



**PERFORMANCE  
ROOF SYSTEMS™**  
A SOPREMA GROUP COMPANY



# HOT-AIR WELDING

FOR MODIFIED BITUMEN MEMBRANES

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## FOR MODIFIED BITUMEN MEMBRANES



### CALIBRATING YOUR MACHINE

Configure the machine according to the job's requirements using the temperature, speed and air volume dials. For DERBIGUM and DERBICOLOR membranes, use the following settings:

AIR VOLUME	TEMPERATURE	MOTOR SPEED
50%	7 -or- 8	4 -or- 5

*\*Calibrated for standard conditions: 70°F and 50% humidity.*

### PERFORMING A TEST WELD

Many different hot-air welder setups and environmental conditions can adversely affect the overall seam quality of hot-air welded membranes. Given the number of variables, test welds must be done at the start of the day, when welding has resumed after breaks or as the weather changes throughout the day (increases or decreases in temperature, rain events or varying wind, for example). Below is a list of welder setup or environmental issues that can adversely affect the quality of welds:

#### Hot-air welder setup:

- Inadequate power source
- Blower speed
- Broken or missing air dam
- Air intake—clean & free of debris
- Wheels—clean & freely spinning
- Temperature of heating element
- Travel speed of welder (too fast or too slow)
- Proper size nozzle—clean & free of debris
- Proper weight on press wheel

#### Environmental conditions:

- Ambient air temperature
- Humidity
- Blowing winds
- Temperature of membrane to be welded
- Seam contamination from cold adhesive

#### To perform a test weld:

1. Cut two 10-foot-long strips of bitumen for performing a test weld.
2. Once the machine has been calibrated and warmed up, weld the two strips together. A good weld should produce a 1/4-inch bead of bitumen along the edge of the seam. **(Figure 1)**
3. Sample cuts should be made perpendicular to the seam and a minimum of 2 inches wide. They should be made at the beginning, middle and end of the test weld to ensure quality throughout. **(Figure 2)**
4. Once the seam weld has had time to cool, pull the sample apart to test the bonding strength. A quality weld should reveal the scrim or reinforcement of the bitumen material. **(Figure 3)**



**FIGURE 1:** Too much bleed could be a sign of too much heat or the travel speed being too slow



**FIGURE 2:** Minimum 2" wide test cuts should be slit across the welded seam

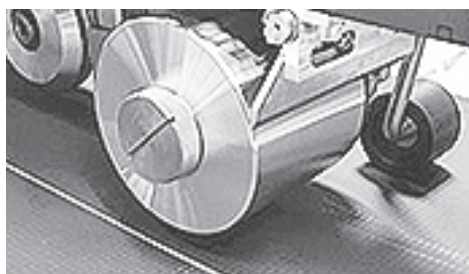


**FIGURE 3:** Underheated weld (left) compared with a properly-welded seam that separates at the scrim (right)





**FIGURE 4:** Lower tracking guide aligned with seam



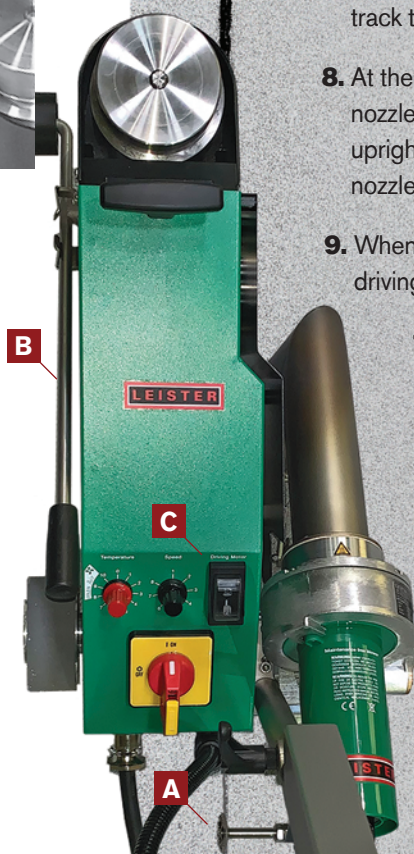
**FIGURE 5:** Lifting device handle engaged; pressure/drive wheel raised off membrane



**FIGURE 6:** Slide nozzle head under seam

## MACHINE WELDING APPLICATION

1. Place the pressure/drive wheel approximately 3/8 inch off the seam. **(Figure 4)** Then lower the tracking guide wheel **(A)** aligning it with the seam.
2. Engage the lifting device handle **(B)** to raise the pressure/drive wheel off the membrane. **(Figure 5)**
3. Before warming up your machine, unlock the blower and lift the nozzle to the upright position. **(Right)**
4. Set the air volume to 50% and the **red** temperature control button to 7 or 8. It will take approximately 3 to 5 minutes to reach the ideal welding temperature.
5. Set the **black** motor speed button to 4 or 5, then press the driving motor switch **(C)** to engage the pressure/drive wheel.
6. Unlock the blower and lower the nozzle head. Insert the nozzle under the membrane seam, sliding it in as far as possible. **(Figure 6)**
7. Lower the lift device handle to set the welder in motion. Be sure to have a firm grip on the machine because it will immediately take off. Slowly navigate the welder, allowing the guide wheel **(A)** to track the seam's edge.
8. At the end of a seam, unlock the hot-air blower and remove the nozzle from under the seam. Lift the blower head and lock it into the upright position. For each seam, reset the machine and keep the nozzle head clean.
9. When finished, engage the lifting device handle and press the driving motor switch **(C)** off.
10. Set the **red** temperature control to 0 and raise the air volume to maximum. This will help gradually cool down the heating element. During this time, use a wire brush to scrape off any melted-on bitumen from the nozzle. **(Right)**
11. After 3 to 5 minutes, it's safe to turn off the welder and place it back into its storage case.



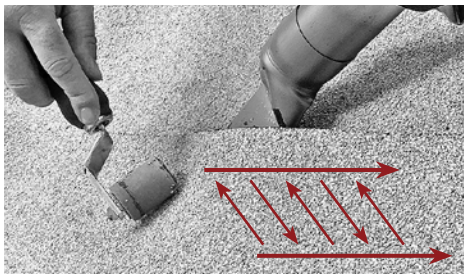


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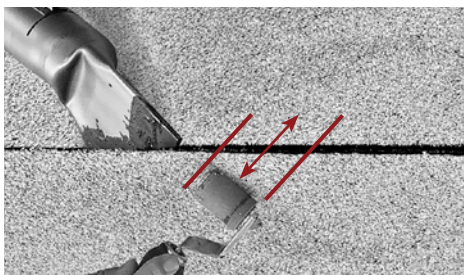
## HAND-HELD WELDING APPLICATION



**FIGURE 7:** Stitching the overlap



**FIGURE 8:** First pass



**FIGURE 9:** Second pass

1. Power on the welder and set the potentiometer knob to 7 or 8. It will take approximately 3 to 5 minutes to reach the ideal welding temperature. **(Right)**
2. Before you begin, verify that the areas to be welded are clean and dry. Also, check that the seams are aligned and have the minimum required overlap.



### For DERBICOLOR membranes:

To embed granules, run the nozzle over the surface until it begins to turn black. Next, slowly press the granules into the membrane with a metal roller or trowel.

**(Left)**

3. Lift the top layer of the membrane to insert the end of the hand-held welder nozzle at a 45° angle to the seam. Using a 2-inch roller, firmly apply pressure parallel to the end of the nozzle to seal the overlap. **(Figure 7)**
4. Use a two-pass technique when using a hand welder. With the first pass, fully insert the nozzle into the seam and weld the inner portion of the seam. Using enough pressure to ensure adhesion, create an air dam. **(Figure 8)**
5. With the second pass, finish the weld by repeating the process above with the outer seam portion. Continually monitor the seam for proper bleed-out. **(Figure 9)**
6. When finished, leave the blower motor running and set the potentiometer knob to 0. The airflow will help gradually cool down the heating element. During this time, use a wire brush to scrape off any melted-on bitumen from the nozzle.
7. After 3 to 5 minutes, it's safe to turn off the welder and place it back into its storage case.

