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M-5 SPECIFICATIONS

Electrical: 120vac

Air Supply: Min. 80psig.

Material Sizes: 25mm – 90mm lay flat (M-5) / 25mm – 122mm lay flat (M-6)
Material Gauge: 50 - 70 Micron (thickness depends on application)
Roll Lengths: Material disk will support roll lengths of 300-500 meters.
Outside diameter of material should not exceed 17 inches.
*Material thickness will affect outside diameter, a 500-meter roll of 70 Micron materials will have a larger OD than a 500-meter roll of 50 Micron material.
Material Core Size: Material should be wound on a core of 5 inches ID.

Band Lengths: 25mm-75mm lengths (M-5) / 25mm-75mm lengths (M-6)
Bottle Heights: Machines have a minimum of 7 inches adjustment of height from low too high. The starting point will vary on the head support, which is determined by application.
Example: The variation could be from 2”-9” or 5”-13”
*Machine height must be a minimum of bottle height plus band length plus ½ inch.

Speeds: The M-5 is designed to run speeds of up to 100 BPM.
*Speeds may be affected by band lengths and application.

Direction of Travel: Standard direction of travel is left to right.
*Right to left machines are available if specified at time of order; delivery times will be affected.

Conveyor Speeds: The machine typically performs best with 40-60 feet per minute conveyor speeds. A variable speed conveyor is recommended.
Conveyor Height: Standard frames are built for 35-37 inch height conveyors.
*Non-standard heights are available if specified when ordering; delivery times will be affected.

Changeover Time: Five (5) minutes
Theory of Operation

The Autocapsealer banding machine is designed to apply a heat shrinkable band to containers. The containers are then transported through a heat source allowing the banding material to shrink and conform to the surface of the container. This is usually for the purpose of tamper-evidence. The material processed through the machine is a tubular material, flattened and wound on a roll sometimes referred to as a roll stock. The material, typically PVC, usually comes wound on a roll in lengths of 500 meters. Because the material is flattened, the machine will have to open the material to apply the bands over an object. For this task we insert a cross-folding device into the material. Then, we set the material with the device inside above a set of rollers, which are closer together than the device is wide. Feeding the individual lengths of material plus the weight of the device and the friction of pulling the material causes the device to interact with the roller removing the original crease from the material. This process will cross fold the material. The material is advanced by 2 opposed rollers, which are driven by either a servo or stepper motor. The rollers create their grip on the material because of the pressure against each other. The amount of rotation by the motor is set at the control panel and will, in effect, cause a specific length of material to be advanced. The banding material is then fed through the cutting mechanism to cut off the individual band from the banding material. Directly below the cutting edge is a vacuum block, which will hold the band in the ready position until a container passes by. To insure that the vacuum block gets a good grip on the band during the cutting process, we use a band retention spring to hold the band against the vacuum block until the band is completely cut. When the spring is removed the individual band will bounce open to a round position. Because the band bounces open so fast, a band-stabilizing finger opposite the vacuum block is used to prevent the band from bouncing around. Above the band is a plunger, which will push the band down when the container sensor detects passage of the container. The band is held at an angle relative to that of the container’s path, such that the downstream portion is lower than the upstream portion. By applying the bands at this angle the band will tend to align itself with the container during application. After the band is applied to the container the process begins all over again until a new band is ready for the next container. The container and band will now be transported through a heat source, such as the Marburg CR6000 heat tunnel, which will shrink the bands to complete the process.
FUNCTIONAL SEQUENCE

In the upper left corner of the display you will see the status of the cycle function. The lower line will flash text as to which button to press to turn on the cycle function. Press the “A” key to activate the cycle function. Doing this the PLC will turn on the main air valve, sometimes called the dump valve. Also, the PLC will turn on the vacuum valve, which sends pressure to the vacuum generator to provide vacuum for the suction cup to hold bands. The PLC will then wait for a signal from the cycle photo-eye. Pressing the “B” key will turn on the spacing wheel and allow product to pass under the applicator. Upon receiving a signal, the PLC will confirm that the door switch is activated and begin the cycle process. The beginning of the cycle is to turn on the cylinder valve, to shift the air sending the cutter back and the plunger down. At the same time the vacuum valve is turned off releasing the band from the suction cup. This process will place the cut band on the container. After a short preset time the feed rollers will begin to turn, advancing another length of material through the open cutter. When the feed process is finished, the cylinder valve is then turned off sending the cutter forward and plunger up. Simultaneously, the vacuum valve is activated, sending pressure to the vacuum generator, which turns on the vacuum. This process will sever a new band from the material and grab hold of it with the suction cup. The band, once cut, will try to open immediately. The plunger has a band retention spring, which will hold the band against the suction cup during the cutting process. Once the spring is high enough, it will allow the band to bounce open to the band-stabilizing finger. The machine is now ready for the next signal to cycle again.
COMPLETE CABINET AND CONVEYOR WITH PRODUCT AND MATERIAL APPLICATION

1. CONTROL PANEL
2. CYCLE PHOTO EYE
3. SPACING WHEEL
4. SPACING WHEEL MOTOR
5. MATERIAL DISK
6. BAND PUSH DOWN CYLINDER
7. CUTTER ASSEMBLY
8. BUTTERFLY ASSEMBLY
9. MATERIAL FEED ROLLERS
10. MATERIAL ALIGNMENT SKI
11. PHOTO-EYE BRACKET
12. CONVEYOR TRACK
13. VERTICAL PERFORATOR (OPTIONAL)
1. DE-BURR AND BREAK ALL SHARP EDGES .015 MIN.
CONTROL PANEL DESCRIPTION

From the control panel, all functions can be turned on and off, and band length can be adjusted. The screen will flash prompts to assist you as to which buttons to press for which functions. When the machine is first powered up, certain text will appear on the screen while the electronics check initial readings. When the machine is ready to be turned on, prompt messages will begin to alternately flash on the screen. On the main menu, you will notice the status of the cycle function and the feed function on the top row of text. On the second row, the text will rotate prompts for different functions. On a basic machine there will be 3 different prompt.

Press the “A” button to toggle the machine on and off (default is “off”)
Will default back to “off” when power is disconnected

Press the “B” button to toggle the spacing wheel on and off (default is “off”)
Will default back to “off” when power is disconnected

*Note: To change the speed of the spacing wheel, you must use the potentiometer located just inside the cabinet.
Press the “C” button to enter the setup screen.
[A] – Photo Registration
[B] – Band Length Adjustment
[C] – Horizontal Perforator

PHOTO REGISTRATION ACTIVATION/DEACTIVATION
To turn the photo registration function on and off on the “Photo Reg” screen:
1. Press the “A” button to enter the photo reg screen
2. Press the “A” button to toggle between on and off (default is “off”)
3. Press the “C” button to exit
*Note: If no photo reg is required, turn option to off.

BAND LENGTH ADJUSTMENT
To change the length of the band on the “Band Length Adjust” screen:
1. Press the “B” button to enter the “Band Length Adjust” screen
2. Press the “SET” button to enter a length value (in millimeters)
3. Press the appropriate number buttons for the length (example, press “3” and “5” for 35mm length). Length values outside of the 25mm-75mm range will show on the screen, but will not be registered. A default minimum of 25mm or a default maximum of 75mm will be used.
4. Press the “ENTER” button and the new length is set
5. Press the “C” button to exit this screen and go to main menu

HORIZONTAL PERF. ACTIVATION/DEACTIVATION
To turn the perforator on and off on the “Perf” screen:
1. Press the “C” button to enter the perforator screen
2. Press the “A” button to toggle between on and off (default is “off”)
3. Press the “C” button to exit

Photo Registration and Horizontal Perforation are optional. For hardware and activation code, contact Marburg Ind.
CONNECTING THE FRAME TO THE BASE

• Position columns over base connectors.

• Base connectors are wedged to allow smooth alignment.

• Screw base to column using ¼-20 screws.
REMOVING THE BACK PANEL

- Remove the 4 screws located at the sides of the cabinet.
- Slide the back panel **down**.
MATING THE CABINET TO THE FRAME

- Place the Cabinet face down on top of two 2x4 boards.
- Lay the Column Plate on the back of the Base Plate.
- Screw the Column Plate in with four 1/2-13 screws.

FILTER/REGULATOR SETUP

- Screw in the Pressure gauge onto the Filter/Regulator.
- Rotate the gauge so that it reads level.
- Insert the large, green plastic pneumatic hose into the output (elbow) of the Filter/Regulator.

MOUNTING THE SKI TO THE CABINET

- Use two 10-32 screws to attach the Ski to the right side of the Cabinet.
MOUNTING THE SUPPORT ARM ASSEMBLY

- Stand the unit upright.
- Use two 1/4-20 screws to mount the Material Support Arm.

- Attach the Spacing Wheel Bracket as shown, using two 10-32 screws.

- Use two 5/16-18 screws to attach the Disk Brake Arm.

- Simply swing the brake arm out and place the Material Disk on the Spindle.

SPACERS INSTALLATION

Install spacers with 2 studs provided between the base frame and the conveyor as shown in the illustration.
CYCLE SENSOR SETUP

- Attach the Cycle Sensor plug as shown.
- The bracket’s post should be attached to the front of the conveyor. The Photo Eye Bracket should be about 3 inches from the left of the inside of the Cabinet.

MOUNTING THE SPACING WHEEL

- Use two 10-32 screws to attach the Spacing Wheel’s motor to its mounting bracket.
- Plug the Spacing Wheel motor into the port inside the Cabinet, below the Control Center.
PHOTOREGISTRATION OPERATION  
(OPTIONAL EQUIPMENT)


READING DURING MOVE

THIS IS THE STANDARD AND WILL BE THE METHOD USED UNLESS THERE IS A STICKER INSIDE YOUR CONTROL BOX TO INDICATE DIFFERENT.

1: THE FIRST THING TO DO IS TO DETERMINE THE LENGTH NEEDED TO INPUT INTO THE CONTROL PANEL. YOU CAN EITHER MEASURE THE BAND IMPRESSION OR USE THE TEST AND CHECK METHOD. TYPICALLY, I PREFER THE TEST AND CHECK METHOD. TURN OFF THE PHOTO-REGISTRATION FUNCTION. SET IN AN APPROXIMATE LENGTH INTO THE BAND LENGTH REGISTER. FEED OUT A FEW BANDS AND THEN COMPARE ONE AGAINST AN IMPRESSION ON A STRIP OF MATERIAL. PUT THE CUT BAND ON A STRIP WITH ONE END ON A PARTICULAR MARK AND SEE IF THE OTHER END IS AT THE EXACT MARK ON THE NEXT IMPRESSION. IF NOT MAKE THE BAND EITHER LONGER OR SHORTER UNTIL YOU HAVE THE EXACT LENGTH.

2: NOW ADD 2MM TO THE LENGTH. NOW TURN ON THE PHOTO-REGISTRATION FUNCTION.

3: CHECK IF THE EYE IS READING THE MARK (LOOK AT THE “OUTPUT” LED ON THE EYE TO SEE WHAT THE EYE IS DOING). IF THE EYE IS NOT READING THE MARK, MAKE THE NECESSARY ADJUSTMENTS TO THE EYE SENSITIVITY.

4: TURN ON THE PHOTOREGISTRATION FUNCTION. ADJUST THE MATERIAL SO THAT THE MARK IS IN FRONT OF THE EYE AND CYCLE A FEW BANDS. NOW THAT THE MACHINE IS CUTTING THE BANDS THE SAME LENGTH, IT IS TIME TO SET THE EYE TO GET THE MATERIAL TO BE CUT IN THE PROPER POSITION.

5: WITH THE CYCLE FUNCTION TURNED OFF MOVE THE BAND MATERIAL SO THAT THE CUTTER WILL CUT THE BAND AT THE BOTTOM OF THE IMPRESSION. NOW MOVE THE EYE UP OR DOWN TO REGISTRATION MARK.

6: TURN ON THE CYCLE FUNCTION AND FEED A FEW BANDS. IF THE POSITION IS A LITTLE OFF ADJUST THE EYE UP OR DOWN ACCORDINGLY. WHEN YOU ARE CUTTING THE IMPRESSIONS AT THE PROPER POSITION YOU ARE READY TO RUN. THE PHOTO-EYE SHOULD
NOW HOLD THE POSITION OF THE MATERIAL CONSTANT. YOU CAN DOCUMENT THESE SETTINGS SO YOU DO NOT HAVE TO GO THROUGH THIS WHOLE PROCEDURE NEXT TIME.

READ BEFORE THE MOVE

THIS METHOD IS USED PRIMARILY USED ON THE M500-HS SERIES MACHINE, IF THIS METHOD IS USED, THERE WILL BE A STICKER INSIDE YOUR CONTROL BOX TO INDICATE SO.

1: THE FIRST THING TO DO IS TO DETERMINE THE LENGTH NEEDED TO INPUT INTO THE CONTROL PANEL. YOU CAN EITHER MEASURE THE BAND IMPRESSION OR USE THE TEST AND CHECK METHOD. TYPICALLY, I PREFER THE TEST AND CHECK METHOD. TURN OFF THE PHOTO-REGISTRATION FUNCTION. SET IN AN APPROXIMATE LENGTH INTO THE BAND LENGTH REGISTER. FEED OUT A FEW BANDS AND THEN COMPARE ONE AGAINST AN IMPRESSION ON A STRIP OF MATERIAL. PUT THE CUT BAND ON A STRIP WITH ONE END ON A PARTICULAR MARK AND SEE IF THE OTHER END IS AT THE EXACT MARK ON THE NEXT IMPRESSION. IF NOT, MAKE THE BAND EITHER LONGER OR SHORTER UNTIL YOU HAVE THE EXACT LENGTH.

2: CHECK IF THE EYE IS READING THE MARK (LOOK AT THE “OUTPUT” LED ON THE EYE TO SEE WHAT THE EYE IS DOING). IF THE EYE IS NOT READING THE MARK, MAKE THE NECESSARY ADJUSTMENTS TO THE EYE SENSITIVITY.

3: TURN ON THE PHOTOREGISTRATION FUNCTION. ADJUST THE MATERIAL THAT THE MARK IS IN FRONT OF THE EYE AND CYCLE A FEW BANDS. NOW THAT THE MACHINE IS CUTTING THE BANDS THE SAME LENGTH, IT IS TIME TO SET THE EYE TO GET THE MATERIAL TO BE CUT IN THE PROPER POSITION.

4: WITH THE CYCLE FUNCTION TURNED OFF MOVE THE BAND MATERIAL SO THAT THE CUTTER WILL CUT THE BAND AT THE BOTTOM OF THE IMPRESSION. NOW MOVE THE EYE UP OR DOWN TO REGISTRATION MARK.

5: TURN ON THE CYCLE FUNCTION AND FEED A FEW BANDS. IF THE POSITION IS A LITTLE OFF ADJUST THE EYE UP OR DOWN ACCORDINGLY. WHEN YOU ARE CUTTING THE IMPRESSIONS AT THE PROPER POSITION YOU ARE READY TO RUN. THE PHOTO-EYE SHOULD NOW HOLD THE POSITION OF THE MATERIAL CONSTANT.

DOCUMENT THESE SETTINGS SO YOU DO NOT HAVE TO GO THROUGH THIS WHOLE PROCEDURE NEXT TIME.
HORIZONTAL PERFORATION
(OPTIONAL EQUIPMENT)

MATERIAL SETUP

- Attach the Material Redirect as shown using two 10-32 screws.
- Roll the material underneath the Redirect.
- Mount the Vertical or Horizontal Perforator (optional equipment).
- The material should be placed on the Disk in a counter-clockwise fashion.
- Feed the material through the top slot, around the butterfly, and through the rollers.
REMOVING THE FACEPLATE

- Open the cabinet door.
- Remove the door switch from the faceplate.
- Unscrew the face panel screws shown above.
- Unplug the interface cable from the PLC.
REMOVING THE CONTROL CENTER

- Unplug the air valves, stepper motor, cycle photo eye connector, and spacing wheel motor. Remove spacing wheel controller from cabinet. Remove the face panel and swing open the cabinet door.

- Squeeze the top of the control center so that it unlocks from the upper mounting bracket.

- Lower and swing out the upper portion so it clears the upper bracket.

- Lift the lower portion of the control center so that it unlocks from the lower bracket. Remove control center.
OPERATIONAL SETUP

When setting the machine to run a container for the first time, first start with the guide rails to align the container with the centerline of the band. If the machine is too low for the container to pass or substantially too high, use the height adjustment crank and adjust slightly higher than necessary. **Caution:** take care not to damage the cycle photo-eye as this is not mounted on the head and will not go up or down with it.

Next, set the tension on the spacing wheel to allow consistent regulation of product.

Then, thread the new material through the machine. Set the length of the new band (instructions for changing the length are on the Control Panel Description page). Cycle the machine several times to clear the wrinkled and flattened material, which inevitably happen when treading the machine.

Then, with the proper length band hanging from the suction cup, adjust the band-stabilizing finger to prevent the band from opening fully round. The beginning of the cycle is for the cutter to go back, and since the vacuum block moves with the blade, the material will follow, opening up round.

Since the cutting assembly is set at an angle, the band will suspend at the same angle, producing a dangling end. With the band still hanging from suction cup adjust the height of the applicator so that the top of the lid just passes under the high end of the band. If the band is shorter than the stroke of the plunger, then raise the head so the plunger does not crash on top of the lid. This will be the starting point for the height adjustment.

Now, adjust the height of the photo-eye so that the lid breaks the beam. The brackets are made to help prevent setting the photo-eye too low (on the neck of the bottle), but this sometimes still happens unless you pay attention. If the neck of the bottle breaks the beam and it is a glass bottle, the light has the potential to pass through the glass, which causes havoc.

Then, with the conveyor moving let one container pass and see if the photo-eye needs to be moved to the left or the right. This will depend on the speed of the conveyor. Forty to sixty feet per minute is usually desired.

Finally, after letting a few containers pass, and you feel comfortable with where the photo-eye is located, let some more containers pass and experiment going up a little, and then down. Different applications require different settings. They will vary from the container barely passing under the high side of the band to ½ inch under the low side. After you run the product, you can make fine tuning adjustments and pick the most suitable setting. On rare occasions, you may find that a different angle of approach is more beneficial. Loosening the two screws on the pivot plate can change this. Typically, we use less of an angle for longer bands and more for shorter bands. However, this is only a suggestion; your application may have unique needs. In general, the machine is very adaptable, and minor changes will not upset the performance.
TROUBLESHOOTING

Machine will not turn on (panel stays dark):

- Machine is not plugged in.
  Inspect plug.
- Circuit breaker is tripped.
  Inspect circuit breaker.
- Line fuse is blown.
  Inspect line fuse.
- Control panel interface cord is unplugged.
  Remove panel and inspect interface cord.
- Circuit breaker is tripped.
  Inspect circuit breaker.
- PLC is defective.
  Check for 120 VAC to PLC—replace if necessary.
- Control panel is defective.
  Replace control panel.

Machine will not turn on (panel lights up):

- No air connection.
  Inspect air connection.
- No air pressure.
  Ensure adequate air pressure (80 psi).
- Transformer is defective.
  Measure output of transformer.
- Run/Stop switch on PLC is in “stop” position
  Check Run/Stop switch is in “run” position.
- PLC is defective.
  Send to factory for replacement
- 24VDC fuse has expired
  Replace fuse

Machine will turn on, but will not cycle:

- Door is not closed.
  Close door.
- Door Switch is set incorrectly.
  Look for LED on proximity switch to be on.
• Door Switch is defective.  
  *Check Input X6 on PLC.*

• No air connection.  
  *Inspect air connection.*

• No air pressure.  
  *Ensure proper pressure (80psi).*

• PLC is electronically locked.  
  *Disconnect power for 1 minute, then reconnect.*

• Photo-eye is not plugged in.  
  *Inspect plug connection.*

• Photo-eye does not give signal.  
  *Check sensitivity and reflector.*

• Photo-eye is defective.  
  *Check input X7 on PLC.*

• Transformer is defective.  
  *Measure output of transformer.*

• 24VDC fuse has expired  
  *Replace fuse*

**Machine will cycle, but will not feed:**

• Material not pulling freely.  
  *Check for restrictions on disk or back of machine. Try different spring tension on disk.*

• Material too tight on butterfly.  
  *Check if material fits freely over butterfly.*

• Bearings damaged in feed system.  
  *Check if rollers turn freely with power off.*

• Gears damaged on roller shafts.  
  *Inspect and check if rollers turn freely with power off.*

• Plug loose on stepper motor.  
  *Inspect plug connection on stepper motor.*

• Pulley loose on motor or roller shaft.  
  *Check set screws in pulleys.*

• Low air pressure to clamping module.  
  *Check air pressure.*

• Fuse blown on driver card.  
  *Check fuse on driver card.*

• Driver defective.
Replace driver card.

- Stepper motor defective.
  
  Check resistance readings in windings—replace if necessary.

Machine will feed material, but cylinders will not move:

- Air not connected.
  
  Inspect air connection.

- Low air pressure.
  
  Ensure proper pressure (80psi).

- Main air valve will not shift.
  
  Check if LED in plug lights. Try manual override.

- Connector loose on main air valve.
  
  Inspect connection on main air valve.

- Dirty air clogging main air valve.
  
  Clean valve or replace.

- Cylinder air valve will not shift.
  
  Check if LED in plug lights. Try manual override.

- Bearings damaged in feed system.
  
  Check if rollers turn freely with power off.

- Gears damaged on roller shafts.
  
  Inspect and check if rollers turn freely with power off.

- Plug loose on stepper motor.
  
  Inspect plug connection on stepper motor.

- Pulley loose on motor or roller shaft.
  
  Check set screws in pulleys.

- Low air pressure to clamping module.
  
  Check air pressure.

- Fuse blown on driver card.
  
  Check fuse on driver card.

- Driver defective.
  
  Replace driver card.

- Stepper motor defective.
  
  Check resistance readings in windings—replace if necessary.

Machine will feed material, but cylinder will not move:

- Air not connected.
Inspect air connection.

- Low air pressure.
  Ensure proper pressure (80psi).
- Main air valve will not shift.
  Check if LED in plug lights. Try manual override.
- Connector loose on main air valve.
  Inspect connection on main air valve.
- Connector loose on cylinder air valve.
  Inspect connection on main air valve.
- Dirty air clogging main air valve.
  Clean valve or replace.
- Dirty air clogging cylinder air valve.
  Clean valve—replace if necessary.
- Cylinder air valve will not shift.
  Check if LED in plug lights. Try manual override.
- Rectifier is defective.
  Use voltmeter and check for voltage output from rectifier.
- Voltage Regulator is defective.
  Check for 24 VDC on output of regulator.
- Capacitor is defective.
  Check with voltmeter.

Bands falling off of vacuum block or being held inconsistently:

- Vacuum valve not shifting properly.
  Clean or replace valve.
- Vacuum generator not producing good vacuum.
  Check filter—replace generator if necessary.
- Suction cup damaged.
  Inspect cup—replace if necessary.
- Band Retention Spring broken or bent incorrectly.
  Inspect and repair—replace if necessary.
- Cutter blades set incorrectly.
  Compare setting with recommended setting in book.
- Material has fold on edge.
  Inspect material for folding. Check for proper size butterfly.

Bands not cutting or fusing together at edge:
• Blades are dull.
  *Flip blades to alternate edge.* When both edges have been used, replace with new set and send dull blades back to Marburg for resharpening. *See blade change procedure in manual for instructions on changing blade set.*

**Material folding at edge:**

• Material is too big for butterfly.
  *Measure material size and compare to butterfly size.* Plastic guide on top of cabinet has broken and material is not pulling straight down causing the butterfly to sit at an angle. Butterfly arms set incorrectly.

**Bands not going on bottles:**

• Machine cycle too soon or too late.
  *Adjust photo-eye closer or further away.*
• Bottles not in centerline.
  *Inspect and adjust guide rails.*
• Height adjustment too high or too low.
  *Use handle under machine and try different height setting.*
• Containers coming too close together.
  *Most applications run best at 40 to 60 feet per minute. This will provide a good spacing at speeds of less than 100 containers per minute.*
• Containers going through the machine too fast.
  *Check the consistency of the feed of containers.* If 50 containers are fed through in 25 seconds and 50 containers are fed through in 35 seconds, then the overall is 100 containers in 1 minute. However, the first 50 containers were actually run through at a rate of 120 containers per minute, which is too fast for the machine. This can happen with as little as 2 or 3 containers too close together.
• The band is bouncing around on the vacuum block.
  *Check that the Band Stabilizing Finger is set close enough such that the finger should hold the band in an oval shape, not round.*
• Inconsistent hold on the vacuum block.
  *See: “Bands falling off of vacuum block or being held inconsistently”.*
• Material too small.
  *Measure (using millimeters) largest diameter which material must fit over, add 2mm, multiply by 1.57, and compare result with actual size.*
This formula will be a good starting pint and will be the actual size in 95% of the applications.

- Material incorrect gauge.
  *The machine will use material gauge anywhere from 40 to 70 microns. Depending on the application, the material may be too thin for your container.*

- Material twisting through the machine.
  *This may happen when the seam is placed incorrectly. The seam should be approximately 25% from the edge of the material.*

- Container lids have flash or burns from capping machine.
  *Sometimes, to get proper torque on caps, the capper is set so tight that it burns the caps, and the debris created will catch the leading edge of the band, causing the band to crumple.*

**Spacing Wheel will not turn:**

- Wheel is set too close to guide rail.
  *Inspect and adjust as necessary.*

- Connector has come loose.
  *Inspect connection.*

- Potentiometer (“Pot”) has been turned to “0”.
  *Check pot setting and adjust as necessary.*

- Brushes worn out.
  *Inspect and replace if necessary.*

- Motor control defective.
  *Inspect and replace if necessary.*
PERIODIC MAINTENANCE

**Weekly**
1. Put light coat of oil on cutter assembly
2. Drain coalescing bowl (daily if necessary)
3. Check for stress cracks in the Band Retention Spring
4. Inspect for distortion of the suction cup
5. Ensure band is cutting properly
6. Clean debris from photo-eye lens and reflector
7. Check that perforator is still perforating both layers if machine is equipped with optional perforator

**Monthly**
1. All weekly items
2. Check for stress cracks in the Band Retention Spring
3. Grease material feed rollers
4. Clean excess oil and debris from machine
5. Check for wear in plunger cylinder
6. Clean or replace vacuum generator

**2 Years**
1. All monthly items
2. Replace air valves
3. Replace pulleys and drive belt
<table>
<thead>
<tr>
<th>PART #</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>FX1S-14MT v2.0</td>
<td>PROGRAMMABLE LOGIC CONTROLLER</td>
</tr>
<tr>
<td>FX10-DU-E-MRG-M5 v2.0</td>
<td>CONTROL PANEL</td>
</tr>
<tr>
<td>TM3PS1 – XT1</td>
<td>STEPPER DRIVE / TRANSFORMER</td>
</tr>
<tr>
<td>GW000OF</td>
<td>MOTOR INTERFACE CABLE</td>
</tr>
<tr>
<td>6G 3-060037</td>
<td>FEED ROLLER DRIVE BELT</td>
</tr>
<tr>
<td>A 6H 3RL25265</td>
<td>DRIVE BELT PULLEY (2)</td>
</tr>
<tr>
<td>S228</td>
<td>SPACING WHEEL SSR</td>
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<tr>
<td>MRG-KBMM-EPX</td>
<td>SPACING WHEEL CONTROL</td>
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<tr>
<td>V05159AA80</td>
<td>SPACING WHEEL MOTOR</td>
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<td>SPC-WHL</td>
<td>SPACING WHEEL TIRE</td>
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<tr>
<td>0410N-12</td>
<td>FAN</td>
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<tr>
<td>5A FUSE</td>
<td>LINE FUSE</td>
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<tr>
<td>Bi2-S12-AN6</td>
<td>DOOR PROX SWITCH</td>
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<tr>
<td>Q23SN6LPQ</td>
<td>CYCLE PHOTOELECTRIC EYE</td>
</tr>
<tr>
<td>BRT-40X23</td>
<td>1 INCH SQUARE REFLECTOR</td>
</tr>
<tr>
<td>C14D-02</td>
<td>NUMATICS COALESCENT FILTER/REGULATOR</td>
</tr>
<tr>
<td>NVZ5123-SDZ-01T-MRG</td>
<td>AIR VALVE (4)</td>
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<tr>
<td>VUHO5-U10-5/32</td>
<td>VACUUM GENERATOR</td>
</tr>
<tr>
<td>PGN-116</td>
<td>SUCTION CUP</td>
</tr>
<tr>
<td>EV-25-4</td>
<td>FEED ROLLER CLAMPING MODULE</td>
</tr>
<tr>
<td>2415-5009-004</td>
<td>CUTTER CYLINDER</td>
</tr>
<tr>
<td>CXSM10-25</td>
<td>1” STANDARD PLUNGER CYL</td>
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<tr>
<td>CXSM10-40</td>
<td>1.5” STANDARD PLUNGER CYL</td>
</tr>
<tr>
<td>CXSM10-50</td>
<td>2” STANDARD PLUNGER CYL</td>
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<tr>
<td>0505D02</td>
<td>SMALL CAP DIA SHORT BAND PLUNGER</td>
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<tr>
<td>0505D06</td>
<td>2.5” WIDE STANDARD PLUNGER</td>
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<tr>
<td>0505D07</td>
<td>3.5” EXTRA WIDE PLUNGER</td>
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<tr>
<td>SMBRS</td>
<td>SMALL BAND RETENTION SPRING</td>
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<tr>
<td>0504D15</td>
<td>ADJUSTABLE STABILIZING FINGER</td>
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<tr>
<td>M-5 5” BLADES</td>
<td>5 INCH CUTTER BLADES</td>
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<tr>
<td>M-6 6.25” BLADES</td>
<td>6.25 INCH CUTTER BLADES</td>
</tr>
<tr>
<td>R42RU</td>
<td>1/4” I.D. LIGHT CONTACT BEARINGS</td>
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<tr>
<td>1616RS</td>
<td>1/2” I.D. BEARING</td>
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<td>DISK SPRING</td>
<td>MATERIAL DISK SPRING</td>
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<tr>
<td>M-5 FDRLR</td>
<td>FEED ROLLER ASSEMBLY (SET)</td>
</tr>
<tr>
<td>0502D05</td>
<td>BUTTERFLY ARM SPRING SET</td>
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<tr>
<td>M22NRXD</td>
<td>MATERIAL FEED MOTOR (M-6)</td>
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<tr>
<td>P22NRXD</td>
<td>MATERIAL FEED MOTOR (M-5)</td>
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## RECOMMENDED SPARE PARTS LIST

<table>
<thead>
<tr>
<th>PART #</th>
<th>QTY</th>
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<tbody>
<tr>
<td>NVZ5123-5DZ-01T-MRG</td>
<td>1</td>
<td>AIR VALVE</td>
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<td>05415</td>
<td>1</td>
<td>ADJ STABILIZING FINGER</td>
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<tr>
<td>VUHO5-U10-5/32</td>
<td>2</td>
<td>VACUUM GENERATOR</td>
</tr>
<tr>
<td>PGN-116</td>
<td>2</td>
<td>SUCTION CUP</td>
</tr>
<tr>
<td>5A FUSE</td>
<td>2</td>
<td>LINE FUSE</td>
</tr>
<tr>
<td>Q23SN6LPQ</td>
<td>1</td>
<td>CYCLE PHOTO-EYE</td>
</tr>
<tr>
<td>BRT-40X23</td>
<td>1</td>
<td>REFLECTOR</td>
</tr>
<tr>
<td>M-5 5” BLADE (SET)</td>
<td>1</td>
<td>5-INCH CUTTER BLADES</td>
</tr>
<tr>
<td>M-6 6.25” BLADE (SET)</td>
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<td>6.25-INCH CUTTER BLADES</td>
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</tbody>
</table>

### MACHINES RUNNING .5-1.25” DIA BANDS

<table>
<thead>
<tr>
<th>PART #</th>
<th>QTY</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>CXSM10-25</td>
<td>1</td>
<td>1” STANDARD PLUNGER CYL</td>
</tr>
<tr>
<td>STDBRS</td>
<td>2</td>
<td>STD BAND RETENTION SPRING</td>
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### MACHINES RUNNING 1.25-2” DIA BANDS

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<thead>
<tr>
<th>PART #</th>
<th>QTY</th>
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<tbody>
<tr>
<td>CXSM10-40</td>
<td>1</td>
<td>1.5” STANDARD PLUNGER CYL</td>
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<tr>
<td>STDBRS</td>
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</table>

### MACHINES RUNNING LONGER THAN 2” DIA BANDS

<table>
<thead>
<tr>
<th>PART #</th>
<th>QTY</th>
<th>DESCRIPTION</th>
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<tbody>
<tr>
<td>CXSM10-50</td>
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<td>2” STANDARD PLUNGER CYL</td>
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<tr>
<td>STDBRS</td>
<td>2</td>
<td>STD BAND RETENTION SPRING</td>
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</tbody>
</table>
NOTES UNLESS OTHERWISE SPECIFIED:
1. DE-BURR AND BREAK ALL SHARP EDGES .015 MIN.
CUTTER BLADE REPLACEMENT PROCEDURE

**LEGEND**
1. CUTTER CYLINDER
2. CUTTER BASE ASSEMBLY
3. MALE BLADE
4. MATERIAL GUIDE
5. FEMALE BLADE
6. GUARD
7. VACUUM BLOCK
8. SUCTION CUP
9. 8-32 X .1/2 SOC
10. 10-32 X .625 SOC
11. #10 FLAT WASHER
12. 10-32 X .25 BTN
13. 10-32 X 1 SOC
14. #8 FLAT WASHER
15. PISCO VACUUM GENERATOR
16. CUTTER RAILS
17. SLIDE PLATE
18. SLIDING PLATE BLOCK

**DO NOT TAMPER WITH ITEMS 1 OR 2**
**Procedure Steps:**

**WARNING:** NEVER ADJUST OR TAMPER WITH ITEMS INDICATED!
**WARNING:** BLADES HAVE SHARP EDGES. HANDLE WITH CARE!

1. Turn machine power to **OFF**.
2. Unplug AC power cord.
3. Disconnect air lines from cutter cylinder.
4. Disconnect air supply line from vacuum generator.
5. Remove 3ea. 1/4-20 screws from bottom of cutter bracket.
   
   **Note:** These exact screws must be used to re-install cutter.
6. Remove cutter from machine and place on work surface.
Procedure Steps:

7. Using a 9/64” Allen wrench, remove 2 bolts that hold the vacuum block.  
   **WARNING: DO NOT LOSE SUCTION CUP!** 
   
   Note: Do not remove suction cup from vacuum block unless you plan to replace it.

8. Grab the actuator block attached to the cylinder shaft and make sure that the slide plate moves smoothly in both directions. 
   
   Note: Leave the actuator block in the fully extended position.

9. Using a 5/32” Allen wrench, remove the 2 bolts that hold the material guide on the assembly.

10. Using an 1/8” Allen wrench, remove the guard from the female blade.

11. Using a 5/32” Allen wrench, remove the female blade from the assembly.
Procedure Steps:

Note: The face of the female blade that the guard was installed on will be the **new** cutting edge. Inspect the new cutting edge and insure it is sharp and free of nicks.

12. Using a 9/64” Allen wrench, remove the male blade. Inspect the slide plate surface under the blade. Insure it is clean and has a light coat of machine oil. Wipe off excess oil with a clean cloth.

13. Flip the male blade to expose the **new** cutting edge.

   **Note:** The new cutting edge is on the top surface of the blade. Inspect the new cutting edge and insure it is sharp and free of nicks.

14. Re-assemble the male blade to the cutter assembly with the 2ea. 8-32 x 1/2” screws. Position the male blade so that the screws are in the center of their slots. Hand tighten until they are snug.

   **Note:** Each screw must have a stack of 4ea. #8 flat washers.

15. Move the cylinder actuator to the fully extended position (cutting position).
CUTTER BLADE REPLACEMENT PROCEDURE

Procedure Steps:
16. Install female blade with 2ea. 10-32 screws with one #10 flat washer each. Hand tighten screws until they are just snug. Insure that the new cutting edge is on the inside.
17. Push male blade forward under female blade until its center line is flush with the outside face of the female blade.
   Note: One side will protrude 1/16” and one side will be short 1/16”. This will be the 1/8” shear built into the cutting edge.
18. Insure that side edges of the male blade are still parallel to guide rails.
19. Tighten the 2ea. 8-32 screws that hold the male blade.
20. Loosen screws holding female blade and allow it to rest on top of male blade.
21. Use 2-3 fingers to apply pressure to the top of the female blade while using the other hand to tighten the 10-32 screws that secure the female blade. Always tighten #1 first and then #2.
22. Re-install the guard on the outside face of the female blade with 2 each 10-32 screws.
Procedure Steps:

23. Open and close the cutter by grabbing the actuator block and moving forward and backward. Insure that it moves smoothly. If there is a rough spot or if extreme force is required, loosen the female blade and start the procedure from step 21.

**Note:** As the female blade is re-sharpened, the holes for the material guide will get closer to the male blade. Insure that enough clearance for the male blade to move from open to close without touching the material guide. Clearance holes on the material guide can be opened up to provide more clearance.

24. Re-install the material guide with the 2 10-23 x 1” screws.
25. Push the actuator block back to the fully retracted position. Look into the throat of the material guide and insure that the edge of the male blade is not visible. If it is, restart the procedure at step 14.
26. Place 1 material thickness of the normal banding material used in the material guide and close the cutter. Material should cut cleanly.
27. Re-install the vacuum block with the 2ea. 8-32 3/8” screws.
28. Refer to sheet 1 of this procedure to re-install the cutter on the machine.
HEAT-SHRINK TUNNEL

(MARBURG Industries Inc.)
DATA SHEET

HEAT TUNNEL

Volt: 240 VAC
Amp.: 30 A
Phase: 1
Freq.: 50/60 Hz
Power: 6000 W
Length: 22 inch.
Height:
Height Adjust: 10 inch.
Base: Stainless Steel
Other Spec: GMP

FAN MOTOR

Company: Dayton
Model: 2C915A
No: 7021-3483
HP: 1/30
RPM: 3020
Volt: 240 V AC
Freq.: 50/60 Hz
Amp: 0.58 A/0.54 A
Type: V21B
Class: B
Amb: 40 C
Protect: Thermally Protected

ELECTROSTATIC POTENTIOMETER

INF 240 96
CH 252 CSA 0035DM
Volt: 240 V AC
Amp: 15 A
HEAT-SHRINK TUNNEL

- Stainless Steel Construction
- Flow-through ventilation

This productive unit uses standard PVC heat-shrink stock on a wide variety of bottle shapes and sizes for tamper-evident packaging.

The tunnel is a totally enclosed unit with dual controls, for greater flexibility. It operates on 240 VAC and uses two 3000 Watt Cal Rods as the heat source. With flow-through ventilation, hot air is used to lock the band in place and radiant heat is used for finish shrink.

The compact unit is only 22 inches long, which eliminates the need for a lengthy conveyor. Installation is easily done by your in-house staff using standard tools.

“Comes complete with mounting brackets.”
START-UP AND SHUT DOWN

START-UP

TO START THE SHRINK TUNNEL, SIMPLY PUSH THE POWER SWITCH ON THE SHRINK TUNNEL CONTROL PANEL TO THE ON POSITION. THIS WILL ACTIVATE THE HEATING ELEMENTS. THE SHRINK TUNNEL TEMPERATURE WILL RISE TO THE TEMPERATURE SETTING ON THE THERMOSTATIC POTENTIOMETER ON THE SHRINK TUNNEL CONTROL PANEL. TO CHANGE THE TEMPERATURE FROM LOW TO HIGH –TURN THE THERMOSTATIC POTENTIOMETER TO THE RIGHT (CLOCKWISE).

SHUT DOWN

TO SHUT DOWN THE SHRINK TUNNEL, SIMPLY PUSH THE POWER SWITCH ON THE SHRINK TUNNEL CONTROL PANEL TO THE OFF POSITION. THIS WILL CUT OFF THE POWER TO THE HEATING ELEMENTS.

CAUTION:

BEFORE ANY WORK IS TO BE DONE ON THE SHRINK TUNNEL TURN ALL SWITCHES TO THE OFF POSITION, AND DISCONNECT THE MAIN POWER SUPPLY.
WARNING

FAILURE TO INSTALL, SERVICE AND OPERATE THIS TUNNEL IN ACCORDANCE WITH PROPER ENGINEERING AND SAFETY TECHNIQUES MAY RESULT IN SERIOUS BODILY INJURY.

CAUTION

BEFORE ANY WORK IS TO BE DONE ON THE TUNNEL TURN THE POWER ON/OFF SWITCH TO THE OFF POSITION. ALLOW THE TUNNEL TO COOL DOWN PROPERLY, AND THEN DISCONNECT THE MAIN POWER SUPPLY CORD.
1. DE-BURR AND BREAK ALL SHARP EDGES .015 MIN.

NOTES: UNLESS OTHERWISE SPECIFIED
HEAT TUNNEL LIFT SYSTEM ASSEMBLY

NOTES: UNLESS OTHERWISE SPECIFIED
1. DE-BURR AND BREAK ALL SHARP EDGES .015 MIN.

LIFT SYSTEM

MATERIAL
S.S.

SHEET 1 OF 1

MARBURG IND.