

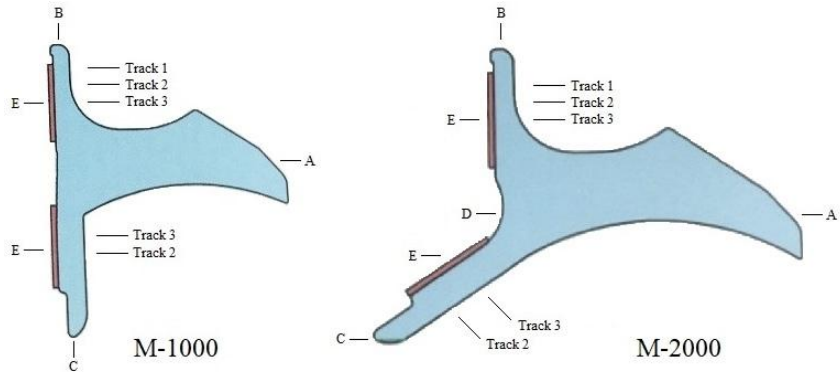
# **THE-SMART-RAIL® SYSTEM**

CLEAN, PEEL, STICK, & INJECT ADHESIVE

For 100% satisfaction, read and follow instructions carefully.

Elements of *THE-SMART-RAIL*:

- A = the BODY
- B = the WALL
- C = the TAIL
- D = the INSIDE CORNER
- E = the BONDING STRIPS



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The surface temperature of the HULL and RAIL **must be AT LEAST 70 DEGREES (F)**. In cooler weather, an outdoor heater directed onto the application area can be used to raise the temperature.

### ***Resources Needed:***

1. A roll of white paper towels
2. 1 pint of Acetone (as a solvent wash)
3. A quality non-ratchet caulking gun with swivel feature
4. 1 pint of Isopropyl Rubbing Alcohol
5. A Disc Sander with appropriate grit sander paper
6. A few sharp pencils
7. A capable assistant and yourself

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### **1. SURFACE PREPARATION FOR FIBERGLASS BOATS**

Decide the location of each rail to be installed, port and starboard. Mark and measure the exact length of each rail (they may differ slightly) and mark the lengths on the hull. Within the marked application area, remove all paint, dirt, and wax, but **NOT** the gelcoat.

For high-speed boats (+30kts) or boats with old gelcoat, sand/remove gelcoat down to the laminate, then prime with resin so that the **tail** bonding strip and structural adhesive bond directly to the primed fiberglass laminate. Use a sander with aluminum-oxide paper until smooth, then wet sand with the abrasive paper provided, dipping the paper in water frequently to rinse out loose particles. Wet sand to a smooth surface.

Thoroughly wipe the application area with **Acetone**, frequently changing towels. Wipe dry with a clean towel before liquid dries. A final wipe with the **Isopropyl Rubbing Alcohol** completes this operation. Gelcoat retains moisture, so allow it to **DRY THOROUGHLY**.

## 2. INSTALLATION OF THE GUIDE LINE

First, mark a vertical start line on both sides of the bow at an equal distance from the stem.

**M-1000:** A displacement hull does not provide for a predetermined rail location. The perfect solution is to study the effect of waves striking the bow in all sea and speed conditions to determine the optimal location of the rail. The guideline is generally set above the bow wave at cruising speed. Once the first side is done, measure distances from the waterline up to the guideline, every foot. Then, mark those positions on the other side. Reviewing the placement guide is recommended.

**M-2000:** Using the **rail template**, press its **inside corner** firmly onto the chine, with the **wall and tail** pressed up against the side and underside of the chine (see Fig.4/Page 6). While holding this position, slide the template slowly along the application area, from stern to bow, drawing a pencil line on the hull, using the wall top as a guide (practice sliding the template along the chine before marking). The resulting line must be exactly parallel to the chine, no bumps or dips.

**NOTE:** See Fig. 4 on Page 6. In some cases, the M-2000 may be installed slightly back of the stem for a better fit on the disappearing chine.

Some hulls have a **disappearing chine**, (**this is when the chine gradually tapers or becomes flat at the bow**); have the assistant place a straight ruler in line with the line you just drew and continue drawing the line towards the bow. When both sides of the boat are done, stand facing the bow and make sure the two lines meet at the bow.

The radius of the chine edge may increase going aft. The chine angle may vary from bow to stem. Make sure that the position of the rail is at the same general angle as Fig.4/Page 6, and not excessively angled up or down. The flexibility of the tail when heated allows you to fit it to the changing angles. **Practice** with the template and the handling of the rail with your assistant to ensure that the steps of the process are understood before committing to the procedure.

From this point on, pick one side of the boat and perform steps 3 to 6, **without interruption**. Make sure that no foreign materials have corrupted the area.

## 3. APPLICATION OF 3M-94 PRIMER

Four ampoules are supplied, one for each 91” bonding strip area. Thumb-crush ampoule on the dot, shake a few times, pointing ampoule downwards. Lightly apply primer to the hull, below the guideline, along the 91” area where the upper ½” bonding strip is applied; shake the ampoule frequently. With the next ampoule, repeat the process for the lower bonding strip area.

**NOTE: M-2000:** while applying primer under the chine, point the ampoule downward frequently to supply constant flow of primer to wick. Primer evaporates quickly; a light coat is sufficient. Double coat “disappearing chine” area if there is one.

#### 4. REMOVAL OF RELEASE LINER FROM THE WALL BONDING STRIP

With clean hands, remove the **red release liner** from the wall's bonding strip **ONLY**. **DO NOT remove the release liner on the tail bonding strip.**

#### 5. RAIL APPLICATION – WALL SECTION

Once in place, the rail stays, so make sure you follow the guideline!

Starting at the bow, the installer applies the wall 1/8" below the guideline with firm thumb pressure. The assistant holds the rail away from the hull, level with the guideline, stretching the rail aft, protecting it from contact with anything else. Continue applying the wall up to the end of the rail inch by inch with one hand holding the body and the other applying firm thumb pressure on the wall, following the guideline for smooth installation.

Using the single round edge wheel of the installation tool, from the bow end, apply roller pressure, first along Track-1, then 2, and 3. **NOTE:** Apply approximately 30lbs. pressure, advancing a few inches at a time (you can determine the pressure on a bathroom scale).

Marking the rail with a pencil every foot, top and bottom, will help monitor the progress of the tool procedure. Check off each section after roller pressure is completed for each of the three tracks. This procedure prevents air from getting trapped between the hull and the bonding strip.

#### 6. RAIL APPLICATION – TAIL SECTION

Start the tail application at the aft (back) end. Bending the body upwards allows you to remove the release liner 12" at a time so that the tail does not prematurely bond to the hull. The assistant checks for a straight body alignment while the installer applies firm thumb pressure, holding a few seconds in each position.

If you reach a disappearing chine as you approach the bow, the assistant may heat the tail with a hairdryer, for instance, to increase flexibility. Firmly press the bow into the hull while pulling the tail back so that it bonds to the vertical part of the hull. **Practice this procedure before removal of the release liner.**

The tail bond is under the greatest stress, perfect bonding of every inch is essential.

The assistant, using both hands on the installation tool, applies about 30lbs. of pressure along Track-1, 2, and 3 from bow to stern. Extra pressure on the tail along the disappearing chine is recommended, along with heat (from the hairdryer), because the tail tries to return to its original angle (M-2000 only).

**Return to Step 3 for the other side. Once both are completed up to this step, continue to Step 7.**

#### 7. STRUCTURAL ADHESIVE SET-UP

**REMINDER:** the mixed adhesive hardens in approximately 15 minutes.

First, decide between the straight and curved needle tip depending on the angles of the application. Do not remove the cap on the adhesive yet (even if you are curious). The adhesive will mix.

#### 8. ASSEMBLY OF ADHESIVE APPLICATION TOOLS

Once you have bonded both port and starboard rails and you are ready to apply the structural adhesive, set up the dispensing system. Insert the cartridge nose-first through the oval opening of the clear sleeve until its flange fits snugly against the end of the sleeve. Now, put the whole assembly into the caulking gun (Fig.1/Page 6); secure the sleeve to the caulking gun with tape. Place the blue plunger into the back end of the cartridge (Fig.1/Page 6). Make sure the plunger is aligned properly with the cartridge. Select the desired needle tip, bent or straight (one or the other is easier to use depending on the position you assume in handling the caulking gun).

Remove the cap from the adhesive cartridge with a  $\frac{1}{4}$  turn. Make sure that the exposed resin and activator have not hardened; clean out the channels (if necessary) with a small nail, though be cautious not to mix the two elements on the nail. Install the static mixer on the cartridge with a firm  $\frac{1}{4}$  turn. If using the bent needle tip, align it in the caulking gun so that the bend points upward and away from the direction of travel, i.e., starting from the stern end and working towards the bow, the bent needle tip points toward the stern, and vice versa. Firmly force the needle tip onto the mixing nozzle. Squeeze out a small bead of adhesive until it changes from light yellow to white. This indicates a correct mixture. The adhesive system is now ready for use.

#### 9. ADHESIVE APPLICATION

Stress is greatest on the tail, so the following instructions are critical for success.

**M-1000:** Insert the needle tip deeply into the gap and inject the adhesive moving about  $\frac{1}{4}$ " at a time, completely filling the gap. Lightly smooth out the adhesive before it hardens. Make up new assembly as required and continue the second coat after the first has hardened. Remember to fill the ends and top well with a small amount of adhesive.

**M-2000:** This process is applied in two passes; each pass includes both rails. One hand operates the gun as the other steadies the needle tip. Starting at the chosen end of one rail, insert the needle tip under the tail edge so that it just touches the edge of the bonding strip (Fig.2/Page 6). Inject the adhesive deeply into the gap, filling it with a  $\frac{3}{8}$ " bead (like spot welding), then pull the needle out straight, advance about  $1\frac{1}{2}$ " and inject another  $\frac{3}{8}$ " adhesive bead and so on until you reach the end of the rail. Do the next rail the same way. The assistant, with latex or vinyl gloves, presses the adhesive beads well into the gap. Do not remove any adhesive.

After the beads have hardened, set up a fresh set of cartridge/mixer/needle into the caulking gun. Return to the starting point and fill each bare 1 1/2" section, injecting the adhesive to fill the gap completely. With gloves, smooth out the edge of the adhesive so it overlaps the tail edge and hull.

With the remaining adhesive, apply a small amount along the top of the wall; fill the gaps at the rail ends (inside corner), and apply a second overlapping coat along the tail edge at the waterline and along the disappearing chine. Use all the adhesive supplied. After the adhesive has cured, any high points can be sanded. Allow the adhesion process to run its course. The structural adhesive cures in about 1 hour, 80% of the adhesion of the bonding strips in about 2 hours, and 100% in 36 hours at 70 degrees (F). After the structural adhesive has cured, you may heat the wall and the tail with heat/hairdryer to accelerate the bonding process.

#### 10. CONNECTING RAILS

The rail ends must meet at a perfect 90 degrees. Use a table or chop saw, rough up ends with 120 grit paper. Spacing the rails 1/16" to 1/8" apart, apply a strip of clear packing tape over the top of the joint, then deeply inject the adhesive from the bottom, using the needle tip until the joint is filled. Remove excess adhesive from the bottom.

#### 11. PAINTING THE RAILS

**NOTE:** A primer may be needed for some paints. Consult with a paint professional.

Before applying paint or trim tape, wipe the surface down with **Acetone**. Vinyl spray paint (available at automotive stores) because of its flexibility or oil bottom paint can be used.

#### 12. CUSTOMIZING THE ENDS OF THE RAILS

After the adhesive has hardened, taper the ends with a disk sander/medium grit paper. Rub with an Acetone-soaked rag to smooth out the area. It is advisable to round off all sharp edges.

#### **NOTE: STORAGE OF RAILS AND ADHESIVE KIT BEFORE INSTALLATION**

Store the rails in a cool, dry area. To extend the shelf life of the adhesive, cartridges should be properly packaged and kept under refrigeration (do not freeze). Before using, allow rails and adhesive to reach the required minimum 70-degree (F) application temperature.

#### **WARNING! Do not use the rail as a footstep or hand hold.**

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With the rails installed, the boat may turn much more sharply, especially at speed, possibly creating an unexpected centrifugal force which could put the passengers at risk. Try smooth turns first to familiarize yourself with performance changes. Test the boat under all sea and speed conditions before active use. Also, follow the safety recommendations of manufacturers of all products used during installation. Keep all adhesives away from open flame, sparks, and children.

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RAILS MUST BE PROTECTED FROM THE LIFTING STRAPS. USE WOODEN BLOCKS OR SANDBAGS. Place a warning label at helm.

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*Integrity Marine Corp makes no warranties, expressed or implied, including but not limited to, any implied warranties of merchantability or fitness for a particular purpose. The exclusive remedy, if any, to the original buyer/user of the THE-SMART-RAIL shall be the refund of the purchase price (no more than the suggested retail price) of, or to repair or replace the product at IMC's option, provided the product is returned shipment prepared, after IMC has been notified in writing and has agreed in writing to accept such responsibility. We are confident that you will be delighted with the performance improvements of your boat. Your comments and suggestions are welcomed.*

