READ ALL PRECAUTIONS & INSTRUCTIONS CAREFULLY BEFORE OPERATING LAMINATOR

Setup
Instruction
Operation
Lamination
Maintenance

Compass
Hot Roll Laminator

Operation Manual

01.2009 v 3.00

IMPORTANT: Don't laminate one-of-a-kind documents unless you are sure of your laminating skills and can afford to damage or ruin the document.

Don't laminate valuable items such as stamps, baseball cards, autographs, or other collectibles because the value of such items can be destroyed by lamination. Collectors generally value these kinds of items only in their original state.

Remember that you cannot laminate thermal paper because it is activated by heat and will turn black. Also, remove paper clips and staples because they can damage the rubber rollers. Be careful about laminating anything that will be affected by heat. For example, the colors in crayon drawings may run together or be smeared, especially if the crayon layer is heavy. Light crayon drawings may not be affected, but test an expendable sample of any item that may not laminate well.

IMPORTANT: Éviter de plastifier du papier thermosensible, comme le papier de télécopieur, pusqu'll noircira sous l'effet de la chaleur, et enlever les trombones et les agrafes gul risquent d'endommager les rouleaux de caoutchouc. Prendre certaines précautions avant de plastifier des articles susceptibles de réagir à la chaleur comme les dessins au pastel dont les couleurs baver et se mélanger, surtout si la couche de pastel est épaisse. Les pastels en couche mince peuvent ne pas réagir, mais, en cas de doute, il est préférable de faire un essai avec un échantillon perdu.

Ne pas plastifier les documents importants dont il n'existe qu'un seul exemplaire, à moins de bien malitriser la technique de plastification.

Ne pas plastifier non plus les articles de collection comme les trimbres, les cartes de baseball, les autographes ou autres, qui peuvent perdre leur valeur pour les collectionneurs s'ils ne sont plus dans leur état d'origine.

IMPORTANTE: Recuerde que no puede laminar papel térmico, tal como el papel de fax tipico, ya que es activado por el calor y se tornará negro. Retire también cualquier sujeta-papeles o grapa, puesto que pueden danar los rodillos de goma. Evite laminar cosas sensibles al calor, por ejemplo, los colores de dibujos hechos en lápiz de pastel pueden no ser afectados, pero ensaye con alguna muestra descartable, en los ìtemes que podrían no laminarse bien.

No lamine ningún documento único, a no ser que esté muy seguro de sus habilidades de laminador y pueda permitirse arruinar el documento.

No lamine artículos de valor, como estampillas, tarjetas de béisbol, autógrafos, u otros coleccionables, ya que su valor puede ser destruido por la laminación. En general, las coleccionistas valoran este tipo de artículo en su estado original.

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1-1 INTRODUCTION

The Compass hot roll laminator is designed to provide quality lamination of a wide range of papers and materials up to 1/8th inch / 3.2 mm thick using film up to 10 mils thick. Common hot applications include, but are not limited to, maps, digital imaging, ink jet prints, packaging, posters, instructional aids, signs, presentation materials, photographs, copies (B&W or color), prints, flyers, promotional sheets, and many other items.

To assure the best performance from your new laminator, please follow the safety, installation, operation, and maintenance instructions in this manual. Read the manual before using the laminator, keep the manual with the machine, and periodically review the instructions. The manual also contains warranty and parts information.

Thank you for selecting the **LEDCO Compass** hot roll laminator. We are committed to your satisfaction.

As you unpack your new laminator, please complete the following information. Always have this information ready when calling.

Purchased From_____

Installation Date _____Serial # _____

WARNING: High temperatures are present, and care should be exercised in operating the laminator.

MISE EN GARDE: La machine à plastifier produit beaucoup de chaleur et on doit l'utiliser avec prudence.

ADVERTENCIA: El plastificador produce temperaturas muy altas; tenga cuidado al utilizaro.

WARNING: The laminator should not be operated without the plexiglass safety shield.

MISE EN GARDE: Ne pas utiliser la machine à plastifier sans son écran protecteur en plexiglass.

***ADVERTENCIA: No utilice el plastificado sin tener el protector de plexiglass en su lugar*.**

LEDCO, Inc.
4265 North Main Street
Hemlock, NY 14466 USA
Phone: 1 (585) 367-2392
Fax: 1 (585) 367-2978
www.ledcoinc.com

Glossary Of Symbols — Part No.

1.		Hand Crush/Force from Above	Lab35
2.		General Danger	Lab52
3.		Arm Entanglement	Lab51
4.		Cutting of Fingers or Hand/Straight Blade	Lab54
5.		Hand Entanglement/Chain Drive	Lab36
6.		International/Hot Warning	Lab100
7.		Electrical Hazard	Lab 43
8.		CE European Electrical	Lab06
9.		International Ground	Lab79

1-2 FEATURES AND BENEFITS

Your new laminator has several standard features that set it apart from other models.

- **Automatic voltage detection.** Automatically detects and adapts to power supply (100-120 v AC or 200-240 v AC)
- **Variable speed.** The laminator operates at any speed up to 15 feet / 4.5 meters per minute. Thicker hot films are generally applied better at mid-range to lower speeds, while 1.5 mil hot films should be applied at mid-range to higher speeds.
- **Precision heat control.** The programmable digital heat control prevents the laminator from operating outside the optimum temperature for your film and provides consistent heating of the laminating rollers throughout the entire temperature range.
- **Ease of cleaning.** The heated silicone rubber laminating rollers and the silicone rubber pull rollers of the laminator should be cleaned regularly. The safety shield (see below) on the laminator removes in seconds, making it easy to clean the laminating rollers.
- **Attached safety shield.** The polycarbonate shield is clear so operators can see their work and does not conduct heat so they'll be protected from hot areas. It is fixed to the feed tray, and the laminator will not operate if the safety shield is not in place.
- **Lamination pressure.** The rubber rollers are spring-loaded and preset to ensure correct and even lamination pressure.
- **Film tension controls.** Film tension is controlled at the idler roller instead of on the mandrels like most laminators. It requires virtually no adjustment and makes loading new film rolls simple.
- **Ease of maintenance.** The Compass is made to last. However, some items on a laminator do wear out. Even the high-quality silicone rubber used in the rollers will lose flexibility over time. Extensive use may wear out the rollers, or an operator may cut a roller by accident. Rollers and other key parts can be changed quickly without disassembling the frame. **Parts are available by calling the LEDCO Service Department at 1-800-937-9293 or 1 (585) 367-2392.**
- **Reverse.** The reverse switch can be invaluable to help avoid problems or clear misfeeds.
- **Right and left adjustable feed guides.**
- **Silicone rubber laminating rollers.** The rollers are flexible enough to provide a good edge seal and firm enough to offer a good surface seal. A high silicone content ensures a much longer average roller life.
- **Very strong steel cores.** These prevent roller flexing and insure uniform pressure across the width of the laminate, giving you the best quality lamination available in a medium-duty commercial machine.
- **Laminate supply gauge with low film warning system.** The information screen on the laminator displays remaining film supply and flashes a warning symbol when there is less than 10% remaining, helping to prevent out-of-film wrap-arounds.
- **Automatic Standby/Shutdown Mode:** Automatically switches to standby after 30 minutes and automatically shuts off after 60 minutes to save energy.
- **Designed, assembled, and tested in the USA.**

1-3 SPECIFICATIONS

Max laminating width	**27” / 70 cm**
Speed	**15 FPM / 5 m/min**
Laminating/pull roller diameter	**2.25”/ 5.715 cm**
Supply roll core size	**1”/ 2.54 cm**
Recommended film	**up to 10 mil, 0.25 mm**
Max laminating thickness	**1/8” / 3 mm**
Max film roll diameter	**6” / 15cm**
Dimensions	**38”L x 23”W x 16”D** **97cm L x 58cm W x 38 cm D**
Shipping dimensions	**40”L x 24”W x 17”D** **101cm L x 61cm W x 41 cm D**
Weight/shipping weight	**85 lbs / 40kg** **105 lbs / 51kg**
Motor	**1/30 HP D/C**
Electrical (single phase)	**100-120 VAC 12A** **200-240 VAC 6A** **50/60 Hz**
Electrical connector	**IEC-C14 (back panel)** **mates with IEC C-13 cord connector**
Heaters	**(2 X 750 watts) 1500 watts total**
Maximum film capacity	
with 1.5 mil	**1200 ft / 365 m**
with 3 mil	**700 ft / 214 m**

NOTE: The Compass relies on your building or facility’s electrical system circuit breaker protection. Please ensure this system is operational to avoid damage to your machine.

1-4 PRINCIPLES OF OPERATION

Hot roll laminators operate by pulling film with a thermally activated adhesive through a heated set of laminating rollers. Film from the supply rolls passes over heated rolls to activate a polyethylene adhesive layer on the film. It then passes through rubber rollers to apply pressure and bond the film to the item being laminated. The adhesive is pressed into the ink and fibers on the surface of the paper (see section 5-3).

The strength of the lamination bond can be checked by cutting a large “X” on the surface of (but not through) a laminated sample with a sharp blade. Use the tip of the blade to pry up one corner of the “X”. Grab that corner and pull up the film. Ink and/or paper fibers coming up with the layer of film indicates a good adhesive bond.

If the film comes up too easily, with no ink or paper, the lamination was probably done at too low a temperature. Check the instructions that may have come with your laminating film and/or the **lamination temperature chart in section 5-3**.

Please note that when doing an X-test on glossy (coated) paper, a good X-test will pull up ink only. The film should not come up easily. When laminating material that is not glossy (uncoated), the paper is often more fibrous and a good X-test will yield ink and paper fibers coming up with the film.

The Compass hot roll laminator is ideal for encapsulation and can accept substrates up to 1/8 inch / 3 mm thick.

Designed for sign and graphics applications, hot roll machines are used in many settings including schools, sign shops, photo-finishing labs, reprographics shops, and manufacturing plants.

Using a hot roll laminator is much easier than doing the same work by hand. Fast and versatile, it requires little instruction for you to be up and running. Film tension is controlled with slotted wheels. The laminating roller gap is preset. Hot roll laminators will apply most materials under a wide range of speeds and tension settings.

1-5 LAMINATING FILMS

Most thermal (hot) laminating film consists of two layers: a base of polyester and an adhesive layer of polyethylene. The polyester layer forms the harder, outer surface of the film and does not melt at laminating temperature. It provides rigidity and protection for your laminated items. The greater the polyester content, the higher the level of protection, rigidity and luster. The polyethylene layer melts at laminating temperature and bonds the film onto the subject material under the pressure of the laminating rollers. As an X-test demonstrates, the adhesive is pressed into the paper and fills irregularities in the surface.

The proportion of polyester and polyethylene in a film is usually described with numbers. For example, a “1-2” film consists of one mil of polyester and two mils of polyethylene. The first number refers to the base layer. The second number refers to the adhesive layer. A mil is 1/1000 of an inch.

Since polyester is the more costly of the two types of plastic generally used in laminating film, a “3-2” film will cost more than a “2-3” film. Both are 5-mil films but the “3-2” version will seem a little thicker on a piece of laminated material because it will be slightly stiffer. Thermal laminating films are available in many different base/adhesive combinations. Five mil films, for example, can be found in 1-4, 2-3, 3-2, and 4-1 combinations.

In the US laminating trade, the generally accepted practice is to describe two-sided lamination, or encapsulation, by the thickness of one layer of film. For example, “3-mil lamination” should refer to lamination with two layers of 3-mil film. If you are buying or selling laminating film or lamination services, please make sure both parties understand the film descriptions being used. There is a huge variety of thermal laminating films available to suit many different kinds of application. Here are some of the more commonly used “special” film types or film additives:

- Film with low-melt adhesives, also known as co-polymer films. These often have better clarity and are less likely to curl or ripple.
- Matte films to eliminate glare or to accept printing or writing. Many suppliers offer a variety of finishes including glossy, matte, satin (in between glossy and matte) velvet, and textured (crystal) finishes.
- Film with UV inhibitors to protect colors in the laminated material from fading in sunlight. Note: All polyester films are inherently UV-protectant.
- Thermal film that has a pressure-sensitive adhesive and a release liner on its outer side. For example, a poster with this material laminated on the back could easily be mounted without fasteners or tape by removing the release liner to expose activated adhesive.
- “Liner films” with a protective liner on the top outer surface. After a piece of material has been laminated, trimmed, packed, and shipped, the person using the material can remove the protective liner to reveal a surface perfectly free of dust, scratches, or abrasion.

- Opaque or colored films for the back side of a lamination. These can form a border for a laminated piece to add visual interest or a more finished look.
- Iridescent clear films for special visual effects.
- Permanently waterproof films for outdoor, underwater, or special applications. The most common thermal laminating films are made with water-based primers and will eventually de-laminate if continually exposed to water or weather; truly waterproof films are made with special primers.

Rolls of film may be purchased in different widths. The size of the laminator is the only limitation on the width of the film rolls you can use. Make sure the upper and lower roll widths are the same and are aligned with each other.

When installing film, always center the rolls of film on the supply roll mandrels.

Because it does not hold heat well,1.5-mil film can be the most difficult gauge of film to use. A standard 1.5-mil film will run at about 250 °F / 121°C, while a 3-mil film with the same adhesive type will run at 240 °F / 115°C. Even when applied at 250 °F/ 121°C, the 1.5-mil film will not adhere as consistently as the 3-mil film applied at 240°F / 115°C, or a 5-mil applied at 225°F / 107°C. For many applications, 5-mil film does a much better job of protecting and enhancing items.

Ten-mil film is suggested for those applications that need the most protection and rigidity. Seven-mil films are also available.

Rolls of film are sometimes spliced. Most film suppliers will mark a splice with colored tape. This way, you can see the splice as a “dash” of color on either end of the roll. If you spot a spliced roll in advance, you can put it on the top supply roll mandrel in order to see the splice coming easily and avoid putting material under the splice. Or you could put it on the bottom roll if you plan to be laminating items that will never be seen from the back side.

1-6 WARRANTY

This laminator is guaranteed against defects in material and workmanship for a period of two years from date of shipment. Defective parts will be replaced without cost within the warranty period provided the laminator has not been abused, altered, or operated contrary to instructions. LEDCO shall not be liable for any alterations or repairs except those made with its written consent.

This obligation under warranty shall not extend to the following:

- The adjustment or replacement of parts which are the normal responsibility of the owner: for example, rubber rollers, heat shoe coatings, scratched or chipped paint, loose fasteners (screws, nuts, etc.), fuses, or other items that show wear under normal use; i.e. “normal wear parts” or are user serviceable items.
- Normal operating adjustments to heat, speed, tension, etc.
- Parts that are not manufactured by **LEDCO**. If the individual manufacturer warrants these items, their warranty is, in turn, passed on to the original purchaser of the laminator. LEDCO Inc. does not incur any obligation or liability as a result of the warranties which are the sole responsibility of the appropriate individual manufacturer.

Any laminator that proves defective during the warranty period may be returned to LEDCO unless LEDCO determines that the necessary repairs can be made during a service call. Customer may be asked to assist our customer service representatives with items such as checking and/or changing fuses and visual inspection to determine whether an onsite service call will be needed. Notice of the defect should be submitted in writing or by phone to LEDCO before any steps are taken to repair or return the machine.
Phone: 1-800-937-9293 or 1(585) 937-2392 Fax: 1 (585) 367-2978 Email: info@ledcoinc.com

If the machine is returned, it must be accompanied by:

- Customer name, address, and phone number
- Written description and details regarding the malfunction
- Date of installation
- Serial number of the machine.

RETURNS MUST HAVE A RETURN AUTHORIZATION NUMBER ON THE OUTSIDE OF THE SHIPPING CONTAINER.

Send all returned equipment freight PREPAID to:
LEDCO Inc. 4265 North Main Street, Hemlock, NY 14466

If your machine needs servicing after the warranty has expired, please contact your dealer. LEDCO does offer technical support if your dealer is unable to assist.

This warranty is in lieu of all other warranties expressed or implied. This includes the warranties of Merchantability and Fitness for use and of all other obligation or liabilities of LEDCO. LEDCO neither assumes nor authorizes any other person to assume it for any other obligation or liability in connection with the sale of this laminator except as provided for above.

Further, this warranty will not apply to any machine or part thereof which has been damaged as a result of an accident or as a result of the abuse, misuse, or neglect of the machine. The warranty is also void if the laminator has been altered or repaired by any other than an authorized repair facility or dealer. If you have any questions about this warranty, contact us at:
Phone: 1-800-937-9293 or 1(585) 937-2392 Fax: 1 (585) 367-2978 Email: info@ledcoinc.com

2 UNPACKING AND INVENTORY

The Compass arrives fully assembled. Some parts such as feed trays may be packed off the machine to avoid shipping damage. Upon arrival, inspect the unit immediately and thoroughly, using the packing list that accompanies the shipment. Please follow these steps to correct any problem with your shipment. LEDCO cannot accept any responsibility for damage or loss unless you notify us within 10 days of receipt of shipment and follow these procedures:

BREAKAGE OR DAMAGE: It is imperative that any shipping damage is reported and a claim is filed with the delivering carrier immediately upon receipt of damaged shipment. The procedure for reporting damage depends on the method of shipment. Please note damage on bill of lading. If possible, take photos of the damage immediately.

FREIGHT, EXPRESS, or TRUCK DELIVERY: According to the contract terms and conditions of the carrier, the responsibility of the shipper ends at the time and place of shipment. The carrier then assumes full responsibility for the shipment.

1. Notify LEDCO **IMMEDIATELY**.
2. Hold damaged goods with container and packing for inspection by the examining agent. LEDCO will arrange the inspection.
3. **DO NOT RETURN ANY GOODS PRIOR TO AUTHORIZATION BY LEDCO.**
4. Submit a copy of the inspector's report to LEDCO. LEDCO will file the claim with the carrier and replace your machine if necessary. You will be credited for the damaged machine when the claim is processed.

SHORTAGE:

1. Check the packing list notations. The apparent shortage may have been marked as an intentional short-shipped (back-ordered) item.
2. Re-inspect the container and packing material, particularly for smaller items.
3. Make certain that unauthorized personnel prior to complete unpacking did not remove the item and inventory.
4. Call us and send immediate written notification of the shortage.

INCORRECT SHIPMENT:

1. If the material you receive does not correspond with your order, notify LEDCO immediately. Include the order and item number(s).
2. Hold item(s) until return instructions are received.

RETURNS: DO NOT RETURN DAMAGED OR INCORRECT ITEMS UNTIL YOU HAVE RECEIVED SHIPPING INSTRUCTIONS AND AN AUTHORIZATION NUMBER FROM LEDCO.

3-1 PRODUCT ILLUSTRATIONS & NAMES OF PARTS

The photo below and those on the following pages identify major components and operating controls. Refer to them as you study the installation, operating, and maintenance procedures described in this manual. The Compass control display, forward and reverse motor controls, speed and temperature controls, and mode controls are on a single integrated panel which is pictured below.

Front panel view:

Control Display

Forward Motor Control

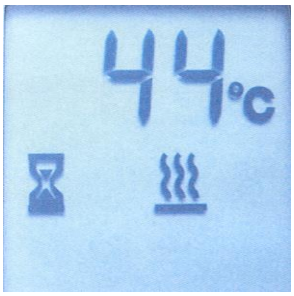
Sleep Mode

Reverse Motor Control

Speed/Temperature Up

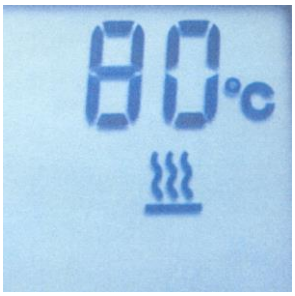
Mode Control
Current Temperature
Film Supply
Set Temperature
Set Speed

Speed/Temperature Down



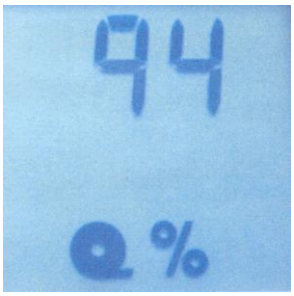
Current Temperature Screen

Reads the current temperature of the rollers. The hourglass indicates that the machine is not at machine set temperature. The rollers will not run until reaches the set temperature.



Ready/Set Temperature Screen

To set the desired temperature, push the Mode key until heat symbol appears and flashes. Then use the arrow keys to set desired temperature. Steady heat symbol indicates that the machine has reached set temperature and is ready to laminate. The rolls will now operate.



Laminate Supply Indicator Screen

Press the mode key until the film symbol appears. The screen displays percent of remaining film on the bottom roll. Film symbol will flash when film supply is under 10%. Do not allow machine to run completely out of film or wraparound condition may occur.

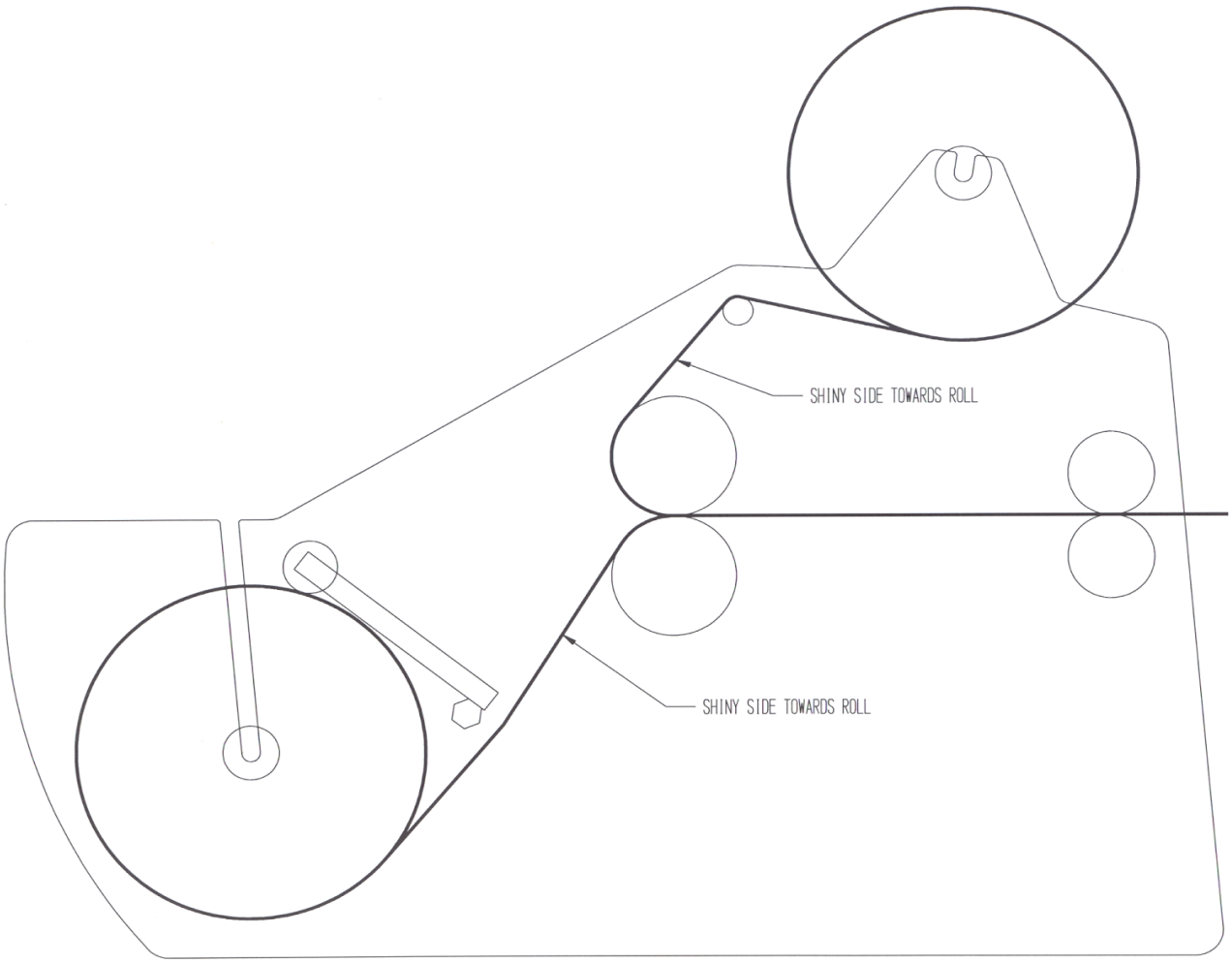
Sleep Modes On/Off Screen

Indicates the machine is off but is still connected to power. Automatically goes to standby (sleep) mode after 30 minutes and maintains 130° F (flashing). After an additional 30 minutes or by pushing sleep button , machine turns off (steady).

Motor Speed Screen

Indicates motor speed. To change speed, press mode key until motor symbol Ⓜ appears and flashes, then use arrow keys to adjust speed. Speed can be adjusted while the machine is running by pressing the up and down arrows. The indicator displays the percentage of maximum motor speed.

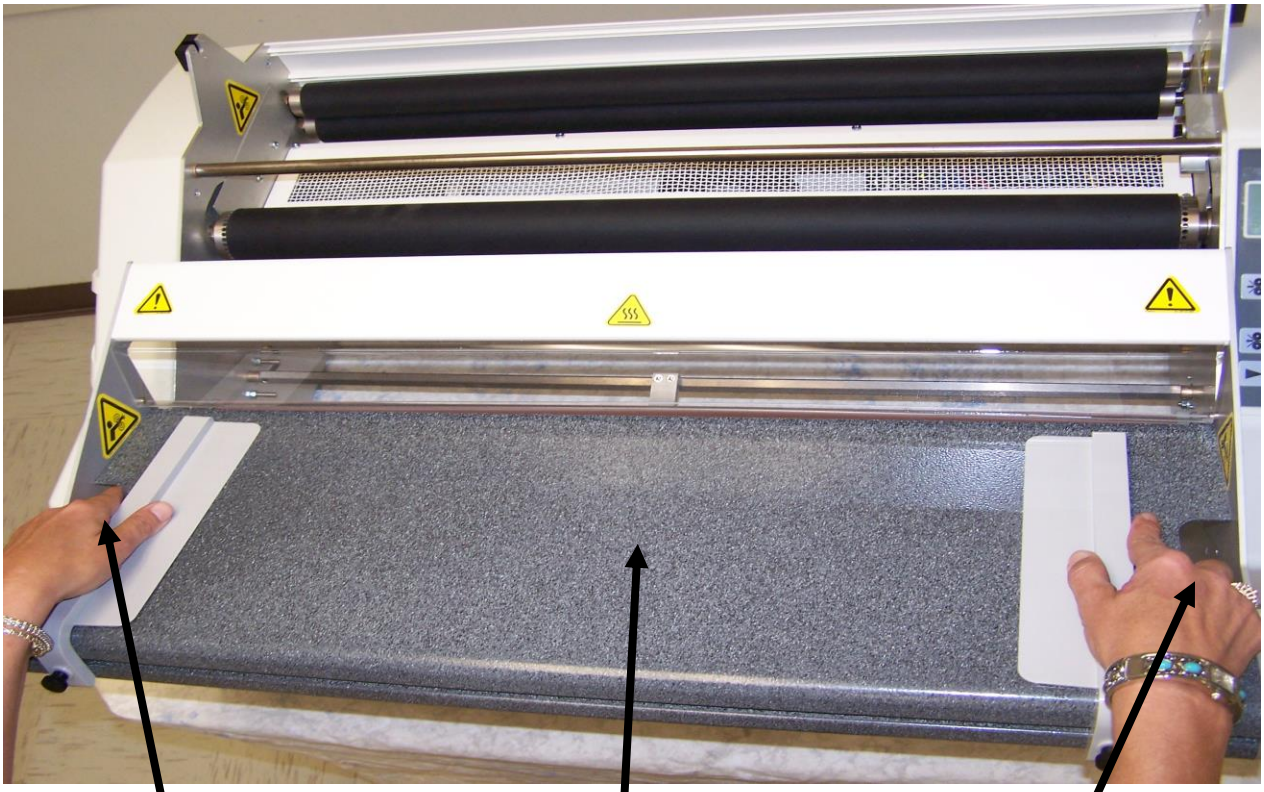
3-2 THREADING DIAGRAM



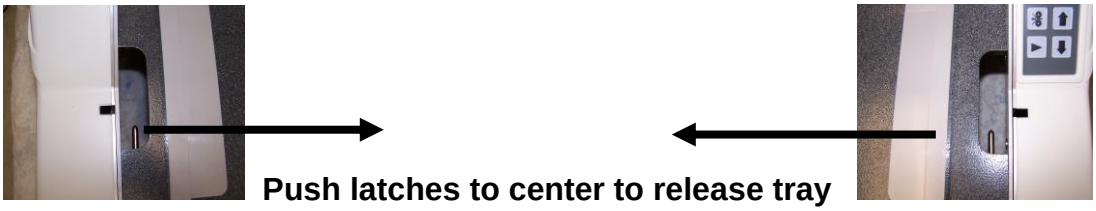
Important

Only the shiny side of the film can contact the roller. Check the film carefully each time the film is reloaded. Failure to thread the film properly will cause roller damage.

3-3 LOADING FILM



Feed table latch | **Feed table** | **Feed table latch**



Push latches to center to release tray

1. Remove feed tray by releasing latches and pulling table back and up.

2. Lift film supply sensor to a straight up position.

3. Load film onto supply rolls. Center the film, and lock it into place using the supply roll retainers.

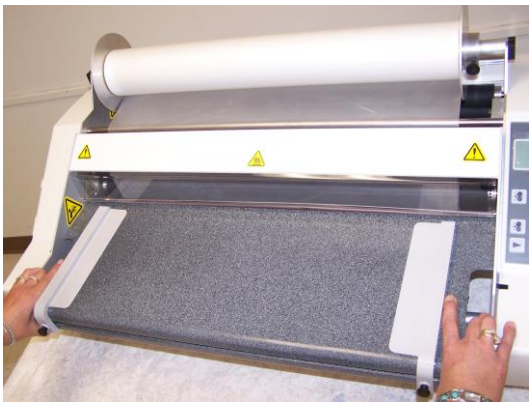
4. Place the film rolls in the slots in the side panels of the machine

CAUTION: Be sure the shiny side of the film is against the rolls or damage may occur.

5. **Rotate the film supply sensor until it touches the film roll. Pull about 18 inches of film from the bottom roll, and drape over the rollers.**

6. **Pull a length of film from the top roll. Drape it over the top idler bar and across the rollers.**

7. **Tape the two pieces of film together with cellophane or masking tape. This is just to hold the rolls of film together during the threading process.**



8. **Depress the feed table latches and reinstall the tray. Push it in firmly until the front edge is flush with the front of the machine. NOTE: If the tray is not fully engaged, you will see a small wrench on the display screen.**

9. **Set the desired laminating temperature and allow the machine to heat up. When the hourglass symbol goes out, the machine is ready to laminate. Place the feed card on the feed table and push in firmly while pressing the forward motor control button. Feed the card all the way through the machine. NOTE: After initial threading, it will be necessary to run 2-3 feet of film through the machine before the laminate smoothes out.**

4 SAFETY PRECAUTIONS

DO NOT OPERATE THIS MACHINE UNTIL YOU HAVE READ AND FULLY UNDERSTOOD THE FOLLOWING SAFETY PRECAUTIONS.

1. Never operate this machine without reminding yourself that a laminator is a powerful and potentially dangerous tool. If misused, used carelessly, or used without observing the rules of safe operation, very serious injury can result.
2. Never operate this machine without all guards, housings, safety shields, stop switches, or other safety devices in place and fully operational.
3. Never operate this machine unless you have been fully trained and have received and understood all operating instructions. Make sure you know how the machine works and how it is controlled.
4. Never operate this machine if it is not working properly or if you notice any abnormality in its performance.
5. Never tamper with, rewire, or bypass any control or safety device on this machine.
6. Always keep all parts of your body clear of the laminating rollers, pull rollers, and heated surfaces of the laminator when the power is on.
7. Remember that even after the machine has been turned off for some time, the laminator's heated parts, and adjoining parts, can remain hot enough to burn you.
8. Never attempt to clean the heated areas, laminating rollers, or pull rollers while the power is on.
9. Never remove the machine housing or attempt any kind of maintenance without disconnecting power to the unit.
10. Always be sure all persons are clear of the machine before advancing or reversing the pressure rollers, especially when multiple operators or observers are present.
11. Never wear loose clothing, ties, jewelry or any item, which could be caught in the rollers or machinery when operating the machine. Operators with long hair must put their hair up before running the machine.
12. The environment where the machine is operated must be dry, with adequate ventilation, with a minimum room temperature of 50° F and a maximum room temperature of 90°F.

NOTICE TO EMPLOYER: A copy of these safety precautions should be given to everyone who sets up, operates, maintains, or supervises use of this machine. A copy should also be hung on the machine readily accessible and visible to the operator. Additional copies are available upon request.

IMPORTANT: Where a language barrier or insufficient schooling would prevent a person from reading and understanding these safety precautions, you should either translate this information or have it read or interpreted to the person, and get assurance that it is understood.

5-1 SET-UP AND OPERATION

With the laminator on an unobstructed, level surface, perform the following:

1. Remove all packing straps, rubber bands, tape, and plastic ties from the machine. Remove the protective paper from the safety shield.

2. Plug the machine into a proper 100-120V/15 amp or 200-240V/10 amp single phase outlet.

5-2 LAMINATING

1. Turn on the power switch located on the back of the machine next to the power cord.

- Using the Mode control, scroll to the set temperature screen and set the desired temperature using the up/down arrow keys. The display will indicate the set temperature and then revert to the current temperature after 5 seconds. The laminating rolls will not start until the laminator has reached the set temperature.
- Using the Mode control, scroll to the roll speed screen and set the desired laminating speed. The screen indicates the percentage of full speed. “50” indicates that the laminator will run at 50% of its full speed of 15 ft per minute.
- Adjust the feed table guides to the desired position.
- When the laminator reaches the set temperature, the hourglass symbol will go out, and you are ready to laminate. Place your document on the feed table, press the forward motor control button, and feed your document into the machine.
- **NOTE: The feed rollers will not operate without the feed table securely snapped into place.**

WARNING: Never permit the temperature to exceed 300° F/ 150°C while film is threaded and the laminator is not running. The film could disintegrate and require cleaning and rethreading of the machine.

MISE EN GARDE: Ne jamais laisser la température dépasser 310 ° F / 154°C lorsque le film est chargéet que la machine n’est pas utilsée, car le film risque de fondre, auquel cas il faudrait nettoyer la machine et procéder à nouveau au chargement du film.

ADVERTENCIA: No permite que la temperatura exceda los 310 ° F / 154 ° C mientras el plástico está cargado y el plasatificador no está en uso. El plástico puede desintegrarse, lo que requeriria limpiar y recargar la máquina. Si es necesario laminar a temperaturas más elevadas que 310 ° F / 154°C, como cuando se lamina cartón para carteleria, hale un exceso de pelicula del rollo de abastecimiento para proveer huelgo, evitando que la película quede muy agretada contra las zapatas calefactoras. Evitará asi que el plástico se derrita el periodo de tiempo en que la pelicula no está avanzando.

2. During warm up, the actual temperature will sometimes overshoot the set temperature by more than a few degrees. When lamination is begun, the actual temperature may initially drop below the set temperature. Unless these temperature swings are extreme, there is no cause for concern.

The heat controller contains an intelligent microprocessor which gauges the heat requirements of any job being run on the laminator. The microprocessor adjusts the power to the heated rollers to keep the actual temperature steady and close to

the set temperature. This process of gauging and adjusting the heat takes a few minutes. The actual temperature will become more stable as you continue to laminate.

3. Check the idler tension per the instructions in the Adjusting Film Tension section below. Make sure the top and bottom idler rolls have about the same tension.

4. Once the machine has reached selected temperature, you are ready to laminate. Adjust the film speed as required. Once the film starts to move, watch as it passes over the hot rolls. Allow any wrinkling to clear out before inserting material to be laminated. Each time you stop the advance of film, slack will form in the web of film. It will take a few inches of film to get the slack and the resulting wrinkles past the hot rollers.

5. Examine the film as it exits the machine. If there are bubbles or wrinkles in the film, it could mean there is not enough tension to draw the film tight and smooth over the hot rolls.

6. As mentioned earlier in this operators' guide, many users tend to use too much film tension. Some film, such as 1.5-mil, requires very little tension. Here are some indicators that you might have excessive film tension:

- "Necking" (the web of film gets narrower as it goes around the heated roller).

- Excessive "waterfalling" or wrinkling anywhere on the heated roller. The film is not perfectly smooth and tight across the surfaces of both rollers. See the next section on adjusting film tension. Some minor wrinkling as the film first contacts the hot roller is normal.

Adjusting Film Tension

If the film curls up as it leaves the machine, loosen the top idler roll (turn counterclockwise) and/or tighten the bottom idler supply roll (turn clockwise).
If the film curls down after it leaves the machine, tighten the top supply idler (turn clockwise) and/or loosen the bottom supply idler (turn counter-clockwise). In making these adjustments, make sure that top and bottom idler tension are kept about equal.

"Heat wrinkles" are formed when the film has not cooled enough before coming out the back of the machine. For the best results, the film should be cooled below melt temperature while it is pulled tight and perfectly flat between the laminating rollers and the pull rollers. If it gets out the back of the machine while still at or above melt temperature, heat wrinkles can form. The major reason for fans on a laminator is to cool the film, not to cool the machine.

7. This machine is equipped with a directional button, **Forward and Reverse**. Push to the forward position to laminate or to reverse as required. To remove anything which may become lodged between the rubber laminating or pull rollers, remove the feed tray assembly and press reverse as required.

8. A unique feature of the laminator is the provision for driving both top and bottom pull rollers and laminating rollers. The laminator becomes capable of accepting thicker materials without roll slippage because the top and bottom rollers are driven. Driven rollers also minimize the curling effect in the finished lamination by providing balanced power to the laminating and pull rollers.

9. The laminator is designed to operate with the operator directly facing the control panels and feed tray assembly.

For operator safety, the upper heat roll guard, an integral component of the feed table assembly, MUST BE IN ITS DESIGNATED POSITION when the temperature of the heated rollers is in excess of normal room temperature or when the drive switch is in the forward position.

5-3 RECOMMENDED TEMPERATURE SETTINGS

Your first source of information about recommended film application temperatures and operating characteristics should be your film suppliers. If you do not know the source of your film, or if the supplier cannot provide the information, please use the following table as a guide.

FILM MELT TEMPERATURE CHART

FILM TYPE	FILM THICKNESS		
	1.5 - 1.7 mil	**3 mil**	**5-10 mil**
Monopolymer	280°-300°F 138°-149°C	280°-290°F 138°-143°C	270°-280°F 132°-138°C
Low-temp (copolymer)	250°-280°F 121°-138°C	225°-260°F 104°-127°C	225°-260°F 107°-127°C
Ultra-low temperature	230°-280°F 110°-138°C	180°-270°F 82°-132°C	180°-260°F 82°-127°C

Several important notes about this chart:

1. Your film vendor must have the primary responsibility for providing information about the film that you are using.

2. This chart is to serve as a general guide when better data is not available.

3. If your film vendor cannot provide this and other information about the film you are using, it may be difficult to achieve good results.

4. When laminating heavy posters or other thick items with 1.5- to 1.8-mil films, some additional heat may be required to get a permanent bond. Never exceed 350° F/177° C.

5. While offset printed materials may be laminated at the lower ends of the above ranges, inkjet and other output from digital printers may require the upper end of the range in order to get a good bond.

Cooling Fans:
The cooling fans are used during lamination to cool the laminate, not the machine. They start automatically when the rollers are activated

NOTE: It is possible that variances from recommended temperature settings may be necessary due to material thickness, ambient temperature, humidity, or the quality or thickness of the material being laminated.

Please note the wide range of temperatures listed, especially for heavier films. This does not mean any thick film can be run anywhere within the given range. There are “standard” (high-temperature) and “low-melt” (low-temperature) versions of all film thickness. Some low-melt films work better at lower temperatures than others. It is important you buy your film from a vendor who can tell you the following additional information about any film you choose:

- thickness
- clarity
- suggested melt-temperature range
- polyester/polyethylene content
- how well the adhesive will stick to the kinds of images you’ll be protecting and enhancing

Temperatures may exceed 310º F / 154° C when laminating poster board or other thick items with 1.5-mil film on a continuous basis; however, when the machine is stopped, turn the heat off if the setting is more than 310º F / 154° C.

Never set the heat above 320º F / 160° C with film in the laminator. Temperatures over 300º F / 149° C are not needed except with 1.5-mil film or when processing heat activated mounting materials. Film that is 3 mils or thicker is generally run at 280º F / 138° C or less.

SAFETY NOTE

This machine will not operate unless:

- **it is plugged into an appropriate power source;**
- **master power switch/breaker on lower back panel is in the "ON" position;**
- **the feed tray and the safety shield are in their proper positions.**

5-4 LAMINATING WITH THERMAL (HOT) FILM

1. If the machine is not already on and warmed up, first make sure the power cord is plugged in. Turn on the machine, and set the temperature for whatever film is being used.

2. The laminator will be ready to operate in about 20 minutes.

WARNING: Do not let the temperature exceed 320º F / 163° C while film is threaded and the laminator is not running. The film could disintegrate and require cleaning and rethreading of the machine.

3. Position the feed guides if needed for precision feeding. You will get the best results by centering items in the web of film.

4. **The film tension is preset at the factory**. Should adjustment be needed, turn the black knobs clockwise to tighten, counterclockwise to loosen.

5. The fans will come on automatically; no user intervention is required.

6. Watch the film as it passes over the heat rolls. If there is some waviness in the film at the leading edge of both top and/or bottom heat rolls, film tension is perfect. The leading edge is the top of the top heat roll and the bottom of the bottom heat roll, the edges that first contact the film. If there is no waviness in the film at all, there is too much film tension. Loosen both knobs a small amount and check again.

If the waviness or wrinkling extends into the laminating rollers, tension needs to be increased. Always keep the amount of tension the same on both top and bottom film. Waviness that extends across 10 to 30 percent of the heat rolls indicates acceptable film tension.

7. When starting the machine to begin lamination, let at least 6-8 inches of film go through the rollers before inserting the items to be laminated. This takes out slack in the film. This also removes any areas of film with excess adhesive that may have pooled just beneath the rolls.

Examine the film coming out the back of the machine. If bubbles or wrinkles appear in the film, this means there is not enough tension to draw the film tight and smooth over the heated rollers. Turn the tension control knobs clockwise to increase the tension.

If the film is stretching and gets narrower as it goes across the heated rollers, idler tension is much too high. The temperature setting may also be too high for that film.

Film that is 1.5 mils thick requires very little tension.

REMEMBER TO TURN BOTH THE TOP AND BOTTOM TENSION CONTROL KNOBS THE SAME AMOUNT TO KEEP TENSION THE SAME ON TOP AND BOTTOM ROLLS.

If the film curls up or down after it leaves the machine, review the section on film tension, and readjust the film tension on the top and bottom film.

If the tension appears balanced but you notice waves or ripples toward the center of the web of film as it comes out the back, the temperature may be too high or the lamination speed may be too fast for that film. These waves in the film are called “heat wrinkles”. Heat wrinkles are formed when the film has not cooled enough before coming out the back of the machine. For the best results, film should be cooled below melt temperature while it is pulled tight and perfectly flat between the laminating rollers and the pull rollers. If the film exits the back of the machine while still at or above melt temperature, heat wrinkles can form. The major reason for fans on a laminator is to cool the film, not to cool the machine.

8. The laminator is designed to operate with the operator directly facing the control panels and feed tray assembly.

5-5 PREVENTING AND SOLVING PROBLEMS WHEN USING HOT LAMINATES

Please read this section before you have a problem.

PROBLEM: Wrinkling of the material as it goes into the laminating rollers. This problem usually occurs when laminating an item that has been folded, rolled, bent or wrinkled.

SOLUTION: Make sure the leading edge of the item being laminated is lying flat and is inserted parallel to the laminating rollers.

It is sometimes essential to smooth out an item as it passes over the feed table and through the rollers to ensure an even lamination without wrinkles. Smooth from the center of the item, back toward the trailing edges. Once the item starts to feed, you may also pull back and to the sides on the corners of the trailing edge.

If material has been rolled up, take the curl out of it on a table edge before laminating. If some curl remains, it may be helpful to insert the item with the curl down so the leading edge is pressed against the feed tray until just before the nip.

PROBLEM: Wrinkling of the film around the material being laminated.

SOLUTION: This is normal and inevitable on any laminator, especially with thicker material. These wrinkles will be trimmed away with the scrap, so they do not affect appearance. Because the rollers are being held apart by the paper or cardboard, they cannot pull equally on the plastic around the paper. This creates wrinkles that tend to look like the bow waves of a boat, radiating out through the clear part of the web from the sheet of material.

PROBLEM: When two pieces of material are laminated side by side, the plastic adheres to one piece but not the other.

SOLUTION: To get maximum efficiency from the film rolls, you can feed several items into the laminator side by side. However, wrinkling can occur if these items are of unequal thickness, because the laminating rollers are lifted off the thinner items by the thicker items. When laminating items side by side, it is important to arrange them so that the thickness is the same.

PROBLEM: Wrinkling of the plastic on a laminated piece of material.

SOLUTION: Make sure you have enough film tension to take the wrinkles out of the film before it gets past the heat rolls (see film tension, sections 5-2 and 5-4). Make sure the film is threaded properly (see threading the laminator, section 3-2).

PROBLEM: Film gets wrapped around the pull rollers.

SOLUTION: While threading cold film, the loose ends of the unlaminated web are particularly susceptible to “wrap-around.” To minimize this, always tape the top and bottom films together in a couple of places to keep them attached to each other while passing through the rollers. Pull the threading card after it emerges from the

pull rollers until the film clears the back of the machine. Use caution when first starting to laminate, being careful that the thin, unlaminated web does not get caught in pull rollers or laminating rollers.

If “wrap-around” does occur while the laminator is cold, you can easily correct it by reversing the direction of the rubber rolls, permitting the laminator to release the film from the rolls.

PROBLEM: Film gets wrapped around the laminating rollers while the machine is hot.

SOLUTION: Leave the heat on so that the adhesive does not harden, and take the following steps.

> **WARNING: Be very careful not to touch the heated rollers when the machine is hot.**
>
> ***MISE EN GARDE: Neb pas toucher les sabots chauffants lorsque la machine est chaude.***
>
> ***ADVERTENCIA: No toque las zapatas calefactoras cuando la máquina está caliente.***

1. Remove the feed tray.
2. Cut the film on the top and bottom, just in front of the heated rollers.
3. Loosen the film from the rollers and grip the two loose ends, holding them together.
4. Depress the reverse drive momentary button. Allow the laminator to back out the film that is wrapped around the rolls. Pull the film off the roller.

WARNING: Keeping the machine in reverse may cause a reverse wrap-around if the film is not getting pulled off the roller. You may need to pull on the film with a lot of force while stopping and starting the drive.

MISE EN GARDE: Si l’on appuie trop longtemps sur l’interrupteur de marche arriére, le film risque de s’enrouler dans l’autre sens. Appuyer par á-coups sur l’interrupteur et vérifier le résultat chaque fois.

ADVERTENCIA: Apretar mucho tiempo el interruptor de marcha atrás puede causar bobinado inverso. Apriételo brevemente, luego suéltelo y observe el resultado. Apriételo nuevamente si se requiere más marcha atrás. Pare si nota que el plástico hala hacia atrás, volviendo sobre los rodillos.

WARNING: Do not try to cut the plastic off the roller with a knife or other sharp instrument. You will end up cutting the rubber rollers and turn an inconvenience into a major repair bill not covered by warranty.

MISE EN GARDE: Ne jamais tenter de dégager un film enroulé en le coupant avec une lame tranchante. Vous entaillerez le caoutchouc des rouleaux, ce qui occasionnera des frais majeurs de reparation qui ne sont pas couverts par la garantie.

ADVERTENCIA: No intente separar el plástico del rodillo cortando con un cuchillo u otro instrumento filoso. Terminará cortando los rodillos de goma y convertirá una incomodidad en una cuenta de reparaciones mayor, que no esta cubierta por la garantia.

If this method does not work, let the machine fully cool. Remove. Carefully cut the wrap-around off the roller with a small pair of scissors, working the point and the cutting edges away from the rubber to avoid damaging the roller. Then clean the rollers, following the instructions in section 6-2.

PROBLEM: Not noticing that the rolls of film are almost used up (one roll of film always runs out before the other.)

WARNING: If the film is run through the laminator without being matched to an opposing film, the adhesive exposed to the rubber rollers will stick to the laminating rollers and create a severe wraparound. This type of wraparound is difficult to clear because the film adheres to the roller and to itself for the entire length of the accumulated film on the roller. It's best to clear this right away, before the adhesive hardens. Follow the steps above to clear.

MISE EN GARDE: S'il n'y a qu'un film dans la machine, le coté adhésif, qui se trouvera contre le rouleau de plastification, y adhérera, ce qui provoquera un enroulement "monstre: trés difficile à défaire puisque le film adhère d'abord au rouleau, puis à lui-meme a mesure qu'il s'enroule. Il faut agir rapidement avant que la colle durcisse. Procéder de la facon indiquée ci-dessus pour régler le problème.

ADVERTENCIA: Si el plástico de uno de los rollos de abastecimiento pasa por el plastificador sin ser igualado por una pelicula de plastico del rollo opuesto, el adhesivo expuesto a los rodillos de goma adherirá a los rodillos de laminación y causará un bucle monumental. Este tipo de bucle es muy dificil de deshacer porque el plastico adhiere tanto al rodillo como a sì mismo, a lo largo de toda la longituh de la película de plastico acumulada sobre el rodillo. Es mejor deshacerlo inmediatamente, antes de que endurezca el adhesivo. Siga los pasos indicados más arriba para lograrlo.

SOLUTION: To avoid this problem, stop the laminator before either roll runs out, cut the webs of film, remove the two near-empty rolls of film, and thread new rolls. When putting film on a laminator, always use two rolls of matched length and width. Experienced users may leave the pieces of film remaining over the rollers to help thread the new film. When the machine is warm, the ends of the new rolls can be easily tacked to the already threaded pieces because the adhesive layer facing outwards will be sticky. Be careful not to burn yourself on the heat rollers.

PROBLEM: Film is not properly adhered or starts to come off sometime after lamination.

SOLUTION: Check the media and ink combination bond compatibility (perform "X" test as described in section 1-4). Unless there is something wrong with the film, if the ink and paper combination is not receptive to heat lamination, this problem comes from film being run at too low a temperature. Check the heat setting on the

laminator. (See recommended temperature settings, section 5-3). If the film is not sticking to the item, it is likely that more heat is required.

If you are using 1.5-mil film, which has a very thin adhesive layer, be sure to consult your film supplier's suggested temperature settings. Thinner films (like a 1.5-mil or 1.7-mil) generally require around 280° F to adequately get that thin layer of adhesive to "kick over" and adhere properly.

If you are running thicker films, you may have a problem if you try to go too fast. In this case, the thicker film may not have enough time on the heat rollers to reach its adhesive melt temperature. Thicker films may be run at low speeds with no problem.

When laminating posters or other thicker material with 1.5-mil film, the paper itself can absorb enough of the heat from the film to drop the adhesive below its melt temperature. The film may start to come off immediately or it may start to fall off after a few days. The solution here is to run the work at a higher temperature. About 280° to 290°F (160-171°C) will usually do the job.

PROBLEM: A laminated item comes out with a large "oily" spot on or near the leading edge.

SOLUTION: It's excess adhesive, not oil, that causes this effect. When a machine is left heated but idle for a few minutes or longer, the adhesive from the film over the heat rollers can form droplets if material is put in immediately. This excess adhesive saturates an area of paper, creating what looks like an oily spot. The solution, as mentioned above, is just to let a few inches of film go through before feeding in your work.

Anytime you are laminating unfamiliar or costly items, it is a good idea to start with an expendable sample or test piece. Laminating a test piece first gives you an indication of the results you'll get and also takes care of any pooled adhesive.

PROBLEM: The laminated material seems to have a pitted or irregular surface that does not match the texture of the paper being coated.

SOLUTION: This is usually caused by adhesive build-up or dirt on the rubber rollers but may be caused by any matter stuck to the rollers, such as a piece of paper. Inspect the rubber rollers; if they need cleaning, refer to section 6-2.

Cuts or other damage to the rubber rollers, especially the laminating rollers, can also cause irregularities in the surface of the film. If the rolls have excessive cuts or damage, they should be replaced. Replacement rolls (and all other components) are available from **LEDCO (Phone 1-800-937-9293 or 1 (585) 367-2392).**

PROBLEM: The film shrinks as it passes over the heated rollers (known as "necking" in the laminating trade).

SOLUTION: Reduce the heat and/or the film tension. The film is not shrinking so much as it is being stretched by excess heat and tension, causing the web to get narrower as it is pulled over the heat rollers.

PROBLEM: **No power is getting to the laminator.**

SOLUTION: Make sure there is power at the electrical outlet being used, and make sure both ends of the power cord are firmly engaged. There are fuses inside the laminator, but dead outlets and loose power cord connections are the most common causes of this problem.

PROBLEM: Wavy or rippled sections in the laminate, especially toward the center of the web.

SOLUTION: These "heat wrinkles" are caused by excess temperature and/or speed for the film being used. Slightly speed up the motor and/or use a lower temperature appropriate for that particular film.

PROBLEM: General haziness or cloudiness in the film after lamination.

SOLUTION: Increase the temperature. Cloudiness is a function of incomplete adhesion. On a variable speed machine loaded with thicker film, it may be that the film is being run too fast and is not getting enough time on the heat rollers.

PROBLEM: Bubbles in the center of the web and/or film not sticking to the center of an item.

SOLUTION: This problem can be caused by excessive laminating roll pressure. Putting too much pressure on the laminating rollers actually decreases pressure in the center of the web.

The other likely cause of this symptom is worn rollers. For example, if hundreds of thousands of 18-inch / 46cm wide sheets are laminated on a 27-inch machine, the center of the rollers can get worn down more than the ends of the rollers. In this situation, the laminating rollers should be replaced.

For problems not listed here, contact your LEDCO dealer. If the dealer doesn't know the answer, please ask the dealer to contact LEDCO and get back to you.

To reduce waiting time, we recommend contacting your LEDCO dealer first, but you are also welcome to contact us directly with any problem at **1-800-937-9293 or 1 (585) 367-2392.**

6-1 CLEANING & MAINTENANCE

<u>DANGER:</u> Always use extreme caution when performing maintenance on your machine! Always make sure the machine is unplugged and there is NO power to the machine when working on or cleaning any part of the unit.

Use extreme caution to avoid hot surfaces, which may remain hot for a period of time even if there is no power to your machine.

Use extreme caution to avoid pinch points at the nip of rubber rollers.

NEVER have rubber rollers turning while performing maintenance to your machine.

NEVER wear loose clothing, ties, or jewelry (which may become entangled in gears or rubber rollers) while performing maintenance on your machine.

<u>MISE EN GARDE:</u> La prudence est de mise lorsque l'on effectue l'entretien de cette machine.

S'assurer que le cordon d'alimentation est débranché et que la machine est mise hors tension avant de toucher à des pièces internes.

Prendre garde aux surfaces chaudes. Ces surfaces demeurent chaudes longtemps après que le courant a été coupé.

Tenir les doigts et les objets loin des roulequx de caoutchouc. Ne jamais faire tourner les rouleaux pendant l'entretien de la machine.

Ne jamais porter de vetements amples, de cravate ou de bijoux, etc. (ces articles peuvent etra happés par les engrenages ou les roulequx de caoutchouc).

<u>ADVERTENCIA:</u> Sea extremadamente cuidadoso siempre que realice tareas de mantenimiento en su maquina.

Asegúrese siempre que la máquina está desenchufada y que no hay NINGUNA energia aplicada a la misma mientras esté trabajando con partes internas de la máquina.

Sea extremadamente cuidadoso en evitar superificies calientes, que pueden permanecer calientes durante cierto tiempo, aún después de estar cortada la corriente.

Tenga sumo cuidado en evitar puntos de constricción en las pasadas de los rodillos de goma. Nunca tenga los rodillos de goma en movimiento mientras realiza trabajos de mantenimiento en su máquina.

Nunca vista ropa suelta, corbata o joyas (que peuden ser atrapadas por engrenajes o rodillos de goma) mientras está realizando trabajos de mantenimiento en la máquina.

6-2 CLEANING THE RUBBER ROLLERS

Both the laminating rollers and the pull rollers need regular cleaning. Collectively, these are referred to as the rubber rollers.

To clean the laminating rollers:

1. Remove the film from the laminator and allow the machine to cool to room temperature.

2. Turn off the master power switch and unplug the machine.

3. Remove the feed table.

4. Clean the rubber rollers with a mildly abrasive cleaning pad such as a white Scotch Brite™ pad which may be purchased in the household section of your grocery store (the green pads are too abrasive). Use **Cool Clean** to clean the rollers (available through your LEDCO dealer). Rub firmly, but do not scrub the rollers vigorously as this might mar the surface. Do not use sharp metal objects or steel wool as these will also mar the rollers.

WARNING: Never clean the rollers while they are turning. While turning, the rollers may catch your fingers and cause injury, or they may catch your cleaning materials and damage the laminator. Unplug the power cord while cleaning the rollers or performing other maintenance on the machine. Turn the rollers by hand.

MISE EN GARDE: Ne jamais nettoyer les rouleaux pendant qu'ils tournent afin d'éviter de se blesser et d'empecher que le produit de nettoyage n'endommage l'intérieur de la machine. Débrancher le cordon d'alimentation avant le nettoyage ou tout autre travail d'entretien. Nettoyer d'abord la partie apparente des rouleaux, puis, a` l'aide de la commande de marche arriére, les faire tourner de facon à pouvoir en nettoyer toute la surface.

AVERTENCIA: Nunca limpie los rodillos de goma mientras estén girando. Al estar girando, los rodillos pueden atrapar sus dedos y lastimarlos, o pueden atrapar sus artículos para limpieza y danar el plastificador. Desenchufe el cordón eléctrico mientras está limpiando los rodillos, o realizando otras tareas de mantenimiento en la máquina. Gire los rodillos por mano.

6-3 LUBRICATION

Drive Chain The drive chain and sprockets on all models should receive a light coat of gear lube or heavy grease, preferably lithium grease, after each 1,000 hours of operation.