

## PVC Waterproof Deck Seaming— A Two Pass Hot Air Method

By Matthew Whale  
Duradek Northwest

Hot air welding of vinyl deck membrane seams are achieved with heat air and pressure. This may sound simple but consider that no practical amount of heat without the proper applied pressure can assure watertight seam performance. Likewise without the correct amount of heat, melding is futile regardless of the pressure applied. The seam may appear welded but a surface bond is not a meld. Hot air welding is the process and melding is the goal, for melding is to cause things to combine in a way that they become one, in essence a true single-ply deck membrane.

A properly prepared and fully melded seam is permanent to the molecular level. For a melded seam failure to occur the membrane physically must decompose. This eventual breakdown is relative to a products exposure, formula and thickness. Since the melded seam is now molecularly twice as thick as the sheet material it will commonly provide greater seam life and strength.

The opposite is just as true, a poorly bonded or cold weld seam will always be questionable. Improperly welded seams are simply surface bonded to each other, like paint stuck on glass. When expansion and contraction coefficients or abrasion is introduced the peel strength of the seam is tested and thus becomes subject to failure. A non-melded seam will never become a proper welded seam.

Understanding the vinyl sheet you are using and its welding characteristics are key. Softening temperature, texture, print, reinforcement, as well as reinforcement placement play significant roll in welding. Now add the variables of deck surface and ambient temperature, moisture, welding equipment and power supply and when adjusting or correcting accordingly, you will begin to decrease the problem potential.



The CAN/CGSB-37.54-95 and ASTM 4434 establishes measurable quality standards for Polyvinyl Chloride Roofing and Waterproofing Membranes which encompasses seam strength. In part these tests require a fully welded seam to achieve a given peel strength when stressed. To achieve a passing result the materials must not break its bond or must exceed the elongation thresholds. Whether vinyl, fleece or cloth backed membranes are used, all seams need to comply with the parameters. The 34 year old waterproof vinyl deck industry has established a 60 mil membrane utilizing a 3/4 inch seam lap as provable for compliance.

Consistent melded membrane overlaps provide reliable performance as well as aesthetics. The additional cap welded or rolled sealed seam edge helps remove dirt collection potential, it lessons trip hazards, and provides a final check and balance. It is not intended to be the only means of watertight protection.

Before one begins to weld, verify all products are clean, dry and suitable for welding. Remember that any foreign debris can hinder, even block, the melding. Contact rubber based glue is a common contaminate and will stop molecular welding, this must be removed prior and no amount of heat will change that fact. A wet seam can be dried if wiped with alcohol or white gas and allowed to evaporate. Keep in mind that the appearance can

be altered with solvents so test on a sample piece prior to use.

When welding, heating each surface within the seam, top and bottom with consistent, proper and even heat is paramount. Too much heat in a focused area, like a seam, will char the membrane rendering a percentage of the seam inert or useless. Low heat produces too much heat penetration. This allows the reducing or eliminating of the embossed texture from the exposed top seam when the proper pressure is applied. To minimize this potential always adjust your heat gun and speed to the current variables of the day.

“Vinyl backed” membranes are the commonly simplest to seam of the meldable deck membranes, this is due to the lack of foreign materials or reinforcement at the seam. To begin welding this type of membrane slide the heat gun under the seam to the working area. Trap the properly adjusted amount of heat in the full width of seam by working your roller as close to the welding tip as possible. As the seam materials become fluid or viscous, which can only be understood through repetition and practice, apply proper pressure, some flow may be visible at the edge of the seam but is not a requirement. Stopping and checking seam integrity regularly is your best defense. A PVC seam checking tool, heater hose tool or cotter key extractor is ideal for this procedure.

The “cloth backed” membranes weld similarly and the process is identical to the “vinyl backed” application; it has only the adjustment of heat focus. Heat should be focused more on the cloth seam top rather than vinyl seam bottom. This is achieved simply by tilting the tool tip to the top membrane. Here again, verify technique is achieving melding.

A “fleece backed” vinyl has an extra step to assure welding. This is achieved by passing your heat welder over the fleece on the top seam without allowing the top to join with the bottom seam. Visually watch the heat melt this backing fabric into consistent little bead of plastic, they should be uniform in spacing to achieve the desired results. Remember if you can’t dissipate it without burning through it you won’t be able to weld it (bond it maybe, meld it ,no.) After this process is complete welding becomes similar to “vinyl to vinyl” welding. Watch out that, during the welding process, the beads may collect on the welding tip allowing the charring and then spitting dark globules out at the seam. Cleaning the tip often with a wire brush will minimize the potential.

The cap weld is the final step of the seam process. After verifying seam integrity and removing any darkened ash from the lap area begin capping. Heat the lap edge (approximately ¼ with) to a viscous state and meld the two surfaces together applying pressure using a rounded silicon roller, held at an angle, or embossing stamp. Care is taken not to overheat and glaze too much of a working area with heat. The 1/8 to 3/8 glazing of the seam edge is common and usually temporary but a leveled area due to over heating is permanent.

A vinyl seam will remain as long as the deck membrane does and thus needs to be melded properly and flawlessly. Keep in mind twenty years is a long time to look at a mistake. Furthermore an un-melded seam can cause a leak, allowing a little rot or even catastrophic damage.

