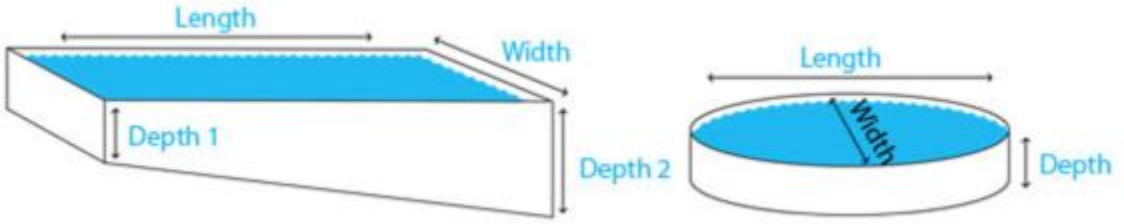
Pool Volume Calculator

Here is a great tool to calculate the volume or capacity of your pool. Important! Remember to measure from the depth of the water rather than the height of your wall.



More complicated pool shapes will require multiple calculations and adding them together. For more detailed information on the calculations, read more below the calculator. For additional help, contact a **swimming pool professional**.

Capacity calculations involve calculating surface area and volume of the pool or spa. This article describes in detail how to calculate the size and capacity of the pool you are planning. Calculating a pool's area in square feet is the first step in determining information including pool gallons, maximum capacity of persons and other important information about your pool.

Geometric Formulas

A simple method of calculating pool size is the use of geometric formulas. Following are the basic formulas and calculations to determine surface areas:

A	Area
L	Length
W	Width
H	Height
r	Radius
d	Diameter
Pi	3.14 constant

Area of a square or rectangle: A = L x W

Area of a right triangle: A = (L x W)/2

Area of a circle: A = Pi x r x r

Calculating Volume

The cubic volume can be calculated by including the depth of the pool with the surface area. For accurate calculations, the pool should be divided into various areas according to the depth.

Constant Depth Pools: Square or Rectangular

Length x width x depth x 7.5 = volume (in gallons)

Length times width gives the surface area of the pool. Multiplying that by the depth gives the volume in cubic feet. Since there are 7.5 gallons in each cubic foot, multiply the cubic feet of the pool by 7.5 to arrive at the volume of the pool, expressed in gallons.

Variable Depth Pools: Square and Rectangular

Length x width x average depth x 7.5 = volume (in gallons)

Length times width gives the surface area of the pool. Multiplying that by the average depth gives the volume in cubic feet. Since there are 7.5 gallons in each cubic foot, multiply the cubic feet of the pool by 7.5 to arrive at the volume of the pool (expressed in gallons).

Measure the length, width, and average depth of the pool, rounding each measurement off to the nearest foot or percentage of one foot. One inch equals 0.0833 feet. Therefore, multiply the number of inches in your measurements by 0.0833 to get the appropriate percentage of one foot.

Example: 25 ft, 9 in. = 25 ft + (9 in. x 0.0833)

= 25 + 0.75

= 25.75 ft

If the shallow end is 3 feet and the deep end is 9 feet, and assuming the slope of the pool bottom is gradual and even, then the average depth is 6 feet.

Average depth = (Depth at the shallow end + Depth at the deep end) / 2

Average depth = (3 + 9) / 2 = 6 feet.

If most of the pool is only 3 or 4 feet and then a small area drops off suddenly to 10 feet, you will have a different average depth. In such a case, you might want to treat the pool as two parts. Measure the length, width, and average depth of the shallow section, then take the same measurements for the deeper section. Calculate the volume of the shallow section and add that to the volume you calculate for the deeper section.

Make sure to use the actual water depth in your calculations, not the depth of the container. For example, the hot tub depicted in Figure 2 is 4 feet deep, but the water is only filled to about 3 feet. Using 4 feet in this calculation will result in a volume 33 percent greater than the actual amount of water. This could mean serious errors when adding chemicals for example, which are administered based on the volume of water in question. There might be a time when you want to know the potential volume, if filled to the brim. Then, of course, you would use the actual depth (or average depth) measurement. In the example, that was 4 feet.

Length x width x average depth x 7.5 = volume (in gallons)

25.75 ft x 10 ft x 6 ft x 7.5 = 11,587.5 gallons

Circular Pools

The formula: **3.14 x radius squared x average depth x 7.5 = volume (in gallons)**

The number 3.14, refers to pi, which is a mathematical constant. The radius is one-half the diameter, so measure the distance across the broadest part of the circle and divide it in half to arrive at the radius. Squared means multiplied by itself, so multiply the radius by itself. For example, if you measure the radius as 5 feet, multiply 5 feet by 5 feet to arrive at 25 feet.

Use the hot tub to calculate the volume of a round container. Let's do the tricky part first. The diameter of the tub is 10 feet. Half of that is 5 feet. Squared (multiplied by itself) means 5 feet times 5 feet equals 25 square feet. Knowing this, you can return to the formula:

3.14 x radius squared x average depth x 7.5 = volume (in gallons)

3.14 x 25 ft x 3 ft x 7.5 = 1766.25 gallons

In measuring the capacity of a circular spa, you might need to calculate two or three areas within the hot tub and add them together to arrive at a total volume. An empty circular hot tub looks like an upside-down wedding cake, because of the seats. Therefore, you might want to treat it as two separate volumes-the volume above the seat line and the volume below. In the wooden hot tub, where there is actually water above and below the seats, the tub can be measured as if there are no seats because this difference is negligible.

Kidney or Irregular Shapes

There are two methods used to calculate the capacity of irregular shapes. First, you can imagine the pool or hot tub as a combination of smaller, regular shapes. Measure these various areas and use

the calculations described previously for each square or rectangular area and for each circular area. Add these volumes together to determine the total capacity.

0.45 x (A+B) x length x average depth x 7.5 = volume (in gallons)

The total of measurement A plus measurement B multiplied by 0.45 multiplied by the length gives you the surface area of the kidney shape. (A + B = 18 feet). The rest of the calculations you are now familiar with. Try this volume calculation:

0.45 x (A+B) x length x average depth x 7.5 = volume (in gallons)

0.45 x 18 ft x 25 ft x 5 ft x 7.5 = 7593.75 gallons

Parts Per Million (ppm)

One of the most important calculation you will use is parts per million (ppm). The amount of solids and liquids in the water is measured in parts per million, as in three parts of chlorine in every one million parts of water, or 3 ppm.

To help, this list shows common terms and their equivalents:

Square foot (sq. ft.) = 12 inch wide x 12 inch long

Cubic foot (cu. ft.) = 12 inch wide x 12 inch long x 12 inch high

Cubic yard (cu. yd.) = 36 inch wide x 36 inch long x 36 inch high

One cubic foot of water contains 7.48 gallons

One cubic foot of water weighs 62.4 pounds

One gallon of water weighs 8.33 pounds

One part per million (ppm) represents 8.3 pounds of chemical per million gallons of water.

However, one gallon of chlorine, for example, poured into one million gallons of water does not equal 1 ppm. That is because the two liquids are not of equal density. This becomes obvious since a gallon of water weighs 8.3 pounds but a gallon of chlorine weighs 10 pounds (in a 15 percent solution). The chlorine is a denser liquid; there's more of it than an equal volume of water.