



**STSS CO INC**

*Specialists in Water Storage  
Since 1976*

CORPORATE OFFICES

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# TARM USA, INC

## STORAGE TANK INSTALLATION GUIDE

MAXIMUM WATER TEMPERATURE, 180 DEGREES F.



# **TARM HEAT STORAGE TANK**

## **GENERAL INFORMATION**

**PLEASE READ GENERAL INFORMATION AND INSTALLATION GUIDE BEFORE  
INSTALLING**

- \*These tanks are designed for indoor, not outdoor, storage.**
- \*Install tanks on a surface that can hold the weight of the water.  
Water weighs 8.33 pounds per gallon.**
- \*Avoid installing in an area where the water will freeze.**

Each heat storage tank is shipped in a single crate. The crate contains the following items:

1. Heat storage tank.
2. Tank lid and tank bottom. Shipped inside the heat storage tank.
3. Aluminum tank lid cover. Shipped on the outside of the tank, between the tank and the stretch wrap.
4. Lid trim. Bundled and shipped in the crate at one end of the tank.
5. Copper lid supports. Bundled and shipped in the crate top.
6. The Miscellaneous Parts Box is shipped in the crate at one end of the tank or in a heat exchanger coil box. It includes the following parts:
  - a. Qest nut, ring, cone assemblies for the copper lid support and raceways.
  - b. Aluminum lid brackets and coated nails for lid support.
  - c. Screws for lid cover and lid trim.
  - d. Tubes of RTV silicone.
  - e. Installation Guide.

**A Serial Number is assigned to each water tank and appears on a label on the tank.**

### **OWNER INFORMATION**

1. Check your water before filling the storage tank. Have the water checked for PH and electrolytes (salt and dissolved electrical conductors such as iron). **Check PH (acid content) once a year. Bring PH to 8.2 to 8.6 Refer to Page 12 of this Manual for more information. Add 2 lbs of NATURAL baking soda to 600 to 1200 gallons of tank water as a precaution.**
2. Check water level of heat storage tank once a year.
  - a. Remove white PVC cap and measure depth with a dowel or small stick.
  - b. Water level should be within the blue tape surrounding the tank.
3. Monitor tank water temperature regularly during the heating season. Temperatures above 180 Degrees Fahrenheit could cause damage to the tank liner.
4. Call for service or make appropriate adjustments when a problem is found.
5. DO NOT use the top of the tank for storage.
6. A smoke detector should be installed in the area of the tank to detect accidental smoke or steam as a result of equipment malfunction.

### **DAMAGE CAUSED BY IMPROPER INSTALLATION OR PROCEDURES**

**Failure, by the installer, to follow specific instructions set forth in the Installer's Manual, resulting in property and/or equipment damage, may void the Warranty.**

## HANDLING THE STORAGE TANK

The storage tank can be carried into place in the crate.

The flexible construction of the tank will allow it to be moved around corners.

If the tank must be moved through narrow hallways or down right angle stairways or into difficult locations:

- a. Remove the wooden crate.
- b. Remove the tank lid and tank bottom which are shipped inside the tank.

If the crated tank is too large or rigid to get into the storage location, tape the cardboard trays to the bottom of the tank using duct tape or filament tape or some other strong tape, surrounding the tank 18" on center. This will prevent the liner from being accidentally damaged by the metal tank skin or other sharp objects. **Note: The STSS warranty does not cover any on-site installation accident or occurrence, including but not limited to; if the liner is damaged during set-up, if the aluminum outer skin of the tank is dropped onto the liner, if the liner is ripped while forcing the tank through a tight opening on delivery or ripped when positioning the heat exchange coils on the tank bottom without properly lifting the coils in place.**



## REMOVING THE TANK CRATE

1. Remove the stretch wrap.
2. Pry loose the vertical crate supports.
3. Remove the aluminum lid cover which is shipped inside the stretch wrap.
4. Remove the copper lid supports which are shipped in the crate top.



## **REMOVING CRATE TOP**

1. Crate lid can be lifted off in one piece and does not need to be disassembled.

If you plan to empty and move the tank from its original location, save the crate, the cardboard trays and the vertical supports.



## **REMOVING THE TANK TOP AND BOTTOM AND LID TRIM**

1. The tank top and bottom are shipped inside the tank liner and can be easily removed.
2. The lid trim is bundled and is shipped in the crate at the end of the tank along with the parts to install it.



## **REMOVING CRATE BOTTOM**

1. Keep the bubble wrap on the tank.
2. Lay the tank on it's side to remove the crate bottom.

The bottom can be in one piece and does not need to be disassembled.

If you plan to empty and move the tank from it's original location, save the crate, the cardboard trays and the vertical supports.



## **PREPARE LINER BEFORE MOVING TANK INTO PLACE**

1. While the tank is laying on it's side, push the liner into the tank so that it will not be damaged while you are moving the tank into place.
2. At this point, if you are planning to move the tank down stairs or any great distance, tape the cardboard trays to the bottom of the tank using duct tape, filament tape or some other strong tape.



## **MOVING TANK INTO PLACE**

1. Check the floor to make sure it is level and flat.

If the floor is not flat, the tank will not be perfectly round at the top, and it will be difficult to install the lid; therefore, shims must be placed under the aluminum tank skin at the low spots. Measure the top diameter while you shim until it is perfectly round. The shims may be removed after water is in the tank and the lid is in place.

2. Move the tank to it's final location.

Be careful not to drag the liner or to drop the aluminum outer skin on the soft liner.



## **OPENING AND SHAPING THE TANK**

1. Open and shape the tank into a circle.

To make sure the tank is perfectly round, measure the diameter from 2 or 3 locations across the top. This is in preparation for installation of the copper cross braces.



## **TANK BOTTOM**

This picture shows the tank bottom. Please note that the blue Styrofoam side of the bottom should be laid on the floor.



## **PLACING BOTTOM BENEATH THE TANK**

1. Lift the tank at one end and slide the bottom beneath the tank.  
Re-arrange the tank liner so that it does not get caught between the tank wall and the bottom.



## **FITTING THE TANK OVER THE BOTTOM**

1. To fit the tank over the bottom, work the tank sidewall insulation over the tank bottom you have just placed beneath the tank.

It may be necessary to get into the tank to push the sides out so that they fit over the bottom.



## **ADJUSTING LINER PLEATS AND BOTTOM**

1. Get into the tank. (Check shoes for sharp objects.)
2. Adjust the liner so that the liner pleats fall evenly to the base.
3. Relieve any stress at the bottom.
4. Clean out any debris that may be at the bottom of the tank. Use a damp cloth.
5. Use the palm of your hand to feel the bottom for any foreign objects that may have lodged in the insulation beneath the liner and remove any sharp objects.

*Note: Any references to drain ports do not apply to **TARM INC** tanks.*



## INSTALLING THE TANK HEAT EXCHANGER(S)

Refer to: Drawings and picture of coils on page 10.

1. Inspect the coils for shipping dents, and repair if necessary.
2. Lift the coil or coils into the tank and make certain that the wood foundation blocks are properly placed and that the copper wire holders will not puncture the liner.
3. When using two or three coils for space heating, the coils must be plumbed together in parallel, not in series. The tops of the heating coils are to be connected to the hot water supply line from the boiler. The pipes that come from the bottom of the coils, which are also to be connected together in parallel, are to be connected to the main return line to the boiler. Place the coils so that they can be piped to the outside through the bulkhead raceways. The domestic hot water coil is to have cold water supplied to the bottom of the coil. Hot water comes from the top of the coil to feed a tempering valve or an anti-scald valve. **NOTE:** The gray plastic nipple and nut, cone and ring assemblies are not to be used as a coupling. They are a race-way for the uncut copper pipes to pass through. The nuts hold the copper in place, so the silicone seal remains intact.
4. When 2 or more coils are supplied with the system, position a pair of them so that they can be connected to each other, coil bottom to coil bottom and coil top to coil top as shown on page 10 in the installers manual. 3/4 inch tees or the 3/4" x 3/4" x 1" bullhead tees can be used. Bullhead tees reduce head pressure and increase flow rates. In any application over 50,000 BTUs heat loss, bull head tees are required.

**NOTE:** Pipe the output of the Wood Boiler (Top boiler port) to the top of the tank coil(s) and pipe the bottom of the tank coil(s) to the input port on the Wood Boiler. (Bottom boiler port). Follow the piping diagram supplied with your heating system.

**NOTE:** Dripping solder will not damage the tank EPDM. This tank was ordered with either 1" raceways for 3/4" pipe OR 1-1/4" raceways for 1" pipe or both.

5. Qest nut, ring, cones are supplied and attached to the bulkhead raceway. Remove and place these nut-ring-cones on the pipes passing through the raceways to and from the heat exchanger coils as shown on the following page to form a vapor-proof seal between the raceway and the pipes.

**6. USE THE RTV SILICONE SENT WITH THE TANK TO COMPLETELY COVER THE NUT.** Silicone will form a "rubber boot" between the EPDM and the copper to assure a vapor-proof seal between the raceway and the pipes

**NOTE:**

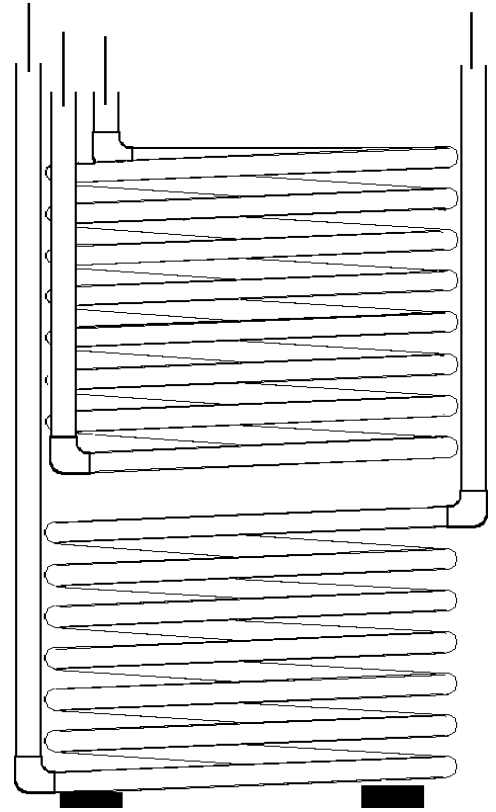
- a. Clean the copper next to the nut because silicone will not bond to dirty copper.
- b. If vapor gets past this seal, condensation will build up in the insulation and cause damage not covered by the warranty.
- c. This procedure should be applied to the lid penetrations and fill/inspection port.

**7. Pressure check your solder joints before putting water in the tank.**

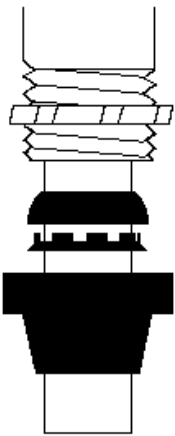
# STSS TANK HEAT EXCHANGERS



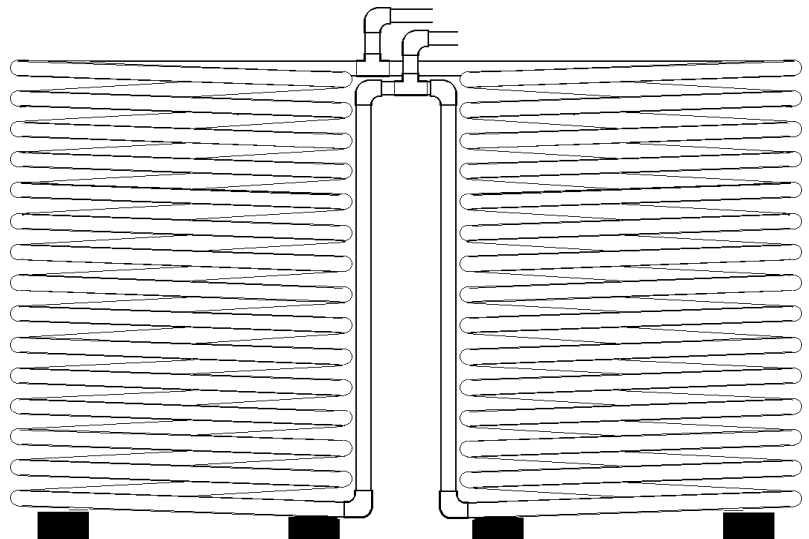
120 FT. OR 180 FT. HEX PIPED PARALLEL



SOLAR DUEL HEAT EXCHANGER



QEST NUT, RING CONE



## INSTALLING THE COPPER LID SUPPORT

A copper cross "T" lid support and a center post are cut to the proper length for the tank size and are shipped unassembled in the crate top. 415 GALLONS AND LARGER.

1. Insert two of the four copper lid supports into the cross "T" of the center post.
2. Place the post in the center of the tank and insert the ends of the copper into the raceways on the side of the tank.
3. Place the other two lengths of copper into the center post and into the raceways.
4. Qest nut, ring, cone assemblies are supplied in the miscellaneous parts box. One by one, pull the copper lid supports out of their raceway and slide onto the copper first the gray nut with female thread, then the silver ring and then the gray cone.
5. Slide the pipe back into the raceway and fasten the nut loosely until all four assemblies are in place.
6. Make sure the tank is round. Measure across each leg of the "T" and so that both measurements are the same.
7. Hand tighten the nut to make the support secure. DO NOT tighten with a wrench.
8. Clean the copper next to the nut with emery tape. The silicone sealant will not bond to dirty copper.
9. Apply the silicone to the EPDM, the Qest fitting and 1/2 inch of the copper. This silicone will harden into a "boot" to form a barrier against moisture condensing into the wall insulation above the water line.
10. Aluminum lid support brackets and coated nails are supplied in the miscellaneous parts box and are part of the lid support system.



## **FILL THE HEAT STORAGE TANK WITH WATER**

1. Pressure check piping for slow leaks before filling the storage tank with water.
2. Fill the tank with water before putting the lid in place.
3. The water level in the tank should not be higher than the bottom of the blue tape on the outside of the tank and must be below the raceways for the lid support. The blue tape near the top of the tank is the water level "full" mark. Fill the tank to the bottom of the blue tape when the water is cold. **DO NOT OVERFILL!**

**Note:** After the lid is in place, the tank can be re-filled through the fill and inspection port in the lid using a hose and funnel.

## **TO CHECK THE WATER LEVEL IN THE TANK**

To check the water level in the tank, unscrew the white cap on the inspection port and insert a dowel or thin stick into the tank.

# **\*WARNING\***

**NO PETROLEUM BASED PRODUCTS SUCH AS BOILER TREATMENT, OIL, GREASE, DIESEL FUEL OR GASOLINE SHOULD BE PUT INTO THIS EPDM-LINED TANK NOR SHOULD THESE PRODUCTS BE ALLOWED TO COME IN CONTACT WITH THE EPDM LINER FROM OUTSIDE THE TANK.**

**Check your water before filling the storage tank. The PH Level of the water in the tank is critical. PH should be brought up to 8.2 to 8.6 to protect copper and brass in the tank and lines. Have a water specialist treat the water coming into your home for acid.**

**Water containing electrolytes, salt or dissolved electrical conductors may set up a condition causing (the dissolution of metals by electrical current).**

**Installing a sacrificial annode rod similar to those used in hot water heaters can add another level of protection if your water has dissolved electrolytes. As a precaution, contact a water specialist to resolve known water problems.**

**Local water conditions are usually known by well drillers. Acid wells, spring water, surface water, mine water, or acid lake water present serious conditions you should be aware of. You may wish to truck in water from a "City Water" system if these conditions are common in your area.**

**UNAUTHORIZED ADDITIVES MAY VOID THE WARRANTY.**

## PUTTING THE LID ON THE TANK

Refer to the Tank Exploded View

1. Aluminum lid brackets and coated nails are shipped in the miscellaneous parts box. Fasten the brackets with the nails every 24 inches on center on the top rim of the tank between the copper cross "T" penetrations. The nails will penetrate the liner and the insulation on the top rim. No brackets are needed next to the copper lid supports.
2. Place the lid on top of the tank with the liner facing the water.
3. Make sure the liner comes up around the lid.
4. Press the lid down 1 inch evenly all around the tank.
5. Apply silicone around the lid where the EPDM lid liner and the tank liner meet.
6. Press the lid all the way down to rest on the brackets and lid support.
7. Carefully fill in with silicone all the way around the lid so that condensation cannot form under the lid cover.

## PLACE ALUMINUM LID COVER AND LID TRIM

1. Line up the vent hole with the hole in the aluminum cover.
2. Center the aluminum and line up the 2 pieces of the lid in preparation to use the sheetmetal screws to fasten the pieces together.
3. Place the metal lid trim around the top to cover the outside of the lid and the outside of the tank.
4. Fasten the sheetmetal screws supplied through the lid cover. **DO NOT FASTEN THE SCREWS THROUGH THE SIDE WALL OF THE TANK.**

## SCREW PVC CAP ON INSPECTION/VENT PORT

Wrap the threads of the PVC nipple with the teflon tape. This will prevent condensation from dripping onto the lid insulation.

**NOTE: THE LID IS NOT DESIGNED TO WITHSTAND HEAVY WEIGHT.  
DO NOT STORE ANYTHING ON TOP OF THE TANK.**

# **INSTALLING TANK THERMOMETERS, AQUASTAT AND TURBULATORS**

## **THERMOMETERS**

Tarm USA, INC. heat storage tanks come with three ports for installing the Taylor or Goldline thermometer temperature sensors. The three sensor ports are located on the side of the tank near the bottom, middle and top. To install the sensors, loosen the screws attaching the electrical cover plate. Remove the cover plate and the two inches of insulation. Once the EPDM rubber liner is visible, insert the sensor probe in between the EPDM and the insulation, 3-4 inches.

## **AQUASTAT**

**Mounting the EXCELHSRP (L8151 Aquastat) on the heat storage tank when using an EXCEL MULTIFUEL BOILER.**

Find the location of the 3 1/2" square electrical box cover plate on the outside of the heat storage tank approximately 15" off the floor. Remove the cover plate and the insulation behind the plate. Carefully insert the sensor bulb of the aquastat between the inner surface of the insulation and the EPDM liner. If there are any sharp edges or projections on the sensor bulb, they must be padded or covered so that they do not damage the liner. The L8151 aquastat is then mounted up high on the side of the tank with sheet metal screws. Run a 3-conductor thermostat wire from the B1, ZR, L1 terminals of the aquastat to the external 24 volt terminal strip as shown in your Excel boiler's field wiring diagram.

## **TURBULATORS**

The 3" turbulators (item #092244) are used to increase the heat exchange efficiency of wood gasification boilers connected to heat storage systems.

To install the turbulators, remove the access cover above the heat exchange tubes. After brushing the tubes, place a turbulator in each wood heat exchange tube.

NOTE: TARM USA, INC. recommends that the turbulators **NOT** be installed when a boiler is first installed. Operate the boiler **WITHOUT** the turbulators installed for a month or two until you can easily get the fire started and operating with flue temperatures of 600 degrees F. or more. Also note that constant flue temperatures of less than 300 degrees F. are too low when the turbulators are installed

# **STSS CO INC**

## **LIMITED WARRANTY**

### **FOR TARM USA, INC. APPLICATIONS**

STSS CO INC warrants that the products manufactured for use with TARM USA, INC. systems by STSS CO INC will be free from defects in material and workmanship for a period of five(5) years from the date of shipment by STSS CO INC within the limitations and terms of the STSS CO INC equipment warranty statements. All parts supplied by TARM USA, INC are covered by the TARM warranty.

STSS CO INC warrants the storage tank liner and lid liner to be free of defects in material and workmanship at the time of manufacture when subject to normal use. **Normal use is defined as storage of water at temperatures not to exceed 180 Degrees Fahrenheit during the five(5) year warranty period.** If the tank liner material should fail to hold water, STSS CO INC will supply a new liner, new pipe pass-through parts and silicone sealant to reseal the lid at no cost during the five(5) year warranty period. Transportation costs will be paid by STSS CO INC. Liner failure can result from physical puncture or high limit failure or temperature exceeding 180 Degrees F. caused by high limit failure. EPDM is a petroleum-based product; therefore, no petroleum-based products such as boiler treatment, oil, grease, diesel fuel or gasoline should be put into this EPDM-Lined tank nor should these products be allowed to come in contact with the EPDM liner from outside the tank. These products can damage the liner. Damage to the liner resulting from these incidents or additives is not covered by this warranty. An annual maintenance service call by a qualified heating professional is required to maintain this warranty in effect.

The warranty services herein described are contingent upon the proper use of the products and do not cover products which have been modified or which have been subject to physical, electrical or electro-mechanical stress exceeding the voltages and temperatures specified for use with these products, or on which the original identification marks such as serial number, warning labels, etc. have been altered or removed. "Proper use of the products" includes the correct application of the silicone sealant around the tank lid. Improper application of the silicone sealant will result in condensation under the lid cover and consequential damage to the insulation in the lid which will not be covered by this warranty. Failure analysis by STSS CO INC shall be final and binding.

STSS CO INC warrants the copper heat exchange coils to be free from defects in material and workmanship for a period of five(5) years from the date of shipment. If, during the five(5) year warranty period, the heat exchange coils fail to hold water, STSS CO INC, at its sole discretion, will replace the defective coil f.o.b. customer location, or will provide compensation not to exceed the amount listed on a compensation schedule which is on file at STSS CO INC.

**This warranty covers materials only. It does not cover labor costs, overtime charges or any other charges or costs resulting from the failure of a product produced or supplied by STSS CO INC.**

All warranty claims must be in writing, must include the Serial Number, must be signed and must include the full name and address of the customer at the location of the installed product. No claims are considered without the above written information. A phone call to STSS CO INC will establish the date of the claim. The date of notification is the claim date.

**LIMITED WARRANTY  
TARM USA, INC. APPLICATIONS**

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The date of shipment begins the five(5) year warranty period. Replacement or repair of component parts will not extend the warranty on these parts or on the original product beyond the original warranty.

Parts not supplied by STSS CO INC are not covered by the STSS CO INC warranty. Check with TARM USA, INC. for coverages under their warranties.

Distributor/Dealers' remedies specified in this warranty statement are Distributor/Dealers' sole and exclusive remedies. STSS CO INC shall not be liable to any Distributor/Dealer or any other person for damages of any nature whatsoever in the event of any breach of the warranty contained in this statement.

The foregoing warranty is exclusive and in lieu of all other warranties, expressed or implied, including implied warranties for merchantability and fitness for a particular purpose. The remedies of Distributor/Dealer set forth herein are exclusive. The maximum liability of STSS CO INC for any other claim of any kind or nature, including but not limited to negligence arising out of or in any way related to any sale, use or other employment of any product delivered to dealer by STSS CO INC, whether such liability arises from any claim based upon contract, warranty, tort or otherwise which may be asserted by Distributor/Dealer, or any successor in interest to the Distributor/Dealer, of any other person or entity, and remedy for same, shall be limited to return of the consideration actually paid for any relevant product, less the reasonable value of any use made thereof by Dealer. In no event shall STSS CO INC be liable for any lost profits or for any claim or demand against Dealer by any third party or for any indirect, special or consequential damages arising out of or in connection with the delivery, use or performance of the equipment even if STSS CO INC has been advised of the possibility of such damages.

**DAMAGE CAUSED BY IMPROPER INSTALLATION OR PROCEDURE**

Failure, by the installer, to follow specific instructions set forth in the Installation Guide, resulting in property and/or equipment damage may void this warranty.

**SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATIONS OR EXCLUSIONS MAY NOT APPLY TO YOU.**

**THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE.**

February 15, 2005