



BACKCOUNTRY RECREATION

H O T T U B S & S A U N A S

Lined Internal Wood Fired Stove Hot Tub

Installation & Owner's Manual

Please read and understand the complete instructions prior to assembly and use of your hot tub. Customer agrees not to hold Backcountry Recreation or any of its authorized dealers liable for improper installation, maintenance and repair of this product.

www.BackcountryRecreation.com



Lined wood fired cedar hot tub with internal stove

READ THIS ENTIRE MANUAL THROUGH TO THE END BEFORE PROCEEDING WITH THE ASSEMBLY

Our hot tub kits are designed for ease of assembly by the customer, and every attempt has been made to make assembly information as clear as possible. If you have any questions about assembly, please do not hesitate to call us at **1877-446-3565**, or send us an email at **info@Backcountryrecreation.com**.

Thank you again for choosing Backcountry Recreation. We are grateful for your business and know you will have many years of enjoyment in your hot tub!

CHOOSE A SITE WITH A STRONG AND LEVEL FOUNDATION

One of the most important installation decisions is deciding where to locate your hot tub. It is important to choose a site that has a level, strong, and stable foundation. This is critical because a hot tub with several bathers inside can weigh over **10,000 lbs**.

If you are locating the tub near the house, a location close to the bedroom and bathrooms is generally the most convenient. Bathrooms, with showers, towels and bath mats, can be a natural changing and drying off area. Having the tub close to your bedroom is also nice. After enjoying a night-time soak, it is wonderful to crawl out of the tub and roll into bed.

Privacy and scenic views should be considered. For most people, relative privacy is important for enjoying their tubbing experience. Accordingly, your tub should be placed where passers-by and neighbors are not in your line of sight. Natural screens of trees and shrubs can maintain privacy while providing scenic views.

Other considerations include the relative location of the stove and drain. Each site presents unique circumstances that may determine where the stove and drain should be positioned. With regard to the stove, you will want to have your wood supply relatively close by and have easy access to the stove door to feed the fire. You will also want the stove located so that its fence and chimney stack don't block your view. The bench locations and their relative heights should also take into account your views. If your installation is in a place where leaking water would damage the area, please build a watertight frame to catch any overflow water or any leaking from the initial sealing process. You can also attach plumbing to the end of your drain so that the water drains to a more convenient location.

FOUNDATIONS

Hot tubs may be supported in a variety of ways. The most important thing to consider is adequate support. The hot tub **unfilled** will weigh **600 - 700 pounds** depending on its size. Filling the tub with water will add considerable weight (see specifications chart below for the water weight of your tub). The weight of the bathers using the tub will also have to be taken into account. In total, a tub full of water will weigh from **5,000 to over 10,000 pounds**.

Types of supports commonly used include posts, piers, concrete blocks, cement slabs, beams or railroad ties. Concrete slabs (at least 4" thick) reinforced with wire mesh provide the most permanent and secure foundation and are recommended where practical. Most other foundations can be prone to uneven settling which may cause the tub to leak. There is a wealth of information on patio design online. Remember, your foundation needs to be able to support the weight of your tub. We recommend you have your foundation inspected by a qualified architect or building engineer before proceeding.

Hot Tub Specifications Chart		
Size	Max Water Volume (Gallons)	Water Weight (LBS)
5' x 4'	550	4,500
6' x 4'	800	6,500
7' x 4'	1,100	9,100
These figures are approximate and should be used only as a guide.		

Some tubs are placed on existing grade; some are dug down and sunk in the ground. Others are set on decks or trestles to elevate them. In every case, but especially with tubs sunk below grade, it is important to allow for ventilation under the bottom and around the sides. Good drainage is required to prevent the tub from sitting on damp earth or in water, which can cause it to rot. It is important that draining water or overflow does not splash dirt up on the tub. A good approach is to line the hole with plastic sheet or similar barrier that will prevent the earth from splashing on the tub. The acids in the earth can cause the tub to rot. A good rule is to allow at least 12" of clearance from the earth around the sides and a minimum of 6" under the bottom boards.

If you are going to put the tub on a deck, you should be aware that most decks are not designed to support the loads created by a hot tub. Consult a structural engineer or contractor to determine the best way to ensure an adequate design for your deck.

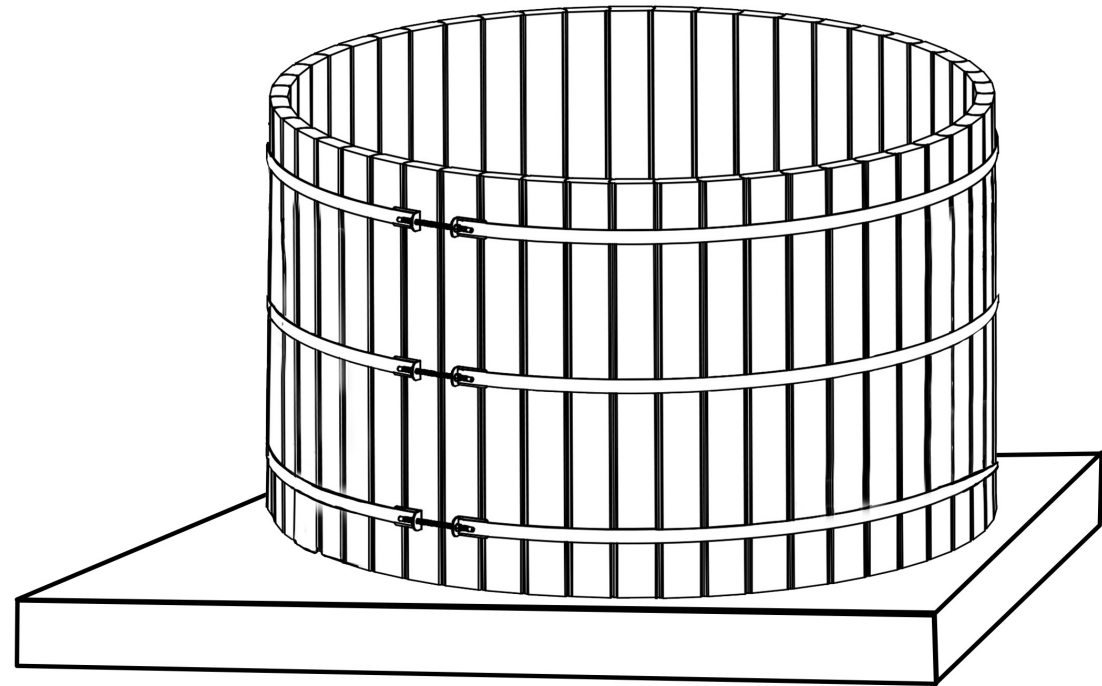
Foundations

Many people like the idea of having the tub inset into a deck both for aesthetic reasons and ease of access. Tubs set into a deck are an attractive installation option. However, if you inset the tub into a deck or set the tub below grade and are heating your tub with a internal wood fire stove you should build a sturdy barrier to prevent accidental contact with the hot stove and/or chimney pipe. Alternatively, the stove should be positioned in such a manner (e.g. at the edge of the deck) so that accidental contact is not possible.

With on grade installations, the tub rim acts as a natural barrier or fence to help prevent someone outside the tub from stumbling or falling against the hot chimney pipe or stove, however, positioning the stove / chimney such that that accidental contact is unlikely is still recommended. When a tub is set into a deck, an accidental stumble or fall can more easily result in contact with the chimney pipe, possibly producing a severe burn. Children could be particularly susceptible to this situation.

An additional consideration when inseting a tub into the deck is to allow for future access to the tub. Older tubs can start to develop minor leaks as the wood loses some of its natural resiliency. If leaks of this nature occur, they can usually be dealt with by tightening the bands or, if necessary, reseating the staves by hammering on them with the mallet while tightening the bands. Either approach, but especially the latter requires some degree of access to the tub.

The illustration on the right shows a tub on a concrete pad, the most stable and, if suitable at your site, the best base for a tub. Whenever, making a base on ground for the tub, make sure to extend the base at least a foot beyond the perimeter or the tub to keep dirt and its acids from splashing up on the tub.



Foundations & General Assembly Information

Once your site is prepared, you will place the chime joists and begin assembly. Your hot tub will sit on its chime joists (provided) which run perpendicular to the bottom boards of the tub.

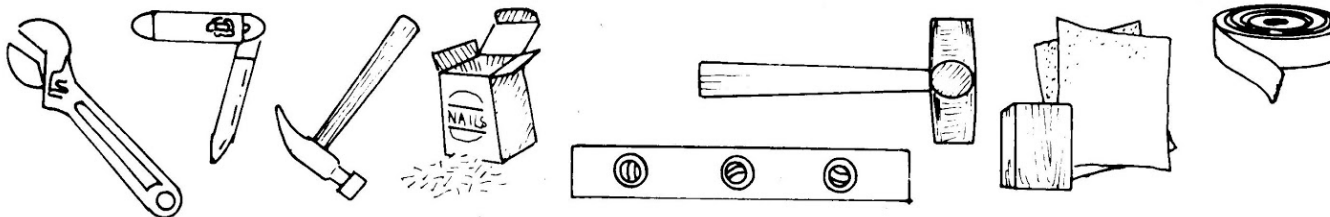
For a basic installation without concrete pad, frame an area with pressure treated beams or railroad ties, dig out the area and fill with 5/8" (5/8" or less in size) crushed rock - usually available at Home Depot or lawn and garden store. This material packs nicely and doesn't shift as much as a more rounded river rock or pea gravel. For a more foot friendly surface, place pavers or medium river rock on top of the crushed rock once the tub is in place. Smaller pea gravel will stick to your feet and end up in the tub. When setting the 4 x 6 chime joists for your tub bottom make sure they are level and the upper faces are flat (in the same plane) so that tub will have a solid surface to rest on. The gravel bed should be large enough to absorb water overflow.

A popular approach is to dig the pit deep enough so that it can be used as a drainage bed. If you have a cement patio, place your supports directly on top of the cement slab. Consider any additions such as decking or steps for access to your tub now, and allow for placement of supports at this time.

HOT TUB ASSEMBLY

Getting ready

Carefully unpack the tub. Inspect each piece to be sure there was no hidden damage that occurred during shipment. If you notice damaged parts that were not apparent when you first received your shipment, please call us immediately. We can help with any after the fact freight claim process and get your replacement parts on the way.



General Assembly Information

List of tools included and items you need to supply

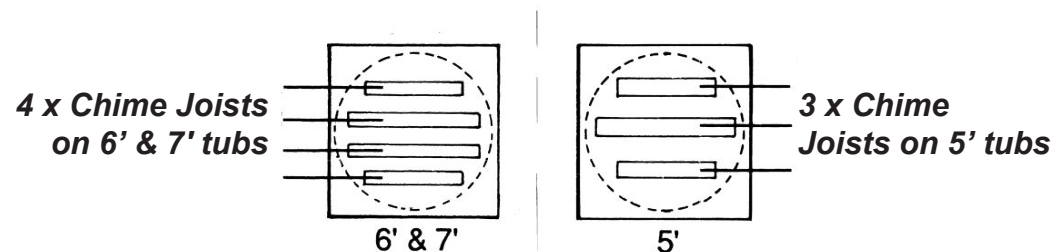
Supplied tools	Tools you need to supply	
<input type="checkbox"/> Heavy rubber mallet	<input type="checkbox"/> Adjustable crescent wrenches	<input type="checkbox"/> Philips head screw driver
	<input type="checkbox"/> Level	<input type="checkbox"/> Sand paper
	<input type="checkbox"/> Tape measure	<input type="checkbox"/> Silicone caulking
	<input type="checkbox"/> Clamps (to secure liner)	

Round up your helpers

One person can assemble a tub but it is more enjoyable, quicker, and more efficient if you have a few helper or two. Two people familiar with the instructions should be able to put the tub together in 4 - 6 hours over two days (i.e., 2-3 hours on day 1 and 2-3 hours on day 2).

Chime joist placement

Chime joists should be placed as shown in the diagram below. Be sure you use the proper guide for your size tub. Make sure that: 1) the chime joists will run perpendicular to the tub bottom boards; 2) the chime joists are set with the 4" side on the foundation (raising the tub 6" off the base) and that they are positioned so they will not interfere with the drain kit assembly. If you have a 5' tub with a drain kit, the standard placement of the outer chime joists, shown below, may interfere with the drain kit assembly. If necessary, move the appropriate chime joist 2 or 3 inches in towards the center joist to provide clearance for the drain kit.



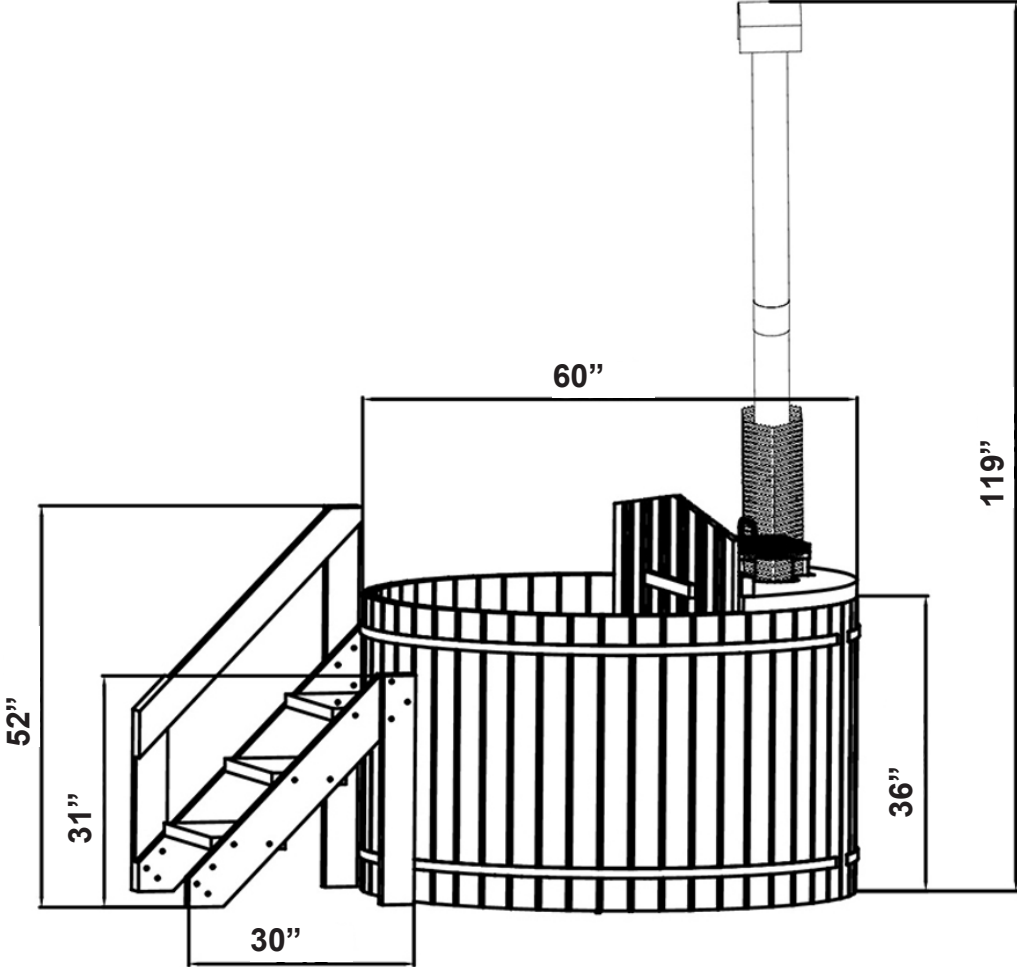
HOT TUB DIMENSIONS

Wood is a natural product that can vary for many reasons (temperature, moisture content, etc.). The final dimensions of your hot tub will be impacted by these natural variations as well as your assembly process. As a result, the dimensions of the assembled product vary slightly from unit to unit. **The dimensions on the following pages are approximate and should be used as a general guide only.** If there are any discrepancies between the dimensions in this manual and the product you received, the dimensions of the delivered product will be taken as correct.

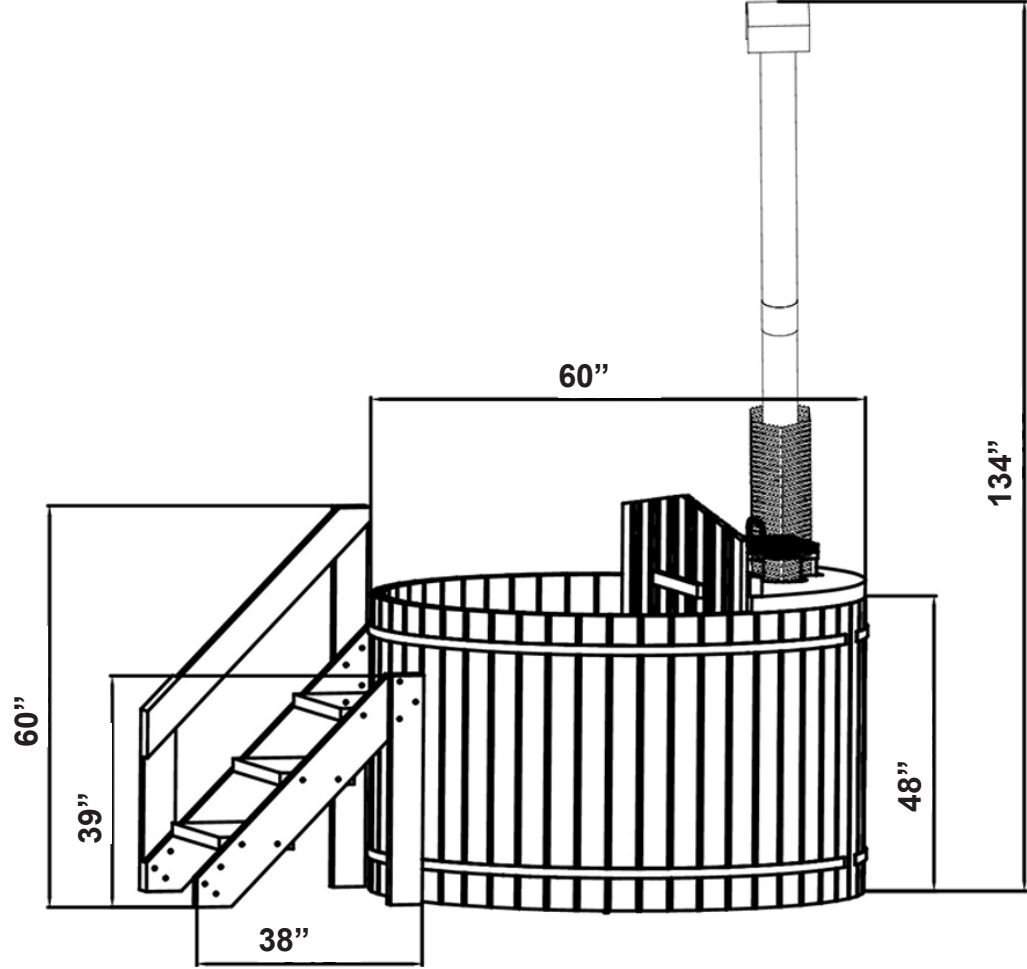
If you plan on building a permanent structure (such as a deck) to house your hot tub and the dimensions of this structure need to match your hot tub exactly (e.g., if you would like the rim of your deck to meet the lip of the hot tub), **we recommend first building the hot tub** and then building your custom structure around it. If you build the structure first, there is a risk it will not match the dimensions of your hot tub.

Note that the hot tub heights shown on the next pages is the length of the stave, **not** the height from ground. The rim of the hot tub will be **1-3"** higher off the ground than the length of the stave, depending on the position of the dado cut, the height of the chime joist, and how much your foundation settles.

3 Person Hot Tub Measurements

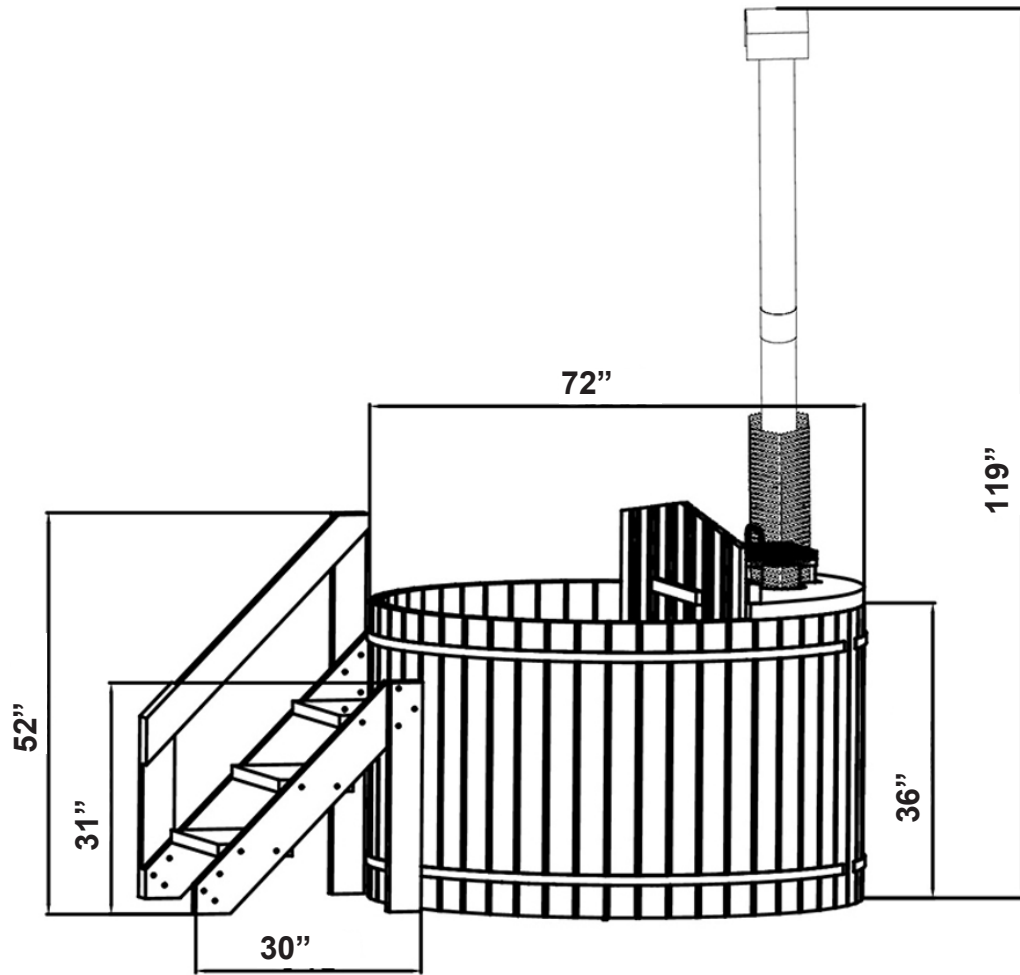


3 Person Regular (3ft)

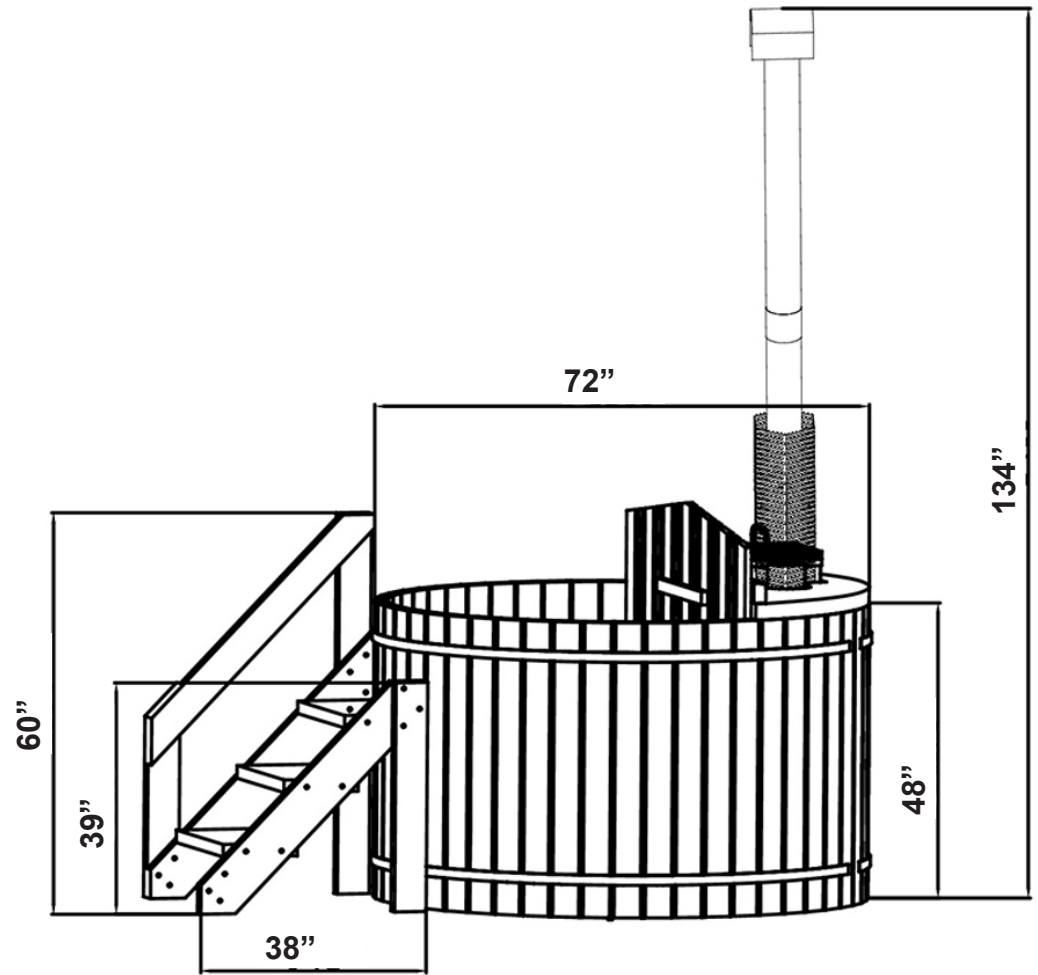


3 Person Deep (4ft)

5 Person Hot Tub Measurements

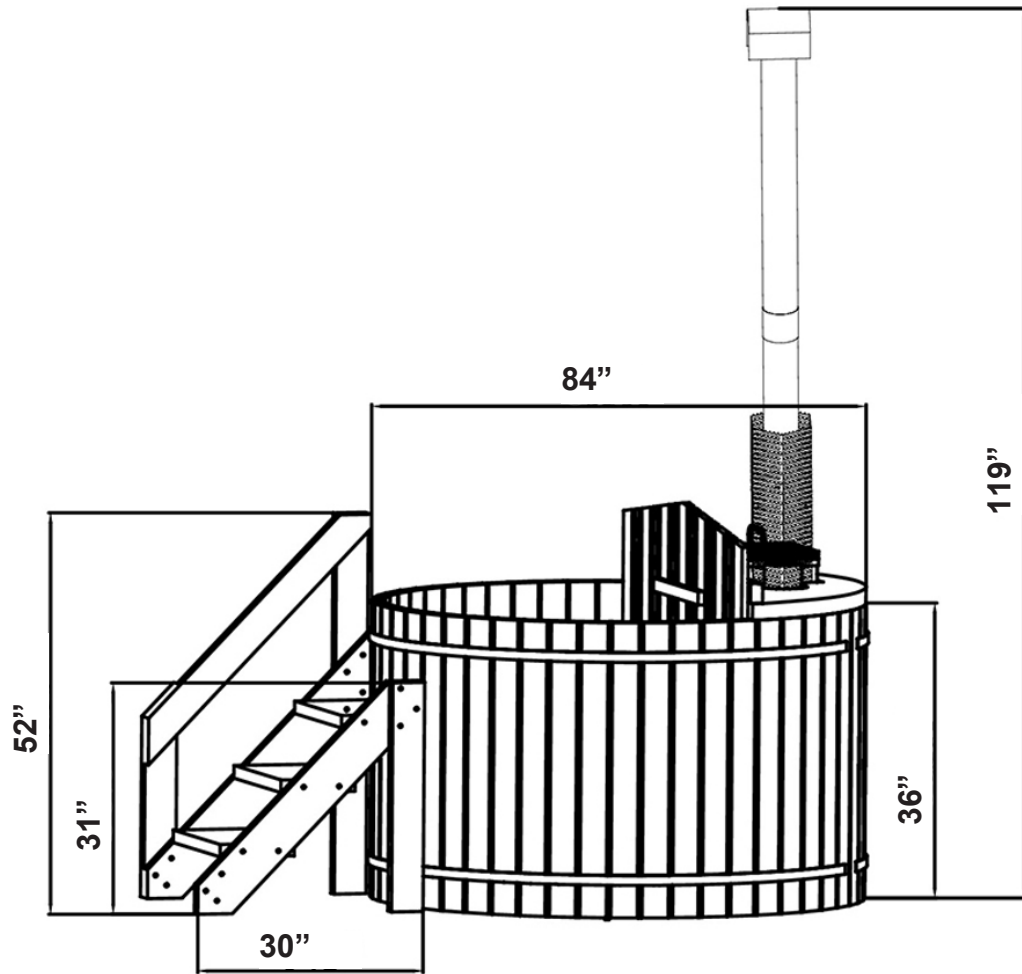


5 Person Regular (3ft)

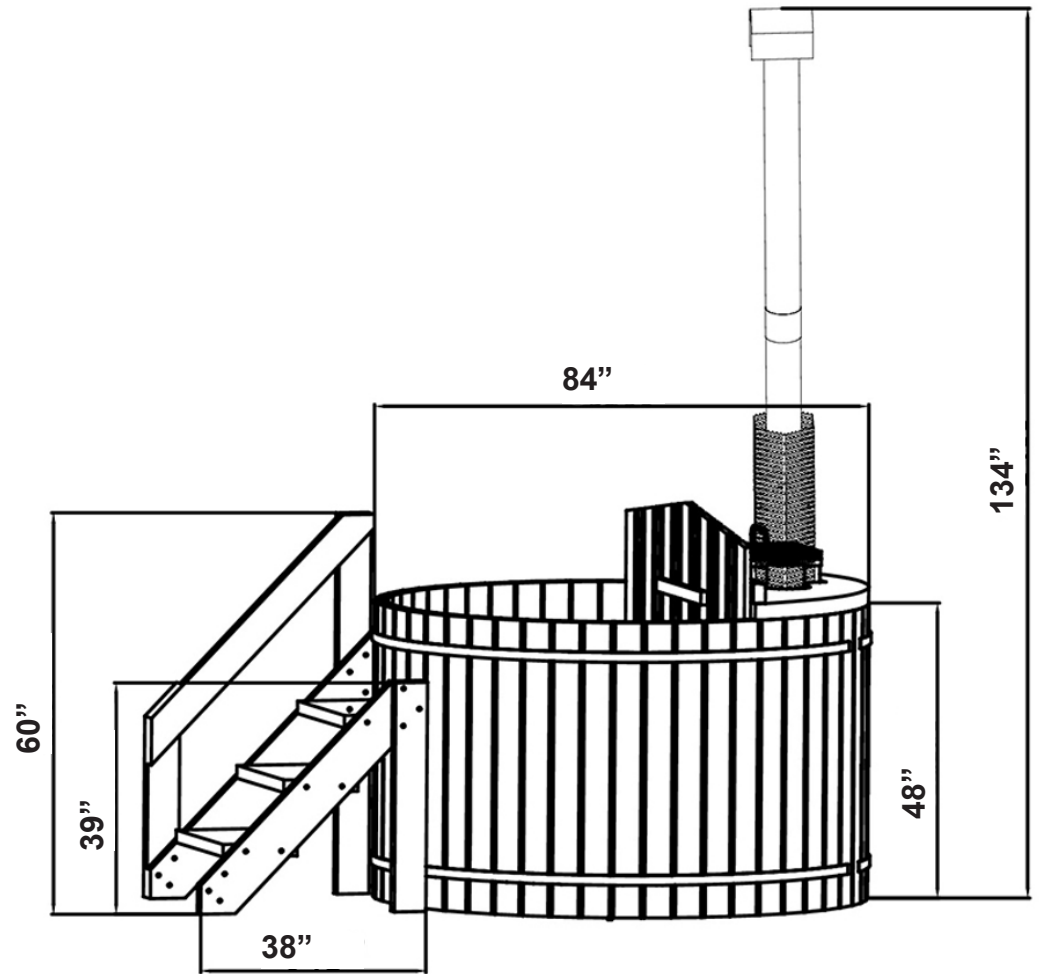


5 Person Deep (4ft)

7 Person Hot Tub Measurements



7 Person Regular (3ft)



7 Person Deep (4ft)

Preperation

Remove the pieces from your crate and place them near where you plan to assemble your hot tub for easy access during your build.

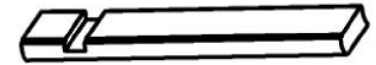
The wooden parts must be kept dry during assembly to prevent warping. Ensure they are appropriately covered / protected from the elements (rain, dew, etc.). If you are assembling over multiple days, bring the parts indoors overnight if possible.

Inside your crate, there will be a bag with hardware (screws, tacks, etc.). You will use this hardware during assembly of the hot tub.

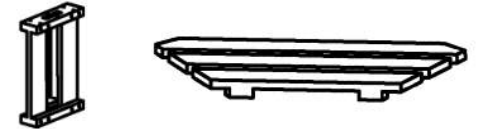
There will be a bathtub plug placed in with the hardware. **Please keep this plug stored in a safe location as you may need it during use of your hot tub.** Some customers experience leaking at the drain and this plug can be used to replace the pre-inserted pop-up drain piece to reduce water loss.

Example Hot Tub Parts

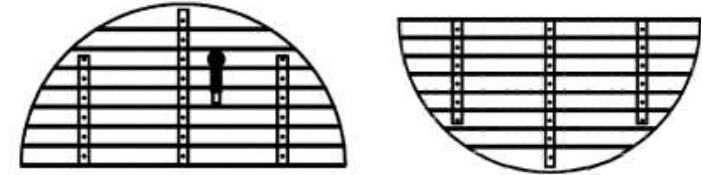
Staves



Benches and Struts



Tub Base



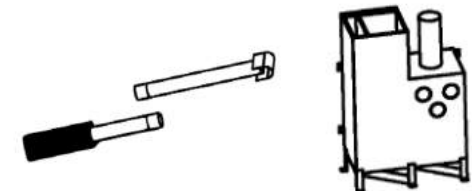
Hardware and Tub Plug



Bands and Related Accessories



Stove and Chimney



Step 1 - Assemble the Hot Tub Base

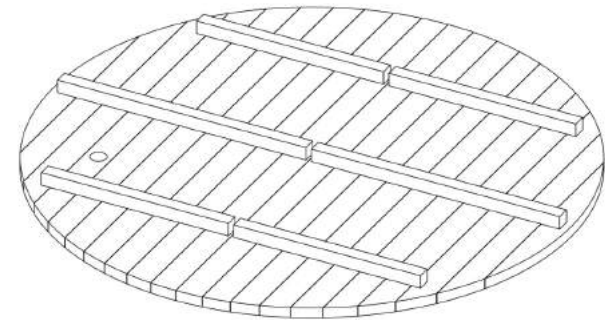
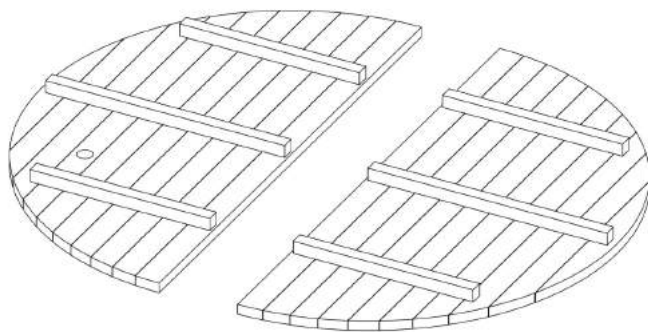
Place the base pieces on the ground upside down. Ensure the ground is dry, we recommend laying cardboard, a sheet, or other barrier on the ground first to protect the wood.

If the drain is pre-installed in the tub base, remove it (this will be re-inserted once the liner is in place).

The tub floor fits together with a tongue and groove construction.

Before fitting the pieces together, apply 3 beads of silicone into the groove. One along the top, the bottom and one in the middle. Tap the floor pieces together with a rubber mallet. Using a ratchet strap helps bring the floor pieces tightly together. Make sure that connections between the base pieces are smooth and that the base forms a nice circle.

Please Note: We no longer ship silicone due to breakage issues. Please source clear silicone from your local hardware shop.



Step 2 - Install the Chime Joists

Once the tub bottom is assembled the floor pieces are fastened together using the chime joists. The tub will be supported by the chime joists during use.

Depending on your tub's diameter, you will receive 3 or 4 chime joists.

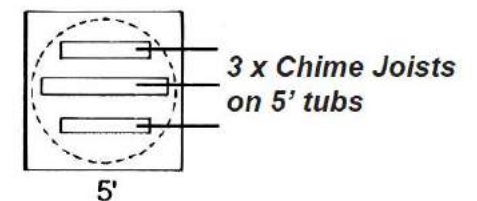
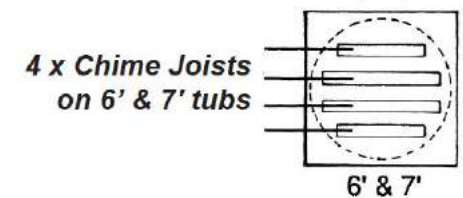
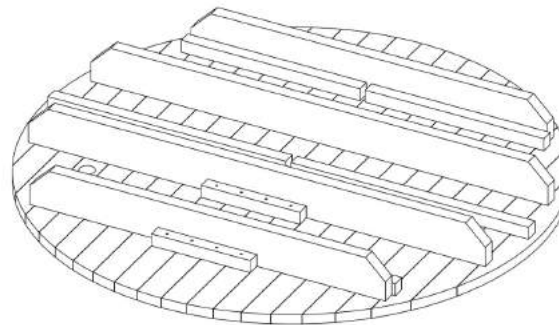
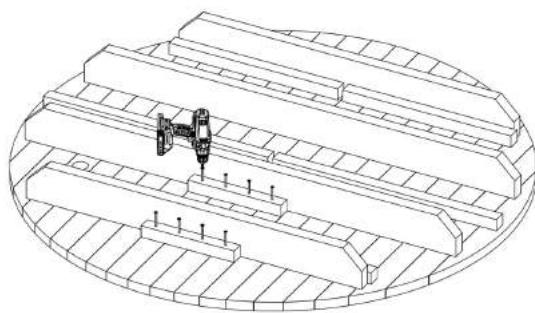
- 5 ft tubs have 3 chime joists.
- 6 ft and 7 ft tubs have 4 chime joists.

The chime joist patterns for each tub size are below.

Position the joists so there is space around drain hole. **Leave space around the drain hole** to install the drain and any other plumbing. Once positioned, screw into place. If later during assembly you find the chime joists block your drain you can move or adjust them.

After the chime joists are screwed into place the floor pieces will be fastened firmly together. Flip the base over so that it is sitting on the chime joists.

Joist Patterns



NOTE FOR 2022 HOT TUBS THERE IS A RESEDESIGNED STAVE CUT PLEASE SEE THE FOLLOWING PAGES IF YOU HAVE A 2022 TUB PLEASE REFERENCE THE SECTION CALLED "REVISED STAVE CUT" FOR CORRECT INSTALLATION

Step 3 - Stand Staves on the Base

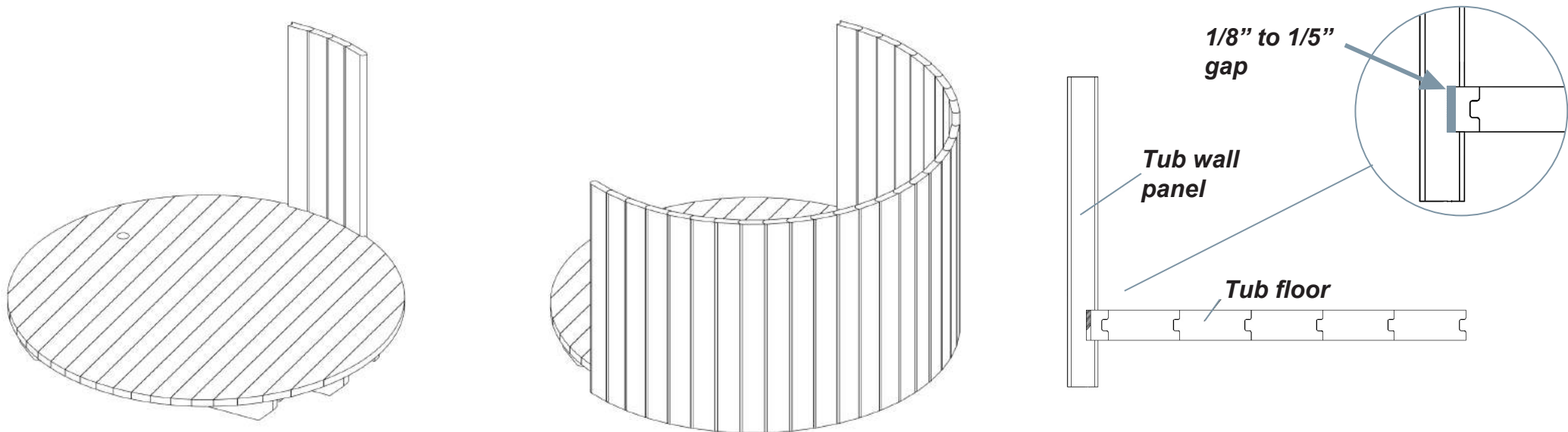
Before standing the staves, consider the position of the tub, in particular where you would like to have your drain.

Work your way around the tub standing staves on the base. Before putting a stave on base, apply a small bead of silicone to the corners of the stave to improve the seal with the base. To prevent the staves from falling outwards during install, use the ribbon and thumbtacks provided to hold the staves in place as you work. Painter's tape is another good option for supporting the staves.

When you initially stand the staves on the tub base, don't push the stave all the way on. Leave a small gap of about $\frac{1}{8}$ " between the back of the dado cut and the tub vase, as shown in the diagram below. This small gap is necessary to allow you to get the maximum number of staves installed around the circumference. After all the staves are on the tub, you will put the steel bands on and begin tightening the bands and tapping the staves with the mallet, gradually drawing them in. Allowing the bands to draw the staves to the base in unison will help you form a more perfect circumference.

Our cedar is kiln dried, however, in transit it can absorb moisture from the air causing it to swell slightly. This sometimes causes some staves to fit tight when trying to put them on the tub floor. **Never force the staves on**, it could cause the bottom of the stave to crack off. If you find that the dado cut is too tight, lightly sand the dado as necessary until you can gently tap the staves into place with the mallet.

Handle the staves with care. If staves are dropped or mishandled, they can crack or even break



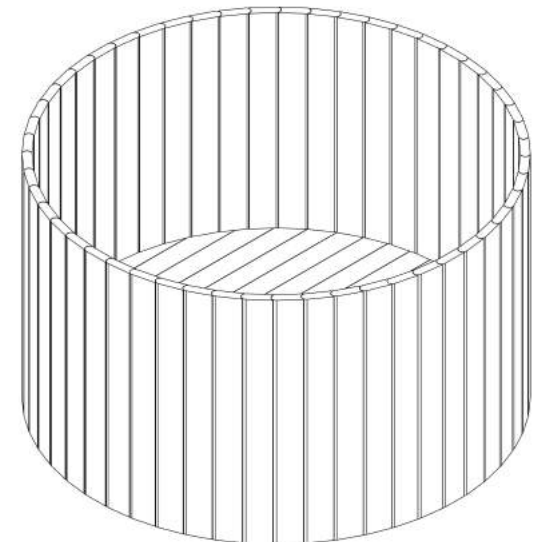
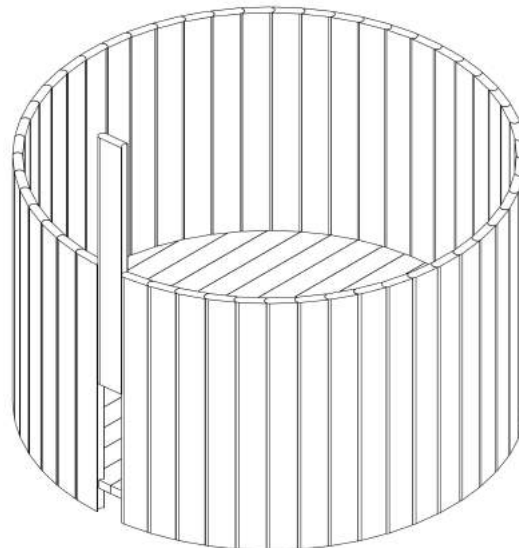
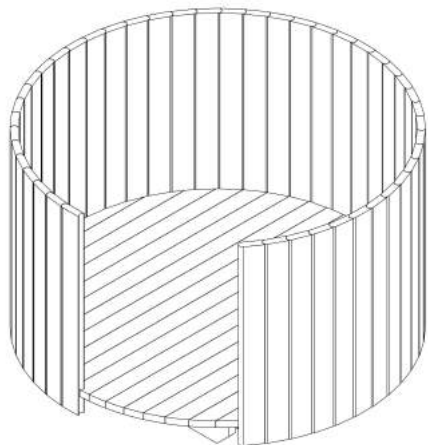
Step 4 - Finish Stave Assembly

Continue standing staves until the body is complete.

Get as many staves installed around the tub as possible. The normal range of staves is shown in the table below. The lower number listed is the minimum number of staves you must install. Note that “half a stave” (0.5) refers to a “key stave” which is a smaller stave that can be inserted if you don’t have room for a full final stave. We provide spare staves in the crate, so its normal to have 1 or 2 staves left over afterwards.

Inserting the key stave can be difficult. Insert the key stave by positioning key stave and the final regular stave are pointing outwards (i.e., form an arrow pointing away from the tub) then tap on the point of the arrow with a mallet. Alternatively, loosely wrap the hot tub with a ratchet strap to prevent staves from falling off and insert the key stave top down. If using the second approach be careful not to tighten the ratchet too tight as the staves need to be able to move side to side, also be careful the that bottom of the stave doesn’t crack on the hot tub base.

<i>Tub Size</i>	<i># of Staves</i>
5'	52.5 to 53.5
6'	62.5 to 63.5
7'	72.5 to 73.5

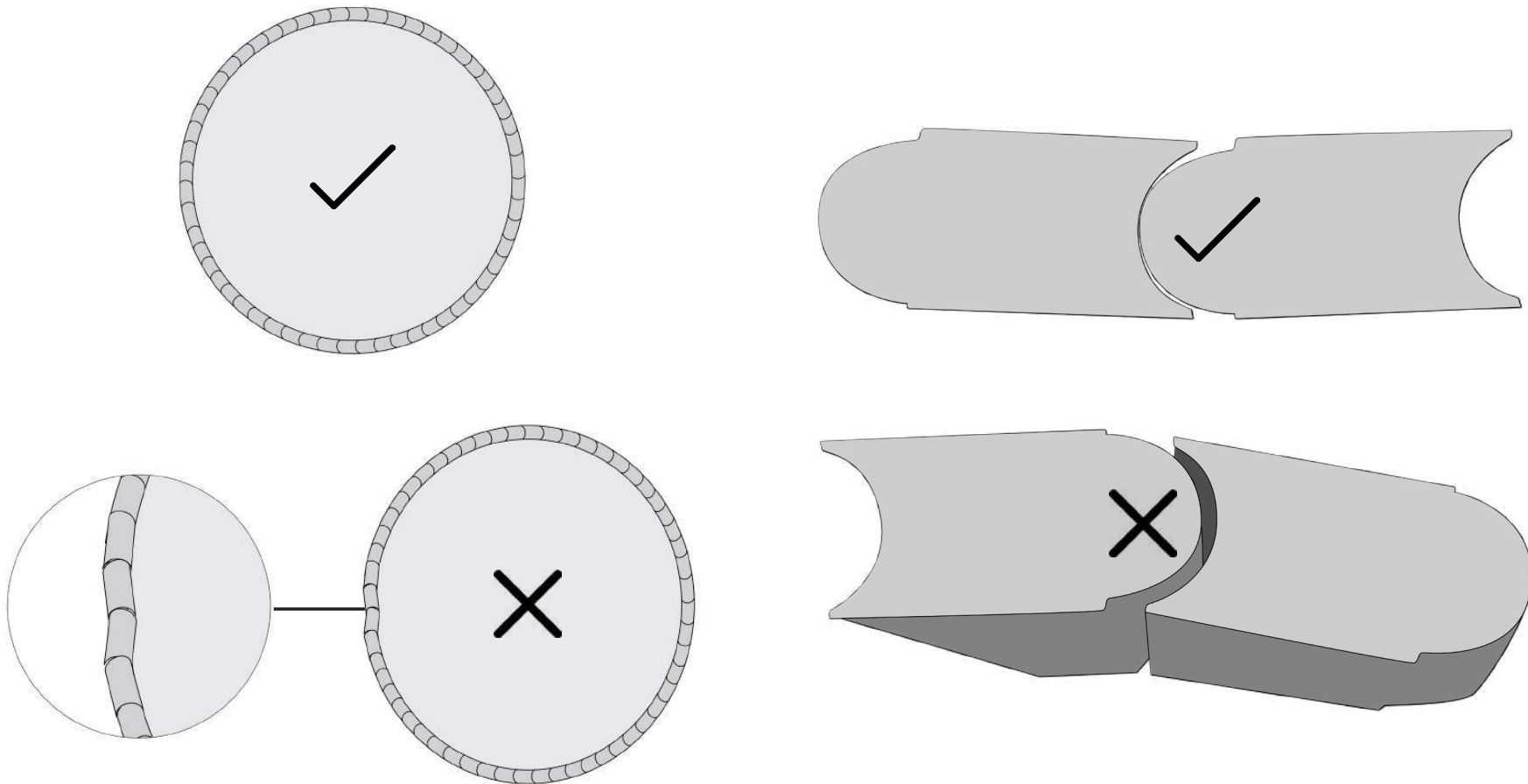


Step 5 - Check Stave Alignment

Check the circumference of your tub from the top down. The tub should be perfectly rounded as opposed to an oval. There should be no zig-zag pattern in the staves. The bead and coves should fit together in a nice circular pattern.

Check your bead and coves are fitting together well. If a stave has been stood at an angle, or is leaning forward or backward, then you will have gaps or misfits.

Any of the issues above can lead to issues when tightening the bands and “rounding” the tub.



REVISED STAVE CUT (ONLY FOR 2022 MODELS)

- You will receive machined hot tub staves as well as metal strips.
- Using a rubber mallet, lightly tap the metal strips so that the teeth bite into the groove in the side of the stave.
 - The strips should be inserted near the top of the stave.
 - Only insert into the left **OR** right side, not both.
 - All staves should have strips on the same side.
 - Tap the strips lightly to avoid bending.
- The first stave placed does not need a metal strip on either side.
- With this new stave design, the liner must be used. The tub will not seal naturally and will leak if the liner is not used.

REVISED STAVE CUT (ONLY FOR 2022 MODELS)

- **Silicone sealant no longer needs to be used to seal the base pieces or to secure the staves to the tub base.**
- **As you place staves on the tub, ensure the new stave is tightly packed to the stave next to it, and that the metal strip is fully inserted into the groove.**
 - **If you are working clockwise around the tub, the metal strips should be inserted into the right side of the stave.**
 - **As you place new staves onto the tub, the metal strip on the right side of the new stave will insert into the groove in the left side of the stave already on the tub base.**
- **Use tacks and ribbon to help keep the staves in place.**



REVISED STAVE CUT (ONLY FOR 2022 MODELS)

- Once there is only a small gap stop and locate the key stave.
 - The key stave is a half-width stave.
- Put a regular stave and the key stave together outside the tub.
 - Neither stave should have a metal strip inserted on either side.
- Place the staves onto the body of the tub and ensure they as well as the staves on either side are firmly inserted onto the tub base.
- Locate the half length metal strips with teeth on one edge only.
- From the top, insert the half metal strips into the channels between the staves.
- Once you are finished, there should be a metal strip in each channel.



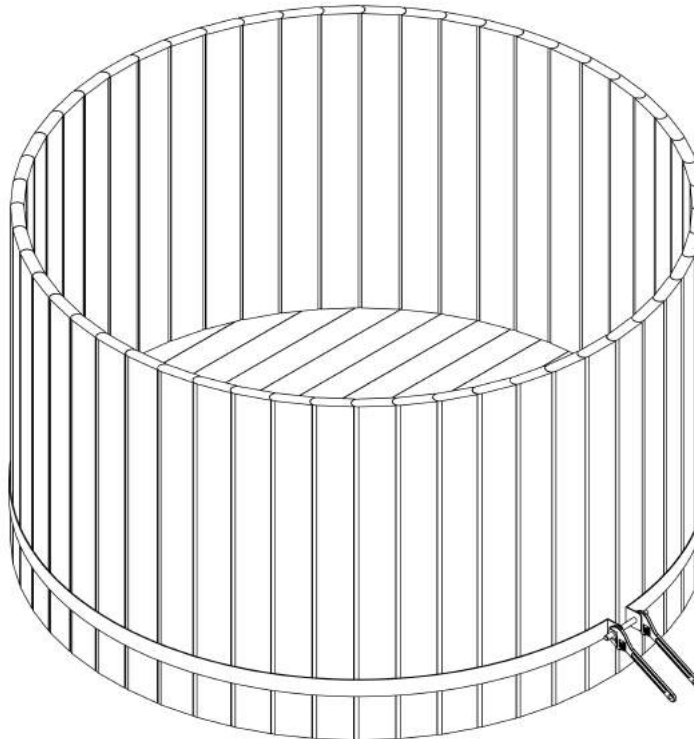
Step 6 - Install the Bottom Band

Wrap the bottom of the tub with one of the bands.

Position the bottom band so that it is **over the dado cut** (i.e., where the stave connects to the tub base). If you are unsure of the exact location, use a spare stave to measure and confirm the height.

Tighten the band so that it is **snug** (goal at this stage is just to prevent staves falling off of the base). The bands will be tightened more later in the assembly process.

If you used a ratchet strap in the previous steps, remove the strap after the band is snug.

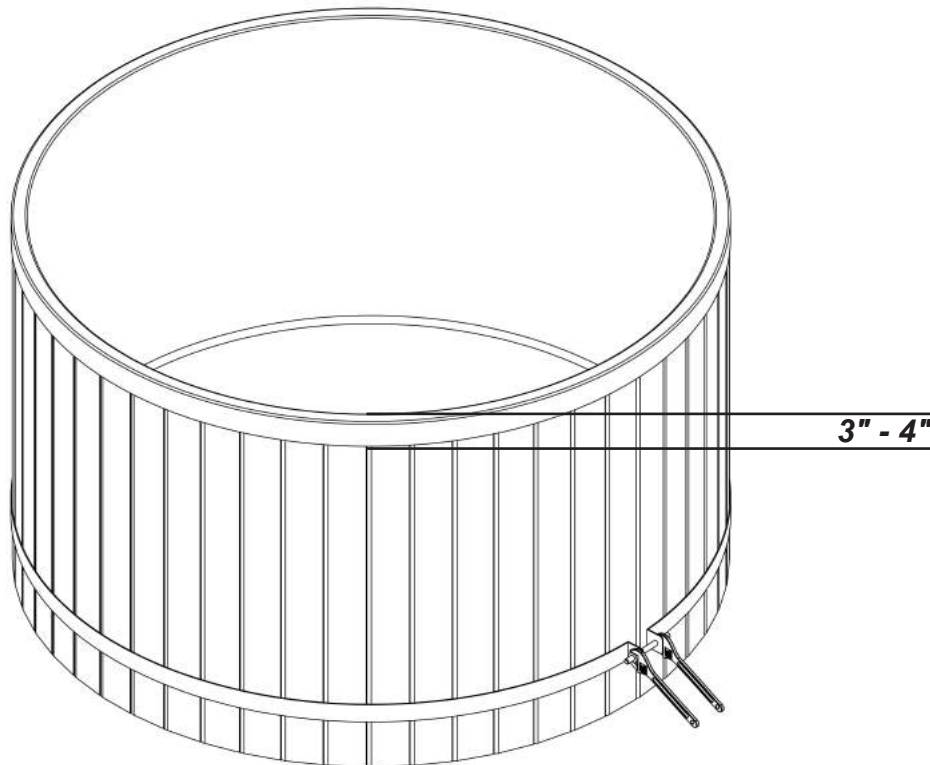


Step 7 - Place the Liner Inside the Tub

Before installing the liner, ensure it is warm. If you are installing in the summer or on a warm day, it should be at the right temperature. If you are installing in winter or on a cold day, run the liner under some warm water (this will make the liner more elastic and stretchier).

Put the liner inside the tub. Work around the sides pulling the liner tight over the sides of the tub, **the liner is designed for a tight fit**. It is best to do this with 2 people, but you could use clamps to keep the liner in place if you are doing this by yourself.

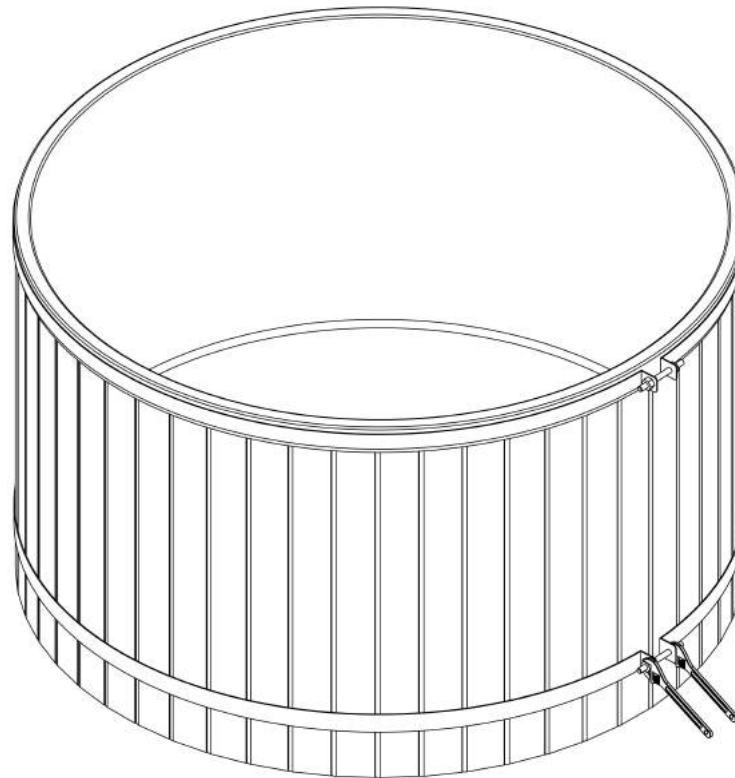
There should be a gap of **3 – 4"** between the edge of the liner and the top of the stave.



Step 8 - Place the Top Band

Confirm the liner is even at all locations around the tub.

Place a band at the top of the tub so that it sits on top of the liner. The liner should sit between the band and staves.



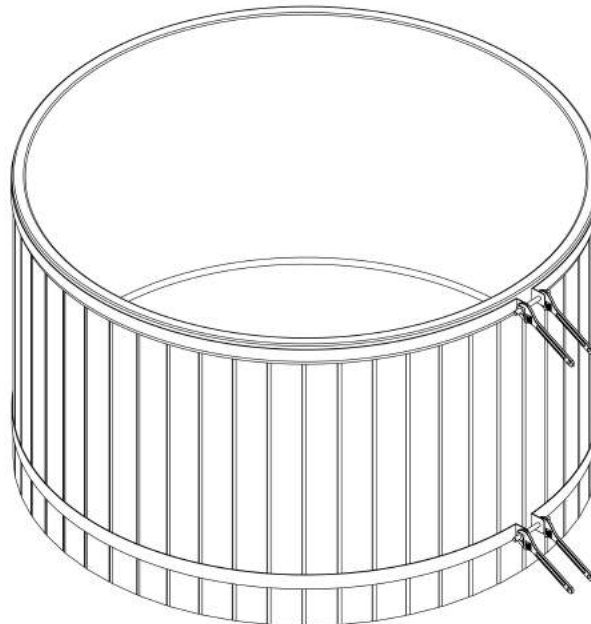
Step 9 - Tighten the Bands

Start tightening your band to "round" the tub. **Rounding the tub is a repetitive process.**

- (1) Pound the bottom band to move the staves inward.
- (2) Tighten the bands.
- (3) Keep the staves aligned so their bead and cove stays engaged. Moving the staves inward by pounding the bottom band creates slack in all the band, which is then taken up by tightening them.

Continue until all the staves are **tightened onto the hot tub base**. You should have no more than a few gaps of 1/32" – 1/16" between staves once the tub is assembled and the bands are tight.

If you cannot get the staves tightened fully to the base, you may have too many staves installed. Remove a key stave and try again to tighten everything in.



Step 10 - Install the Drain

Step inside the tub and work your way around the inner edges stretching the liner into the corner with your toes.

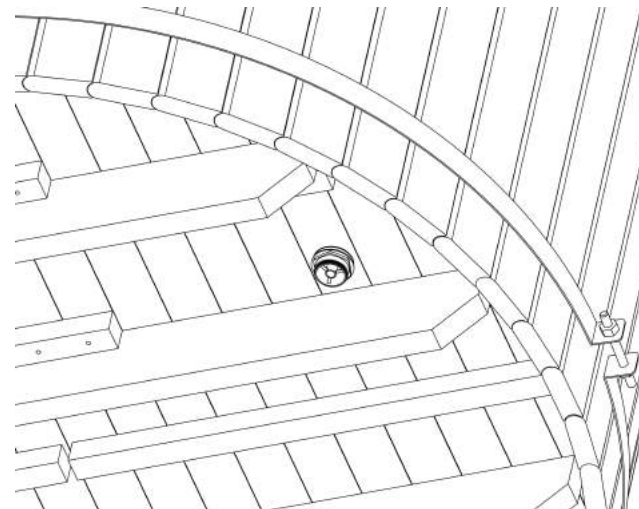
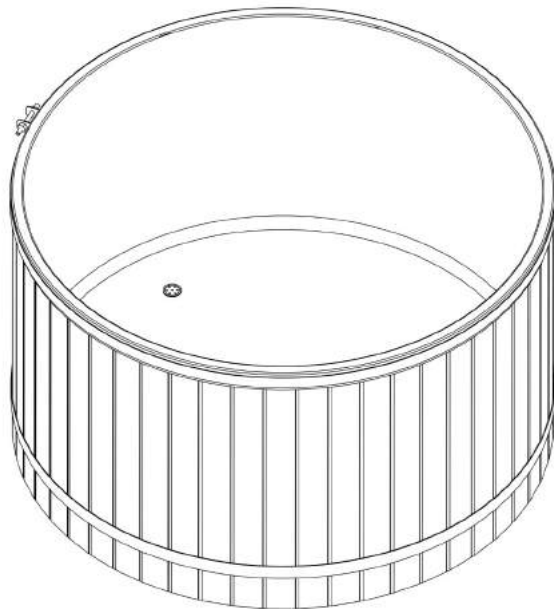
Once the liner has been stretched, spread liner across the base of the tub as evenly as possible.

Locate the drain hole in the base and cut a **SMALL x-shaped hole** in the liner over top of the tub base outlet. It is best to cut a hole that is a bit smaller than the drain plug and the liner will stretch so that the plug will fit.

Spread silicone sealant around the bottom of the drain plug (i.e., where it touches the liner), then push through the liner / tub base.

From underneath the tub, screw the bottom back onto the drain. Make sure you screw the bottom piece on **tight** (you may need to lean the tub onto its side in order to access the bottom of the drain). Use a pipe wrench to tighten the bottom piece.

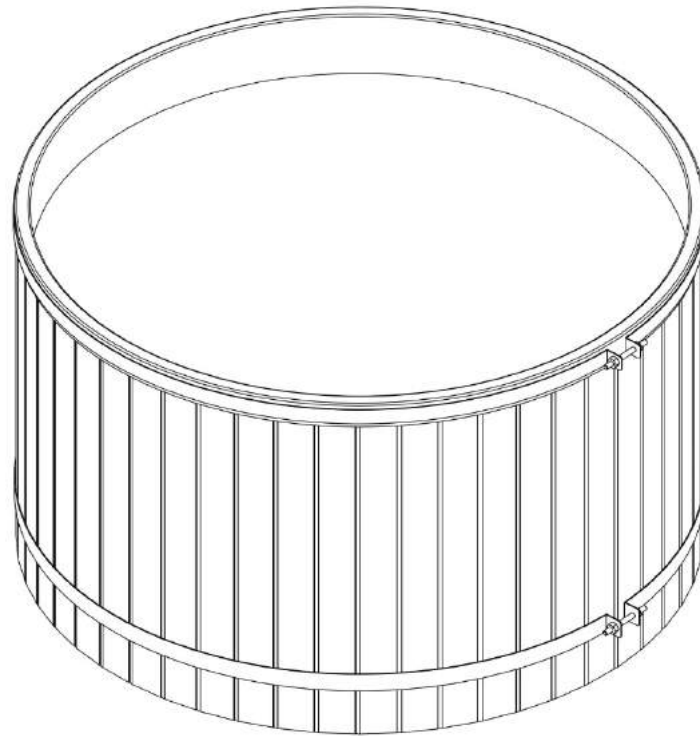
If you would like the water to drain to a more different location, attach plumbing to the bottom of the drain (plumbing must be sourced locally).



Step 11 - Set the Liner

Fill the tub up with water and let sit for **~24 hours**. This will stretch the liner so that it sits evenly when you install the benches. This step will maximize the liner's life.

After the liner is set, drain the water and continue assembly.



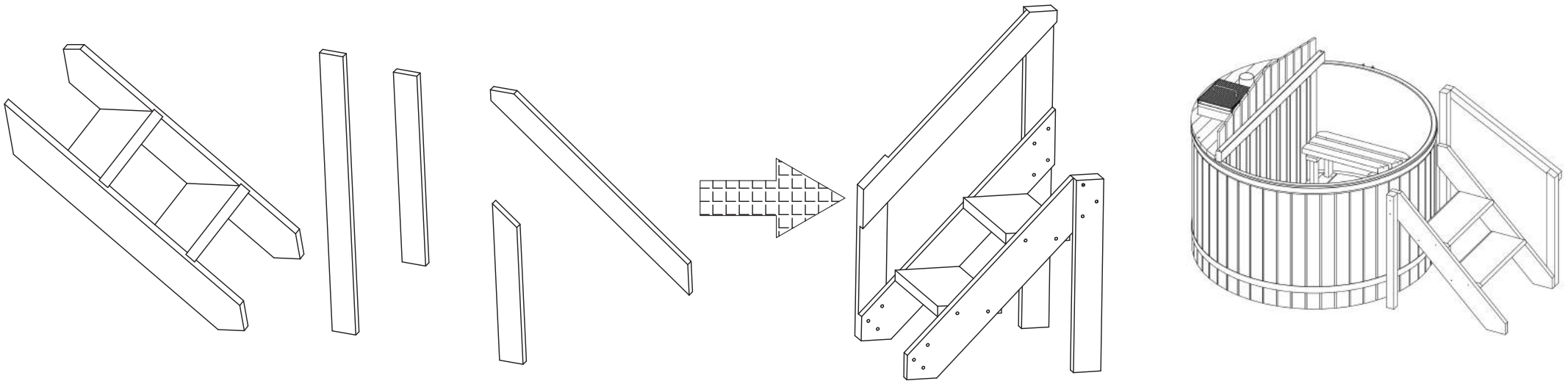
Step 12 - Assemble the Stairs

Assemble the stairs using the pieces in the diagram. The number of stair treads you have will depend on the height of your hot tub.

Use the wooden piece with two flat ends as a guide, first attach this so it is flush with the top of stair treads. Then on the other side attach the long piece, position it such that the treads are level when stood up. Finally, attach the back piece and handle.

After you have finished assembly, place the stairs next to the tub. The stairs do not need to be secured to the tub.

This step can be done earlier or later in the assembly process if preferred.



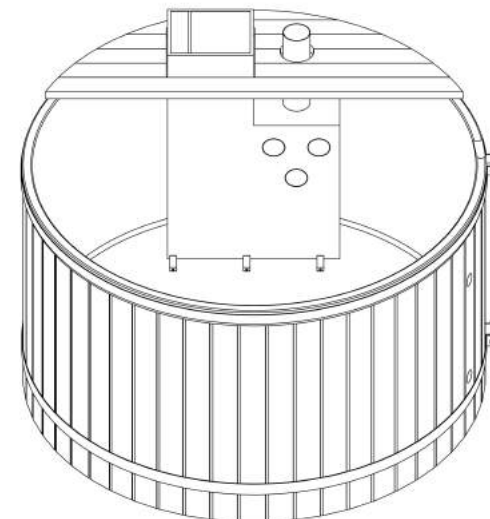
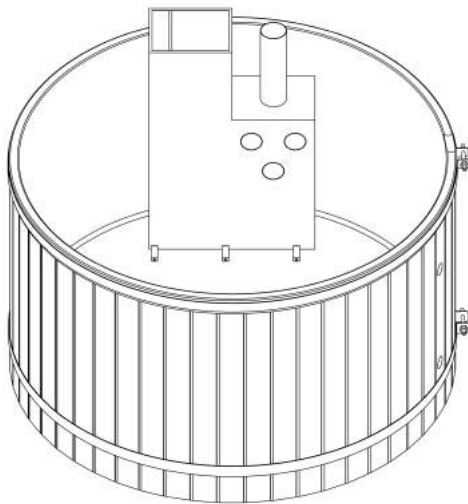
Step 13 - Place the Stove and Wooden Cover

Place the stove inside the hot tub as close to the side wall as possible. Be careful not to tear the liner on the stove struts when moving into the corner.

Placing a silicone gasket underneath the stove struts (in-between the stove and liner) can help improve the seal. Gaskets should be attached to the bottom of the stove struts with silicone sealant at least 1 hour before installing into the tub. **Note that gaskets must be sourced locally.**

Place the wood cover over top of the stove using the pre-cut holes as a guide. The circular edge of the cover should sit flush with the edge of the tub. **Make sure there is at least a finger width of gap between the wood cover and stove components at all locations.** If the wooden cover touches the stove when the stove is in use, it can char and potentially catch fire.

If you cannot position the cover such that it is flush with the outside of the tub without touching the stove components, increase the size of the pre-cut holes with a saw-all or similar tool.



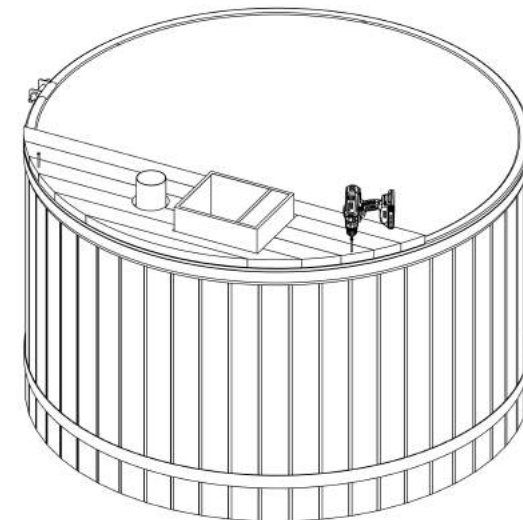
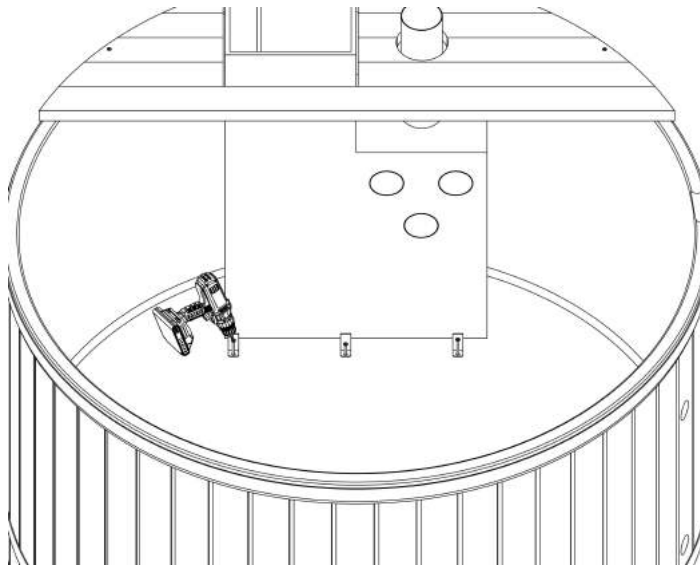
Step 14 - Fasten the Stove and Cover into Place

Once the stove and wooden cover are positioned, fasten them to the base of the tub / top of the staves respectively. Thoroughly check the position before inserting any screws, **after a screw pierces the liner, it cannot be removed**. Taking the screw out leaves a hole in the liner and will seriously reduce the liners ability to prevent leaks.

The stove must be fastened tightly to the tub base, if the fit is loose, you could experience leaks from underneath the struts. Silicone sealant can be applied around the corners of the stove struts (i.e., where the struts meet the liner) after they are fastened to further improve the seal.

If there are tabs on the side of your stove (i.e., to fasten the stove to the tub side wall), **these should not be used**. These are only used if the hot tub is being installed *without* a liner.

The tub must be full of water before operating the stove.



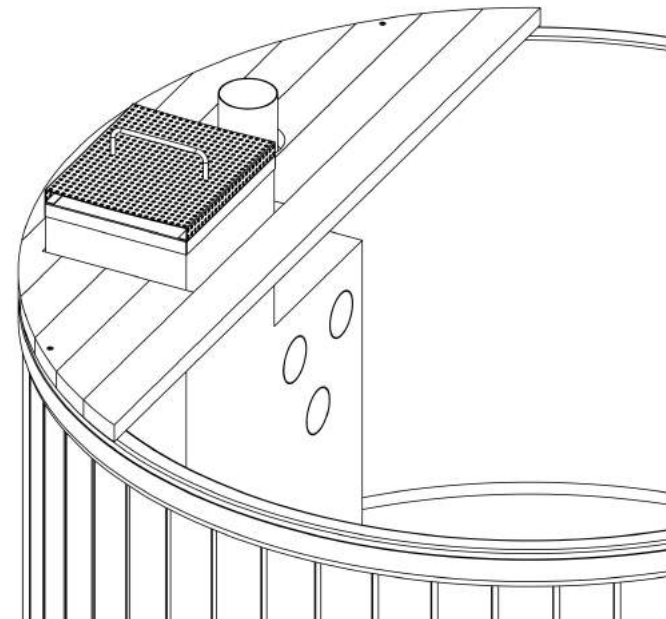
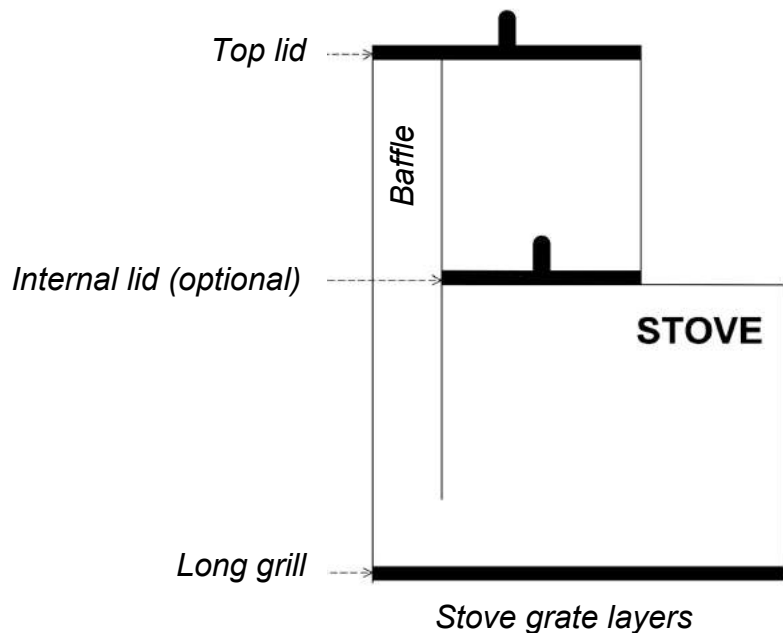
Step 15 - Place the Stove Grates Inside the Stove

The stove opening is divided into two pieces, the larger opening is for placing wood and other combustible materials and the smaller opening (the baffle) for letting air flow into the stove.

First, place the long grill into the bottom of you stove via the large opening.

Depending on your model, you may have a internal stove lid. This lid is **optional** and has been discontinued in our newest stoves. Your tub may or may not include this lid. If you have received this lid, you can place inside the stove over the opening to the bottom of the stove (i.e., where you placed the long grill) or not use it depending on your preference.

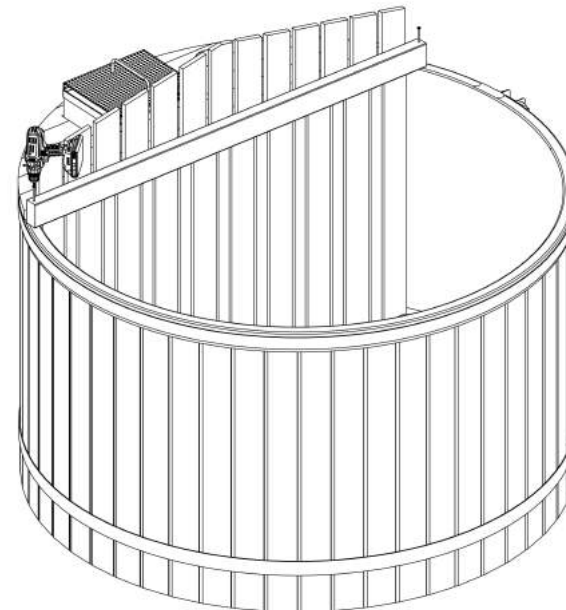
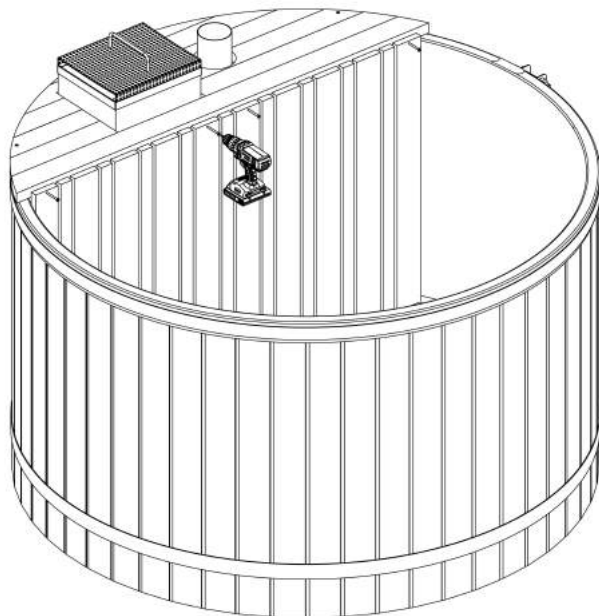
The top lid is placed on top of the stove and covers the large opening and the baffle. During operation, adjust the lid such the baffle is fully or partially exposed to provide air to the fire (the more the baffle is exposed, the more intense the fire will burn).



Step 16 - Install the Fence

Place the bottom fence piece inside the tub so that it sits against the wooden cover. The bottom corners of your fence may interfere with the liner depending on how well your liner is stretched. If you are experiencing any interference, trim the bottom corners of the wooden fence to improve the fit. Fasten the fence to the front of the wooden cover with screws.

Place the triangular fence piece on the tub so that it run across the width of the tub and sits flush with the staves. Fasten the triangular fence piece into the top of the staves with screws.



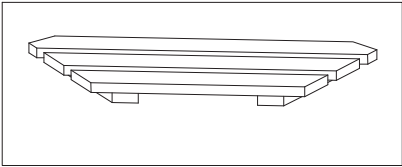
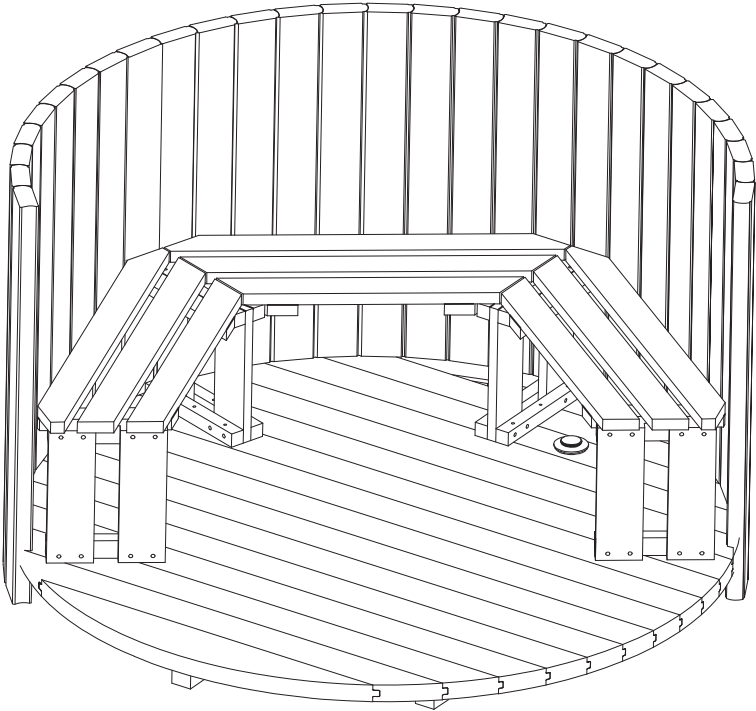


BENCH CONFIGURATION VARIES

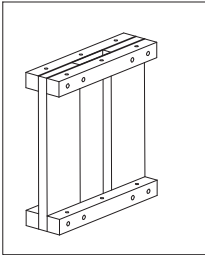
Bench configuration varies according to hot tub size. Please refer to the next pages to see the bench configuration for your hot tub model.

Bench Configuration

3 Person Regular (3ft)

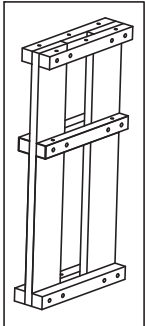
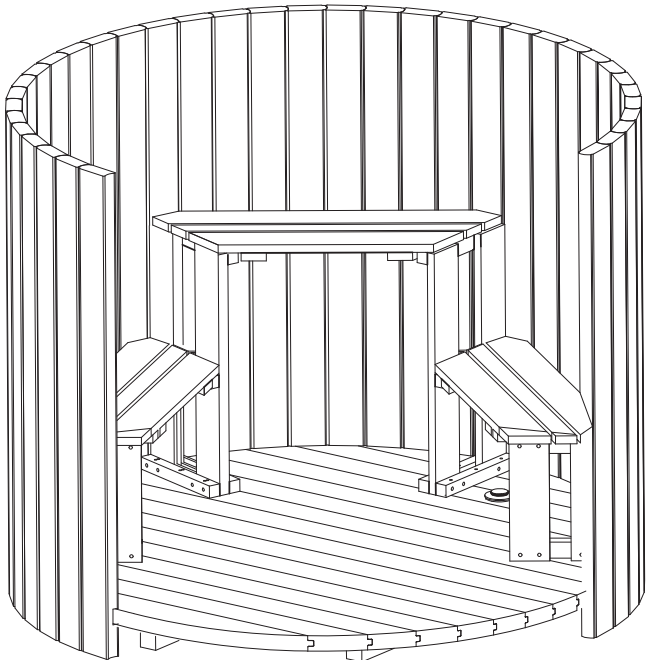


3 sets

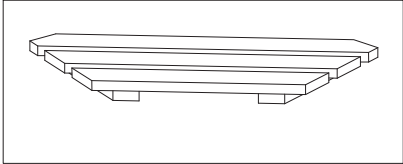


4 sets

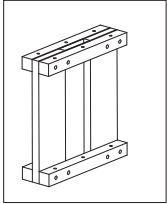
3 Person Deep (4ft)



2 sets



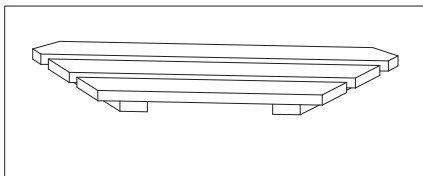
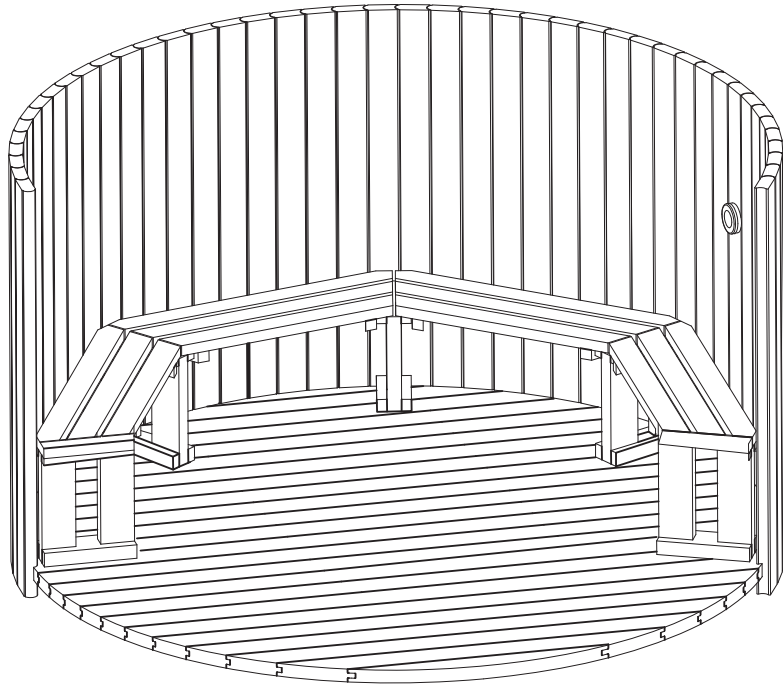
3 sets



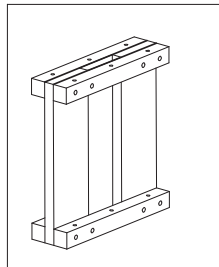
2 sets

Bench Configuration

5 & 7 Person Regular (3ft)

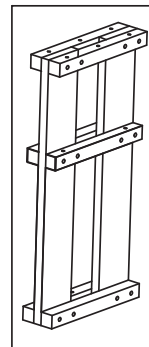
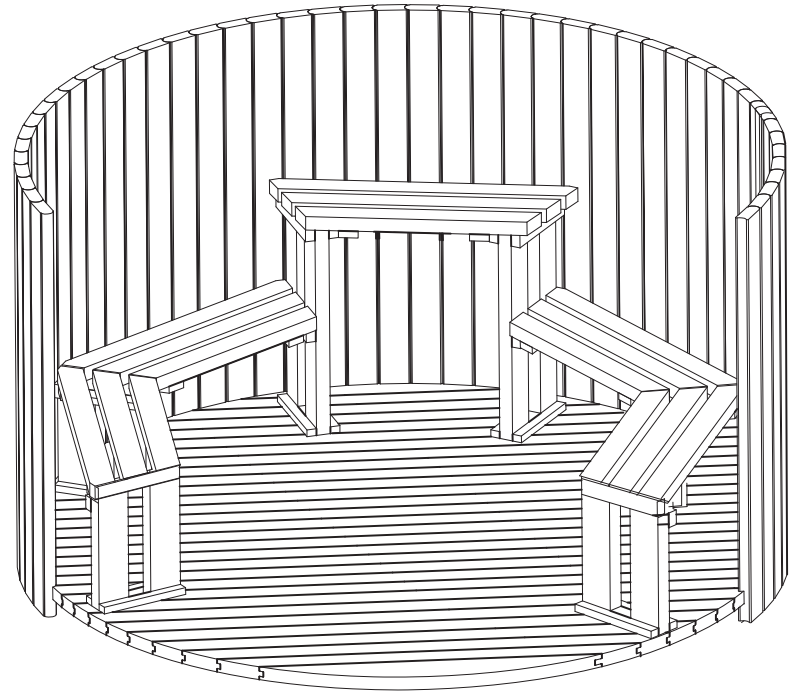


5 sets

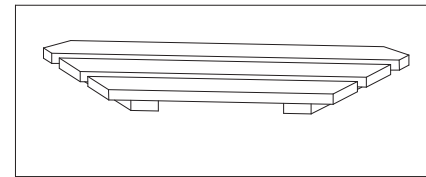


5 sets

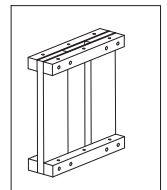
5 & 7 Person Deep (4ft)



2 sets



5 sets



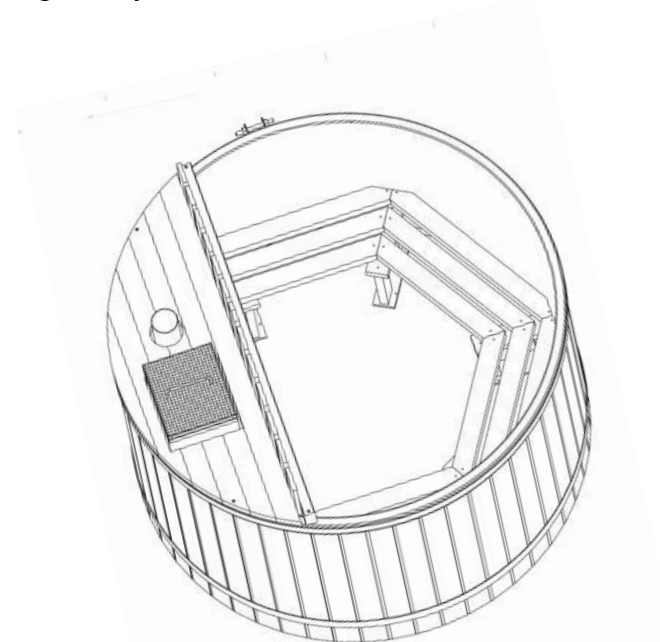
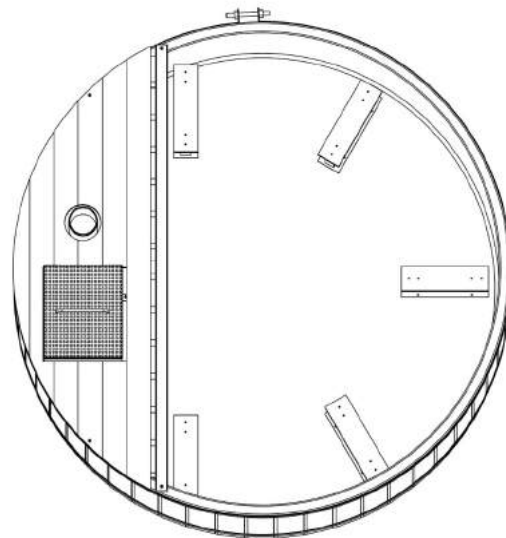
4 sets

Step 17 - Place the Bench Struts and Tops

Following the bench pattern, place the bench struts around the bottom of your hot tub. **Do not fasten the bench struts to the tub base yet.** Try to get the struts close to the side of the hot tub, however, be careful not to tear the liner on the edge of the bench strut while pushing.

Placing a silicone gasket underneath the bench strut in-between the bench strut and the liner and bench strut can help improve the seal. Gaskets should be attached to the bottom of the bench strut with silicone sealant at least 1 hour before installing into the tub. **Note that gaskets must be sourced locally.**

Place the bench tops on the struts to confirm fit and positioning. If the bench struts have not been positioned correctly, the bench tops might not fit perfectly. If you encounter fit issues, adjust the position of your struts. If there is too much of a gap between the edges of your bench tops, you may need to pull your bench struts and tops in towards the middle of the tub. If there is not enough room between the bench tops, you may need to push you struts/tops back towards the hot tub wall or trim the edges of your benches to fit.



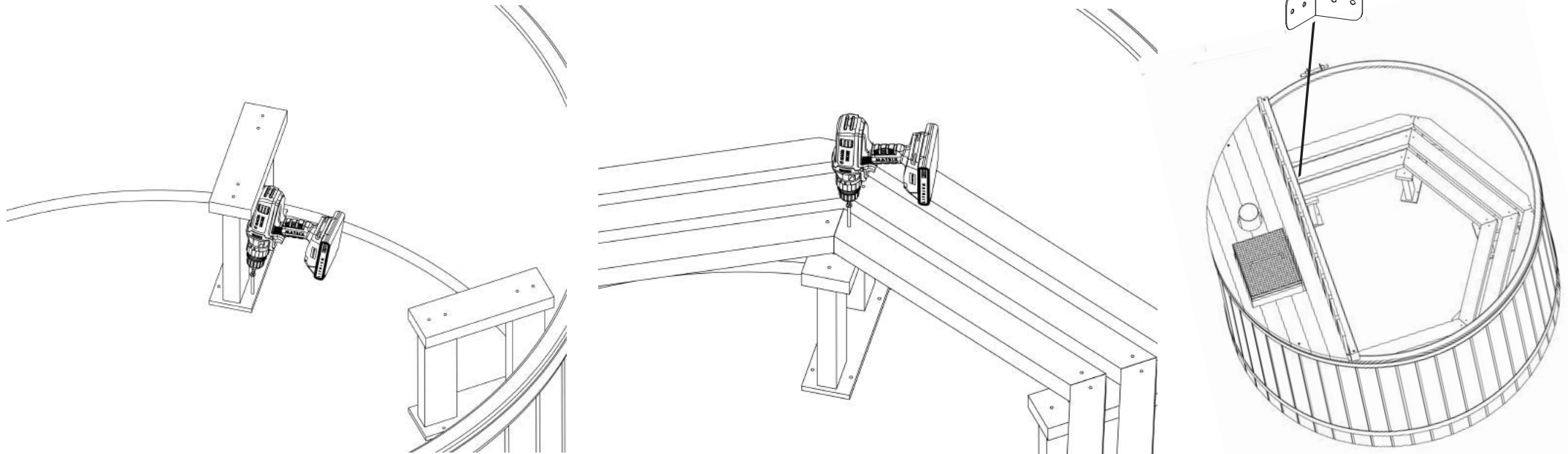
Step 18 - Fasten the Bench Struts and Tops

Once the position of the benches and bench tops is confirmed, work your way around the inside of the tub fastening the bench struts to the base of the tub. Thoroughly check the position before inserting any screws, **after a screw pierces the liner, it cannot be removed**. Taking the screw out leaves a hole in the liner and will seriously reduce the liners ability to prevent leaks.

The bench struts must be fastened **tightly** to the base, if the fit is loose, you could experience leaks from underneath the bench struts. Silicone sealant can also be applied around the corners of the bench struts (i.e., where the struts meet the liner) after they are fastened to further improve the seal.

Once all struts are fastened to the base, fasten the bench tops to the struts one at a time. After all bench tops are fastened, you can secure the bench tops to the fence using the L shaped brackets. Fasten a bracket on each side of the tub where the bench meets the fence (i.e., 1 screw inserted into the fence, one inserted into the bench top). This step is **optional**.

Do not fix the L brackets to the side of the tub as this creates a hole in the liner and result in leaks.

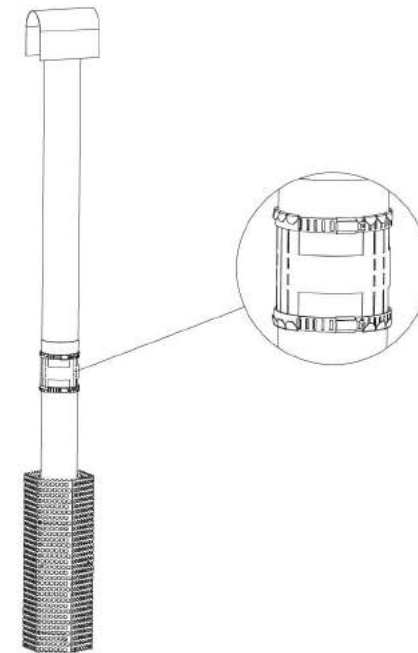
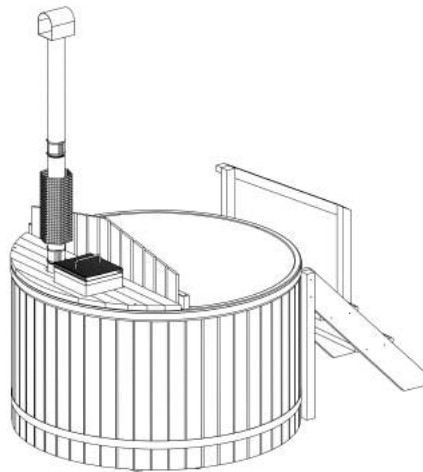


Step 19 - Install the Chimney

Mount the two chimney sections on the stove. The chimney pieces are pressure fit together and can be snug.

If you are having issues getting the chimney to stand straight, add clamps over the joints between the pipes and tighten them to adjust the chimney positioning. The clamps are **optional**, if your chimney stands straight without the clamps they do not need to be installed.

To install the clamps, wrap the wide metal piece around the chimney joint, place a metal hoop at either end, then tighten the metal hoops to draw the clamp tight. You can install clamps at both connect points (i.e., where the chimney meets the stove and where the middle piece meets the top piece).





IMPORTANT:

Make sure you read and understand the section on Stove Operation before using the wood burning stove.

FILLING AND SEALING THE TUB

Overtime, your tub will seal itself and achieve a watertight seal through the natural swelling of the wood that occurs as water is absorbed into the wood. Begin to fill your tub with water using a standard garden hose. If your water supply is limited, see tip #4 in the following section on leaks.

Once the tub has begun to hold water, you can expect some dripping and leaking. If you have done a superior job it may hardly leak at all. If your tub is not as tight as some it may leak more. Don't get nervous if you see small streams of water. As long as you have closed your gaps to less than the thickness of a matchbook cover and there aren't more than a half dozen or so such gaps between the staves, the tub will be able to swell and seal itself.

The swelling and sealing process may take over a week to run its course. Cold winter weather can cause the swelling process to take longer. Occasionally, a tub may even drain completely after the initial filling, but the wood is absorbing water and swelling so keep adding water.

Tips if you experience leaks

If you are having problems and aren't sure what to do, **remain calm**, leaking is normal and should stop as long as the directions were followed. There are a number of steps you can take to reduce the leaking and/or speed up the swelling of the wood.

1. First, if you have a big leak, e.g., a pencil sized stream or larger. With a leak that large you will probably need to do some disassembly/reassembly.
2. If there is a leak between staves or the bottom halves coming from an obvious gap and the gap is less than 1/8" , tear or cut a strip of a brown paper shopping bag, get it wet and tape it over the opening. This can reduce water loss while the wood swells.
3. One of the simplest general purpose solutions for stopping leaks in a new tub is an old tank maker's trick, using sawdust. Make a paste from fine sawdust and water and then press the paste into the areas in the tub where there is leaking. Then fill the tub slowly. The sawdust will be drawn towards the void where the leak is and block it or slow it down. This is a temporary measure that slows leaking enough to retain water in the tub so the wood can become saturated and swell.
4. If you are in a location where water is a scarce resource and you are concerned about excess water use, there are two other approaches that use less water than just running a hose until any leaks have stopped. The first is to get a couple of buckets of hot tap water and put those in the tub. The hot water speeds up the swelling process significantly. The other approach is to use a lawn sprinkler. Put it in the tub and turn it on low. The water will keep the stave and floorboards wet so they will swell without wasting a lot of water.

Tannin Leaching

At first, tannins will leach from the wood into the water turning it reddish-brown. This leaching process may last anywhere from 2 to 3 months depending on the amount of tannin contained in the wood. The tannins are not harmful and in fact, are indicative of the amount of natural preservatives in the wood, but they can discolor bathing suits. If your water has tannins in it, change it more frequently, and eventually, all the tannins will be leached out of the wood.

JAPANESE STYLE BATHING

Traditionally in Japan, many people, regardless of wealth, enjoy a daily hot tub. Everyone scrubs themselves clean before entering the hot tub to prevent contaminating the water. In addition the water is changed regularly. The baths are large enough to be comfortable, but not so large as to be wasteful. Many are heated with wood or coal.

Our wood-fired hot tubs may be used Japanese style - i.e., simply draining, cleaning and refilling. The frequency with which you change your water will depend on a number of variables. The variables include the number of bathers, how clean they are when they enter the tub, and the size of the tub. In considering your sanitation plan, please bear in mind that a hot tub is really just a large bath tub.

If you are going to use your tub Japanese style, there are four important elements.

1. The bather is clean upon entering the tub. (Scrub off with soap and water right before entering)
2. Water is changed frequently (this can be once a day with a high bather load like a family party over a special weekend).
3. If your water looks dirty, or is in any way questionable, change it.
4. Clean your tub and scrub with a brush, then rinse with clean water before refilling.

SANITATION

At a minimum, your hot tub water should be treated with both a sanitizing agent (bromine) and an oxidizer (also called “Shock”). The sanitizer will kill bacteria, keeping your water clean. Shock oxidizes your water, giving the sanitizer a boost as well as helping remove organic contaminants from the water.

Although a common choice for other pools and spas, we do not recommend using chlorine to sanitize your tub or using chlorine / tri-chlor based Shock to oxidize your tub. Chlorine is harsh on the wood and will lead to faster decay of the wooden components. Further, if you have a wood-fired tub, chlorine can lead to corrosion of the hot tub stove.

Bromine is gentler on the skin and has a less powerful odor. Bromine also has a lower pH level than chlorine and therefore it can be easier to keep your water pH balanced when using bromine.

NEVER mix chlorine and bromine either dry or in the hot tub water as this can cause a dangerous reaction. If you are considering switching from one sanitizer to another you should always first clean and drain your hot tub including a plumbing line flush.

Adding and Monitoring Sanitizing Chemicals

To add bromine to your tub, we recommend using a floater which will distribute chemicals evenly. Putting tabs directly into the tub so they sit on the bottom is not recommended as this will damage the liner. There should be a floater with bromine tabs floating in your hot tub at all times. After adding new water, use approximately 1 bromine tab per 100 gallons (always refer to the product label for the manufacturer’s specific directions).

Regularly check the bromine levels within your hot tub (i.e., multiple times per week) to make sure your water is sanitary. We recommend maintaining a bromine level of 3ppm (or slightly lower). This is at the low end of the typically recommended level for a plastic spa (3 - 5ppm). The reason for this is to better preserve the wood. At higher concentrations, bromine, like chlorine, can be harsh on the wood. Color-coded test strips are available that easily test the concentration of bromine (and other chemicals) in your hot tub.

In addition to bromine, use 3 tablespoons of Shock per 500 gallons of water. If you are using bromine, be sure that the Shock you are using is not chlorine or tri-chlor based. If you are tubbing less than 4 times per week, add Shock once per week. If you are tubbing every day, add Shock twice per week. These are general guidelines and you should always refer to the product label for the manufacturer’s specific directions.

After adding Shock, leave the hot tub for at least 30 minutes with the cover off before using the hot tub again.

ALKALINE, PH, AND CALCIUM (HARDNESS)

Unfortunately, keeping your water sanitary is not enough to maintain your hot tub. It is also very important to monitor your alkaline, pH, and calcium (hardness) levels to avoid damaging your hot tub and equipment.

In the sections below, we'll discuss these elements and what damage could occur if they're not kept within the recommended range. Any damage to the equipment or the hot tub due to improper water maintenance is not covered under Redwood Outdoor's product warranty or 3rd party equipment warranties.

Alkaline

Alkaline acts as a "buffer" in your water to changes in pH level. Alkaline is measured in ppm. The recommended range for alkaline is 80 - 120 ppm.

pH

pH is the acidity of your water. pH is measured on a relative scale from 0 - 14, with 0 being most acidic, 7 being neutral, and 14 being not acidic at all. The recommended range for pH is 7.2 - 7.8.

Calcium (Hardness)

Dissolved calcium is naturally present in most water. Calcium is measured in ppm. The recommended range for calcium is 150 - 250 ppm.

Balancing Your Water

1st: Test your alkaline levels and adjust to within the recommended range.

2nd: Once the alkaline levels are between 80 and 120ppm, test your pH levels and adjust to within the recommended range.

3rd: Once your pH is between 7.2 and 7.8, test your calcium levels and adjust to within the recommended range.

It is important to adjust levels in this sequence because they will influence each other, if you switch between testing pH and alkaline you may never get either into the correct range.

Changing the Water and Maintenance

CHANGING YOUR WATER

Our wood-fired hot tubs do not have filtration systems. This means that even with chemical treatment, the hot tub water needs to be changed regularly. It is especially important to shower and clean off before using an off-grid hot tub, as this will help extend the life of your water.

Wood-fired hot tub owners should change their hot tub water approximately every 2-3 weeks, depending on your usage.

MAINTENANCE

Wood hot tubs require little maintenance. It is best to leave them full of water. This reduces expansion and contraction of the wood, which can shorten its life. However, during the winter you do not want your tub to freeze solid (see below on freezing). If your tub shows signs of wear after a number of years, the easiest thing to do is to sand the interior surface with standard sandpaper.

Freezing Weather

How you deal with freezing temperatures will differ depending on your usage pattern, climate, and site conditions.

While our wood-fired tubs don't have any plumbing to freeze and break, letting your tub freeze to a solid block of ice may cause severe damage to the tub. If you will be using your tub a few times each week you can probably get by with doing nothing if the temperatures are above zero. If you won't be using your tub during for extended periods during freezing temperatures, there are a number of approaches you can take.

1. Some owners who have electricity near the tub like to use stock tank heaters to keep the water from freezing.
2. If electricity is unavailable and water to refill your tub isn't a problem, drain all but about six inches of water from the tub. This will keep the bottom sealed and no damage will occur. Once the freezing weather has passed, refill your tub to prevent the wood from drying out.
3. Some owners with tubs at cabins where there is no water available during winter to refill during their visits leave their tubs full, but secure a large, partially inflated inner tube to the bottom of the tub. A similar and easier approach is to anchor several air-filled plastic milk jugs at various levels of the tub. Either procedure allows the inner tube or milk jugs to take the stress of the expanding ice so that the tub is not damaged (the inner tube needs to be completely sub-merged near or at the bottom).

When heating a frozen or partially frozen tub with a internal stove, make sure the stove is covered by sufficient ice/water. Then build a small fire and let the stove heat slowly. A fast burning fire quickly melts the ice around the stove and then boils the water away exposing the stove to air. Without water surrounding the stove, it can melt. If necessary, add water to the tub on top of the frozen surface while melting the ice.

Recommended Maintenance Plan

Weekly Maintenance Checklist

- Check your bromine levels and add bromine tabs if needed.
- Add Shock (Oxidizer).
- Check the water's alkalinity, pH, and calcium. Adjust if any of the levels are out of the recommended range following the sequence above.
- Clean above the waterline. Wipe away the debris that might contaminate the water and throw off the chemical balance.

Bi-Weekly Maintenance Checklist

- Change your water. This could be done every 3-weeks if you use your tub less frequently.

Annual Maintenance Checklist

- Drain your hot tub and hose down the interior with fresh water. Gently scrub the liner / benches with a soft-bristled brush and soapy water. Never use harsh chemicals such as bleach to clean your hot tub.

Moving Your Tub

When possible, it is easiest to move your tub assembled.

1. Drain your tub and let it dry for a bit. It will be lighter than if the wood is saturated.
2. Remove stovepipe and plumbing fittings from the tub.
3. With a few helpers, tip tub onto its side.
4. Roll on the steel bands. If necessary use lumber to build a ramp into your moving vehicle. Block into place with the chime joists, placing them on both ends of the tub. Secure with tie downs.
5. When resituating make sure the chime joists are perpendicular to the floor boards. You may have to re-tension at least the bottom hoop by pounding on it and tightening the nuts.

Exterior Finishing

It is not necessary to coat the tub with a protective finish. Left alone the tub will weather and turn light gray. We recommend that you do not use wood sealer or paints on the tub, because the wood benefits from exposure to the air. The water will seal the interior surface; therefore it is important to leave the exterior surface unsealed so it can breathe.

If you want your tub to have a finished look, you can apply boiled linseed oil to the exterior. It is absorbed into the wood without making a permanent seal. When applying linseed, coat the exterior (only) with a brush or roller. Before disposing of the application tools let them dry out in a non-confined, well ventilated area. They are prone to spontaneously combust if placed in a confined area.

Stove Operating Instructions

STOVE OPERATING INSTRUCTIONS

ALWAYS MAKE SURE TO MAINTAIN PROPER WATER LEVEL AROUND THE STOVE. OPERATING THE STOVE WHEN IT IS NOT SUFFICIENTLY COVERED BY WATER CAN CAUSE DAMAGE TO THE STOVE AND/OR HOT TUB.

Your hot tub stove is made from stainless steel and can melt at the temperatures produced by a wood fire if it is not submerged sufficiently in water. **It is essential that the stack plate, (the horizontal plate from which the chimney pipe emerges) be covered with at least 1" of water whenever operating the stove.** If the stack plate is exposed to air when a fire is burning in the stove, the stove can melt in a matter of minutes or transfer heat to the surrounding wood, causing charring or even fire. When the stove is properly encased in water, the heat from the fire transfers directly to the water and there is no risk of damage to the stove or surrounding wood components. Wood burning hot tubs must be placed at a minimum of 10ft from any combustible materials including all structures and trees. Each wood burning hot tub is equipped with an internal spark arrester.

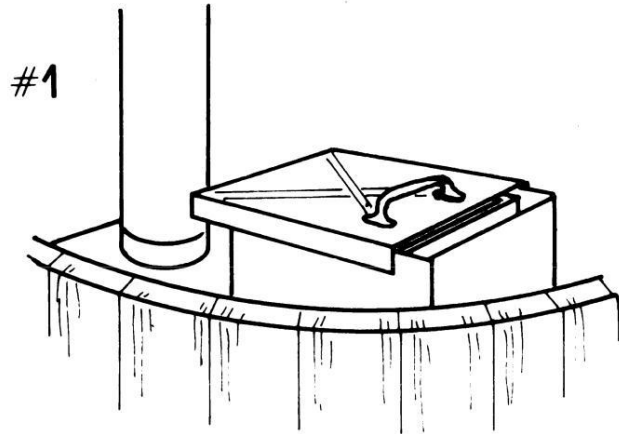
Most problems occur when owners let friends use their hot tub without adequate instructions. Be sure to inform anyone using the tub that it **must be filled with water before starting a fire.**

It is very easy to start a fire in the stove. Place several pieces of wadded newspaper on the bottom of the stove. Fire-starter bricks also work well.

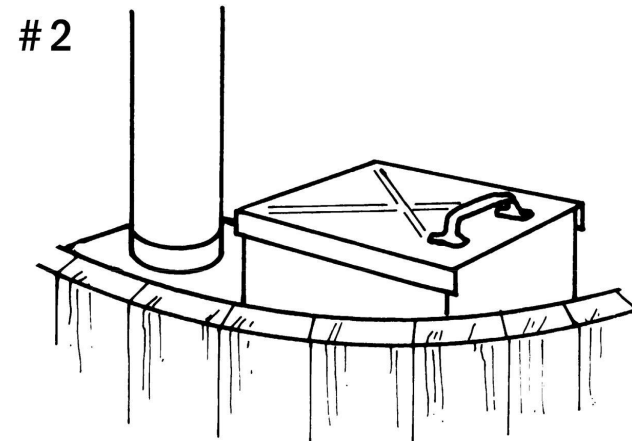
2. Over this, lay a generous amount of kindling and smaller logs in a criss-cross pattern.
3. Check to make sure the damper is open.
4. Light the paper or fire starter and set the door to the edge of the intake baffle (the steel divider). Air will draw in through the air intake quickly finding the fire, and then draft up the chimney. To produce a clean burn, always start your fire with clean, dry kindling. If you get excessive smoke, reduce the amount of wood you are starting your fire with.
5. Once the fire has taken hold, add more wood to the stove. Start by adding smaller pieces slowly. Give the fuel a chance to catch fire; this helps eliminate smothering your fire and excessive smoking. You eventually want to have your stove 1/2 filled with burning wood. Refill frequently (visiting the stove box every 20 minutes or so) to produce the optimum heating rates. If your fire dies out, your stove is not heating at its full capacity. Keep your fire burning hot until your tub is about 10 degrees from desired tubbing temperature, then begin to let the fire burn down. The hotter and faster the fire burns the quicker the tub will heat up. Most people tub at 102-104 degrees.

Stove Operating Instructions

- Occasionally stir the water with the wooden paddle to prevent stratification (i.e. hot water on top, cold on the bottom), check the temperature and decide whether you need to add more wood to the fire.
- Check the water temperature before entering the tub. Make sure it is within the recommended levels. Most people tub between 102-104.



For maximum draft and fastest rate of burn, position the door fully open. That is, with the leading edge of the door lined up with the baffle.



You can put the fire out by sliding the door completely across the opening. This cuts off the air intake to the fire.

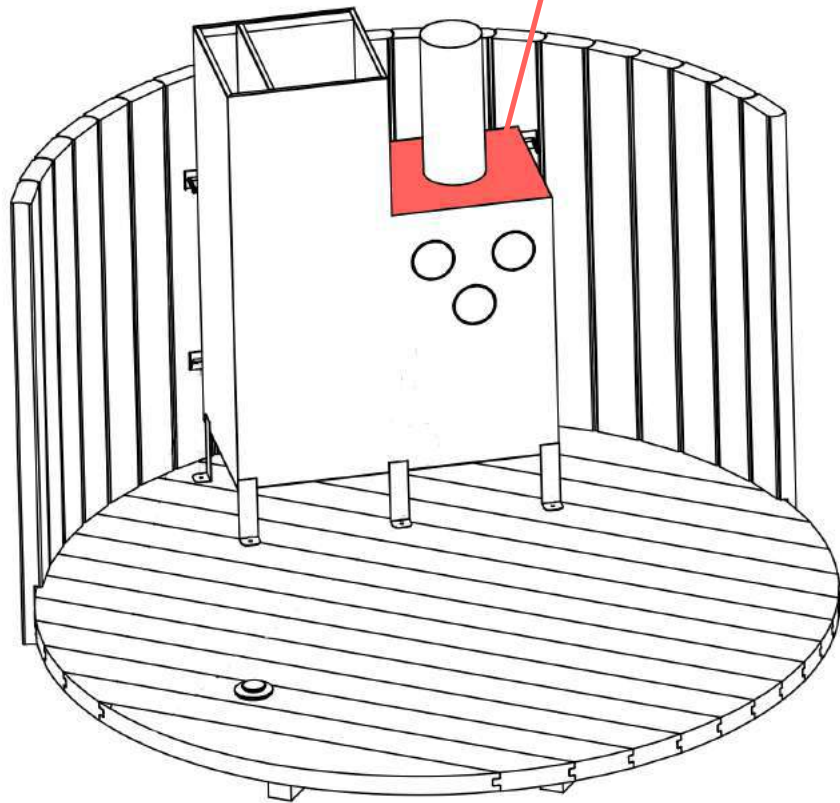
Always close door when stove is not in use

Adjusting the damper will help increase the efficiency. When the stack is producing clear exhaust, your stove is burning at its maximum efficiency.

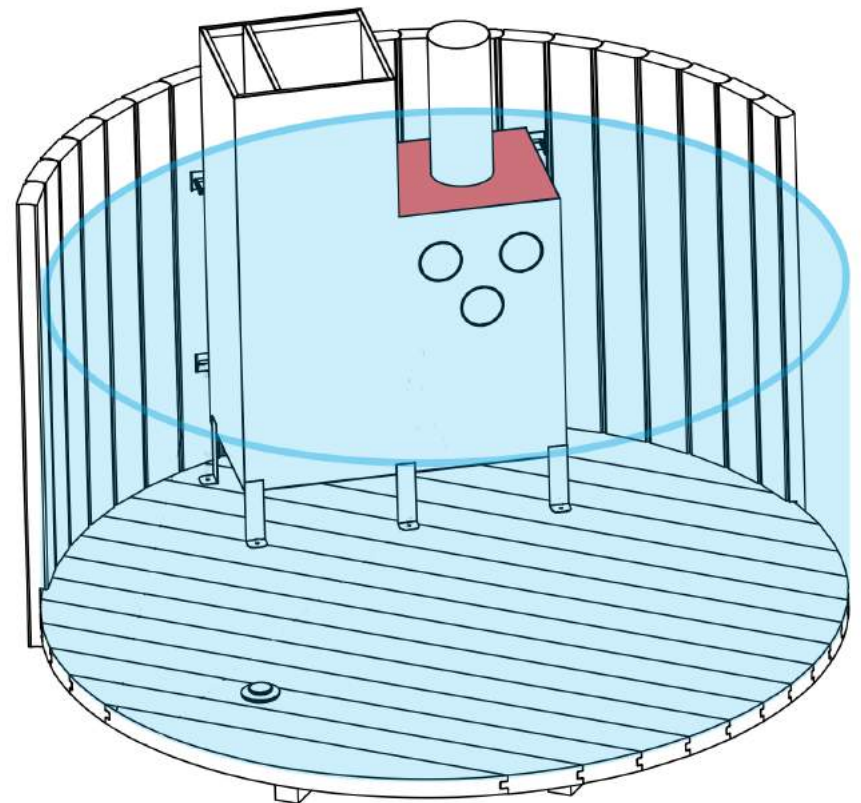
CAUTION: Always use care when operating a wood stove. Keep hands, face, head and clothing away from the door and the chimney sections. Always open the damper prior to opening the door for fueling and starting the stove.

Stove Operating Instructions

Stack Plate



**Stack plate must be covered
by at least 1" of water before
operating stove.**



Stove Operating Instructions

Temperature Control and Efficiency

With our wood burning stoves it is possible to heat the water in excess of the normal maximum hot tub temperature, 104°. If you are heating beyond this temperature, please use extreme caution to ensure that no one accidentally enters the tub. Always check the temperature before entering.

Heating rates vary depending on the species of wood used for fuel, its dryness, how frequently you refuel your stove, and the size of your fuel. These factors all determine the BTU output rate.

For maximum heating speed, cut your wood small, fill the stove as full as possible, set the air intake to allow maximum draw (diagram #1), and set the damper (if any) at 45 degrees. For longer burns and more efficiency, use less airflow. Restrict exit first with the damper, then the intake.

Without agitation, water will stratify into layers, with the hottest water on the top. Heat loss will occur more slowly if you mix the water up occasionally. Use the provided cedar paddle to stir the water, make sure to pull the cold water to the surface.

If you overheat the water, it is easy to cool the tub back down. Simply add cold water from a hose and mix it with the existing water until the desired temperature is reached. After using the stove a few times, you will be able to gauge fairly accurately the heating time required. Always agitate the water and check the temperature before entering the hot tub.

It is always best to have someone attending a wood-burning stove. Do not leave children alone with a burning fire. Remember to always follow local fire regulations and comply with any fire bans that may be in place. For more information about safe burning, contact your local fire department for advice and tips.

STOVE MAINTENANCE

Ash Removal

Your stove will heat more efficiently if the ashes are cleaned out frequently. The bottom of your stove is an important heat transfer surface and old ashes can act as an insulating barrier. Use our ash scoop or a shop vac to remove ashes. Ensure the fire is out before vacuuming or otherwise disposing of the ashes.

If you live in a wet climate it is important to remove the ashes after every fire and to prevent water from getting in the stove. The mixture of water and ash forms lye, which can quickly eat through the aluminum stove.

The stove flue is designed to have the chimney sections mounted the opposite of normal stove-pipe. That is, the crimped section is to point up rather than down. This provides a shingling effect making the water run down the outside of the stovepipe instead of directing to the inside of the pipe and into the stove. This help keeps the water out of the stove.

If you will be gone for an extended period, remove the stack and put a bucket or something similar over the flue pipe of the stove.

Creosote can build up inside the stove and reduce efficiency. This usually occurs when the stove is not fired hot and fast. This may be eliminated by a couple of hot fires or a little scraping with the ash scoop or shovel.

Smoke

Most stoves will smoke a bit when first ignited. A slow burning fire generally produces more smoke, indicating less efficiency than a fast burning fire. If you are concerned about neighbors, it is best to burn a hot and fast fire. To achieve this, use smaller pieces of wood, load the wood with lots of space for air circulation, and only fill the fire box up half way. Pull the stove door straight back so that it is touching the chimney pipe and set the damper at a 45 degree angle. Do not burn scrap wood covered with grease, glue or paint.

SAFETY ADVICE

NEVER FIRE STOVE UNLESS WATER LEVEL IS ABOVE STACK PLATE; If the water level drops below the stack plate (the horizontal surface to which the stack (flue) is welded) you must immediately put out the fire to protect the stove from excessive heat. You can put the fire out by closing the stove door completely or dousing with water. Keep the stove cool by running water over it. Operating the stove with an insufficient water level could cause warping of the stack plate, and thereby void your warranty. As long as the fire is put out immediately, your stack plate should be safe.

DON'T DRAIN YOUR TUB WITH A FIRE IN THE STOVE; If you are in a hurry, throw a few buckets of water in the stove and put out the fire.

NEVER OPERATE YOUR STOVE WITHOUT A PROTECTIVE FENCE; Although the body of the stove remains cool, the door and stovepipe get hot and can cause a bad burn if touched. In addition, the fence mounting brackets are sharp and can be dangerous without the fence to shield you from them.

USE CAUTION: THE STOVE DOOR AND STOVE PIPE GET VERY HOT

OPEN DAMPER FIRST BEFORE FIRING AND RELOADING STOVE; Opening the damper first will prevent smoke and possibly flames from exiting through the door opening. Stove door may get hotter when using a damper.

Safety Concerns

Hot tubs are not toys, nor are they places for small children. Never let your tub be used by unsupervised children. Drowning is a very real risk. Hot tubs are designed for sitting and relaxing in. Never use a hot tub for playing in or diving in. Please review the Safety and Accident Prevention information Health Manual with your family. Put this information into practice.

Children should use the tub at lower temperatures. Consult your personal physician regarding hot tubbing and children, pregnant women, or if you have specific questions relating to your health and safety. Hot tubbing can accelerate your heartbeat, lower your sperm count, and may overheat pregnant women. Don't take long hot baths if you are concerned about these items. Consult your physician if you are concerned. Drinking, drugs and hot tubs do not mix and can be lethal.

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