TECHNICAL INFORMATION

WHAT IS THE PURPOSE OF WATERFALL FOAM?

Waterfall foam ensures the water in transit stays in the feature. Fill any crevice you believe water could leak through with foam. While foam is drying, you want to disguise the foam by placing small rocks onto it. The foam will hold the rocks in place and then cure.

I BELIEVE MY POND IS LEAKING

The first step to finding the leak is to turn off your pump and mark the water level of the pond with a piece of tape. Then, if you see the water level has not fallen, then there is a leak in the plumbing or filter system. If the water level has continued to fall, then the leak is in the pond itself. You can continue to mark the water level periodically until it stops falling. Then you will know at what level the leak is located.
Now, add some more water to the pond (about an inch) so you can find the leak. Take a turkey baster and fill it with some milk or cream. You want to go very slowly and carefully around the edge of the pond trying not to disturb the water or create as little disturbance as possible. What you want to do is very carefully and slowly squeeze some milk out in an area that you begin searching for the leak. Work your way around the pond until you have made a complete circle. Squeeze a little milk out at your starting point and watch the milk to see if it moves in a direction. If there is a leak near it, the milk will be pulled toward the hole. The fluid in the baster should contrast and be visible in the water. You want the milk or cream to stay separated from the water as much as possible. So, squeeze the turkey baster very slowly and watch for the milk to move in a direction.

HOW DO I WINTERIZE MY POND?

Ponds With Fish

If you plan on keeping fish in your pond during winter, you will need a depth of about 3 feet. You will also need to keep a hole in the ice open for gases to escape. Without the pond pump running you will need to have some sort of aeration inside your feature. You may also consider a pond heater, or remove fish and keep them inside.

Tropical Plants

If you have perennials in deep enough water they will possibly be alright. As a general rule, it is always good to have an indoor solution for your plants in the winter. A water tank with good nutrients and UV lights will help keep your tropical plants alive. Familiarize yourself with your plants and what they will need to survive.

Water Pump

If you do not plan on running your pond in the winter, it is best to remove and winterize your pond pump. Remove your pump and let it soak in a CLR and water bath. This removes the calcium, rust, dirt, and grit build up on your pump. Then place your pump in a bucket of water and keep it someplace where it will not freeze over winter. If your pump is below the freezing line or you live in a warm climate, then it will not be necessary to remove over winter. However, annual cleaning is very important for your pond pump.

HOW DO I SEAM EPDM LINER?

Step #1 Layout the Liner

Layout the sections of the liner to be seamed. Overlap ends by 6"–12".

Step #2 Clean the Seam Area

Lift the top liner. Use gasoline or mineral spirits & thoroughly clean the seam area.

Step #3 Mark the Seam Area

With the top liner down, use a crayon or lightly score with the back of scissors the seam area on the bottom liner. Raise the top liner in preparation for priming.

Step #4 Prime the Seam Area

Prime both liners. On the bottom liner, prime an area ¼" above the mark, approximately 6"–8" wide. Prime a matching area on the top liner.

Step #5 Apply 3" Double-Sided Tape

Apply 3" double-sided tape to the bottom liner, pressure rolling as you go to eliminate air bubbles or wrinkles.

Step #6 Smooth the Seam

With the double stick paper still on, replace the top liner and pressure roll the seam.

Step #7 Seal the Seam

Slit the double-stick tape in the center. Overlap the liners & carefully remove the paper, pulling off the tape from between the liners at a 45˚ angle, one side at a time.

Step #8 Apply 6" Single Stick

Prime an area 6" wide-spaced evenly over the exposed edge of the seam. Apply 6" tape over primer.

Step #9 Roll and Seal Forever

Thoroughly pressure roll the 6" tape and generously apply lap sealant along both edges of the 6" tape.

Step #10 Allow the Seam to Dry

Allow the seam to dry thoroughly before contact with water.

TECHNICAL INFORMATION

POND LINER SIZING FORMULA:

MAX LENGTH + (POND DEPTH x 2) + 2' = LINER LENGTH
MAX WIDTH + (POND DEPTH x 2) + 2'= LINER WIDTH
Example: A 15' long, 10' wide and 1.5' deep pond is:
15' + (1.5 x 2) + 2' = 20' Long
10' + (1.5 x 2) + 2' = 15' Wide

HOW MANY GALLONS OF WATER?

Rectangular Ponds
LENGTH x WIDTH x AVERAGE DEPTH x 7.48 = GALLONS
Example: A 15' long, 10' wide and 1.5' deep pond
15' x 10' x 1.5' x 7.48 = 1683 Gallons

Oval Ponds
RADIUS1 x RADIUS2 x 3.14 x AVERAGE DEPTH x 7.48 = GALLONS
Example: An oval pond 15' long, 10' wide and 1.5' deep
7.5' x 5' x 3.14 x 1.5' x 7.48 = 1321 Gallons

Round Ponds
RADIUS x RADIUS x 3.14 x AVERAGE DEPTH x 7.48 = GALLONS
Example: A round pond 12' diameter and 1.5' deep
6' x 6' x 3.14 x 1.5' x 7.48 = 1268 Gallons

Streams
LENGTH x WIDTH x 0.25 x 7.48 = GALLONS
Example: A stream 20' long, 3' wide, 3" deep
20' x 3' x 0.25 x 7.48 = 112 Gallons

HOW BIG OF A PUMP DO I NEED?

The minimum pump size is determined by pond type, water volume, head height, and friction loss. The minimum pump size recommendations are:
Water Garden, Few Small Goldfish
CIRCULATE TOTAL POND WATER VOLUME EVERY 2 HOURS
Example: 2000 GPH pump for a 3000-gallon pond with 2' waterfall

Fish Pond, Several Small Fish
CIRCULATE TOTAL POND WATER VOLUME EVERY 1 HOUR
Example: 3,800 GPH pump for a 3,000-gallon pond with 2' waterfall

Koi Pond, Several Large Fish
CIRCULATE TOTAL POND WATER VOLUME EVERY 45 MINUTES.
Example: 5,500 GPH pump for a 3,000-gallon pond with 2' waterfall

Head Height
Dynamic head pressure is found by taking the vertical height of your waterfall; the distance between where your pump is (typically in the skimmer) and where your waterfall is, and adding the static head pressure (pipe and fittings) 1' for every 10' of tubing and 1' for every elbow or "T" fitting.
Example: 3(vertical height) + 2.5(tubing) + 2(elbows) = 7.5

POND FREE WATERFALLS

Determine the overall size and layout of your feature

Measure the length (L) , width (W), and average depth (D) in feet

Calculate the water in transit (WIT)
L = Total Length of waterfall and streamway combined
W = Average width of the streamway and waterfall
D = Average Depth of the streamway in feet (ex: 3" = 0.25' deep)

L x W x D= Cubic Feet of Water in Transit (WIT)
NOTE: 1 ft³ of water = 7.48 gallons

Ex: 5' Length (1'+ 2' + 6'' + 1' + 6'' = 5') x 2' Width x 0.25' Average Depth = 2.5 ft³ WIT
2.5 ft³ x 7.48 = 18.7 Gallons = round off to 20 gallons

Recommended basin size
We recommend a basin that holds 2.5x the amount of water in transit:
2.5 x 20 = 50 gallons
(minimum depth must be as deep as pump vault/housing unit)

Select your Pond Free Kit and Products
We recommend utilizing Pond Free® blocks and a waterfall well to allow for a smaller basin. Each block accounts for 30 gallons and waterfall wells add 20 gallons. (Extensions allow more space if needed see pg. 14)
Example: If 50 gallons are needed for the basin, use one matrix block (30 gallons) and a pump vault of 20 gallons. Resulting in a basin size of 2' x 2' x 1.5'

When a basin is filled with rock instead of using Pond Free blocks, **the hole size is 5X Larger**
Example: 50 gallons x 5 = 250 gallons. Resulting in a basin size of 4.5' x 4.5' x 1.5'

PIPE FLOW CHART

The minimum flow rate is the flow that a pipe will produce with just gravity pushing the water. The efficiency rating is the rate we recommend using for your tubing to keep friction loss to a minimum. Max rate is the maximum GPH the pipe will produce with pressure from a pump.

Pipe Flow Chart			
Size	GPH (min.)	Efficiency GPH	GPH (max.)
0.5"	60	< 300	420
0.75"	300	< 720	900
1"	700	< 1,200	1,500
1.25"	900	< 1,600	3,200
1.5"	2,000	< 2,600	4,400
2"	3,000	< 4,800	6,800
3"	6,000	< 9,000	14,000
4"	14,000	< 21,000	28,000
6"	33,000	< 42,000	60,000