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## TILE ROOF INSTALLATION MANUAL ADDENDUM

Note: In winter ensure all piping slopes downhill to drain and all drains are left open (unless you live where it won't freeze.) Hot Sun's flexible fin-tubing can freeze full of water without concern.



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**WEAR EYE PROTECTION AND GLOVES WHEN WORKING WITH THE SPECIAL CA ADHESIVE. FOLLOW PROPER SAFETY PROCEDURES WORKING ON A ROOF. DO NOT ATTEMPT THIS WORK IF YOU ARE NOT TRAINED AND CERTIFIED IN FALL PROTECTION. REFER TO HOT SUN GENERAL INSTALLATION MANUAL.**

Make sure you know the plumbing scheme recommended for your unique situation. Consult Hot Sun or your dealer. Background information is at [www.h2otsun.com/pools](http://www.h2otsun.com/pools). Hot Sun solar pool heaters come with full design support and warranty. This technology is tricky.

Read the general installation manual. It covers how to attach headers to fin tubes and other important instructions that apply to all systems. This manual only discusses the methods unique to tile roofs.

Biggest mistake people make is gluing the manifolds to each other and doing that plumbing before gluing the fin tubes to the headers. ALWAYS glue fin tubes to headers (CA adhesive) before gluing header manifolds together (via PVC pipe and fittings).

The fin tubing comes in 88 foot lengths , 3.75 inches in width , including 6 water flow tubes. Three of these strips of the fin tubing fit on one row of tile. A single header manifold corresponds to the same one row of tile. A header manifold is 13.5 inches long. In most cases headers will alternate meaning the male ends are connected via couplings (removable or glue-one) and the female ends are connected via lengths of 1.5” pvc pipe. These lengths are determined by the tile row spacing. You want to match the header manifolds to the fin tubes one row of tile at a time.





If your tile spacing is tighter than 13.5" you can steal an extra inch by gluing the male end to the female end of two adjacent headers but don't glue too many together like this. You want to be able to service it. Read the main installation manual for instructions on the use of pvc cement. We recommend heavy body grey pvc cement for the connections to the headers (no primer).

- 1) Once its laid out and you know which row to do first without wasting fin tubing (see main manual) attach the first header to the first 3 strips of fin tubing.
- 2) Roll out the 3 fin tubing strips and begin gluing it to the roof starting about a foot from that first header manifold (that is already glued to the fin tubes) Gluing the fin tubing to the roof is done with Loctite (or Lepages) PL Premium 3x. This mastic is runny and things may slide around while the mastic sets up. Depending on air temperature this can take days. If the roof is steep enough that gravity takes over and things won't stay in place alternate with beads of Loctite Powergrab (we call it PG) and Loctite PL Premium (which we call PL). Glue down every crest of every tile or every 12"-16" side to side. PG is tacky and sticks and holds things in place initially while the alternating bead of PL can set up. PG is poor structurally long term so think of it as the tack and PL as the structural.

An alternate method is to stitch the material to the roof as seen in the tile roof video at [www.h2otsun.com/videos.html](http://www.h2otsun.com/videos.html). Stitching allows you to avoid adhesive entirely or add the adhesive later and either remove the stitching or not. Florida hurricane code requires the use of PL every 8" side to side but this is gross overkill for non hurricane zones. The strap is made by separating one or two tubes of Powerstrip material. It tears along a perforation once started.

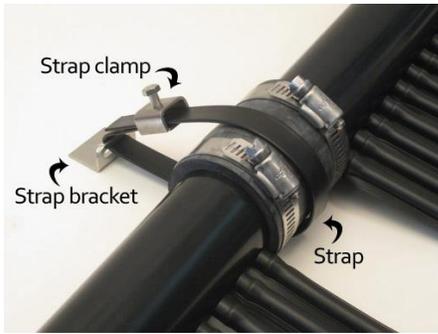




Use regular solid electrical wire (12 gage). Just cut pieces about 8" long, bend one end 90 degrees, lift tile with a screwdriver, slide the bend end between tiles until you can rotate the wire 90 degrees so it grabs the top of the tile below. See video under videos at [www.h2otsun.com](http://www.h2otsun.com) This wire can secure the strap. This positions and secures all the fin tubing. You can glue it all down later with construction mastic or use a strap every tile trough negating the need to glue the fin tubing down at all . This is called stitching the system to the roof.

3) Attach the second header to its fin tubes and roll those fin tubes out and strap them down part way. Attach this header manifold to the first one and secure the assembly to the roof. This row of headers will sit in a trough. Its very important that the fin tubes come off the headers at the same angle and that the fin tubes don't touch the roof next to headers. The headers will expand and contract with temperature and this movement against the tile will wear the fin tubing and a leak will develop. See repair manual under manuals on [www.h2otsun.com](http://www.h2otsun.com)





The supplied riveted plate (a ss strap bracket riveted to a ss plate supplied by Hot Sun) can be slipped between tiles. Secure this plate by gluing it to the tile above and below. Gluing is done with PL (Loctite or Lepage's PL Premium 3x) . Other methods can be employed. Continue until your entire row of headers is complete. Note the reason you attach a header before stitching the fin tube to the roof is so you don't have to trim the fin tubing to length. The reason you attach fin tubes to headers before connecting headers together is ease of assembly. Its easy to glue headers together. The work and the challenge is gluing (see general manual) the fin tubes to the headers fully. You have to inspect from all angles and you can't do that if the header is glued in place first.

Take the weight of the headers.



One good way is to slip ppa coated ss strap through a strap bracket as shown above left. Then just slip it between tiles (lift tiles with a screwdriver) . Note we glued the cap to the end of the row of headers via an elbow so we had an easy way to hang it. Another good way is to secure to the wood you will find under the ridge cap as seen below left..

Secure the headers down every 2 headers to prevent lifting in wind. Remember the headers still need to expand and contract as they change temperature so don't lash them down tight. Below right is a plate with a strap bracket riveted to it, glued between tiles using construction mastic. Then a loop of ppa coated ss strap goes around the header and the loop is completed with a strap clamp.



If you strip the 6 tube wide strips into individual tubes you can twist it to go around bends as shown above right. Separating into individual tubes at the end and attaching each tube individually to the header allows you to angle the headers. The headers do not need to be perpendicular to the flow!



If the headers are angled it simply means there is a longer stub of pvc pipe between female ends. You'll need a glue-on PVC coupling for each male to male end or you can alternate where male ends are connected via pvc couplings and female ends are glued together via varying lengths of pvc pipe to line things up. Always paint any piping exposed to the sun. We recommend paint that comes in a can as opposed to spray paint. Acrylic based paint is best for pvc. For more on corners and angled headers refer to the main installation manual.

4) Assemble the headers at the other end to the fin tubes first, then to each other and secure to the roof using the same methods described. It's very important you don't try to glue the headers to each other first. Attach headers to fin tubes first then to each other.

Complete the stitching to the roof or the gluing with alternating beads of PL and PG as described earlier (or both). The straps go every trough which is approximately every foot and stitch to the roof at every single row of tiles. Its one stitch for every square foot. You might want to complete the plumbing first and run water thru the system to keep the surface cool as you crawl around on it. Hot Sun collectors can be very hot in hot sun.



1/4" copper tube drains dead corner

The vacuum breaker should be teed off the pipe entering the bottom corner of the bank of collectors. If the vacuum breaker being used attaches with a rubber removable coupling then it needs to go onto the male header manifold end at the top of the row of header manifolds at the feed side. Do not use rubber removable couplings on PVC pipe because PVC can't take the stress with the heat. Actually you can but don't squeeze the hose clamps too tight and use CA adhesive to prevent the rubber from slipping off the pvc. Its not removable this way but the rubber can be carved off with a knife.

Recognize that water freezes inside a black surface exposed to the night sky at an air temperature of 42F not 32F. There's one place that water gets trapped and that's the dead lower corner of the bank. You can put a drain there that has to be opened (nah) or you can plumb from there to the return pipe with a 1/4" copper tube (see main manual) or you can install an automatic freeze dump valve that we can supply.

Once system is plumbed, check pressure at vacuum breaker location with solar off and with solar on. It should be zero with solar off and no more than 3 with solar on. If not read the main installation manual or consult with Hot Sun or your dealer.

Flexibility is absolutely key to longevity of a solar heater like this and Hot Sun collectors are the only flexible collectors made in North America that are not epdm synthetic rubber and therefore do not break down in pool chemistry guaranteed. See [www.h2otsun.com/warranty.pdf](http://www.h2otsun.com/warranty.pdf)

Note above several different methods are discussed. The standard best practice at the time of writing this manual (June 2017) is to not stitch at all. It is to alternate beads of PL and PG on crests of tiles or every 12-16" side to side. There are many subtleties to this method. Its normally only done by experienced professionals so if this is your first installation (and we know it is because you wouldn't read this manual otherwise) please study up and then discuss it all on the phone with us. Hot Sun experts with decades of experience are at your service so you are wise to take advantage of it.

