

How to Build TOGA Floats 2023



Four Foot Wire Bender for Making the Taylor Float

The 2x6 inch boards are 50 in. long with 48 inches between the end screws. A 42 inch bender is made the same, only shorter, with 40 inches between the end screws. It is made for the flip float, but can still be used for larger floats , but a little less convenient.



First a $\sim 3/8$ in. chamfer is cut along each 2x6. This is to make room later for the hinge barrels.



Wire Bender

Screw holes are drilled for the #8 2 in. deck screws at intervals of 4 inches, at a ~30 degree angle (from vertical), right along the top of the chamfer. The metal jig for spacing and aligning the screw holes is shown here but it was actually used where the screws are. A wooden jig can be made as well.

Here a 5/8 in. router bit set 3/4 in. deep was used to cut grooves about 1.25 inches down, exactly opposite the screw hole. This makes space for the screws to rotate when bending. The grooves can also be made with a large drill bit and a jig saw. Does not have to be pretty.



Place 3 inch door hinges between the screws as shown. I like to use 1.25 deck screws rather than the screws that come with the hinges.

The handles are the cheap 1x4s cut in 2 foot lengths and assembled with 1.25 in. deck screws.



Wire Bender

Last, drill in the 2 inch deck screws leaving about 5/8 inch exposed. There should be about ¼ inch between the top of the hinge barrels and the screw heads. Rotate the bender until completely closed to make sure the screws are completely clear of the grooves. Then test the bender on a real piece of 1 inch mesh 16 gage oyster float wire. For long term durability, the bender should be painted.



Taylor Float



Start by cutting the main wire panel 4' wide by 5' long. The lid wire panel is 30" wide by 42" long. Then cut out the corners.

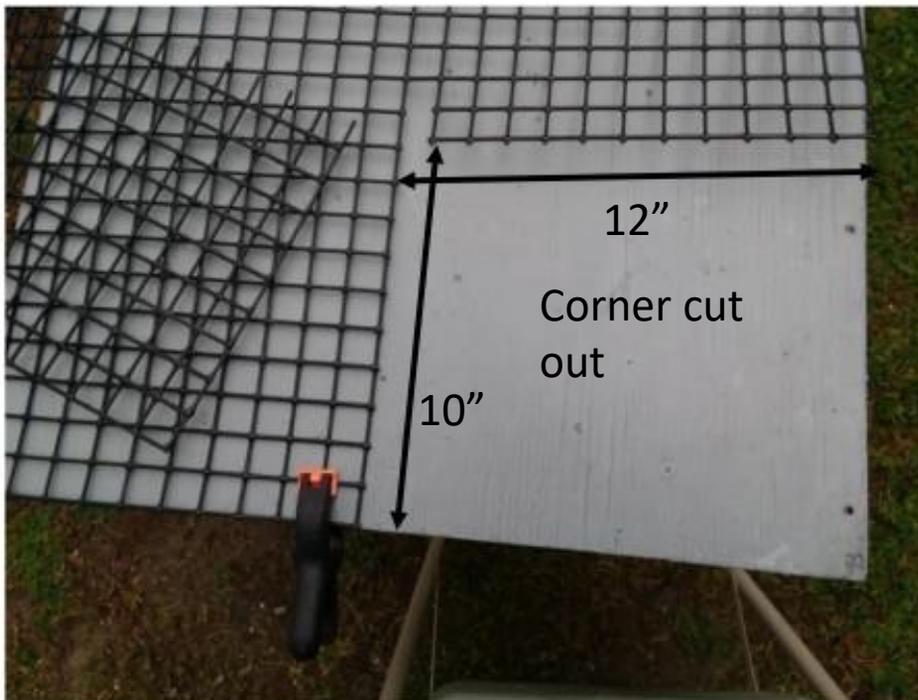


Taylor Float

Template for Taylor Float
available at float workdays

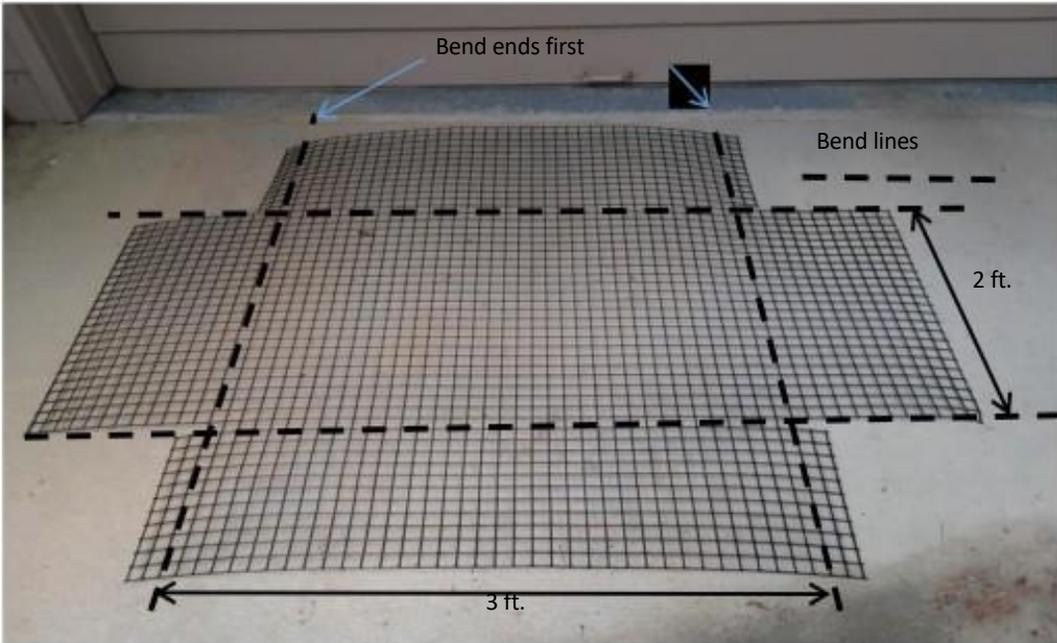


Cut Out the Corners



Taylor Float

Bend lines



Clamp Bender to Table



Taylor Float

Bending the basket

First bend, repeat at both ends, then bend the long edges. This method creates reinforced corners.



Pig ring the reinforced corners.



Taylor Float

Pig ring all 4 corners, 2 inch overlaps on the outside of the basket.



Assemble the thin wall 4" drain pipe PVC donut. Long pipes cut to 36.5", short pipes 24.5". Use the compact short drain pipe elbows.



Taylor Float

Apply primer to elbows and pipe. Add heavy-duty cement one corner at a time. Work fast while the cement is wet.



After adding second elbow on the short pipes, press hard on a table to align the elbows so the long pipes will be parallel.



Taylor Float

After priming and adding glue, insert the long tubes as shown.



Complete the donut with the other assembled short end.



Insert the basket and apply large cable ties (18" or 24") to secure the donut to the basket.



Taylor Float, Bending the lid.



Starting on a long edge, bend the outer 2 rows of mesh into a triangular stiffener, as shown, using ~ 135 degree bends. Repeat on the opposite long edge.

Then the same on the short edges.



Finished lid.

Taylor Float

Completed Taylor Float with Top



Flip Float

How to Build a Flip Float with Reinforced Seams



In 2013, TOGA started to build flip floats with reinforced (or overlapped) seams. This results in a stronger device with a longer life. The end product is a wire-mesh box that is 39" long, 23" wide, and 6" deep. It will hold up to 300 3" oysters. When sitting vertical, the cage should not be more than 1/3 full of oysters. Flip every few weeks to minimize fouling. Occasional spraying down may also be required.

Flip Float

Tools and Supplies Required

Source

5' by 4' piece of 16 gauge vinyl-coated wire mesh.

OPR*

½ lb. stainless pig rings, ½ or ¾ in.

OPR or hardware store

Pig ring tool

same

4 24" or 18" cable ties

same or home store

2 ft. length of 1/4" bungee cord or similar

same

Crab pot hook or similar

same

Wire bender**

TOGA

Wire cutter

hardware, home store or similar

10' length of thin-wall sewer pipe, 4" dia. ***

same

4 4" sewer pipe caps

same

Purple primer for PVC

same

Heavy duty PVC cement

same

Saw to cut 4" PVC sewer pipe

same

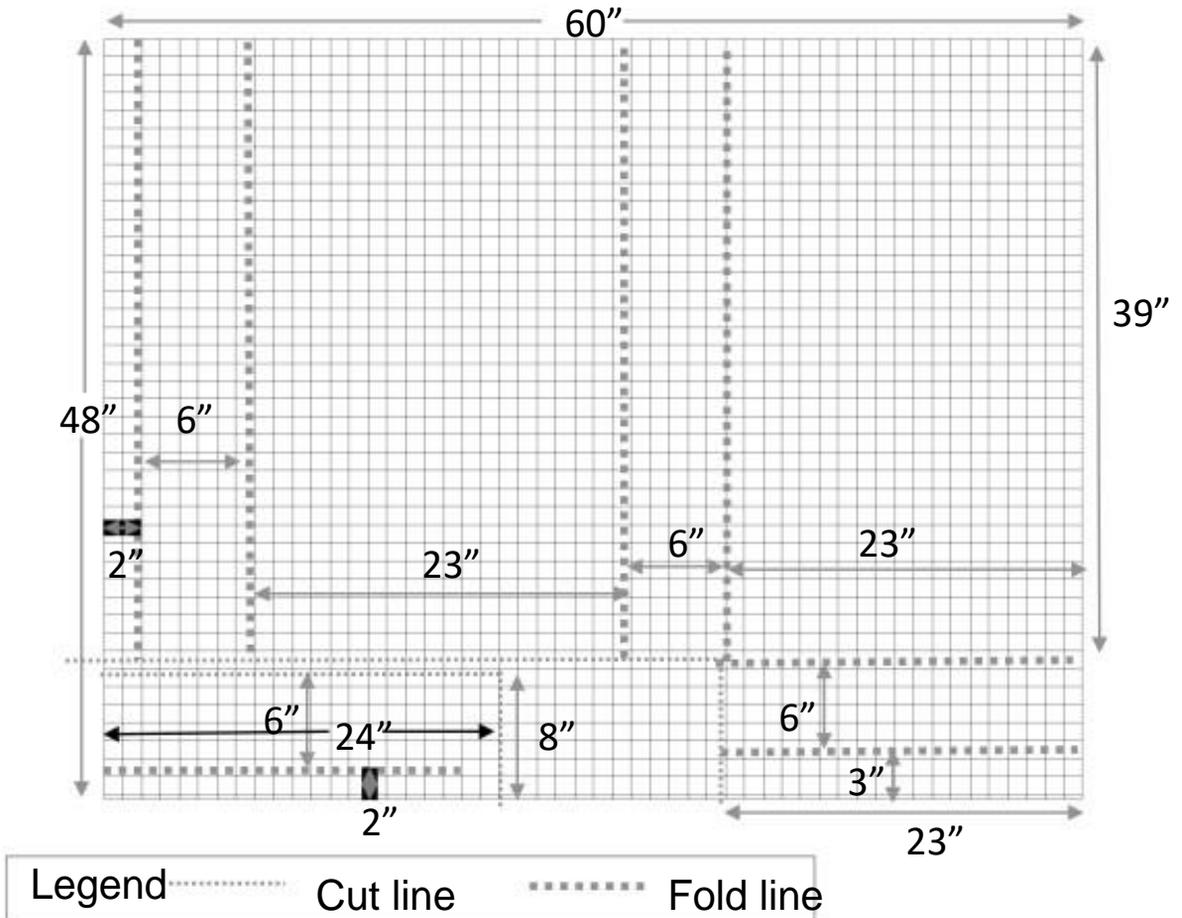
* Ocean Products Research, Diggs (Mathews County), VA

** Wire can also be bent on a table edge with a board and rubber hammer.

*** Pipe comes in 10' pieces. Hardware store may cut it into 38" lengths if requested. 2 38" pieces are required for each float.

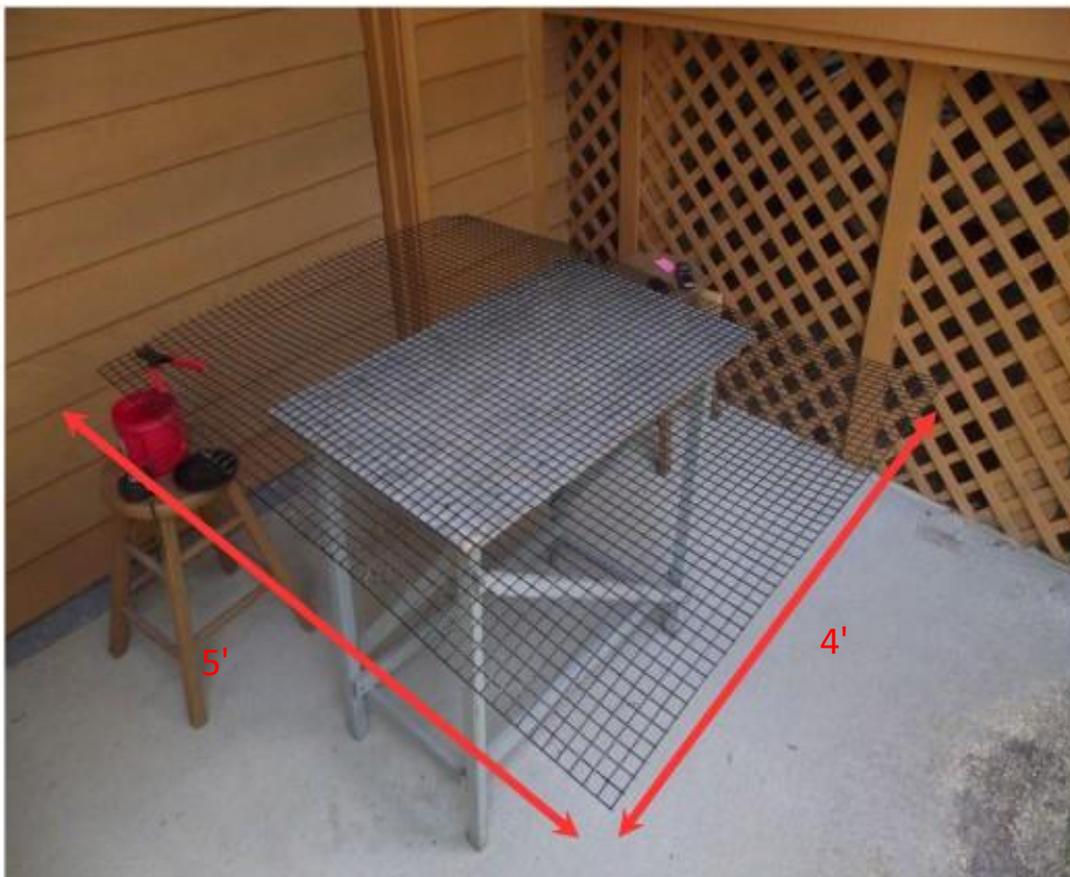
Flip Float

Layout of Flip Float Wire Mesh



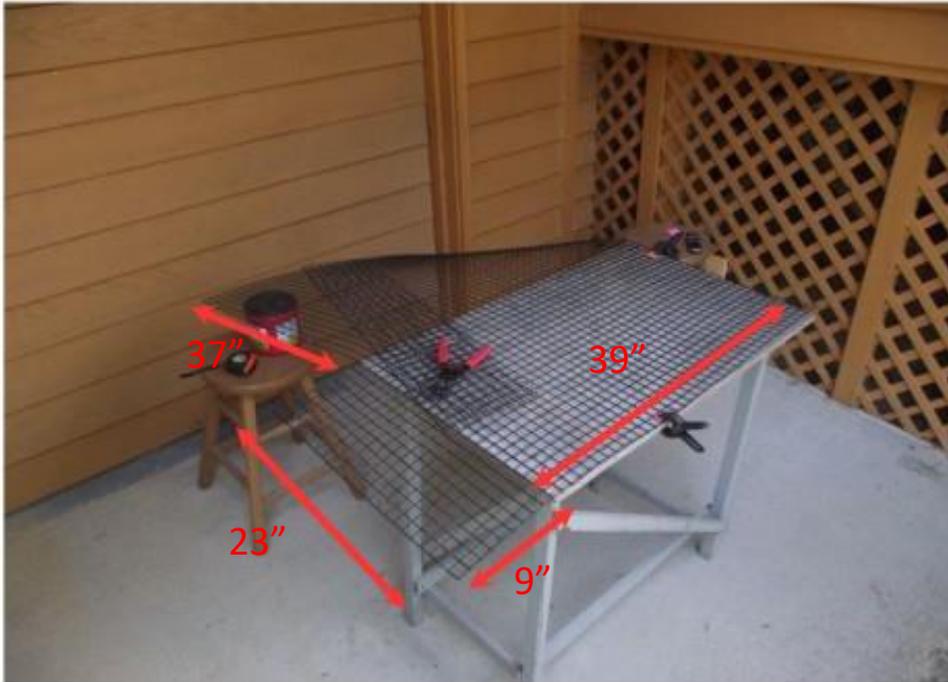
The diagram shows the cut lines and fold (or bend) lines for the 5 ft. by 4 ft. piece of wire mesh.

Flip Float



Start with a 5' length of wire mesh that is cut from a 4' wide roll. TOGA buys 16 gage vinyl-coated wire from Ocean Products Research in Diggs (Mathews), VA.

Flip Float



Cut out lower left panel leaving the dimensions shown. Be sure to remove all nubs in the finish pieces (They can cut skin if not trimmed closely). The 23" by 9" panel left attached will become the bottom of the box. The 37" by 9" panel cut out will be further cut to become the lid.

From the panel removed above, cut out the lid (24" by 8"). Note that the lid is 1" wider than the box.



Flip Float

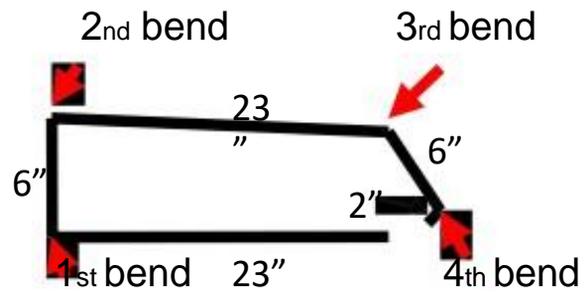


Bend a 2" lip along the leading edge of the lid.

Flip Float

How to Build a Flip Float with Reinforced Seams

Start bending the wire into a box, starting with the long edges as shown in the photos. Save the bottom for last. The diagram shows the sequence of bends. Imagine looking at the plane of the wire from the bottom edge.



First bend.



Second bend.

Flip Float

How to Build a Flip Float with Reinforced Seams



Third bend.

Continue with the the bending. The fourth bend creates the 2 in. overlap.



Fourth bend.

Flip Float

How to Build a Flip Float with Reinforced Seams



Fifth bend

Now bend the attached 23" by 9" panel to create the bottom. The 5th bend creates the overlap lip on the bottom, the 6th bend closes the bottom.



Sixth bend



Finish sixth bend

Flip Float

How to Build a Flip Float with Reinforced Seams



Pig ring all seams, roughly 5 to 6 in. apart. Note that the bottom seam and side seam are overlapped, and therefore reinforced.

The pig rings along the back edge of the lid create a hinge.

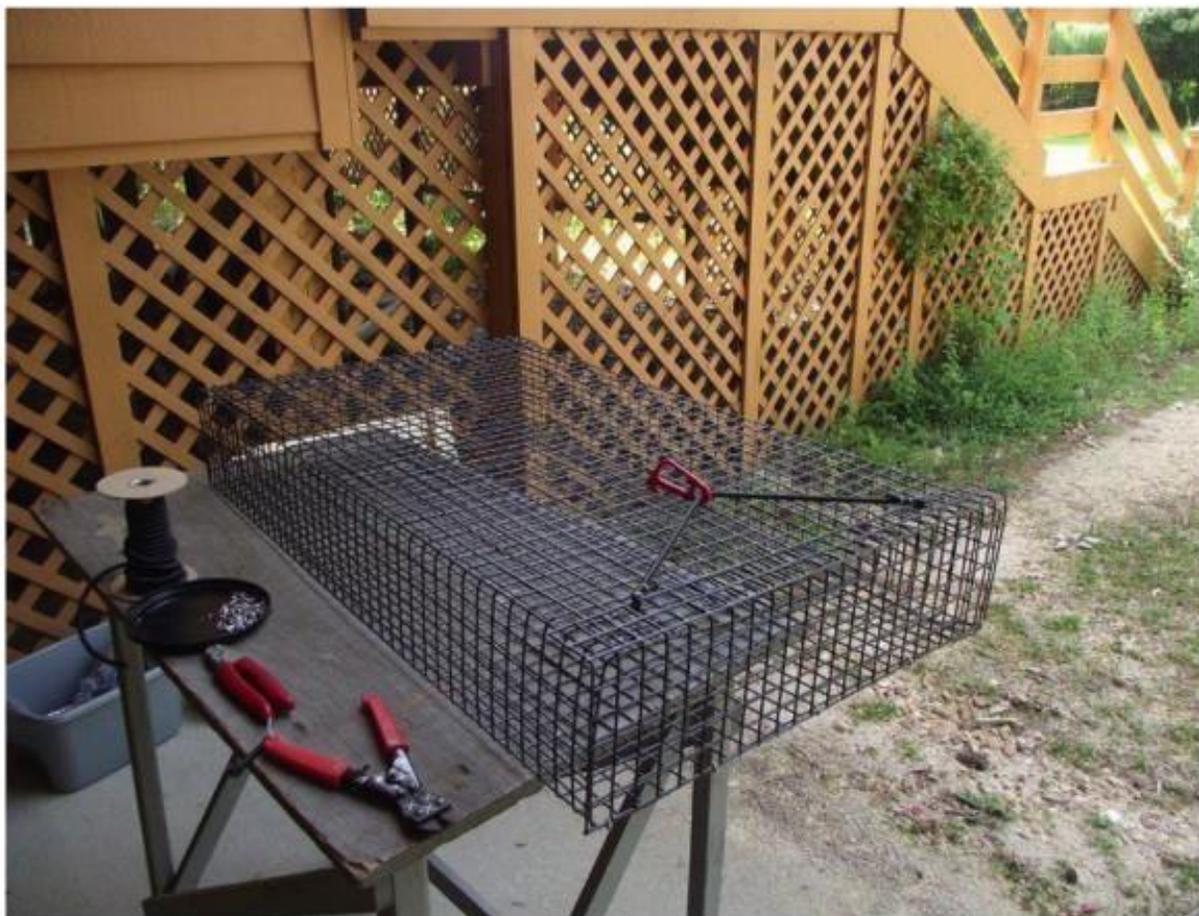


Flip Float



Cut a 23" length of bungee cord. Attach one end as shown with 2 pig rings.

Flip Float



Thread the bungee cord through the hook and attach the other end. This is the basic box that can be made into a flip float or bottom cage.

Flip Float



PVC drain or sewer pipe comes in 10 ft. lengths. Cut 2 38" pieces. You will have an extra piece for your next flip float. You can cut with a chop saw, jigsaw, circular saw or hand saw.



Note that this is 4" diameter thin-wall drain pipe. It is cheaper and lighter than schedule 40. The 4" caps shown are sold in the same section of most building product stores.

Flip Float



Prime the pipe ends and cap walls with purple primer. Then Coat the pipe ends and cap walls with heavy-duty PVC cement. Push the caps all the way on the pipe with a $\frac{1}{4}$ turn. When placing the cap on the opposite end, hold down for 15 seconds so the air pressure will not push the cap out.

Flip Float



Attach the floats to the sides of the box using 24" or 18" cable ties. The cable ties should be near the ends to keep the PVC floats from sliding back and forth.



Voila, you're done! Happy oyster gardening.

Bottom Cage

The cage is the same as for the flip float



Use a bender and pig rings to make feet. Wire pieces are 21" by 19":: Bend the wire along the 21" edge for each foot, then add the 3" by 6" panels at each end for stiffness. Attach feet to cage with pig rings.



How to Build TOGA Tidal Tumbler and Rough Rider Oyster Float Cages

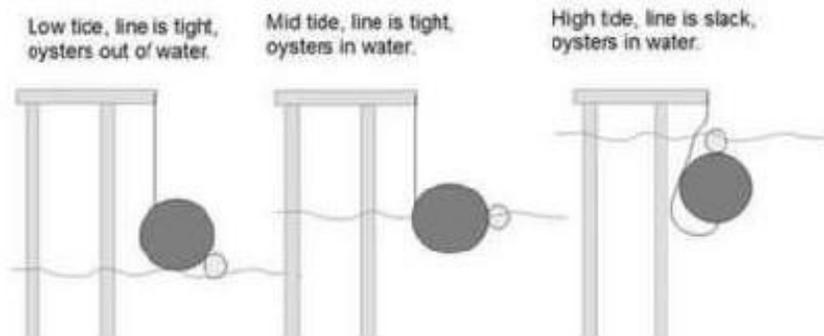
2023 Edition

The Tidal Tumbler is 36 inches long and 12 inches in diameter and is designed to hold 150 market-sized oysters and to hang on a line beneath a dock. With the float attached, this device can be set to tumble automatically with the change of the tide. The tumbling action helps clear the cage of some critters that can harm your oysters as those critters do not like to live out of the water. Wire end pieces on the 2022 edition replaced paint can lids making the device more durable and less prone to fouling.



Tidal Tumbler 2023 edition, Note- cage no longer has a side hatch.

Setting a Tidal Tumbler to automatically tumbler with the change of the tide:



Tidal Tumbler and Rough Rider

The Rough Rider is 36 inches long and 12 inches in diameter and like the Tidal Tumbler is designed to hold up to 150 market-sized oysters. It too hangs on a line attached to a dock and is good for high-energy water on big rivers and the bay. The all wire construction minimizes fouling. The Rough Rider does not have a float tube and does not automatically tumble with tidal change. In fact, the only difference between the Tidal Tumbler and the Rough Rider is the addition of a float tube on the Tidal Tumbler.



An optional Spat Tube fits inside either a Tidal Tumbler or Rough Rider and is designed to keep the smaller oysters in your cages. Small or medium mesh spat tubes are available. This enables an oyster gardener to start with 1,000 spat and then move to larger mesh or to the one inch mesh cage as the oysters grow. One also needs to spread the oysters out to multiple cages as they grow.



Spat Tubes

Tidal Tumbler and Rough Rider

Materials Required for Tidal Tumblers and Rough Riders:

16 gauge vinyl-coated wire mesh, one inch opening, various pieces:

1 piece 39 by 36 inches for main cylinder of cage

1 piece 11 by 20 inches for side hatch

1 piece 14 by 14 inches for fixed end

1 piece 15 by 14 inches for end hatch

4" PVC thin wall drainpipe, 1 piece 33.5" long (Only required for the Tidal Tumbler)

4" PVC thin wall drainpipe caps, 2 each (Only required for the Tidal Tumbler)

24" cable ties, 2 each (Only required for the Tidal Tumbler)

Small ½" stainless pig rings

Bungee cord, 2 each at 12 inches long

Crab pot hooks, 2 each

Crab pot line, 1 piece at 5 foot long with ends burned

PVC Primer (Only required for the Tidal Tumbler)

PVC Heavy Cement (Only required for the Tidal Tumbler)

Tools Required:

Wire Cutter

Pig Ring Pliers

Rubber Mallet

Flat Screwdriver

Wire Bender

Clamps, 2 each

Worktable

Compound miter saw, jigsaw, circular saw or hand saw to cut PVC pipe

Tidal Tumbler and Rough Rider

Building a Tidal Tumbler or Rough Rider:

Making the float tube: This step is only required for a Tidal Tumbler. First cut the 4 inch PVC pipe.



PVC drain or sewer pipe comes in 10 foot lengths. Cut one 33.5 inch piece for each Tidal Tumbler. None are required for a Rough Rider. You can cut the pipe with a compound miter saw, jigsaw, circular saw, or hand saw. Note that this is 4" diameter thin-wall drainpipe. It is cheaper and lighter than schedule 40 PVC pipe. The 4" end caps shown are sold in the same section of most building product stores.

Next prime the pipe ends and end cap walls with purple primer. Then coat the pipe ends and cap walls with heavy-duty PVC cement. Push the caps all the way on the pipe with a ¼ turn. When placing the cap on the opposite end, hold down for 15 seconds so the air pressure will not push the cap out.

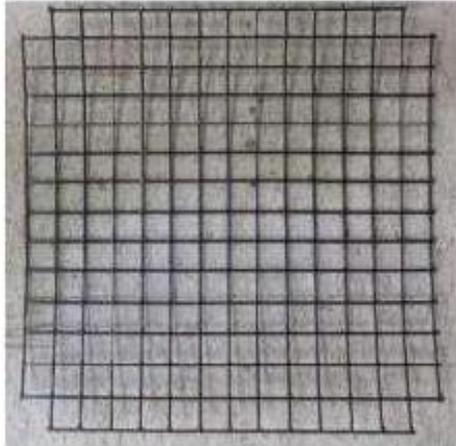


Tidal Tumbler and Rough Rider

The main wire panel for both the Tidal Tumbler and Rough Rider is 39 inches by 36 inches without any special cuts prior to starting the cage assembly.

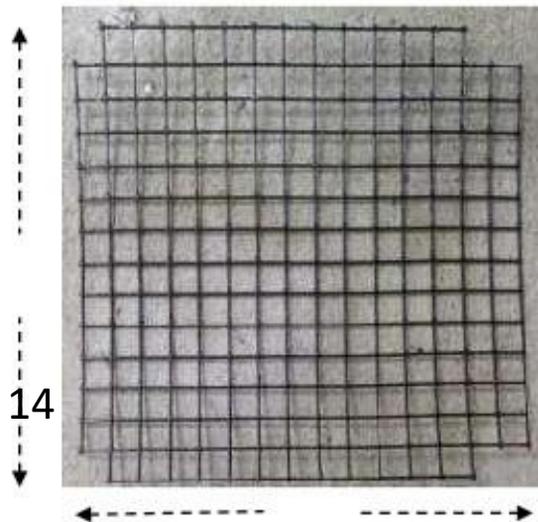
The side hatch is an 11 by 20 inch rectangular piece also without any special cuts.

The fixed end piece is a 14 by 14 inch piece with each corner having one inch cut out as shown below.



14 x 14 Fixed End Piece with corners cut out

The end piece of wire for the end which will open, is 15 by 14 inches. Two corners have a one inch cut out. The other two corners have a two by one inch cut out as show.



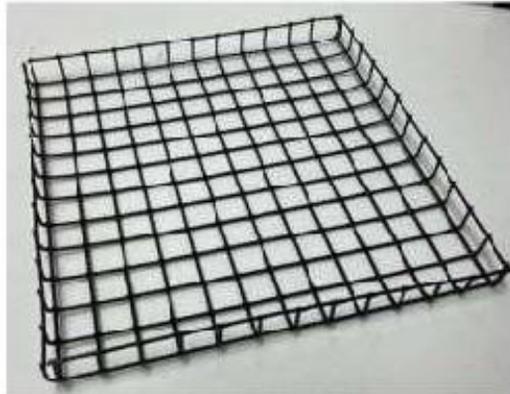
15 x 14 End Hatch Piece with corners cut out

Tidal Tumbler and Rough Rider

Bending the fixed end: For the 14 by 14 inch piece, each side has one inch of wire bent 90 degrees. All four sides are bent in the same direction.



Bending the 14 x 14 end piece



Fixed end piece bent one inch on all four sides

Bending the end hatch: The 15 x 14 inch end hatch is first bent one inch of wire 120 degrees twice along the 14 inch wide end which has the 2 x 1 inch cut out at each side. This forms a triangle just as was bent for the side hatch piece. Next bend one inch along the remaining three sides 90 degrees in the opposite direction as from the triangle.



End hatch piece bent and ready for assembly

Assembling the main wire cylinder: The main wire panel is 39 inch long and 36 inch wide. When wrapping on the 39 inch length, there is a 2 inch overlap resulting in a 37" circumference. Start by clamping one 36 inch wide side to a table with three inches of the 39 inch length handing over the table. Next wrap the other end of the 39 inch length around to form the wire cylinder and pig ring it in place two inches inside the end that is clamped to the table. Use ½ inch pig rings and connect them loosely, that is to not clamp them down hard at this point. Pig ring each end, and at the middle.



Now tighten the seam of the wire cylinder by firmly clamping 1/2" pig rings every 4 inches along the outside edge of the overlap. Then attach a few more pig rings to the inside edge of the overlap.

Next attach the end hatch. Place the triangle end up and the 90 degree bends down and place the end hatch on top of one end of the wire cylinder. The middle of the triangle bent side of the end hatch is placed over the middle of the overlapped seam of the cylinder. Use a bungee cord and hook to hold the end hatch closed.



End Hatch attached at the overlap on the wire cylinder

Now turn the cylinder over and attach the fixed end piece. Align the corners of this piece with the corners of the end hatch already attached. Use ½” pig rings to attach the middle of each side of the fixed end to the cylinder. Then place additional pig rings halfway between each of the initial four rings.



Fixed End attached

Cut out the opening for the side hatch by starting 5 inches below the overlapped seam and 9 inches from the end of the wire cylinder. Cut an opening 18 inches long by 5 inches high. This allows the bent side hatch to have a one inch overlap over the cut opening. The edges of the cut out opening will “puff” out a little, so bend the edges in gently with a flat screwdriver. Attach the side hatch with pig rings along the bottom edge of the hatch. Use a bungee cord and hook to hold the cover closed.



For the Tidal Tumbler only, attach the PVC tube along the overlap seam. Use a 24 inch cable tie at each end just inside of the end cap to secure the PVC tube to the wire cylinder. Cut off the excess cable tie once secured. Use a 5 foot piece of crab pot line to create a harness which is attached opposite from the PVC float. Use 2 pig rings for the loop at the apex and to attach each end.

Your Tidal Tumbler with PVC float tube, or Rough Rider without a float tube are now complete.