Your Guide to Water Gardening
# Sunterra Water Gardening

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THE “3C” SYSTEM
Sunterra’s Approach to Water Gardening

Sunterra uses a special approach called the “3C” System when communicating with the customer about water gardening. This approach allows us to break down 2 very intensive subjects, how water gardening works and what our product line consists of, into 3 easy to understand stages: Contain, Control and Create.

CONTAIN
The first stage of the “3C”s, Contain, covers the first step of creating a water garden and the necessary products to do so. This stage involves mainly liner, which is the first product that needs to be purchased and is the vessel used to shape, or contain the water.

LINER
There are 2 types of liner available: pre-formed and flexible. Preformed liner is basically a hard plastic shell that has already been shaped and cannot be changed. The advantage of this type of liner is that it is easy to visualize the finished pond and the dimensions, gallonage, etc. have already been chosen and need no further consideration.

Flexible liner comes in two types: PVC and EPDM. Our PVC liner is 20mil in thickness and has a 15yr warranty. Flexible liner is advantageous to creating customer pond shapes, and is a good place to start for someone who wants to take a more personalized approach to water gardening. Sunterra’s pre-cut PVC liner comes in 5 sizes: 8’x10’, 12’x12’, 14’x14’, 16’x18’ and 20’x20’. Also available is a 5’x10’ waterfall liner, which is used when adding a waterfall or stream connection to the water garden. Our EPDM liner is 45mil in thickness, has a 20yr warranty and is the premium liner for the serious water gardener. The EPDM liners are available in 5 sizes: 8’x10’, 10’x15’, 15’x15’, 15’x20’, and 20’x20’.

TIP
Sunterra recommends using a form of underlayment to help protect the liner from sharp rocks or underground roots. Common forms of underlayment are sand or carpeting. (See installation section for liner size/pond size formulas).
CONTROL
The second stage of water gardening, Control, covers everything that is needed to control the water flow and biology of the water garden. This includes primarily pumps, filters, tubing, and connections.

PUMPS
Pumps are needed to keep the water flowing and from becoming stagnant. This also helps prevent the pond from becoming a breeding ground for insects. Our pump line is 100% water tested, have 25 foot power cords and are guaranteed with a 2 year limited warranty.

Sunterra's line of pond pumps consists of 6 sizes, ranging from 450gph to 4300gph in flow capability. (The pond pumps also include a built-in pre-filter which help block debris from entering the pump). Our packaging clearly communicates the flow capability of the pump, as well as the maximum lift, and recommended filters and tubing needed. This helps guide the customer through the task of matching up the different components.

In addition to our line of pond pumps, Sunterra offers a line of smaller water accent and fountain pumps, which may be used to supply water to an extra water feature. These pumps range from 30gph to 320gph. Fountain pumps are designed to operate in clean water; therefore, would need to be used with a pre-filter to prevent debris from entering the pump.

(A pre-filter box is offered for use with pumps that do not contain built-in pre-filters).

FILTERS
Sunterra’s line of bio-filters come in 3 size configurations; 1000 gallons, 2000 gallons and 3000 gallons. The filters contain 3 layers of mechanical filtration, as well as bio-balls, which provide a home for good bacteria to colonize. The bio-filters are available with or without the U.V. light option. (The U.V. light destroys any algae that may have made it through the mechanical filtration process, before it gets sent back into the pond). As mentioned earlier, a pre-filter box is an option available for use with any smaller clean water fountain pumps.
TUBING AND ACCESSORIES
Tubing is also included in the Control stage. Accessories are any related components, such as diverter valves or tubing clamps. Tubing comes in 20ft or 50ft lengths in the following diameters: 3/8", 5/8", 3/4", 1", 1 1/4" (inner dimensions). The packaging of both the Sunterra pumps and Sunterra bio-filters provide recommendations for the appropriate tubing size. Sunterra also recommends using a tubing connector clamp or glue at the pump and filter connections to create a water-tight seal.

TIPS
It is important to follow the recommendations on the pump and filter packaging. Using the incorrect combination of pump to filter can result either in poor flow or excessive flow, both scenarios resulting in a pond ecology that is less than optimal.

Sunterra recommends allowing for an average circulation of pond water at 1.5 times per hour. Less than 1 circulation per hour will not clean the water sufficiently, whereas more than 2 times per hour can actually “over clean” the water, stripping the pond of good bacteria and harming the ecosystem.

It may be necessary to use multiple pumps or filters, depending on the size of the pond and how many waterfalls or other water features are desired.

Maintenance will also need to be performed periodically on all filters and pumps. This mainly consists of extracting the mechanical filter pads and cleaning by running them under hot water. Sunterra also offers a line of replacement filter pads to fit the bio-logical and pre-filter box when the time comes.

WATERFALL CONSIDERATIONS
When adding a waterfall to the pond, it is important to consider the vertical lift and distance the water must travel from the pump to the waterfall; this may affect which pump or filter is necessary to attain enough lift while maintaining an average pond water circulation rate of 1.5 times per hour. (See Installation section for additional information to determine pump).

CREATE
The final stage in designing a water garden is Create. This stage encompasses all product needed to add a personal touch and enhance the aesthetic value of the water garden. This is the most flexible stage in the process, since everyone will have different ideas of how to personalize their water garden.

The most common form of decoration in a water garden is plant life. It is especially important if the water garden contains fish life, that there be some plant life as well. Plant life provides shade, acts as a natural filter, helps to reduce algae production within the pond and releases oxygen, which is essential for any fish in the pond. Sunterra offers several plant baskets, which come in a 7” round or 10” square design and can be used to add plant life to the water garden.
TIP
It is highly recommended to research any plant life introduced into the ecosystem, as some plants are considered to be hazardous to certain areas.

Also, consider adding submersible plants as well as floating plants to help cut back on algae production. (See FAQ section for further details).

FOUNTAIN NOZZLES
Creatively, much can be done with the water action in a pond to add charm and personality. Sunterra offers a line of nozzles, in both decorative lotus and pineapple shapes and in traditional waterbell, cascade and foam jet styles. These traditional styles come in both ¾” and 1” diameters to be matched with whichever pump is being used. In addition, diverter valves and risers connect the nozzle to the pump. These come in ¾” and 1” diameters as well. Sunterra’s pump packaging clearly states which diameter is appropriate, to help guide the customer in making the correct choice.

LIGHTS
Many water gardeners are now choosing to use lighting as a medium of expression within their water gardens. Sunterra offers both an individual low voltage submersible light and three piece light set. Both sets come with four color shades to allow for even greater customization.

WATER ACCENTS/WATER ACCENT PLATFORM
Sunterra’s water accents and accent platform are very unique for the market. This is the Water Accent line of statuary-like water features. With this line, the water gardener is able to actually place a stone-like fountain inside the water garden. This combination works wonders to create an
atmosphere that is unlike most typical water gardens. The customer may choose from 4 styles; Garden Oasis, Sundial, Tuscan pillar, or Canterbury.

To make the placement of these accents possible, Sunterra has introduced a new patent-pending water accent stand to the marketplace. This stand has telescoping legs to conform to any pond depth between 18”- 51” in depth. The platform has a twist and lock bayonet system which will actually keep the water feature in place irregardless of wind or wave conditions. It also has a platform designed to hold the water feature pump off of the pond floor, lessening the chance that debris will be an issue. Finally, the stand has three light holders so the water gardener may choose to accentuate the feature from underneath.

Now the “3C” System has been covered and the customer is ready to purchase the necessary product in order to create a personalized water garden. Following are Sunterra’s 7 simple steps of installation, which will provide detailed instructions and tips to guide the customer through the installation process.

INSTALLATION

3 Questions - 7 Simple Steps

3 QUESTIONS TO CONSIDER

Before beginning installation of their Sunterra water garden, the customer needs to answer 3 important questions that may affect their decisions for their finished pond results. Such questions are:

1. Will the water garden be home to fish?
2. What climate zone will the pond be installed in?
3. What are the features of the yard where the pond will be located?

The first question, “Will the water garden be home to fish?” This question is important for several reasons. Primarily, if the pond will be home to fish year round it will need to be deeper than the customary 18” in depth (between 24-36”).

Depending on the climate zone, the temperature may dip down into the freezing ranges and require that the pond will need to be built within the 24-36”range, otherwise the water will freeze through completely, killing the fish life. At 24-36” however, only the top layer of the pond will freeze, allowing living space for the fish underneath.
TIP
It is important to remember that fish create toxic gases, and during the winter months an opening must be maintained on the surface ice of the pond in order to release these toxic gases and allow oxygen in. It is recommended to use a floating electric or solar deicer to accomplish this.

Whether or not the customer wants to include fish in their pond affects the location of where pond will be installed. For example, most fish and plant life require an average of 6 hours direct sunlight per day. This means that the pond should not be placed in a highly shady area of the yard, or directly under very leafy trees. (This will also help decrease the amount of debris in the pond). Having said that, it is important to remind the customer that fish life, while needing direct sunlight, will also require an optional source of shade - as in lily pads or other floating plants. It is generally recommended that during the hottest summer months the pond be around 60% covered in such a way.

The features of the customer’s yard and positioning of the pond also concerns more than sunlight availability. One such area of concern is water runoff into the pond. It is important that the pond not be located at the bottom of a sloped area, as rainwater runoff into the pond can be potentially hazardous to its’ ecosystem. It is also important to consider from where the pond will be viewed. It is all to common for a pond to be installed, only to be re-located due to a change in desired viewing area.

7 SIMPLE STEPS
Sunterra has identified 7 simple steps required to create a personalized water garden. These 7 steps help to ease the customer’s fear that installing a water garden is beyond their abilities. By communicating these 7 simple steps on our packaging, website and in-store signage, both textually and graphically, the customer comes to understand that achieving the desired result can be a do-it-yourself project. Once the customer understands the importance of selecting the optimal location for the pond, they will need to follow these “7 simple steps of installation”.

1. SHAPE
The first step in creating a water garden is to layout the desired shape. There are several important things to note before deciding on the shape of the pond. Primarily, if the customer is using our pre-cut liner, then depending on the width they may not be able to get the pond size they desire. For example, at 18” deep, our pre-cut 8’x10’ liner creates a 4’x6’ pond, NOT an 8’x10’ pond. (This is important to note, as many customers do not initially understand this, and may end up digging a hole that is too big for the liner they have purchased).

When purchasing a pre-cut liner, the following general rules can be applied to liner sizes based on depths:

18” deep: subtract 4’ from each liner dimension to get finished pond dimensions.
24” deep: subtract 5’ from each liner dimension to get finished pond dimensions.
36” deep: subtract 7’ from each liner dimension to get finished pond dimensions.

This is very important for the customer to understand before purchasing the pre-cut liner. For example, if they need a 36” deep pond, and purchase the 8’x10’ liner, they will NOT be able to line the hole completely. In this case, they would need to purchase at least the 10’x12’ liner. A more exact formula that can be used for these situations is the following:
Liner size (length or width) =
water garden size (length or width) + twice the depth + twice the 6 inch pond border.
For example, if the customer wants an 8’ x 10’ pond at 18” deep the formula would be:

Required Liner width = 8 + (2 x 1.5) + (2 x .5) = 12
Required Liner length = 10 + (2 x 1.5) + (2 x .5) = 14
The customer would need to purchase a 12’x14’ liner to create an 8’x10’x1.5’ finished pond.

Once the pond size and liner have been determined, marking the shape of the pond onto the ground is a good way to create a template for digging. Keep in mind that the dimensions mentioned above are to be measured at the maximum lengths and widths of the pond. This is important to ensure that there is enough liner to cover the hole.

TIPS
Before measuring out and marking the pond shape, it is a good idea to set the liner out flat in the sun. This will help to make the liner more pliable and easier to adjust when it is placed into the pond basin. Typically it is best to do this 1 or 2 hours before lining the basin.

Using a rope or garden hose can be a great way to mark your pond outline. Once the finished pond widths and lengths have been determined by using the above formula, simply use the following perimeter formula to find the length of rope needed:

Rope Length = 2 (length + width) Add feet to the total for liner edging.
For example, if the finished pond size is 4 x 6 the formula would be:

Rope Length = 2 (4 + 6) or 8+12 = 20, then add 4 = 24ft.
A 24ft rope will create the correct perimeter, in any shape, for the appropriate liner.

WATERFALL AND STREAM CONSIDERATIONS
If creating a waterfall with the pond, a good first step is to mark the water course perimeter with stakes running along both sides. These will help define the stream’s course and guide the digging efforts. If working in a flat area, it will be necessary to build a burm to channel water in the correct direction and provide a foundation for the waterfall lip.

2. DIG
Now that the planning of the water garden shape and size is complete, creating the basin becomes the next step. Sunterra recommends first creating a shelf approximately 6”-8” below the projected water level. This will provide a surface for placing aquatic plants while also helping to secure your liner’s position. Begin by digging down to the 6”-8” shelf level depth and leveling the surface with a flat shovel. Then check levelness using a level and a 2” x 4” board. Also, check the levelness of the water garden perimeter. If you adjust the perimeter, be sure to adjust the shelf accordingly.

Measure approximately 12”-16” from the perimeter wall to the inside of the water garden. Using spray paint or chalk, mark this distance throughout the inside of the water garden. This mark represents the edge of your shelf and will guide your final digging step.

Following the shelf width mark, dig the remaining depth (18” plus underlayment thickness deep from outside perimeter edge to the bottom) of the basin. Remember to dig the walls at a 30 degree angle. Measure the bottom depth in multiple locations to make sure it is the recommended depth.
TIPS
Dig all of the walls at approximately a 30 degree angle. This preserves liner placement and reduces erosion of the basin walls.

Also, dig a small ledge around the perimeter of the water garden that is wide enough and deep enough for the type of edging used. Remember, the shelf should be 6”-8” below the bottom of the edge, so shelf depth may need to be adjusted after creating the perimeter ledge.

If using underlayment, make sure to add the thickness of the material used into the depth calculation. For example, 1” of underlayment would mean digging an 18” deep pond 19” deep instead.

WATERFALL & STREAM CONSIDERATIONS
Sunterra recommends creating the lowest basin before beginning any other areas of the water garden. Once the lowest basin is complete there will be additional soil to create a berm (if necessary). Next, create any remaining basins and then begin to create the waterfall or stream. (The minimum recommended slope when building a berm is 1-2 inches for every 10 feet in length)

3. MEASURE
This step is meant to be a final checking process, to make sure all dimensions of the pond are accurate before adding liner and water. Begin by measuring the bottom depth in multiple locations to make sure it is the desired depth. Next, measure the depth of the plant shelf to verify it is 6-8” below the desired water level. Also, make sure the width of the shelf is at least 12”, to allow enough space for potted submersible plants. Finally, measure out the perimeter shelf, used for placing ledging such as rocks. This shelf should be approximately 1” deep and 12” wide (depending on the ledging used).

TIPS
Water is naturally even, whether or not the container is. Therefore, it is very important to make sure the pond is level in relation to the surrounding ground. Otherwise, the pond will look lopsided due to the water naturally evening itself out.

Remember to add the depth of the perimeter shelf to the overall depth of the pond. Therefore, a desired 18” deep pond with a 1” deep perimeter shelf will actually need to be dug to 19” deep.

4. LINE POND
Placing the liner in the basin is a very simple, yet important step in creating the pond. It is important to remember and place the liner texture side up, keeping an even overlap on all sides of the water garden. Once the liner is in place, adjust it to best fit the shape of the pond basin. If the water garden has a round dimension, there will be a few wrinkles in the liner. Anchor the liner edges with stones, bricks or heavy objects to help temporarily hold it in place while water is added.

TIPS
Sunterra recommends using a form of underlayment to protect the liner from puncture by roots and rocks. Common forms of underlayment are sand or carpeting.

Always remember to install the liner texture side up. The textured surface of the liner creates a habitat for essential pond bacteria to colonize.

When placing large rocks or bricks on the edges of the liner for decoration, it is recommended to place a padding of some sorts between the decorations and liner. Do not place heavy bricks or sharp rocks directly onto the liner.
In order to make the liner more flexible and easier to install, it is recommended to place the liner out flat in the sun approximately 1-2 hours before installing. This will help make the liner more pliable when adding it to the custom dug pond basin.

WATERFALL & STREAM CONSIDERATIONS
When placing the liner in the basins, remember to always overlap the upper piece over the lower piece. Complete this step by sealing the overlapping areas with tape or sealant. Make sure the liner is both clean and dry before applying the sealant.

5. ADD PRODUCT
Now that the basin(s) are created and completely lined, it is time to begin adding functional components that will control the water garden’s health and appearance.

Pump
Begin by adding the Sunterra pump. The pump is the heart of the pond and will keep the water circulating to help prevent the water garden from becoming a breeding ground for unwanted insects, while oxygenating it for plant and fish life. Place the pump on top of a flat brick or stone at the bottom of the water garden. Elevating the pump off of the basin bottom will help prevent debris from interfering with pump performance.

After the pump is in place, add water until the pump is completely submerged. Plug it in to a GFCI outlet to test its performance. When the pump is working it will make a low humming sound and water will circulate out of the top outlet.

TIPS
Remember when choosing a pump that it must be able to circulate the water in the pond at a MINIMUM of one rotation per hour. This means that for a water garden that holds 1100 gallons of water, at least an 1100 gallons per hour pump would need to be used. This is a general rule, and will need to be tweaked depending on the number of water features, or waterfalls that the water garden contains.

A good rule of thumb is to use a pump which can rotate the water at least 1.5 times per hour.

A formula which can help determine the gallonage in a square pond with 30 degree walls is:

\[
\text{length} \times \text{width} \times \text{depth} \times 6.7 = \text{gallons}
\]

For example, a finished pond size of 8’ x 10’ x 1.5’ would contain 900 gallons of water.

\[
8 \times 10 \times 1.5 \times 6.7 = 804 \text{ gallons}
\]

TIP
If pond has 90 degree angle walls, substitute the above 6.7 with 7.5, to adjust for the drop in water volume.

Filters
Most pond owners will choose to use a bio-filter to help maintain the health of their water garden. Installing the Sunterra line of bio-filters is amazingly simple. Simply bury the filter OUTSIDE of the pond, making sure that the basin is completely covered. Only the functional top cover should be above ground level. This helps hide the filter from view, while allowing for easy maintenance operations. (Refer to bio-filter instructions) Also, if using additional smaller pumps for supplying water to added water features, you may need to place the pump into a pre-filter box. This will help keep the smaller pumps free of debris and optimize their performance.

Water nozzles
Whether or not a filter is being used, most pond owners will opt to use at least a water nozzle with the pond. This not only helps to aerate the water, but also adds the first element of decoration to the water garden. Sunterra nozzles are created to fit our line of pumps. When using a water nozzle, or a filter, it is necessary to connect a diverter valve to the outlet of the pump. This allows for the connection of tubing to the pump, and for the diversion of outbound water to both the filter.
and a water nozzle. If choosing to only use one or the other, the diverter valve has a shut off dial that can be used to channel water in only one direction.

**WATERFALL & STREAM CONSIDERATIONS**

If adding a waterfall to the pond connecting the pump, tubing and bio-filter for the waterfall will be done in mostly the same way, only using the water return tube as the waterfall supply tube. First, position the pump in the lowest basin away from the waterfall. Make sure to place the pump on a brick or other surface to lift it off of the pond basin floor. Dig a 6” to 8” deep channel connecting the lower and upper pond basins (if using multiple basins), making sure to include the filter in the path. Using the tabs on either side of the hose connectors, slide the filter disc into the “WORK” position. Connect the pump and filter with flexible tubing of appropriate size – lay the tubing in the channel and be sure to attach it to the “IN” connector on the filter and the appropriate valve on the pump. Attach the tubing to the filters “OUT” connector and lay it in the channel leading to the upper basin (if using multiple basins). Use a tubing clamp to create a water-tight seal at all of the tubing connections (filter & pump). Trim the tubing edge so that it can be concealed and safely dispense water inside the upper basin. After submerging the pump in water, plug it in to check both the pump and filter performance. If there are any performance problems, please read the bio-filter section for trouble shooting.

6. **ADD WATER**

Double check to make sure that the liner is anchored in place. Fill the remainder of the water garden with water until it is full. As the water garden is filling, adjust the liner to better form fit the custom shape of the pond basin. Where necessary, try to smooth out wrinkles and creases.

**TIPS**

Some water gardeners prefer to line the bottom and slopes of the pond with small rocks or pebbles as a form of U.V. protection. This should be done prior to adding water.

Be sure to wash excess dirt from the rocks/pebbles to help keep the pond water clean. Adding rocks or pebbles will help to preserve the liner over time, however it is not required for successful water gardening.

7. **DECORATE**

Now that the pond is completely filled with water it is time to decorate by adding edging and landscaping. The liner may need to be adjusted to make sure it is secure under the edging and completely sealed. Try to keep a minimum of 6” liner around the pond perimeter. Adding aquatic plants onto the previously created shelf is also recommended to enhance the look and “feel” of the water garden.

Also available is a line of unique Sunterra water accents and accent stand platform. These accents are a very unique way to customize and decorate a water garden. The water accent stand simply sets up in the middle of the pond, and has a pump platform specifically for the smaller Sunterra pumps that are used to operate water accents. It also has a unique locking bayonet system that ensures the accents will stay in place no matter what wind/wave conditions exist. In addition, there are several light holders that connect on all sides of the platform. This allows for a great aesthetic effect at night.

**WATERFALL & STREAM CONSIDERATIONS**

If adding a waterfall there will be more to consider when placing any stones to complete the waterfall and/or stream. Begin by creating the bottom waterfall lip and add stones until the fall is built up to the correct height. When positioning the waterfall stones, slightly tilt them towards the lower pond basin. Double check the height of the waterfall lip’s top stone to make sure water will naturally flow across it to the lower pond basin. Once the stones are in place, test the water flow using a garden hose or watering can. Adjust the stones until the desired flow is achieved. Fill the water garden with water and turn on the pump to being the filtering cycle.
IN-STORE SUPPORT

Sunterra strives to communicate the “end result” to the customer at the store level in several ways. Packaging is the first and most obvious way that Sunterra can give the customer an idea of what their finished water garden will look like. On all of our packaging we have not only informational panels, which help customers understand the product inside, but we also include very prominently, a beautifully finished water garden photo. This can be very effective in persuading the customer as to why they need to purchase this product.

In addition, there are several Sunterra point of purchase kits available. Included in these kits are Sunterra header signs, tri-fold take home brochures and holder, project idea “coupons” and a merchandise selector wheel.

HEADER SIGNS
Sunterra header signs are unique in several ways. First, they include both informational panels which communicate our “3 C” approach to water gardening and help the customer understand that water gardening can be very easy to understand when broken down into its basic elements. They also include product definition panels to help illustrate for the customer how the basic components all fit together in relation to the pond. Finally, there are panels that are full-sized, beautiful “end result” shots of water gardens. This shot is also repeated on the back of all header sign panels. This allows for greater flexibility when setting up the display.

TAKE HOME BROCHURE
The Sunterra brochure is a guide for the customer to take home. It not only includes a snapshot of the product line, but also communicates the “3C” approach and illustrates where and how each of the products work in relation to the pond. This pamphlet emphasizes “how-to” by using the same illustration idea as the header signs, only on a more inclusive scale. It also helps explain the “7 simple steps of installation”, so the customer can start to understand that installing that beautiful water garden on the cover can be a do-it-yourself project. Finally, the brochure gives the customer a chance to answer some very important questions that must be considered before purchasing/planning out the water garden. It also directs the customer to the Sunterra website, which will include its own array of features to help the customer understand the ease with which a water garden can be created at home.

PROJECT IDEA SHEETS
The “project idea sheets” are a unique idea in the water gardening market. As a point of purchase aid, these idea coupons will communicate a different “project ideas” for the customer to choose from. After the customer decides what they want to build, they use this sheet as a complete shopping list and purchase the items needed to create the end result shown on the sheet. On the backs of these tear-offs are complete instructions as to how each of the products work together and the “7 simple steps” to install the pond.

PRODUCT SELECTION WHEEL
We also have a merchandise selector wheel. This is a tool that can be used at point of purchase for those customers who are more interested in a customized pond. This allows the customer more flexibility in choosing which items to purchase. The first step is to simply decide on the size and depth of the desired finished pond, and then turn the wheel until this information is shown in the windows. The wheel will then show all necessary items to create that size/depth of pond.

All of these in-store items help to communicate to the customer that Sunterra should be their source for water gardening ease.
SUNTERRA SUPPORT
CUSTOMER/CONSUMER SERVICE
In addition to providing ample in-store support, Sunterra has dedicated resources to provide excellent out-of-store support to the customer. We have a highly trained, dedicated staff of customer service representatives who are specifically assigned to your account. We also have a dedicated consumer support staff, in-building, ready to answer any questions or concerns consumers of our water gardening product may have.

WEBSITE
Sunterra’s website is a wealth of information for both our customers and yours. Upon entering the website, you are welcome with the beautiful and tranquil images of our water gardens, and the people who enjoy them. There are sections for product knowledge, installation steps, FAQs, catalog downloads and project ideas. Most importantly for those who are in the planning stages, the Sunterra website will include a “make your own” pond section. This section will work off of the same principle as the merchandise selector wheel. The participant simply chooses the desired size/depth of the pond and the program creates a shopping list with all of the necessary components. This list can then be printed off and used to purchase in-store all of the necessary items. This section will also contain a visual illustration of the pond, populating itself with all the components on the shopping list. This will help to communicate to the customer how each of the components will work together to create the finished water garden.

Frequently Asked Questions

Q. What if I have lost my installation instructions?
A. Sunterra includes easy reference charts and installation tips with the majority of the product liner. However, if additional installation tips are needed, the customer may visit our website – www.sunterrausa.com, or call our consumer service line at 800–635–7668 ext.302 to request additional instructions.

Q. How do I know which pump to use in my pond?
A. This depends on the amount of water in the pond, if the pond has a waterfall, if the pond has only a filter or in addition has several water accents. In general, it is recommended to circulate the pond water at least one rotation per hour. This is the minimum recommendation. Therefore, if a pond contains 1000 gallons of water, it would need at least a 1000gph pump. However, if this pump is being used to supply water to a filter and several features, Sunterra recommends moving up to the next gph size or using multiple pumps (one for the filter and an accent, another for additional accents). Sunterra does not recommend circulating pond water more than 2 times per hour through the filter, as this would actually begin stripping the pond of good bacteria.

Also, all of Sunterra’s packaging contains an information panel which helps the customer match up the pump with any complimentary components. This is for basic installation purposes only, and each water gardener can get as involved as desired in determining how many pumps/filters/accessories they want in the pond. This will be a case by case decision based on each individual pond’s needs.

Q. How do I winterize my water garden?
A. Sunterra recommends discontinuing use of pumps and filters when the temperature drops below 41 degrees farenheit. Store all pumps and filters in-doors until temperatures rise in the early spring. Remember, if the pond contains fish it will be necessary to make sure the pond surface does not completely freeze over. Installing a small electric or solar powered deicer to keep a hole open for oxygen exchange is the best method.

Also, remember to research any fish life in order to make sure they can survive the winter in the pond. Do not feed fish when the temperature drops below 41 degrees, as fish cannot digest food in these temperatures and could potentially die of spoiled food remaining in their system.
Q. What regular maintenance needs to be done?
A. Most maintenance that will need to be performed should take very little time; approximately 10 minutes per thousand gallons of water per week. This covers such things as; feeding fish, skimming debris from surface, checking water quality (water test kit) and caring for any plant life.

Q. How often should I clean the filter/pump?
A. Sunterra recommends cleaning your filter and pump on a monthly basis to prevent clogging. Always be sure to unplug any electricity to the pump/filter before cleaning. If you find yourself cleaning these more than once a month, you may need a larger filter for your water garden. Make sure neither the pump or filter is operating before cleaning. Then simply rinse out the pump and filtration sponges inside the filter with warm water. If your pond contains fish, cleaning may need to be performed on a more frequent basis.

Q. What can I do to avoid algae, foam, build-up?
A. There are several ways to avoid algae build-up. First, add snails, which naturally feed on algae, into the pond. Also, use floating plants, which not only help control algae but also provide shade for fish life. In addition, it is recommended to use submerged plants to help feed and protect fish as well as to act as a natural filter for the pond. (1 bunch of submerged plants for every 2-3 square surface feet of water). Another natural way to inhibit algae is by introducing Barley Straw into the pond in the early spring. (Approximate use: .3oz Barley straw per square yard of water surface). It is important to keep near the surface. (Try attaching loose bundles in nets and using floaters to keep from sinking).

Q. How often do I need to change the water?
A. Changing out of pond water should not be necessary in most environments. Usually, the natural process of evaporation and rainwater will take care of the necessary 10% water recycling per month. If, however, the weather is unusually dry it may be necessary to manually perform this process.

Q. Aren't Water Gardens a haven for mosquitoes?
A. As long as you use your Sunterra pump, the water will continually circulate throughout your water garden. Circulating water will minimize mosquitoes and help prevent them from hatching their eggs. Fish like to eat mosquito larvae and can also help in keeping mosquitoes out of your water garden.

Q. Are there any places where I should not create my water garden?
A. You should first consult your local building codes for any restrictions on location, depth and design. It is important to avoid locations where there is water/rain run-off. This may be harmful to your pond water ecosystem, especially if you use fertilizers and chemicals for your lawn. Keeping your water garden in low shade areas will make it easier to grow aquatic plants and help keep it free from tree debris. It is best to locate your water garden where it will receive a minimum of 6 hours sunlight.

Q. What is a water garden filter system and what are the benefits of using one?
A. A water garden filter system consists of a filter and pump. The filter works two ways, mechanically and biologically. Mechanical filtration removes solid particles that can cloud water, while biological filtration removes pollutants that harm plants and fish.

Your pump helps circulate dirty water into the filter for cleansing and also provides oxygen for plants and fish in your water garden.

Overall, the benefit of adding is water clarity and a healthy pond environment. It does require a bit more installation and maintenance but it removes dirt, debris, and bacteria to ultimately provide you with a healthier water garden.

Q. How do I install my water garden filter system?
A. Consult your design guide for filter system installation details. If you cannot locate your design guide, you may download an additional copy from the Customer Support section of our website.

Q. How long will it take for the pond water to become clear?
A. You should notice clear water within 1 week of using your filter system.
Q. What if the pump stops working or breaks down?
A. If you have fish or aquatic plants in your water garden, Sunterra recommends having a spare pump in case of pump failure. We recommend that you have the same size (gph) pump that you are already using. Always unplug the pump before checking the pump. Secondly, check the pump’s front cover to see if anything is preventing the intake of water to the pump. Remove any debris that may be blocking the outside of the front cover. If you continue to experience performance problems, consult the troubleshooting section of your design guide for troubleshooting tips and warranty information regarding your pump. Additional copies of your Design Guide can be found in the customer support section of the Sunterra website.

Q. How often should I change the pond water?
A. You should remove and replace 10% of your pond's water volume, once a month to limit the amount of chlorine, ammonia, nitrates, and other chemicals, especially if you include plants and pond life in your water garden. You can test your water to ensure the right chemical levels by using a water test kit, which can be purchased at any garden supply or pet store.
LINER CALCULATIONS

If you know the liner size and need finished pond size....

**GENERAL RULE:**
18” deep: subtract 4’ from each liner dimension to get finished pond dimensions.
24” deep: subtract 5’ from each liner dimension to get finished pond dimensions.
36” deep: subtract 7’ from each liner dimension to get finished pond dimensions.

**ACTUAL FORMULA:**
Required Liner size (length or width) = desired water garden size (length or width) + twice the depth + twice the 6 inch pond border.

**EXAMPLE:** if the customer wants an 8’ x 10’ pond at 18” deep the formula would be
- Required Liner width = 8 + (2 x 1.5) + (2 x .5) = 12
- Required Liner length = 10 + (2 x 1.5) + (2 x .5) = 14

The customer would need to purchase a 12’x14’ liner to create an 8’x10’x1.5’ finished pond.

ROPE CALCULATIONS

If you know the finished pond size and need to know rope length to shape....

After you know the finished pond dimensions and depth, you can use rope length to shape the pond.

**Rope Length = 2 (length + width) Add 4 feet to the total for liner edging.**

**EXAMPLE** if the finished pond size is 4 x 6 the formula would be
- Rope Length = 2 (4 + 6) or 8+12=20, then add 4 = 24ft. Rope

A 24ft rope will create the correct perimeter (including perimeter shelving), in any shape, for the appropriate liner.
PUMP & FILTER CALCULATIONS (GALLONS)

In order to select the correct pump and filtration you need to find the gallonage....

Match the number of gallons of your pond to the number on the pump and filter packages to determine products for your pond.

A formula which can help determine the gallonage in a square pond with 30 degree walls is:

\[ \text{length} \times \text{width} \times \text{depth} \times 6.7 = \text{gallons} \]

For example, a finished pond size of 8’ x 10’ x 1.5’ would contain 900 gallons of water.

\[ 8 \times 10 \times 1.5 \times 6.7 = 900 \text{ gallons} \]