

COPPER SHEATHING A HULL USING SELF-ADHESIVE COPPER TAPE

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Using self-adhesive copper tape to sheathe a hull is a satisfactory alternative to the far more time-consuming method of installing copper plates one at a time. It is also less costly, much easier to install, and looks good, too.

HULL PREPARATION:

In order for copper tape to adhere well, the surface of the planking must be prepared to accept the adhesive on the back of the copper tape. If you have used hardwood for your planking, it is only necessary to sand the planking smooth and remove all traces of sawdust or other debris. However, if you've used a soft wood for your planking such as basswood or pine, it is essential that you paint a coat of sanding sealer onto the planking first, mainly because soft woods are too porous to provide a good adhesion for the tape. After applying the sanding sealer, sand the surface lightly. Check it again. If it still seems a bit porous, repeat with another coat of sanding sealer, and sand lightly afterward. The less porous the surface, the better the adhesion will be.

TOOLS AND MATERIALS:

1. **A cutting board:** Any hardwood surface will do as long as it has a smooth surface.
2. **Self-adhesive copper tape:** This tape comes in a standard roll that is 36 yards (32.92 m) long. Two widths are available: ¼" (6 mm) and 5/16" (8 mm). A single roll of tape will cover a hull about 24" (610 mm) long, with a 6" (152 mm) beam, and with a 5" (127 mm) depth. One roll costs about \$10 (USA). The copper itself is coated with extremely sticky glue, and it adheres temporarily to a waxed paper backing. This is the same tape used by folks who work in stained glass.
3. **Pounce wheel:** This device will be used to imprint rivets in the copper tape before it is placed on the hull. It contains a very small sprocket-line wheel at its end that makes the rivet-like impressions as it is turned along the surface of the copper. Pounce wheels come in several sizes that are measured by the number of impression-points per inch, with each impression-point representing a rivet. Make sure you choose a pounce wheel that corresponds to the number of rivets per inch that are required for your particular vessel.
4. **X-Acto Knife:** A No. 11 blade is recommended. It is used to part the copper from its waxed paper backing.



5. **Thin Steel Ruler:** It must be thin enough so that the pounce wheel turns effectively and makes the proper impression in the copper tape.
6. **Scissors:** A small pair is needed for cutting lengths of copper from the coil.
7. **Burnisher:** This is simply a hard, smooth plastic knife-like device that can be purchased for a small sum at artist-supply stores. It is not an essential tool for this job, but many people like to use them for applying pressure to the copper once it's installed on the hull to ensure that the copper adheres firmly. Myself, I have found is sufficient to run the copper tape onto the hull with the firm pressure on my finger.

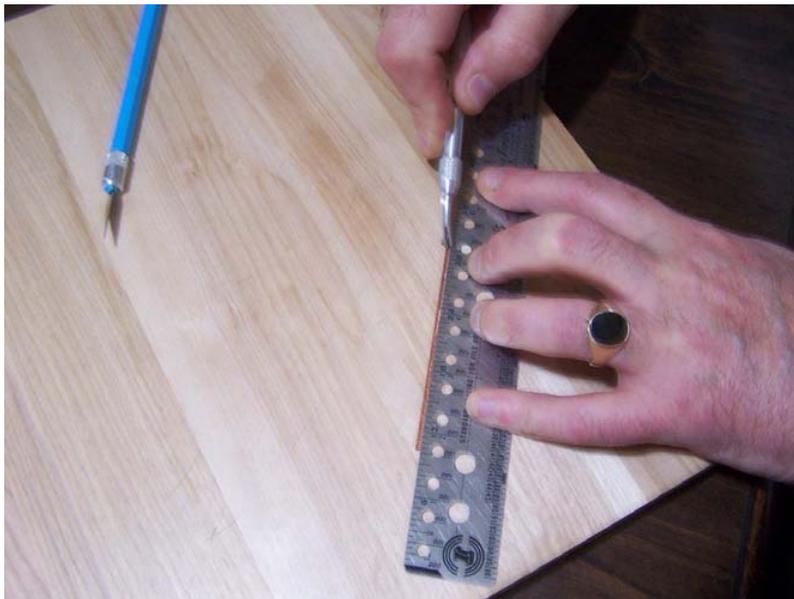
USING THE COPPER TAPE

The first few inches of the coil of copper tape will not be good enough to use, so simply cut this portion off with a pair of scissors and discard it.

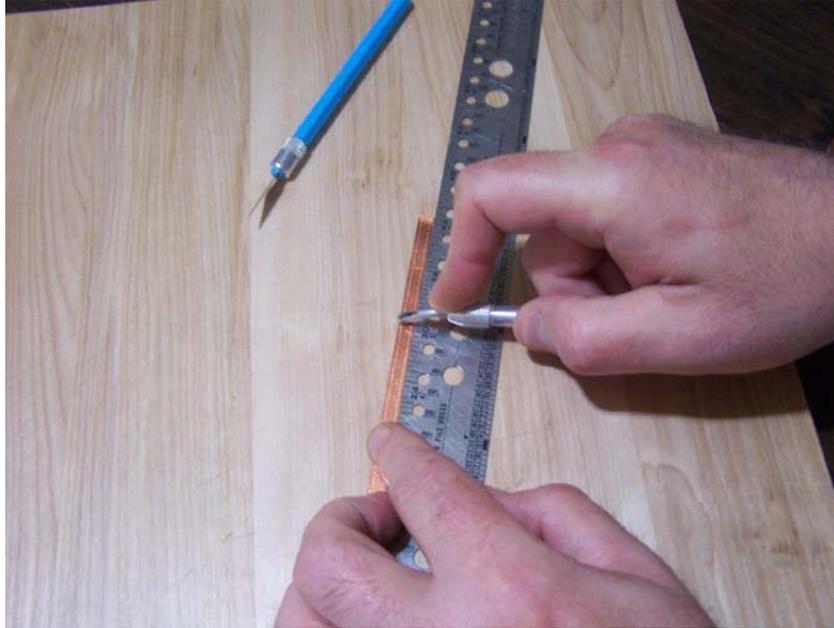
On a full-size ship a single copper plate typically measured 14" x 48" (35.6 cm x 121.9 cm), especially on 19th century ships. Your ship may be different. You should do some research to make sure this is the size of the plates on your particular ship. If you are building your model on a 1:48 scale, this would measure about 5/16" x 1" (8 mm x 25.4 mm). Thus, your copper tape should be 5/16" (8 mm) wide. It is recommended that you don't use copper tape longer than about 6" (152 mm), because it becomes too difficult to handle at lengths longer than this. This means, in our 1:48 scale model, you should cut lengths exactly 6" (152 mm) long, which will represent six copper plates side by side. Measure these lengths on the coil of copper by placing a small mark on the copper tape at 6-inch intervals. Using a pair of scissors, cut these lengths of tape neatly across the marks you made on the tape.

After you have cut a supply of 6-inch lengths, you are ready to use your pounce wheel to make rivet-like impressions. Make sure you use the pattern indicated on the plans for your vessel. Some copper plates not only have rivets around the edges but also may have rivets in the center, sometimes even diagonally. The following instructions are given only to show the general procedures for creating copper plates using self-adhesive copper tape.

1. Place a strip of copper tape onto your cutting board so that it lies flat. Use your fingers to straighten it out, if necessary. Place the steel ruler on the tape so that pounce wheel will make impressions in the copper about 1/32" (1.5 mm) from the edge of the tape. Holding the ruler firmly in place, run the pounce wheel all the way across the tape at the edge of the ruler. Turn the copper tape around and repeat on the other edge.



2. Now take the strip of copper and place it against the outer edge of the steel ruler. Using the pounce wheel, make double lines at 1-inch intervals to represent the riveted separations between plates. Mark these perpendicular and between the upper and lower lines of rivets. Start at the top of the upper rivet line and go down to the lower rivet line, with the steel ruler acting as a stopper for the pounce wheel.



3. Make only a single line of rivets at each of the outer edges. The outer edges will rest adjacent to another 6 inch length of tape on both sides. You are now finished with the first strip of copper tape. You can make as many as you can. They will look like this:



4. Make as many copper tape strips as you think you will need. Of course, you can make a few at a time, installing them on your ship as you go.

5. To install your first piece of copper tape, part the tape from its waxed paper backing by placing the edge of an X-Acto knife between the two, slicing it gently and pulling the tape off about ¼" (6 mm). This may be a little tricky at first, but you'll soon figure out the best method for yourself.



6. Place the face of the copper tape upside-down on a flat surface while holding the very tip of the tape you just lifted from its backing with the finger and thumb of your left hand. Hold it gently; it will be extremely sticky, so you don't want to grip so hard as to remove its stickiness. Then use your right hand to lift the backing off the tape. You must manipulate the tape in such a way that you don't make unwanted creases or wrinkles in the copper. Keep the copper as flat as possible at all times. Again, after you've removed the backing from a few strips, you will develop a good style for yourself.



7. The best place to install the first strip of copper is at the stern-most edge of the bottom of the keel. So, using both hands, attach the copper strip there. Make sure it is centered, even, and has no wrinkles. It can still be lifted with an X-Acto knife to make adjustments at this point. Once you are satisfied, press it down firmly, ensuring that it sticks. Rub your finger firmly all along all parts of the strip.

Some folks use a burnisher at this point to rub it all over to make sure it sticks. It's also a good idea to rub it so no fingerprints show.

8. The next copper strip should be placed with a very small overlap over the edge of the first piece, just enough so that you can't see the planking. Keep placing the copper strips until you reach the waterline at the bow. Before pressing this strip in place, cut off the unwanted copper just at the waterline with a razor blade or sharp X-Acto blade.
9. To start a new strake of copper strips, place the first piece so that the rivets are staggered in a brick-line fashion. You will have one-half inch that will be cut off from the first strip of the second row. Overlap this strip very slightly over the first strake, just enough so you don't see the planking beneath.
10. Continue installing your copper strips as described. There are three general rules you must follow in laying your copper strip properly:
 - a. Follow the pattern of copper plating that applies to your own specific ship. In most ships, the plates are laid in bands, but now always.
 - b. Always lay the strips from aft to forward, which is true for all ships.
 - c. Always lay the strips from the keel upward, which is also true for all ships.
11. When you reach the waterline, some of your copper strips may require that they be cut off at angles. Do this with a razor blade or sharp X-Acto knife, making sure that your waterline is perfectly straight.

A couple of photos will illustrate the finished coppering process. Now that you've finished sheathing your ship with copper strips, you should be pleased with the results. It is a very satisfactory substitute for the tedious process of installing copper plates one at a time. Like copper plates, the copper tape will take on a patina of its own over time.



