

GUIDE to water BALANCE

Expert since 1928



hth-pool.com

Expert since 1928



Why **balance** my water?

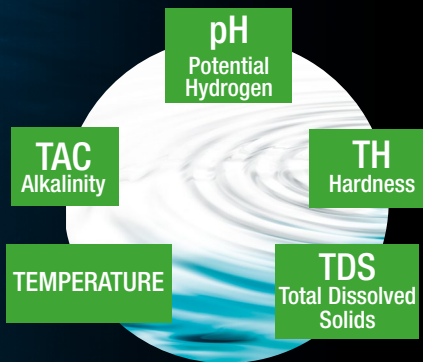
Pool water is a variable element and treating it is essential.

As a living element, water can change rapidly in response to light, cold, heat, mineral salts, sediment and organic waste. The addition of bathers and environmental pollution are foreign elements that will alter it.

That is why swimming pool water needs to be checked and balanced!

The BALANCE of the water is the essential 1st step to ensure the comfort of bathers and optimal effectiveness of the disinfecting products.

Water balance is built around 5 closely related factors:



Pool water is said to be balanced when each of these factors is within the recommended scale of values.



The balance

of your water is first and foremost a question of correctly adjusting the pH

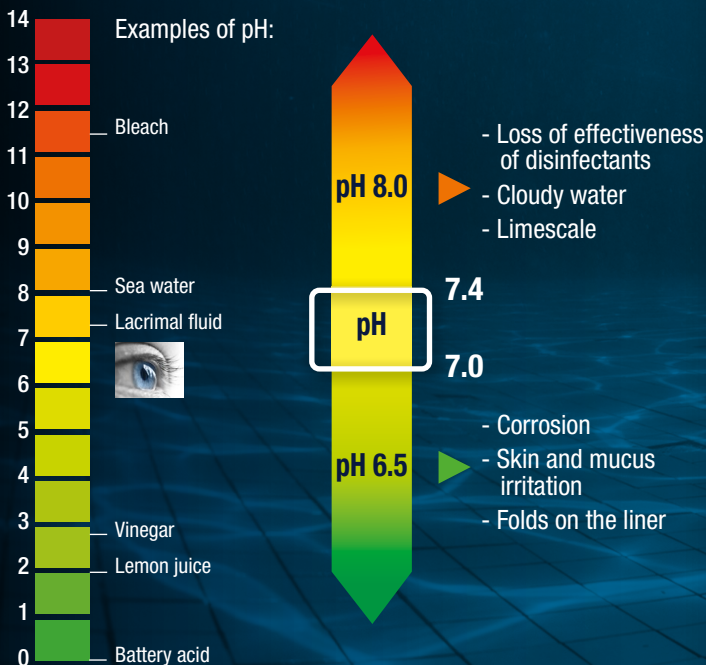
1 pH : Potential Hydrogen

The Potential Hydrogen, more commonly known as pH, tells us the acidic or alkaline nature of the water.

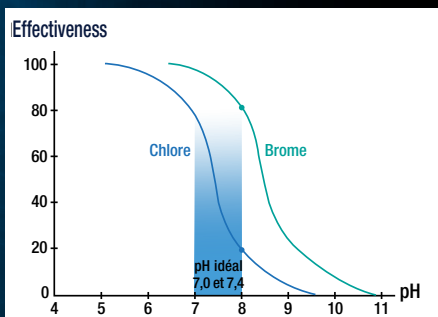
pH is a logarithmic scale that varies from 0 to 14. pH of 7.0 is synonymous with neutral pH. Water with a pH value that is lower than 7.0 is considered to be acid and can cause eye irritation, corrosion of the metal components and damage to the liner (folds appear when the pH is too low). Water with a pH value higher than 7.0 is considered to be base.

When the pH increases, the disinfectants become progressively less effective in destroying bacteria and algae. In addition to this, the water can become cloudy and limescale can build up.

In a swimming pool, the “ideal” is something approaching neutral pH (7.0) and that of lacrimal fluid (our tears), which is around 7.2..





Effectiveness of disinfectants in relation to pH



7.0 < ideal pH > 7.4

This range is also interesting because it offers optimal disinfection.

The **hth**[®] solution:

Function	Products	Dosage
Raise the pH	hth [®] pH PLUS powder 	To increase the pH by 0.2 units, use around 150 g of product for 10 m ³ of water
Lower the pH	hth [®] pH MINUS micro pellets 	To lower the pH by 0.2 units, use around 150 g of product for 10 m ³ of water

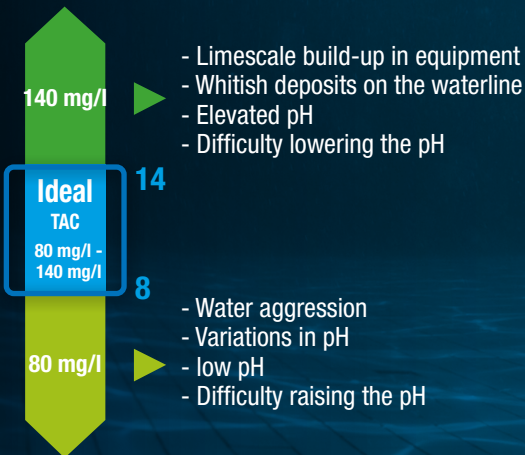
Do not underestimate the **TAC**; its role is primordial!

2 TAC: Total Alkalinity

The TAC: Total Alkalinity (generally called: Alkalinity) represents the concentration of carbonate, bicarbonate and hydroxide ions in the pool water.

Many analysis kits do not offer analysis of the total alkalinity; therefore, its importance is often underestimated. Any yet, its role is primordial.

The TAC can stabilise the pH to the recommended value; this is what we call the “ buffering capacity “. Water with the right TAC value will have relatively stable pH. Rainwater (acid) can contribute to lowering the TAC





DID YOU KNOW?

If you notice variations in pH, check that the TAC value is correct, because the stability of the pH is closely related to the TAC.

The role of CO₂

When the pH goes above 8, the bicarbonates transform into carbonates that can precipitate in the form of calcium (scale) to which pathogen germs, algae, sun oils... can attach. Sufficient CO₂ is essential when it comes to avoiding the transformation of bicarbonates into carbonates.

Unfortunately, the CO₂ concentration of water can be greatly reduced when the latter is subjected to strong agitation (infinity pool, waterfall, endless swim pool); the water becomes imbalanced because it "lacks CO₂" with the consequence that it precipitates calcium onto the sides of the pool.



Infinity pool with waterfall



Expert since 1928



The measurement of the alkalinity is expressed in degrees (° f) or in mg/l. 1° f = 10 mg/l.

To have sufficient buffering capacity:

8° f < ideal TAC > 14° f

(80 mg/l)

(140 mg/l)



For treatments with calcium hypochlorite:

6° f < ideal TAC > 12° f

(60 mg/l)

(120 mg/l)

The **hth**[®] solution:

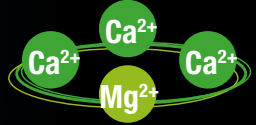
Function	Products	Dosage
Raise the TAC	hth [®] ALKANAL 	To increase the TAC by 1° f (10 mg/l), use around 170 g of product for 10 m ³ of water
Lower the TAC (Ask your specialist retailer for advice)	hth [®] pH MINUS micropellets 	To lower the pH (and the TAC) by 0.2 units, use around 150 g of product for 10 m ³ of water

Is your water hard? Measure the hardness

3 HARD WATER: TOTAL HARDNESS

TH: Total Hardness represents the level of calcium salts and magnesium in the water.

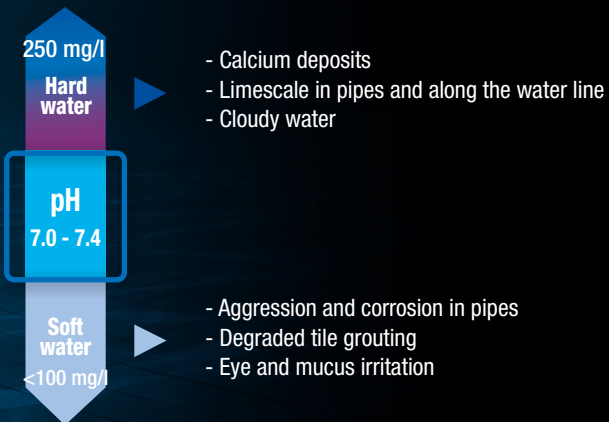
Depending on where you live, the water can be hard or soft. When rain falls, it infiltrates the soil on the way to the reservoir and absorbs the different elements with which it is contact: this is when the water becomes mineralised.



The hardness of the water depends on the nature of the soil it passes through: granite soil will create water that is low in calcium and magnesium, while chalky or limestone soil will lead to hard water, with high levels of calcium and magnesium. In addition to this, atmospheric pollution is responsible for the level of calcium in some water.

As with TAC, the measurement of hardness is expressed **mg/l: 10 mg/l**.

The higher the TH, the harder the water and the lower the TH, the softer the water.



ideal TH




(100 mg/l)

(250 mg/l)

Map of water hardness in the UK





DID YOU KNOW?

-  Hard to very hard water
-  Medium to hard water
-  Soft to moderately soft water



The **hth**® solution:

Function	Products	Dosage
Prevents the build-up of scale	<p>hth® STOP-CALC liquid</p> 	<p>On 1st use, use 500 ml for 10 m³ of water. Afterwards, add the product regularly in relation to the addition of clean water, observing the same proportions.</p>
Raise the TH (addition of calcium to soft water)	<p>Treatment with calcium hypochlorite:</p> <p>hth® STICK® hth® SHOCK® hth® ADVANCED®</p> 	<ul style="list-style-type: none"> - 1 STICK® for 20 m³ every 5 days - SHOCK® : 15 g for 10 m³ of water - 1 tablet of ADVANCED® for 20 to 25 m³, every 5 to 7 days.

EXERCISE PRECAUTION WHEN USING CHEMICAL POOL TREATMENTS. BEFORE USING, READ THE LABEL AND INFORMATION ABOUT THE PRODUCT ON HTH-POOL.COM



Problems & Solutions

Cloudy water

- **The TAC or pH is incorrect:** Adjust the TAC to between (80 to 140mg/l) with **hth**[®] ALKANAL , then adjust the pH to between 7.0 and 7.4

Calcium deposits

- **The TAC or pH is incorrect:** Adjust the TAC to between (80 to 140 mg/l) with **hth**[®] ALKANAL , then adjust the pH to between 7.0 and 7.4
- **Very hard water:** Add **hth**[®] STOP-CALC in relation to the addition of clean water

Eye and skin irritation

- **The pH is incorrect:** Adjust the pH to between 7.0 and 7.4

Unstable pH

- **The TAC is too high:** Add **hth**[®] pH MINUS (ask your specialist retailer for advice)
- **The TAC is too low:** Adjust the TAC to between (80 to 140 mg/l) with **hth**[®] ALKANAL

Incorrect pH

- **The pH is too high:** Check the pH frequently, adding **hth**[®] pH MINUS
- **The pH is too low:** Check the TAC and adjust if necessary, then raise the pH with **hth**[®] pH PLUS

Langelier Water Balance

The formula for calculating the Langelier Index is as follows :

- pH
- + Temperature factor
- + Alkalinity factor
- + Calcium Hardness factor
- TDS factor



The formular is applied using the table below to obtain the factors from the actual test results for pH, Temperature, Alkalinity, Calcium Hardness and TDS.

Temperature		T.F.	Calcium Hardness mg/l	C.F.	Total Alkalinity mg/l	A.F.	Total Dissolved	Factor
°C	°F	as CaCO ₃		CaCO ₃		Solids mg/l		
0	32	0.0	5	0.3	5	0.7	0	12.0
3	37	0.1	25	1.0	25	1.4	-	-
8	46	0.2	50	1.3	50	1.7	1000	12.1
12	53	0.3	75	1.5	75	1.9	-	-
16	60	0.4	100	1.6	100	2.0	2000	12.2
19	66	0.5	150	1.8	125	2.1	-	-
24	76	0.6	200	1.9	150	2.2	3000	12.25
29	84	0.7	250	2.0	200	2.3	-	-
34	94	0.8	300	2.1	300	2.5	4000	12.3
41	105	0.9	400	2.2	400	2.6	-	-
53	128	1.0	600	2.35	800	2.9	5000	12.35
-	-	-	800	2.5	1000	3.0	-	-
-	-	-	1000	2.6	-	-	6000	12.4

The example below provides a usfull guide to balanced water

Example	Langelier calculator
pH = 7.5	7,5
Temperature = 29°C (84° F)	f 0,7
Total Alkalinity = 100	f 0,2
Calcium Hardness = 300	f = 2,1
TDS = 1100	subtract: f 12,1
	Total = +0,2 (+ 0.5 or - 0.5 is acceptable)

A + result = Scale forming water
 A - result = Corrosive water
 (+0,5 or -0,5 is deemed acceptable)

Our advice

- ✓ Check the pH at least twice a week before and after using the pool and adjust it to between 7.0 and 7.4. Avoid abrupt treatments. Adjust by 0.2 units, then perform another analysis after full recycling of the pool water. Perform the operation again if necessary.
- ✓ Check the TAC when opening the pool at the start of the season and when pH values are significantly out of range; maintain TAC between (80 to 140 mg/l).
- ✓ Check the TH when opening and closing the pool.
Use **hth**® STOP-CALC as soon as the TH exceeds (250 mg/l).
- ✓ Change at least 30% of the water in your pool every year to dilute the mineral load of the water.

For a full water analysis we recommend to take a sample of your pool or spa water to you nearest **hth**® retail dealer.

How to calculate the volume of your pool?

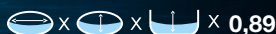
Rectangular



Round



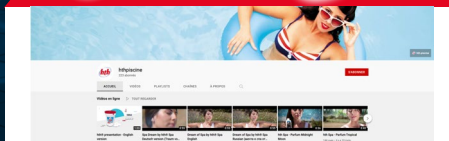
Oval



Freeform



YouTube
channel



Customer service

+44 (0) 1924 792909

hth-pool.com