the increasing use of narrow web presses and flexo printing technology, it has become necessary to create a method for measuring system performance. Degradation of UV lamps and parts can cause decreases in lamp output and create curing problems.

R3 stands for “Rapid Reach Radiometer”. The R3 Probe features an 18” extended probe allowing the operator to reach areas that might otherwise be inaccessible or dangerous to access. The probe is simple to use; just hold the unit’s base and position the sensor under the curing source. Quick readings allow the operator to measure performance of the system long before curing problems occur, without holding up the curing process.

The inside of a UV curing system can include extreme temperature variations and other harsh physical conditions. The R3 Probe is designed to withstand these conditions while protecting the operator and instruments from electrical shock or damage. The 18” rigid light guide is completely made of non-conductive ceramic material to insulate and protect the equipment and the operator from damage or accidental shock.

The tip of the R3 Probe can detect all ultraviolet, visible and infrared radiation wavelengths with its specially designed input aperture. It even detects into the UV-C spectrum down to 230nm. The sensor at the end of the arm directs the light down the arm to the base of the unit, there a UV filter passes the light of interest to the unit.

The R3 Probe is an effective method of quantifying UV output. It provides the operator with instant feedback as to the performance of his UV curing system.

FEATURES:

- A 9V battery block ensures extremely long life in excess of 100,000 readings.
- It can monitor UV intensities up to 9,990 mW/cm²
- Compact, Portable size
- Light-weight - Approx. 5 ounces
- 18” non-conductive ceramic probe
- The measurements taken can be viewed directly on the LCD display.

TECHNICAL DATA:

- Spectral range: UV 230 – 400 nm (Standard)
- Max. Power Input: 0 to 9,990 mW/cm²
- Display: LCD, 3 digits X 10
- Display range: 0 to 9,990
- Measuring range: 0 to 9,990 mW/cm²
- Power source: 9 V Block Battery
- Power consumption: 20 µA
- Battery service life: 2,000 hrs (100,000 Measurements)
- Handle dimensions: 6.25” (158 mm) x 1.6” (40 mm) x 1.3” (34 mm)
- Length of light guide: Approx. 18” (45 cm)
- Overall length: Approx. 24.25”
- Weight: Approx. 5 ounce (125 g)
- Operating temperature: 0 to 122° F / 0 to 50° Centigrade
- Base Accuracy: ± 5 %

The maximum permissible temperature for the light guide is 400° Centigrade/ 750° Fahrenheit. The temperature of the housing should not exceed 122° F / 50° Centigrade.

PART NUMBER	DESCRIPTION
M007-108	R3 PROBE UV-A RADIOMETER
M007-109	R3 PROBE FULL UV RADIOMETER



VERSAPROBE PRO RADIOMETER

The CON-TROL-CURE® VersaProbe Pro™ Radiometers are compact, high-tech, probe-style UV measurement devices. They measure UV Dose (mJ/cm²) and UV Intensity (mW/cm²).

The VersaProbe Pro can measure UV intensity and dose with the push of a button. Pressing the “Scan” button begins a 30 second cycle during which peak UV intensity and total dose are measured and recorded.

While exposed to the heat of UV curing lamps, the VersaProbe Pro’s metal-housed probe can withstand 110°C (230°F) for up to 10 seconds. The temperature of the housing should not exceed 45°C (113°F). An Auto Off function shuts down the unit after one minute of inactivity to save battery energy.

The VersaProbe Pro offers 4 models, each measuring a different UV wavelength:

- Full UV 250 - 410nm
- UV-A 315 - 400nm
- UV-B 280 - 315nm
- UV-C 230 - 280nm

SPECIFICATIONS:

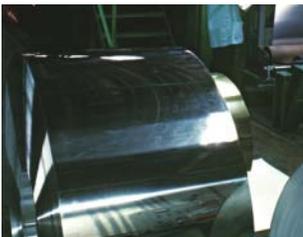
Spectral Range:	UV-A, UV-B, UV-C, Full UV
Max. Power Input:	Sensor input to 5,000 mW/cm ²
Display:	LCD, 2 x 16 digits
Display Range:	0 to 36,000 mJ/cm ²
Measuring Range:	0 to 2,000 mW/cm ²

SPECIFICATIONS (cont.):

Sampling Rate:	0.005 sec (200/sec)
Recording Cycle:	30 seconds
Base Accuracy:	±5%
Power source:	2 x 3.6V Long Life Lithium Batteries
Battery Service Life:	2,000 hours
Dimensions (housing):	5.5"H x 3"W x 0.4"D (120 x 75 x 10mm)
Dimensions (sensor):	1.6"Diameter x 0.4"D (40 x 10mm)
Length of Sensor Cable:	40" (1m)
Weight:	6 oz (150 g)

PART NUMBER	DESCRIPTION
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M007-155	VERSAPROBE PRO FULL UV RADIOMETER
M007-156	VERSAPROBE PRO UV-A RADIOMETER
M007-157	VERSAPROBE PRO UV-B RADIOMETER
M007-158	VERSAPROBE PRO UV-C RADIOMETER



UV LAMP REFLECTORS

This affordable reflector material can be cut to size and attached to your reflector housing. The highly polished aluminum sheet is 24" x 48" and 0.02" thick. The ability to install or replace your existing reflectors quickly and inexpensively ensures that your curing unit is always functioning at peak efficiency. Price breaks for multiple sheet order.

Replacement reflectors for Lighthouse Curing Systems from the same high quality material are available in Shuttered, Non-Shuttered, their accompanying end pieces, and V-Shaped Reflectors (each sold by the inch.)

PART NUMBER	DESCRIPTION
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U004-001	REPLACEMENT REFLECTOR: SHEET (24"x48"x.02")
U004-006	REPLACEMENT REFLECTOR: NONSHUTTERED
U004-007	REPLACEMENT REFLECTOR: SHUTTERED
U004-008	REPLACEMENT REFLECTOR: END PIECES SHUTTERED
U004-009	REPLACEMENT REFLECTOR: END PIECES NONSHUTTERED
U004-010	REPLACEMENT REFLECTOR: V CENTER NONSHUTTERED

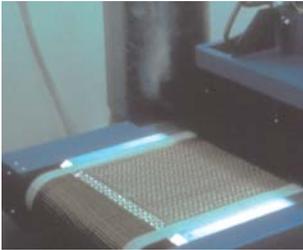


UV LAMP REFLECTORS

CON-TROL-CURE® UV Lamp Reflectors are ideal for basic UV curing. They are available in 2 elliptical shapes featuring different focal points: 1.75" and 3.5". These elliptical reflectors provide excellent focus and 86% reflectivity for efficient cure. They are especially effective for pigmented coatings. Choose the proper dimension to best suit your equipment needs. The focal point (or focus point) is measured from the center of the lamp to the curing surface.

Note: These reflectors are sold as a 1/4 portion of an ellipse (see below right image). Ordering 1 of the below part numbers will provide enough reflector material to create a 5 ft. 1/2 ellipse reflector.

PART NUMBER	DESCRIPTION
U004-002	ELLIPTICAL REFLECTOR; 1.75" FOCAL POINT; 10 FT. LENGTH
U004-003	ELLIPTICAL REFLECTOR; 3.50" FOCAL POINT; 12 FT. LENGTH



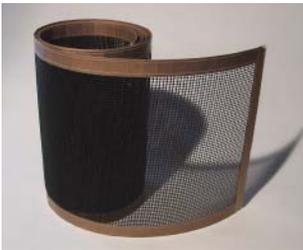
STANDARD CONVEYOR BELT

The CON-TROL-CURE® Standard Conveyor Belt can withstand UV light, ozone and solvents, and provide long life at exposure to processing temperatures from -40 to 500 degrees F. Our open mesh fiberglass belts are impregnated and coated with Teflon®. Alligator® splice and Teflon® sewn-and-sealed edge reinforcement are standard in all CON-TROL-CURE® Conveyor Belts. Alligator splicing provides better tracking for riding around pulleys and rollers, especially those with small diameters. Clipper® and Soft Seal® splicing are also available.

SPECIFICATIONS:

- Working Tension: 50 lbs/inch of width
- Pulley Diameters: As small as 1"
- Edge Reinforcement: Two rows of 1" fiberglass, sewn and sealed to prevent unraveling
- Chamber: Allowed 1"/100' or less
- Widths: Up to 72" (Wider belts available by special order)

PART NUMBER	DESCRIPTION
B002-001	STANDARD CONVEYOR BELT



HEAT DISSIPATING CONVEYOR BELT

The CON-TROL-CURE® Heat Dissipating UV Conveyor Belts are specially designed to withstand high levels of radiation emitted from a UV curing system. Special PTFE coating over the fiberglass mesh contains carbon black to dissipate heat very rapidly. Suitable for smaller UV curing systems which provide limited belt cooling time. PTFE coating also provides higher resistance to solvents, harsh detergents, acids, alkalis and corrosive chemicals. Available with Teflon® sewn-and-sealed edges, and stitched with Kevlar® threads. Custom-sized to your specifications. 1/4" open mesh. Choice of splice: Alligator®, Clipper®, or Soft Seal®.

SPECIFICATIONS:

- Working Tension: 50 lbs/inch of width
- Pulley Diameters: As small as 1"
- Edge Reinforcement: 2 rows of 1" fiberglass, sewn and sealed to prevent unraveling
- Chamber: Allowed 1"/100' or less
- Widths: Up to 72" (Wider belts- special order)

PART NUMBER	DESCRIPTION
B002-002	HEAT DISSIPATING CONVEYOR BELT



LAMP/REFLECTOR MAINTENANCE KIT

Regular maintenance is necessary to ensure your UV system continues to deliver maximum UV output. This kit includes everything required to clean UV lamps and reflectors: cleaning fluid, wiper pads, cotton gloves, and maintenance information.

Cleaning Fluid: Lamp and reflector deterioration can be accelerated by dust, dirt, and fingerprints accumulated from poor cleaning or improper handling. This solution cleans the quartz sleeve and aluminum reflector without leaving behind residue.

Lint-Free Wipes: These conveniently sized cotton Webril® 4" x 4" pads are 100% non-woven material will not contaminate cleaning fluid or scratch surfaces. 100/box.

PART NUMBER	DESCRIPTION
A012-017	LAMP/REFLECTOR MAINTENANCE KIT



LAMP/REFLECTOR CLEANER

During production, various deposits accumulate on the lamp and reflector surfaces. These deposits prevent the uniform delivery of UV light to the product. The reflector supplies as much as 70 percent of the UV that reaches the curing surface. The other 30 percent is emitted directly from the bulb itself; yet more time is spent discussing when to replace the bulb than reflector maintenance. Gauges such as hour meters and amp meters give you information about the power supplied to the lamp and how long that power has been applied, but they tell you very little about the UV energy that performs the bulk of the curing, which is reflected energy.

UV irradiators attract dust and fumes that are given off as the curing product passes through the intense UV and thermal environment. These impurities gather on the reflector, causing it to become less efficient. The UV portion of the light spectrum is much more difficult to reflect to begin with than visible light. As the reflector becomes dull, the UV wavelengths tend to be lost, even while the visible light looks as bright as ever. Generally speaking, the shorter the wavelength, the sooner its intensity drops off. If you have a means of measuring the various UV wavelengths separately, you will be aware of deterioration in the shorter wavelengths first. As the short-wave UV drops off in relation to the longer wavelengths, you will foretell the need to clean the system earlier than if you just monitor the longer wavelengths.

CON-TROL-CURE® Lamp and Reflector Cleaning Solution cleans lamps and reflectors and does not leave behind any organic residue which can reduce optimum light transmission. Also available in convenient aerosol dispenser. Formulated specifically for safe use on UV lamps.

PART NUMBER	DESCRIPTION
A002-019	LAMP/REFLECTOR CLEANER 8oz
A002-020	LAMP/REFLECTOR CLEANER 1 GAL
A002-025	LAMP/REFLECTOR CLEANER AEROSOL



WEBRIL® HAND PADS

The industry standard tool of cleaning up small ink and curing spills. These pads are safe enough to use on the most sensitive equipment. These lintless pads will not scratch even the most delicate surface. The wipes spread ink, lacquers, and wipe-on coatings with consistent uniformity. They will not streak even the finest halftones. Removes etches and acids from the plates quickly, easily, and completely. There is no detergent residue from washed rags to damage the plates. This makes them perfect for small UV material spills.

FEATURES:

- 4" x 4" pads feature Webril®, 100% cotton, nonwoven material
- Convenient and economical
- No binders or chemicals
- Will not react or contaminate developing solutions or chemicals
- Excellent wet strength, highly absorbent
- Convenient for small press and plate making operations, camera work, stripping, and cleaning
- 100/box.

PART NUMBER	DESCRIPTION
J006-030	WEBRIL HAND PADS



PRECISION MULTIMETER

The handheld Precision Multimeter features 50,000/500,000 count, benchtop accuracy, and wide bandwidth AC+DC True RMS. This unit measures 0.02% basic DC V accuracy with 1µV maximum resolution at 500,000 counts, 50,000 count (500,000 for DC V and Hz) backlit LCD display with bargraph, and filtered frequency function with adjustable trigger levels for variable speed motor drives and high voltage applications. It also has a special true RMS combination AC+DC function for measurements of rectified AC (non-symmetrical) voltage and current waveforms. Type K Temperature Probe also available -58 to 482°F (-50 to 250°C).

PART NUMBER	DESCRIPTION
M015-011	PRECISION MULTIMETER
M015-012	PRECISION MULTIMETER with NIST CERTIFICATE
M015-013	TEMPERATURE PROBE FOR PRECISION MULTIMETER



DIGITAL MULTIMETER

This digital multimeter has a large 1" LCD display that adjusts for better viewing angle. Improper test lead position alarm alerts the user if position does not match function selected. Measurement functions include AC/DC voltage and current, resistance, diode, continuity, transistor, capacitance and frequency measurements. Highest resolution, 20000 count (4-1/2 digits) display and basic DC V accuracy of 0.05%.

PART NUMBER	DESCRIPTION
M015-009	DIGITAL MULTIMETER
M015-010	DIGITAL MULTIMETER with NIST CERTIFICATE



HANDHELD ANEMOMETER

Excessive cooling can reduce the effectiveness of your curing system. Ensure proper cooling and lamp efficiency with this handheld air velocity measurement device. With a selectable LCD display indicating knots, m/second, KPH, MPH or FPM, this waterproof meter has a range of 70-7830 FPM, and 0.7-89 MPH to precisely detect air flow. 3 operating modes of current, average, and maximum air speed can be changed at any time depending on requirement.

SPECIFICATIONS:

- On-axis accuracy of +/-3%
- Digit height: 10mm (.4")
- Update timing: 1 second
- Auto shutdown: 30 seconds after last key press
- Battery: User-replaceable CR2032 coin cell; typical life of 400 hours
- Operating Temperature: Range of -15 to 50°C (5 to 122°F)
- Storage Temperature: Range of 20 to 80°C (-4 to 176°F)
- Dimensions: 4.8" x 1.7" x 0.6" (122 mm x 42 mm x 14 mm)
- Weight: 1.5 oz (43g)

PART NUMBER	DESCRIPTION
M015-001	HANDHELD ANEMOMETER



3-IN-1 THERMO-ANEMOMETER + HUMIDITY

The 3-In-1 Thermo-Anemometer + Humidity instrument conveniently measures temperature, air velocity, and humidity in one handy device. This unit features an ergonomic pocket-sized housing with large dual LCD for simultaneous temperature and air velocity or relative humidity readings. Features data hold to freeze the displayed value and records minimum/maximum readings. The 3-In-1 has a built-in low friction vane wheel that improves accuracy of air velocity in ft/min, MPH, m/s, km/h, and Knots. The built-in precision thin-film capacitance humidity sensor enables fast response while the thermistor relays ambient temperature measurements. High temperature measurements available by using Type K thermocouple (not included).

PART NUMBER	DESCRIPTION
M015-050	3-IN-1 THERMO-ANEMOMETER-HUMIDITY



HIGH-VOLTAGE INSULATION TESTER

The digital High Voltage Insulation Tester is used for insulation test voltages. This unit features high voltage warning alarm, LCD display to indicate test voltage, test duration and insulation resistance, and insulation resistance, autoranging on all ranges. It tests voltages from 500V to 10kV in 500V increments and measures insulation resistance to 500G.

PART NUMBER	DESCRIPTION
M015-028	HIGH-VOLTAGE INSULATION TESTER



MICROWAVE LEAKAGE DETECTOR

Handheld instrument reads microwave radiation through non-contact detection. With no switches to set, this easy-to-use device provides a low-cost method for measuring leaks from any microwave system. Does not require batteries.

NOTE: This unit is designed as a warning device only and is not suitable for laboratory or scientific applications.

SPECIFICATIONS:

- Range: 0-10mW/cm²; mid-scale calibrated to 5mW/cm². Detects down to 0.5mW/cm²
- Microwave frequency: 2450MHz nominal

PART NUMBER	DESCRIPTION
U011-002	MICROWAVE LEAKAGE DETECTOR



MICROWAVE REPLACEMENT PARTS

CON-TROL-CURE offers microwave replacement parts for the UV curing systems manufactured by Fusion UV Systems, Inc[®]. The extensive list of parts includes bulbs, screens, reflectors and magnetrons, together with a comprehensive selection of other microwave parts.

Spare parts are available for all models. All parts have been precisely engineered and thoroughly tested to provide a level of quality, fit and performance equal to or better than other parts currently available. For example, our magnetrons have been designed with a larger cooling surface area for longer and more consistent operation.

With its comprehensive inventory, CON-TROL-CURE has positioned itself as the UV curing industry's full stocking, alternate source of supply for replacement microwave spare parts, all designed and manufactured to meet or exceed standard specifications.



MERCURY RELAYS

CON-TROL-CURE stocks hard-to-find mercury relays designed to handle the high power needs of UV lamp switching. Excellent for use with UV curing lamp controls and panel safety switching. Contactors are hermetically sealed with high quality glass to metal seals. Easily mounted on most enclosure panels, these relays offer the dependability of mercury technology. Terminals are standard pressure connectors and leads are 5000V AC rated.

OPTIONS:

- 10A, 15A, 30A, 35A, 60A, 100A
- Normally Open or Normally Closed Terminal
- Single or 2 Pole
- 120V or 220V, 50/60 Hz Coil Voltage
- Standard or Universal mount

PART NUMBER	DESCRIPTION
A042-001	MERCURY RELAY 220V
A042-002	MERCURY RELAY 110V
A042-003	MERCURY RELAY CUSTOM
A042-004	MERCURY RELAYS 240V



CAPACITORS

By controlling voltage output of your UV curing system's power supply, capacitors are a critical component to consistent curing performance. The complete line of CON-TROL-CURE[®] Capacitors suits the specific switching requirements of most power supplies available today. If you aren't sure of your specific needs, we can help you determine which unit or combination of units would best suit your needs. We are confident that we can obtain any capacitor(s) you need. Visit our web site or call us to place your capacitor request today.

SPECIFICATIONS:

- Voltage Range: 440-3000V
- Micro Farads Range: 0.5-18.5µF
- Bushing Options: HW cup, STD cup, MW cup

PART NUMBER	DESCRIPTION
A004-XXX	CAPACITORS-- contact us for pricing based on your specifications



UV CURING SYSTEM FANS

Effective reflector, lamp housing and power supply cooling are critical to ensuring consistent cure results and equipment performance. These highly durable cooling fans can be fully integrated into any current UV lamp housing or power supply. Exceptional quality rotor motor has yielded years of exceptional performance. Offers optimum cooling and extended in-field life. Can be fully integrated with speed controllers. Locked rotor protection. Must be grounded in accordance with current regulations. ISO 9001 compliant. UL, CSA, VDE approved. Finger guards and electrical plugs must be ordered separately.

The High Performance Cooling Fan (A005-016) is ideal for larger reflectors, lamp housings and power supplies. At 230V, it provides maximum air volume for excellent cooling results. Field-tested, all-metal construction has produced years of exceptional performance. Allows full integration into any curing system and/or speed controller.

The Standard Cooling Fan (A005-007) incorporates a light, internal rotor motor and plastic impeller for quick starts at full speed. At either 220V or 240V, it is ideal for power supplies and quick starting curing systems requiring little to no warm-up period. Highly durable, low-vibration metal housing easily integrates into any curing system housing or power supply encasement.

The smaller, Mini Cooling Fan (A005-001) has the same light, internal rotor motor and plastic impeller as the Standard Cooling Fan, but in a smaller footprint. At 115V, this efficient model is a perfect replacement unit for our Portable 2" Systems (A012-025, p.143) and other systems where cooling is required, but space is a limiting factor.

PART NUMBER	DESCRIPTION
A005-001	MINI COOLING FAN
A005-007	STANDARD COOLING FAN
A005-016	HIGH PERFORMANCE COOLING FAN



WIRE FOR UV SYSTEMS

CON-TROL-CURE can supply your complete UL-approved wiring needs for building or rewiring your own UV curing system power supply. This wire can also be used to extend the power leads from the ballast to the lamp. Sold by the foot.

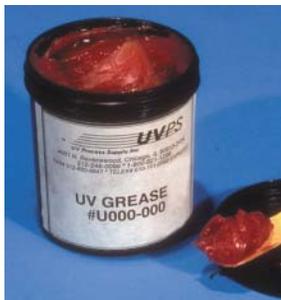
PART NUMBER	DESCRIPTION
A004-008	INSULATION WIRE
A005-003	HIGH TEMPERATURE/TEFLON COATED WIRE
A005-026	12AWG 20KV WHITE WIRE
A005-027	10AWG 25KV WHITE WIRE
A022-003	14G WIRE



FIBERGLASS SLEEVING

CON-TROL-CURE™ Braided Fiberglass Sleeving is designed to protect heat sensitive wiring from high temperature applications to 1200°F. It also provides additional insulation protection for high voltage wires. It is extremely flexible, tightly braided, non-flammable, class-C fiberglass. Available in I.D. sizes: 0.022" to 1.018". Standard Color: Natural. Additional colors available to order.

PART NUMBER	DESCRIPTION
A005-030	FIBERGLASS SLEEVING



UV GREASE

UV grease is formulated with a synthetic oil base which does not break down or set up when exposed to UV light. Useful for mechanical areas around UV lamps, such as grippers and shutters. Also contains rust and oxidation inhibitors, color compounding, and lubricity additives. Medium consistency with high temperature resistance. Sold per lb.

PART NUMBER	DESCRIPTION
U000-000	UN GREASE: 1 LB
U000-000A	UN GREASE: 8 LB