

# The *onBalance* Method of Starting Up New Plaster Pools With More Durable Surfaces and Without Plaster Dust

## Step 1 – Pre-testing the Water

- We test the chemistry of the water that will be used to fill the pool. The key characteristics we observe are pH, Alkalinity, Hardness, Copper and Iron.

## Step 2 – Calculating the Chemical Dose

- We add the Alkalinity and the Hardness numbers together. Then we subtract that number from 500. The result is the amount of bicarbonate in ppm to add. For example, if the fill water Alkalinity is 90 and the fill water Hardness is 200, then 210 ppm of new bicarbonate needs to be added:  $500 - (90 + 200) = 210$  (If the combined alkalinity and hardness is more than 500, do a traditional start-up instead.)
- Then we apply the Simplified Dosage Formula for raising alkalinity using sodium bicarbonate:  $(\text{Volume} \div 71,425) \times \text{ppm to add} = \text{pounds to add}$
- For example, if the pool will hold 20,000 gallons, and we want to add 210 ppm of bicarbonate alkalinity:  $(20,000 \div 71,425) \times 210 = 58.8$ , or about 60 pounds to add
- It is always better to err toward overdosing the baking soda rather than underdosing. It won't hurt anything to use more, other than requiring a little more acid a month down the road. Too little baking soda, however, can result in not preventing all plaster dust formation, which defeats the purpose.



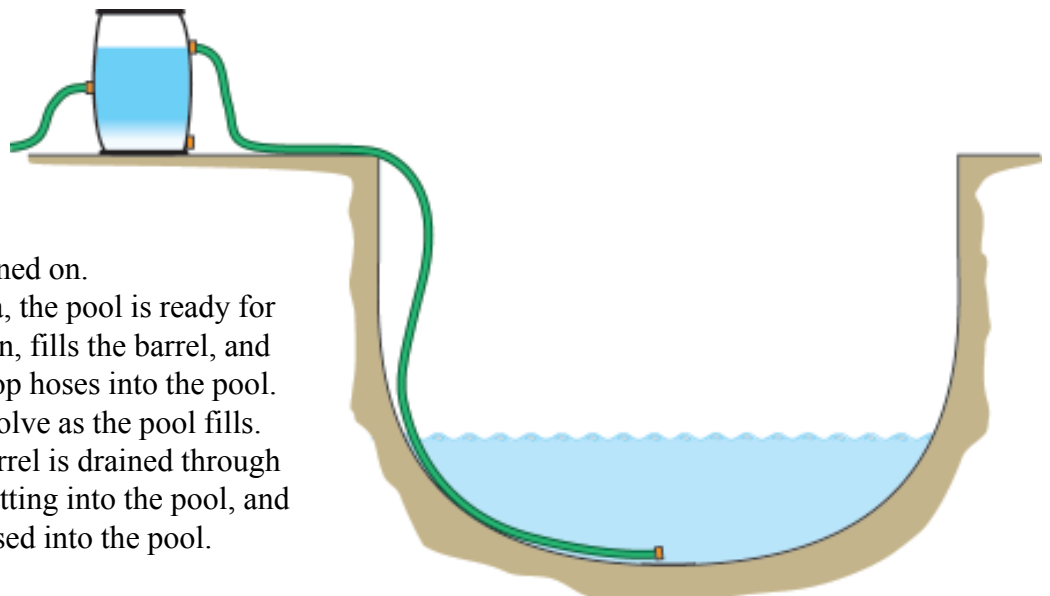
## Step 3 – Setting up the Delivery System

- We then set up a 55 gallon plastic drum that has garden hose connections added to it. The drums include the following modifications:
  - An 8 to 10 inch hole is cut in the top of the barrel to facilitate pouring in the bicarb
  - A female hose connector is mounted halfway up the “back” or “deck” side of the barrel
  - Three male hose connectors are mounted about 4" below the top lip on the “pool” side of the barrel, enough to make sure that sufficient output hoses are provided to handle the pressurized input from the tap without overflowing the drum
  - One fitting is mounted at the bottom of the pool side of the barrel, which leads to a plastic ball valve and then a male hose connector. This is for final draining purposes.

- To start the process, a hose is run from the home water source to the deck-side fitting, and three hoses are run from the top pool-side fittings to the bottom of the pool, with the ends wrapped in cloth and taped.

Baking soda (we use technical grade sodium bicarbonate) is added to the drum before any water is turned on.

- After adding the baking soda, the pool is ready for filling. The water is turned on, fills the barrel, and gravity-flows out the three top hoses into the pool. The powder will slowly dissolve as the pool fills. When the pool is full, the barrel is drained through the bottom pool-side drain fitting into the pool, and any remaining powder is rinsed into the pool.



#### Step 4 – pH Adjustment

- If the pH of the fill (tap) water is over 8.2, we add 1 quart of acid to the drum once the drum is full of water.

#### Step 5 – Determining Fill Delay, Turning On the Water

- In consultation with the plasterer, we decide when the water will be turned on relative to the crew finishing the pool. Conditions permitting, we encourage the plasterer to allow at least 6 hours between final troweling and turning on the water.
- At the pre-determined time, we ensure that the water is turned on and that the flow through the barrel to the pool is working properly, without leaks.
- Working with the homeowner, we ensure that the water fills uninterrupted from main drain to surface tile.

#### Step 6 – Making Adjustments

- Once the pool is filled, we double check the pH, which should be right at 8.3. This requires the use of a pH meter, since 8.3 is at the extreme high detection range of phenol red.
- We double check the Alkalinity, which should be anywhere from 100 to 350 ppm.
- If the pH is 8.2 or higher, we add acid to adjust the pH down to the high 7 range – 7.7 to 7.9ish.
- If the Hardness level is below 150 ppm, we add calcium chloride as needed, using the Simplified Dosage Formula for adding Hardness (see below).
- We recheck the copper and iron levels and add chelating agents as needed.
- We then add cyanuric acid, borax, chlorine, etc. to reach to our target maintenance levels.

#### Step 7 – Monitoring the Progress

- Over the course of the next two weeks, we ensure that the pool is being brushed and filtered per the plasterers specifications, and chemically maintained per our standards.
- For the first month after fill, we allow the alkalinity to remain as high as it was from the start-up, and ensure that the pH remains at 8.2 or lower.
- For the first month we use an acidic sanitizer so we don't raise pH through sanitizer usage.

#### Step 8 – Final Balancing

- After a month or so, we begin adding acid until the Alkalinity reaches the target range.
- We aren't in any great hurry to finish that – as long as the pH remains below 8.3, there will be no plaster dust and no scale formation.

#### Simplified Formulas

Raising TA with Sodium Bicarbonate:  $(\text{Volume} \div 71,400) \times \text{___ ppm desired change} = \text{___ pounds}$

Raising Hardness with Calcium Chloride:  $(\text{Volume} \div 83,300) \times \text{___ ppm desired increase} = \text{___ pounds}$

(Amount in pounds to increase calcium hardness with 77% calcium chloride strength – use 101,700 as divisor for 94% strength)



#### A Fun Example:

This pool/spa combo, featuring black plaster, was set up to be bicarb-started. You can see the barrel and hoses in the background. When we came back that evening, the pool was crystal clear, but the spa looked like it was full of milk (especially once we brushed it!). The homeowner had come home and decided to fill the spa using non-bicarbonated tap water. What a difference!