

READ ALL PRECAUTIONS & INSTRUCTIONS
CAREFULLY BEFORE OPERATING LAMINATOR

Setup
Instruction
Operation
Lamination
Maintenance

ECONOCRAFT

44/60

**Pressure sensitive roll applicator,
cold laminator, mounter**

OPERATION MANUAL
W/inhibit Oct 2006

ECONOCRAFT

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1-1 SAFETY PRECAUTIONS

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

***If the equipment described in this manual is used in a manner not specified by the manufacturer, the protection provided by the equipments safety devices may be impaired**

- 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 and clothing clear of the rollers when the power is on.**
- 7. Never attempt to clean the laminating rollers when the power is on.**
- 8. Never remove the machine housing or attempt any kind of maintenance without disconnecting power to the unit.**
- 9. 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.**
- 10. 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.**
- 11. Always keep your hands clear of any slitter mechanism or blade except when the power is off and you intend to adjust the mechanism or change a blade.**

NOTICE TO EMPLOYER: A copy of these safety precautions must be given to all operators, set-up personnel, maintenance people, and supervisors 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.

1-2 UNPACKING AND INVENTORY

The laminator arrives fully assembled, except that 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 Inc. cannot accept any responsibility for damage or loss unless you notify us within ten 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.

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.

DO NOT RETURN ANY GOODS TO LEDCO PRIOR TO INSPECTION AND AUTHORIZATION BY LEDCO.

3. Submit a copy of the inspector's report to Ledco. Ledco will file the claim with the carrier. Ledco will replace your machinery if necessary. You will be credited for the damaged machinery 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 the item was not removed by unauthorized personnel prior to complete unpacking 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 number and item(s).
2. Hold items 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.

2-1 INTRODUCTION

The ECONOCRAFT is designed to provide quality lamination of a wide range of papers and materials up to ½ inch thick. Common applications include:

- transfer tape applications
- digital imaging
- vinyl application to sign blanks
- mounting and overlaminating
- one sided over lamination

Options include slitter attachment, bottom supply roll, and roll feed assembly kit.

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.

We take this opportunity to thank you for selecting the ECONOCRAFT laminator and to assure you of our commitment to your satisfaction with our products.

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

Dealer Where Purchased _____

Installation Date _____ Serial # _____
(located on outer rear right housing by power cord)

WARNING: The laminator should not be operated without the Plexiglas 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
Fax 585-367-2978 • Phone 585-367-2392
Web: ledcoinc.com E-mail: ledco@ledcoinc.com

2-2 WARRANTY

This laminator is guaranteed against defects in material and workmanship for a period of two years after 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 Inc. 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, scratched or chipped paint, loose fasteners (screws, nuts, etc.), or other items that show wear under normal use; i.e. "normal wear parts."
- Normal operating adjustments to speed, tension, etc.
- Parts that are not manufactured by Ledco Inc. If these items are warranted by the individual manufacturer, 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 which proves defective during the warranty period may be returned to Ledco Inc. unless it is decided that the necessary repairs can be made during a service call. 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. tel: 585-367-2392 • fax: 585-367-2978

If the machine is returned, the following should accompany it:

- Customer name, address and phone number
- Written particulars regarding the malfunction
- Date of Installation
- Serial number of the machine.
- **All 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 Inc. does offer technical support if your dealer is unable to assist.

This warranty is expressly in lieu of all other warranties expressed or implied, including the warranties of Merchantability and Fitness For Use and of all other obligation or liabilities of Ledco Inc., and said company 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 Ledco. Phone: 585-367-2392 Fax: 585-367-2978

2-3 PRINCIPLES OF OPERATION

The Econocraft pressure-sensitive roll applicator automates the application of transfer tape and other pressure-sensitive adhesive (PSA) tapes or films. The Econocraft conveniently and easily applies transfer tape to weeded vinyl, transfer-taped vinyl to sign blanks, and will apply clear PSA overlaminates to finished signs or promotional materials. Econocraft applicators are ideal for mounting applications and can accept substrates up to ½ inch thick.

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

Jobs such as applying vinyl to sign blanks or putting transfer tape on vinyl signage are very labor intensive. As the material gets wider and longer, the labor costs become disproportionately high. Bubbles and wrinkles are introduced and waste increases. Some jobs require the additional time and mess of liquid application.

When signage is ruined during the taping or application process, the cost of re-cutting, re-weeding and reapplying will usually take all the profit out of a job. Whether it is transfer tape, vinyl, sandblast or acid resist tape, pre-masks, adhesive film, clear polyester, or other pressure-sensitive material, an Econocraft applicator will put it down effortlessly with no bubbles or wrinkles.

Using an Econocraft is much easier than doing the same work by hand. Fast and versatile, it requires little instruction for you to be up and running. Supply roll tension is controlled with knobs. Econocraft applicators are forgiving. They will apply most materials under a wide range of speeds and pressure or tension settings.

The Econocraft is a heavy-duty commercial laminator designed for the most rigorous and demanding jobs and workloads.

2-4 FEATURES & BENEFITS

Your new machine has many standard features and accompanying benefits that set it apart from other laminators:

- **A scrap rewind** with an adjustable clutch takes up the release liner found on many pressure-sensitive films.
- **Roller bearings** with alloy construction and high quality motors insure a long and trouble-free life for these machines.
- **The laminating roller opening** is adjustable in seconds and allows operators to work with different thickness materials.
- **A variable speed motor control** allows operators to apply different materials to different substrates.
- **The feed tray** is non-ferrous, so magnetic materials may be applied.
- **The supply roll tension knobs** are important because without some supply roll tension, most films and tapes will wrinkle during application.
- **A reverse drive switch** makes it simple to back material out of the laminating rollers or correct material wraparound.
- **A foot pedal** is now a standard feature that frees hands to align and feed work.
- **A stand** is included with removable castors.
- **A safety shield** with electronic interlock prevents operation of the machine if the guard and the feed tray are not in place, protecting operators and other employees.
- **Two emergency stop buttons** with one on each side of the machine will automatically stop the machine when the operator pushes them in.
- **Manufactured in the USA** means quality, better service and faster parts availability.

2-5 OPTIONS

- **Prefeed Slitter attachment** cuts material on the supply roll for application to narrower substrates, for multiple-up production or for striping.
- **Bottom supply roll feed assembly** can be used when applying film or tape to a long piece of material such as weeded vinyl signage. Tape the material to be covered to a 3-inch supply roll core. Roll the material onto the core so that it is not telescoped. The edges of the material at both ends of the rolls should be even.

Put that core with the material to be laminated on the bottom roll feed mandrel and line it up with the tape or film on the top supply roll mandrel. Once the two webs (widths) of material are squared and aligned to each other, they will stay aligned for the entire run.

The bottom roll feed mandrel is also useful when applying tape or film wider than the materials being covered. In this case, put a roll of “sacrifice” paper (such as wrapping paper) on the bottom roll feed mandrel. The roll of “release paper” should be wider than the tape or film. This width allows the tape or film on either side of the material being laminated to stick to the paper. The “release paper” serves to keep adhesive off the bottom laminating roller, prevent wraparounds on the bottom laminating roll, and to keep adhesive from sticking to the exit table, which would ruin the job as material jams against the stoppage. The signage or other material can then be trimmed out of the sandwich formed by the tape or film and the release paper.

In other jobs where the tape or film is not wider than the material being covered, it is advisable to overlap pieces or put scrap paper between pieces to serve as “release paper” for the reasons listed above. Scrap paper can also be used at the beginning and end of a job for the same purpose.

- **Roll Feed** The roll feed option allows you to feed a roll of substrate through the laminator when using the lower supply roll for either release paper or another laminate. This option attaches directly to the feed table.

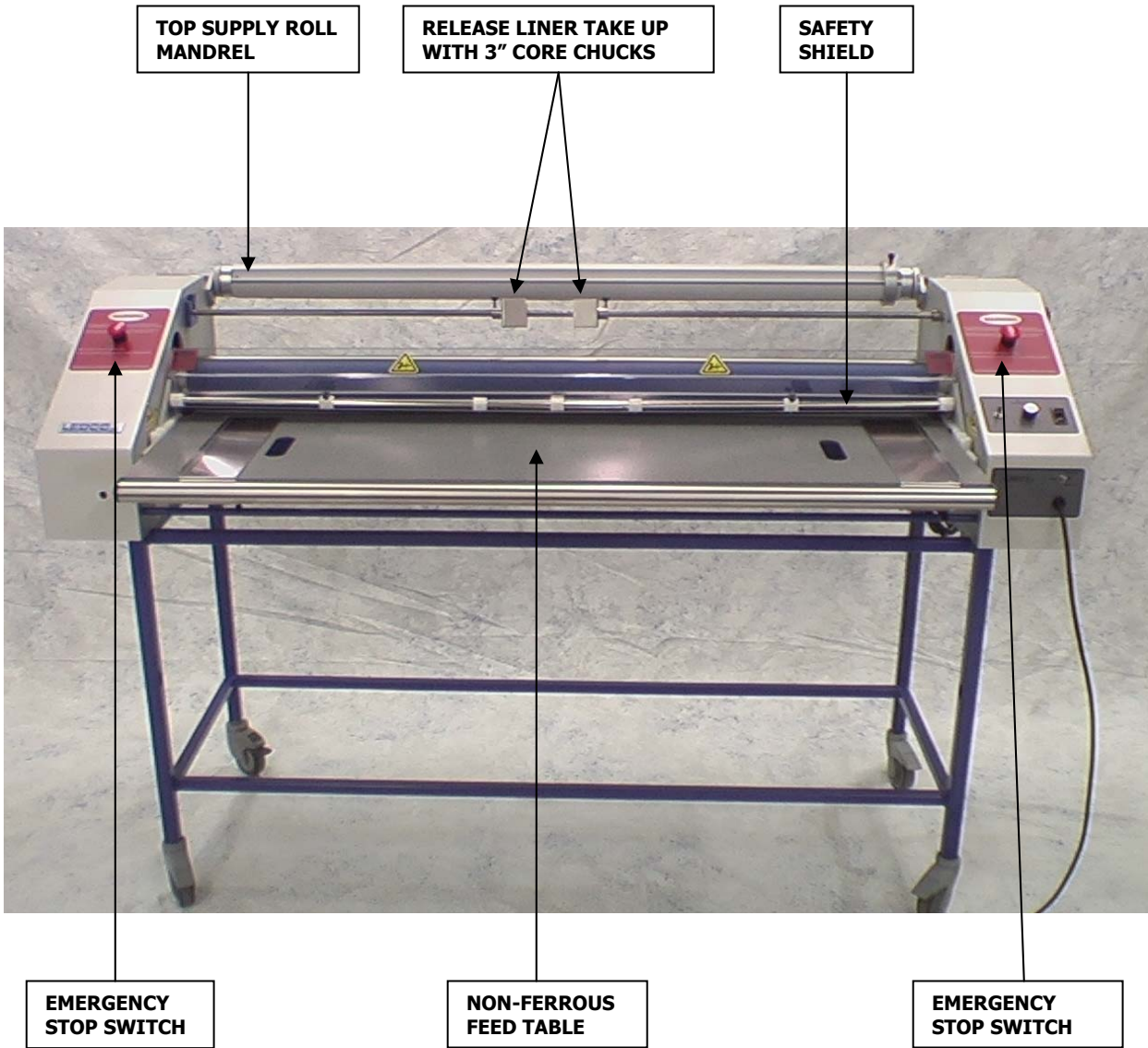
2-6 DEFINITIONS OF TERMS

- **PSA** stands for pressure-sensitive adhesive, used for cold mounting of images and for cold application of vinyl and clear overlaminates.
- **Vinyl** is the base or outer protective layer of many cold/PSA overlaminates.
- **Acrylic** is the type of adhesive most often used on vinyl and other types of cold films.
- **Substrate** literally means under-layer. It can refer to material we print on, or it can refer to the board we use to mount an image
- A **web** is the unwinding width of plastic coming off a supply roll, or the continuous flow of laminate coming out the back of the laminator.
- The **nip** is the line where the two laminating rollers meet and lamination takes place.

2-7 SPECIFICATIONS

Max. lamination width/E60	60"
Max. lamination width/E44	44"
Variable speed	1-25 fpm
Laminating roller diameter	3"
Supply roll core size	3"
Recommended film thickness	1 mil and up
Max laminating thickness	1/2"
Dimensions with stand/E60	80L 50H 34W
Dimensions with stand/E44	63L 48H 27W
Shipping dimensions/E60	91L 53H 43W
Shipping dimensions/E44	71L 53H 43W
Shipping weight/E60	805 lbs
Shipping weight/E44	700 lbs
Motor	1/4 HP DC
Electrical	110V 220V 3 amps

(specifications are subject to change without notice)



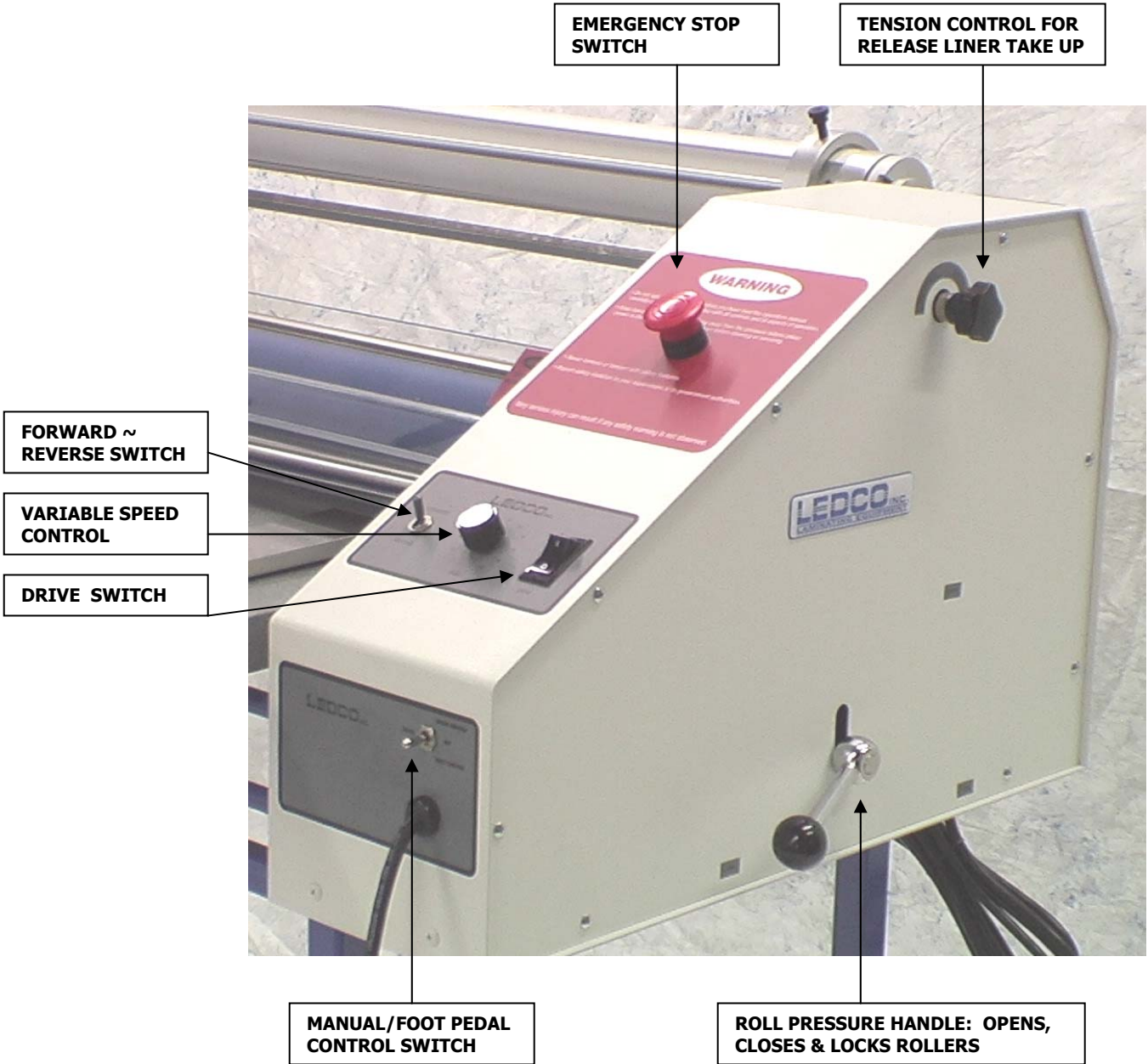
3-1 INSTALLATION AND OPERATION

With the laminator positioned on an unobstructed, level surface and always with easy access to the main power switch or circuit breaker, perform the following check before putting the laminator into service.

1. Install supply roll mandrel and scrap rewind mandrel (a spare 3" cardboard or plastic core) into their respective positions as shown in the familiarization illustrations.
2. Place safety shield down, toward rubber rolls.
3. Check both EMERGENCY STOP BUTTONS. They should be in the up position. If buttons are depressed, turn clockwise slightly until they pop up. In the event of any emergency depress the stop button closest to operator to stop machine.
4. Insert the feed tray into the slots of the feed table mounting brackets located at mid level on the insides of both side panels and gently push the tray until it seats.
5. Connect the power cord to a suitable power source which conforms to the specified power requirements of the unit.
6. Place the drive switch in the FORWARD position. Gradually rotate the speed control knob clockwise and observe the lamination drive rollers to see that they are moving.

IMPORTANT: RETURN THE SPEED CONTROL KNOB TO ZERO!

7. Place the drive switch in the OFF position. Locate the forward/reverse switch and place it in the REVERSE position, you will need to pause between positions. Turn the drive switch ON and increase the speed by turning the speed control knob clockwise. The rolls will now rotate in the opposite direction. This feature will allow the operator to correct "wraparound" conditions.



3-2 THREADING THE LAMINATOR

SAFETY NOTICE: Always disconnect power from source before threading laminator to prevent accidental injury to operator.

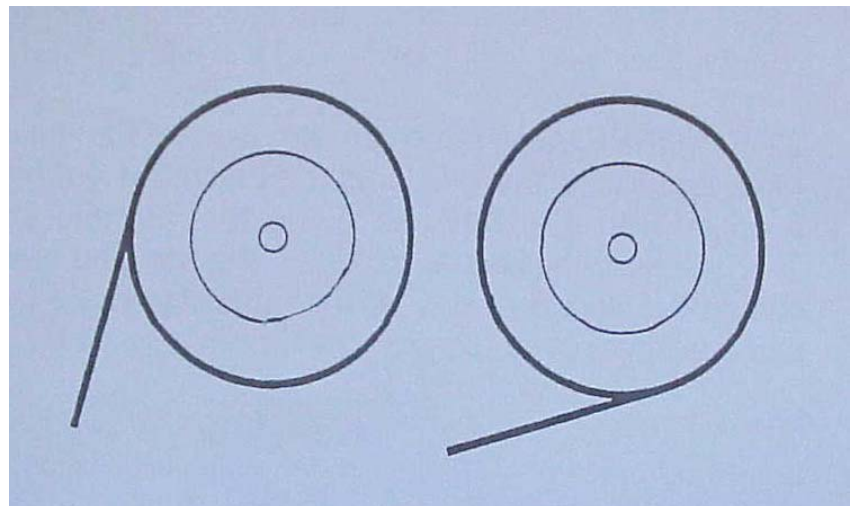
APPLICATION OF OVERLAMINATES:

1. Remove the supply roll mandrel and the feed tray. The supply roll mandrel is now ready to accept loading of the PSA (pressure sensitive adhesive) material. Slide a roll of film onto the top supply roll mandrel, turning the roll slightly to slide the gripper inside the core. Center the roll. Make sure the adhesive side of the film is facing upwards.

RIGHT SIDE VIEW OF TOP SUPPLY ROLL

ADHESIVE OUT

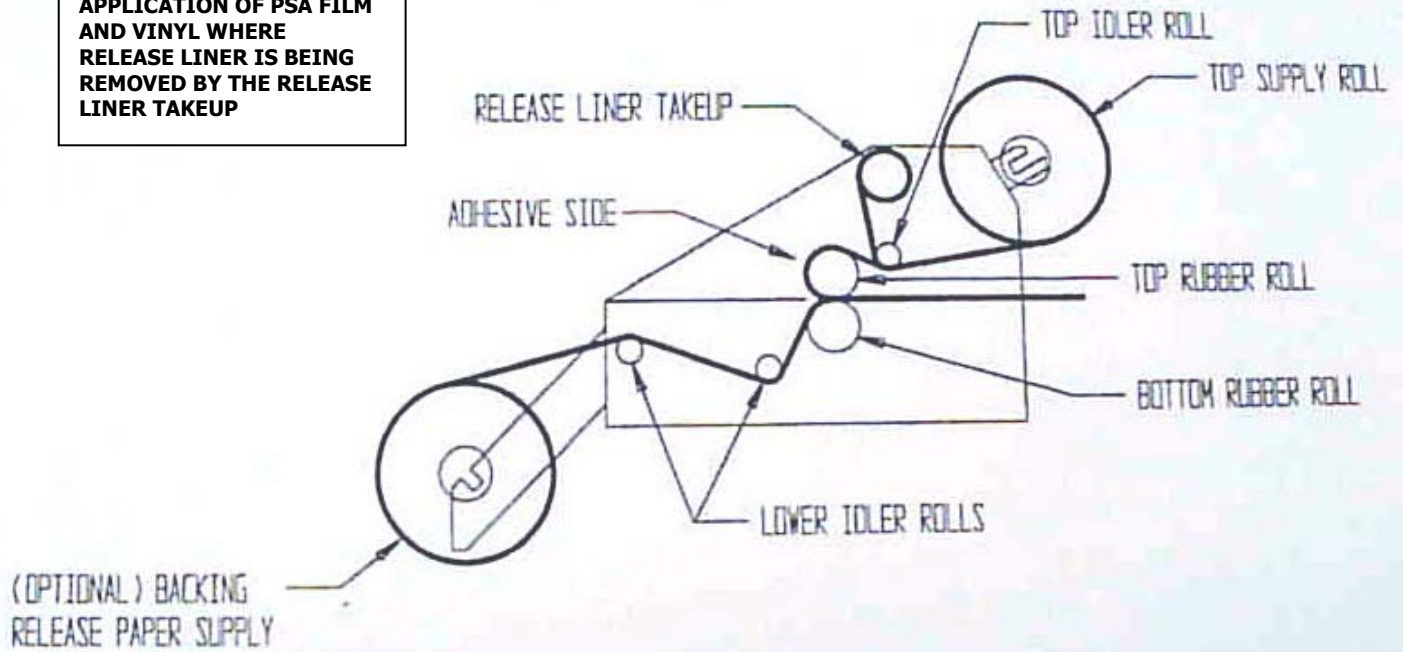
ADHESIVE IN



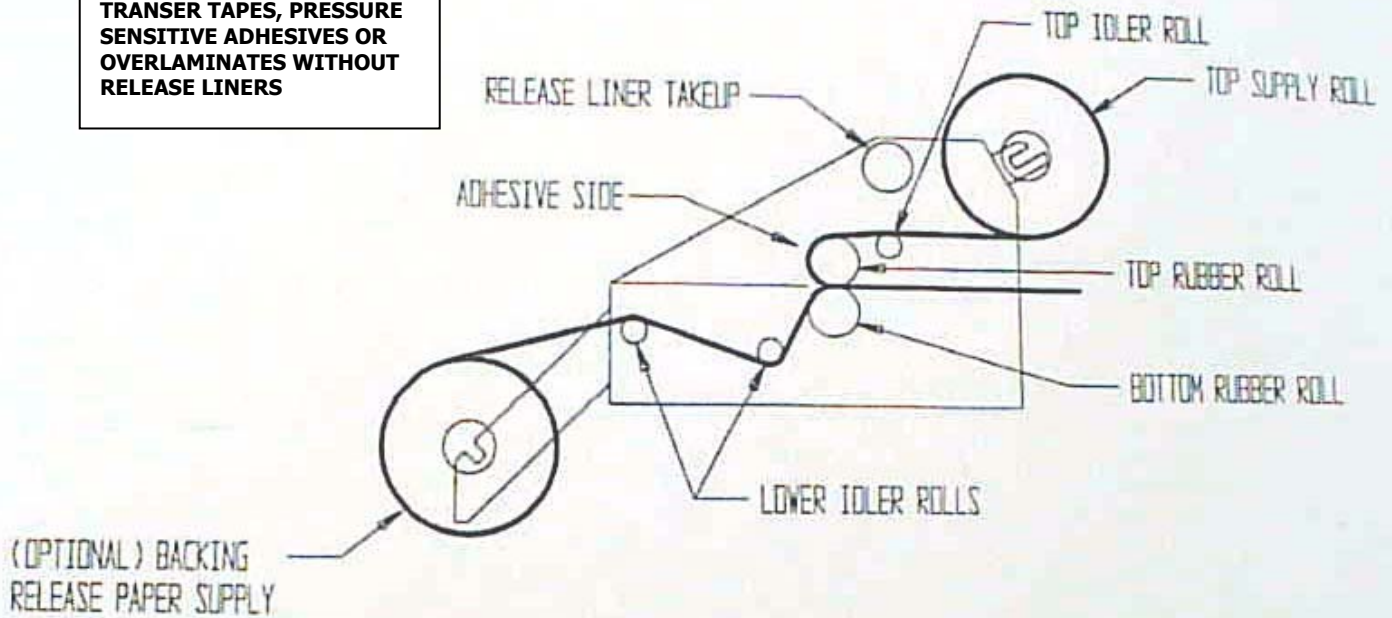
2. Center the roll on the mandrel and place the mandrel in the top brackets. This is a job best done with two people, even if the roll of film is not very heavy. With a person holding each end of the mandrel, it is easy to put both notch fittings into their respective brackets. Make sure they are both fully seated. Attempting to load the PSA material on the laminator by yourself may result in a back strain or other injury.

3. For easier threading use a scrap paper leader or release paper from the optional bottom roll feeder, preferably the same width or wider than the PSA you are applying. Open laminating rollers and slide the paper through, leaving just enough paper to tack onto the leading edge of your PSA material.

APPLICATION OF PSA FILM AND VINYL WHERE RELEASE LINER IS BEING REMOVED BY THE RELEASE LINER TAKEUP



APPLICATION OF PREMASKS, TRANSFER TAPES, PRESSURE SENSITIVE ADHESIVES OR OVERLAMINATES WITHOUT RELEASE LINERS



NOTE: The operator must use a backing paper either from a supply roll or in sheets to prevent adhesive from adhering to the machine

4. Make sure when using a PSA with a liner that the film has been threaded underneath the top idler bar (see threading diagram). Separate the liner from the adhesive part of the film and tape the liner to the 3" core mounted on your release liner take-up.
5. Close the laminating rollers and lower the safety shield toward the rollers. Lock the feed table in place.
6. Reconnect power to the laminator.
7. Place the forward/reverse switch in the forward position. Turn the speed control to the zero position. Turn the drive switch ON. Adjust supply roll tension and release liner take-up tension as needed. **NOTE: The release liner clutch adjustment knob is located on the upper right side housing denoted by "INCREASE / DECREASE" decal.**

If a wraparound occurs, place the drive switch in the OFF position and turn the speed control to zero. Place the forward/reverse switch in the reverse position. Turn the drive switch on slowly and increase the speed. The operator will need to alternately reverse, pull, reverse, pull, reverse, pull until the film is free of the wraparound. Use the reverse jog sparingly as too much reverse can create a "reverse wraparound".

CAUTION: The laminator is designed to be run with the operator directly facing the control panel and feed tray, not at an angle or from the side of the machine. For operator safety, THE SAFETY SHIELD MUST BE IN POSITION WHEN THE MACHINE IS ON or WHEN THE DRIVE SWITCH IS IN THE FORWARD POSITION.

MISE EN GARGE: La machine a plastifier est concue pour que l'utilisateur se place directement en face du plateau d'alimentation et des commandes. De plus, pour assurer la securite de l'utilisateur, l'ecran protecteur doit etre releve de facon a recouvrir le sabor chauffant superieur lorsque la machine est sous tension (on) ou que l'interrupteur-moteur est en position de marche avant (forward).

ADVERTENCIA: El plastificador está disenade para funcionar con el operador estando directamente en frente del panel de mando y la bandeja de alimentacion, y no a un angulo, o desde un costado de la maquina. Para mayor seguridad del operador, el protector de seguridad debe estar en su lugar cuando la maquina está a encendida, o cuando el interruptor de mando está hacia adelante.

3-3 APPLICATION NOTES

LAMINATION:

With the Econocraft laminator now properly threaded with film, it is now ready for continuous and/or interrupted lamination duty.

The quality of the finished lamination depends on several factors, such as: film quality, substrate, items to be laminated, lamination pressure, and correct feeding technique. To assure the highest quality lamination possible, some degree of experimentation is required. The following are some helpful hints:

- To remove wrinkles during initial threading and set up, **TURN OFF THE MACHINE**, open the laminating rollers. Gently pull the film and backing release paper at the exit point until all wrinkles are removed. Close the laminating rollers as film is being pulled taut over the rollers. This will conserve more material than trying to run the wrinkles out with the laminator.
- When using release paper to prevent adhesive buildup on the rollers, be sure to closely match the widths of paper and film.
- When using smaller-width substrates, it becomes most practical to set up and laminate these substrates as near the center of the roll as possible.
- Films for protecting images printed on vinyl should be made of vinyl themselves so that the flexibility of the vinyl substrate is not impaired. Polyester films are not recommended over vinyl because of their stiffness.
- When laminating only one side, you must not allow exposed adhesive to go into the machine. Make sure the material being coated is at least as wide as the roll of film. If material being laminated is narrower than the film, be sure to run release paper off of the bottom roll feed mandrel (see options). When not using release paper be sure to overlap sheets of scrap paper under the film, leaving no exposed adhesive. Eliminating exposed adhesive will decrease chances of creating a wraparound.

SUPPLY ROLL TENSION:

A small amount of tension is needed for most jobs. Too little tension and too much tension can both cause wrinkling. The right amount of tension is the least amount that will do the job.

Most tapes and pressure sensitive films do not require a great deal of roll pressure. Roll pressure is set at the factory and rarely needs adjustment. Balance of roll pressure across the rollers is more important than the actual PSI for most applications. Low-tack products such as transfer tape (also called pre-

mask or application tape) do not require high pressure as much as they require a certain amount of time between the laminating rollers (also called dwell time). Many transfer tapes will not stick well if applied at top speed. Your tape suppliers can provide high-tack transfer tapes that are much more suitable for use in the laminators. The common transfer tapes are very low-tack so that they will be forgiving enough to allow application by hand with a squeegee.

High-tack films, vinyl and tapes can be applied at higher speeds because they do not require as much dwell time.

2. APPLICATION OF TRANSFER TAPE SIGNAGE TO A SUBSTRATE:

The Econocraft will accept rigid substrates up to 7/16 inch thick. This allows the versatility that you need to accomplish various mounting applications where use of a thicker substrate is required, such as applying vinyl to sign blanks.

The vinyl signage should be placed on the substrate (signboard), release liner side down and aligned the way it is to appear on the substrate. Create a “hinge” by taping the leading edge of your transfer-taped signage to the substrate. Peel back two inches of your release liner and slide the positioned end of the board into the laminator, holding the taped graphic up with one hand. Using your free hand, gently pull away the release liner as the machine pulls the substrate through.

With the vinyl adhesive exposed it is imperative that the operator keep the vinyl suspended above the substrate until the point of application (nip rollers). If the graphic were to touch before being laminated, there is a greater risk of trapping air bubbles or wrinkles.

Slowly start the laminator and pull the release liner off the signage as the machine pulls the substrate through. Remove the liner slowly. The release liner will come off easiest if it is pulled away at a 90 degree or greater angle from the signage. Slowly remove the separated release liner from the graphic, keeping the vinyl suspended until the point of application. Hold up the taped signage with one hand and be ready to pull away the release liner with the other. Slowly start the laminator and pull the release liner off the signage as the machine pulls the substrate through.

If the signage is held straight up (90-degree angle to the feed tray) from the point where it curls under the safety shield, the release liner can easily be separated from the signage at this point. The safety shield can serve as a guide for removing the release liner in this application. Holding the signage straight up against the bottom of the safety shield as the machine pulls the material into the rollers also keeps the vinyl adhesive off the substrate until it reaches the rollers, insuring a bubble-free application.

3. COLD MOUNTING:

The Econocraft can be used to apply adhesive to mounting boards such as foam core. Substrates can also be purchased pre-coated with pressure-sensitive adhesive and a release liner. Cold adhesives adhere better and are more reliable than dry mount (hot) adhesives when it comes to the various plastics, coated papers, and coated mounting boards often used in digital imaging.

Most rolls of adhesive have a single release liner. When threading the laminator the release liner should be facing the top roller. When laminating only one side, you must **NOT** allow exposed adhesive to go into the machine. Make sure the material being coated is at least as wide as the roll of film. Overlap the pieces or use scrap paper underneath them in order to prevent the adhesive from coming in contact with the rollers.

Thread the machine by putting a large piece of scrap paper or cardboard through the open rollers. Stick the adhesive to this threading card, close the rollers, and begin to laminate. Keep feeding scrap paper so that the adhesive does not start a wraparound on the rollers.

Adjust the supply roll tension knobs to remove any wrinkles from the material. Do not use any more tension than needed or you may stretch the material.

Begin to feed the mounting boards, butting each up against the one ahead. Cut the boards apart with a utility knife at the back end. Once your boards are coated, or if you buy them pre-coated, you are ready to mount any graphic. There are many methods for sizing and trimming, but most operators pick a board slightly bigger than the graphic and trim board and graphic together after mounting.

Peel back about two inches of the release liner on one end of the board. Create a "hinge" by using this exposed adhesive to position the graphic on the board. Slide the positioned end of the board into the laminator, holding the graphic up with one hand. Pull off the release liner before it goes into the nip. Pick up the mounted item at the back of the machine. Trim away the unwanted portions of the graphic and the board at the same time.

4-1 PREVENTING AND SOLVING PROBLEMS

Please read this section before you have a problem.

PROBLEM: Laminated images are curling up or down.

SOLUTION: Excessive supply roll tension causes the laminated image to curl up. This curl can be strong enough to prevent the item from hanging straight. It can even pull a mounted image off the substrate.

PROBLEM: Laminated images are exhibiting opposite corner curl.

SOLUTION: See the above solution and reduce supply roll tension. Opposite corner curl comes from stretching the film too much.

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. The fuse (3 amp) is located on the back right housing, but dead outlets and loose power cord connections are the most common causes of this problem.

PROBLEM: Tenting of the film on the image.

SOLUTION: This has nothing to do with the film or the laminator. It's caused by various contaminants on the surface of the image. Use cotton gloves or a tack rag as appropriate to clean your image just before it is laminated. If your system is not in a fairly clean environment, close off the area and filter the air or... move the system.

Supply roll tensioning systems dependent on friction between the cardboard film core and the supply roll mandrel and/or tension collars can also create dust in the environment.

PROBLEM: The laminated material seems to have a pitted surface 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 debris stuck to the rollers, such as a piece of paper. Inspect the rubber rollers and if they need cleaning, refer to section 5-3. Irregularities in the surface of the film can also be caused by cuts or other damage to the rubber rollers.

PROBLEM: Bubbles or wrinkles in the laminate, accompanied by movement of the supply roll from side to side (applies to laminators which use a clutch for supply roll tension).

SOLUTION: Cause of the problem is insufficient supply roll tension caused by the film core slipping on the supply roll mandrel. Increasing the clutch tension doesn't help, because the roll is turning with the mandrel. Depending on the design of the laminator, the supply roll lock mechanism has failed or the supply roll was put into the film core backwards.

PROBLEM: A defect in the lamination which repeats at the same interval each time.

SOLUTION: Look at the laminating roller on the side where the defect is appearing. This problem is usually caused by a cut or gouge in the roller, or by something stuck to the roller. Pieces of paper, a small bit of wood or metal, or a hunk of adhesive are frequently the culprits.

Clean the rollers of the laminator each time you change film, and at least once a day. Carefully educate your operators how to treat the laminator. Make sure they are trained to keep knives and other sharp objects away from the rollers.

PROBLEM: Film gets wrapped around the laminating rollers.

SOLUTION: This mess is most often caused by violating the most inflexible law of laminating: Do not allow exposed adhesive to go into the rollers. Adhesive may stick to the rollers, or it may build up on the rollers to cause a wraparound later.

When laminating one-side, keep your items wider than the film and keep them overlapping each other. The operator should run a web of paper under the web of film whenever the item being laminated is narrower than the film. The operator should run sheets of scrap paper or plastic under the web of film as he/she set up. Adjust the machine, and do your laminating. There should be an unbroken stream of material under the adhesive as it goes into the nip.

If adhesive does get on the rollers, clean it off before continuing to work. **UNPLUG THE MACHINE FIRST !!** Use a hard rubber eraser or a moistened white Scotch Brite pad to clean the adhesive off the roller. Then wipe the roller down with a clean cloth and some Windex. NEVER try to clean the rollers while they are turning. Clean one section of the rollers at a time while the laminator is turned off.

PROBLEM: Wrinkling of one side of the web or skewing of images as they are laminated indicates that perhaps the pressure on one side of the laminating or pull rollers is greater than on the other.

SOLUTION: Skewed, wrinkled images are most often generated by skewed trimming or skewed feeding. If the leading edge of an image is not trimmed at right angles, the nip will catch one side before the other. Unless the paper is fairly heavy and stiff, the item will most likely be ruined. The same thing will happen if the operator feeds an item in with the leading edge not parallel to the nip.

If trimming or feeding are not problems, check to make sure the roll tension is balanced. Make sure the rollers are fully closed. Make sure they are in the locked position. Consult your laminator vendor if the problem persists.

PROBLEM: Myriad small bubbles of air caught between the image and the film, known as silvering.

SOLUTION: Silvering is often seen when laminating with cold films. With many cold films, this silvering will go away in a day or two as the adhesive penetrates and pushes the air through the back of the sheet.

5-1 MAINTENANCE

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

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.

MISE EN GARDE: *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.

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

Ne jamais porter de vêtements amples, de cravate ou de bijoux, etc. (ces articles peuvent être happés par les engrenages ou les rouleaux de caoutchouc).

ADVERTENCIA: *sea extremadamente cuidadoso siempre que realice tareas de mantenimiento en su maquina.*

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

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 pueden ser atrapadas por engranajes o rodillos de goma) mientras está realizando trabajos de mantenimiento en la máquina

5-2 GENERAL CLEANING

Cleaning the laminator daily or weekly will help prevent dirt or adhesive build-up on the rubber rollers and will improve the performance of the unit.

5-3 CLEANING THE RUBBER ROLLERS

The laminating rollers need regular cleaning. Turn off the master power switch and unplug the machine.

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 mildly soapy water to clean the rollers. 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.

For cleaning stubborn adhesive buildup we suggest using our special formula "Cool Clean." Designed to safely clean and condition the rollers, "Cool Clean" is available directly from Ledco or Graphic Laminating.

5-4 LUBRICATION

Drive chain: The drive chain and sprockets should receive a light coat of gear lube or heavy grease (lithium preferably) after each 1000 hours of operation.

5-5 STORAGE

A dust cover is recommended when equipment is not in operation.

Avoid extreme temperatures in the office/factory environment.

NOTES

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