

The Bicarb Start – Pre-treating Fill Water for New Plaster Pools (Preferred Method)

Step 1 – Pre-testing the Water

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

Step 2 – Calculating the Chemical Dose

- Add the Alkalinity and the Hardness numbers together. Then subtract that number from 500. The result is the amount of bicarbonate in ppm to add. see footnote 1 on reverse
- Apply the Simplified Dosage Formula for raising alkalinity using sodium bicarbonate: $(\text{Volume} \div 71,400) \times \text{ppm to add} = \text{pounds to add}$. see footnote 2 on reverse
- If the Alkalinity and Calcium Hardness combined equal 500 ppm or higher, make sure that the TA is over 200, then no additional adjustment is needed.

Step 3 – Setting up the Delivery System

- Set up a 55 gallon plastic drum that has garden hose connections added to it (see illustrations on reverse side). The drum should include the following modifications:
Cut an 8 to 10 inch hole in the top of the barrel to facilitate pouring in the bicarb, Mount a female hose connector halfway up the “back” or “deck” side of the barrel, mount three male hose connectors 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, and mount one fitting 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, run a hose from the home water source to the deck-side fitting, and run three hoses from the top pool-side fittings to the bottom of the pool, with the ends wrapped in cloth and taped. Add the baking soda (technical grade sodium bicarbonate is fine) to the drum before any water is turned on.

Step 4 – pH Adjustment

- If the pH of the fill (tap) water is over 8.2, 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, decide when the water will be turned on relative to the crew finishing the pool. Conditions permitting, encourage the plasterer to allow at least 6 hours between final troweling and turning on the water.
- Turn the water on, which fills the barrel, and gravity-flows out the three top hoses into the pool. The powder will slowly dissolve as the pool fills. Make sure that the flow through the barrel to the pool is working properly, without leaks. Working with the homeowner, ensure that the water fills uninterrupted from main drain to surface tile. When the pool is full, drain the barrel through the bottom pool-side drain fitting into the pool, and rinse any remaining powder into the pool.

Step 6 – Making Adjustments

- Once the pool is filled, 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.
- Double check the Alkalinity, which should be anywhere from 100 to 350 ppm.
- If the pH is 8.2 or higher, 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, add calcium chloride as needed, using the Simplified Dosage Formula for adding Hardness (see reverse). Be sure the pH is below 8.2 before adding calcium chloride.
- Recheck the copper and iron levels and add chelating agents as needed.

Step 7 – Monitoring the Progress

- Brush and filter the pool daily for the first two weeks, and chemically maintain per APSP standards.
- Add cyanuric acid, borax, chlorine, etc. according to your normal practice to reach to target maintenance levels. Always predissolve powders before adding.
- For the first month after fill, 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 use an acidic sanitizer so the pH remains below 8.3.

Step 8 – Final Balancing

- After a month, begin adding acid until the Alkalinity reaches the target range.
- There is no great hurry to finish that – as long as the pH remains below 8.3, there will be no plaster dust and no scale formation.

The Bicarb Start – If the Pool is Already Filled (Alternate Method if you can't pre-treat the fill water)

Step 1 – Pre-testing the Water

- Test the chemistry of the pool water. The key characteristics are pH, Alkalinity, Hardness, Copper and Iron.

Step 2 – Calculating the Chemical Dose

- Add the Alkalinity and the Hardness numbers together. Then subtract that number from 500. The result is the amount of bicarbonate in ppm to add. see footnote 1
- Apply the Simplified Dosage Formula for raising alkalinity using sodium bicarbonate: $(\text{Volume} \div 71,400) \times \text{ppm to add} = \text{pounds to add}$. see footnote 2
- If the Alkalinity and Calcium Hardness combined equal 500 ppm or higher, make sure that the TA is over 200, then no additional adjustment is needed.

Step 3 – Adding the Sodium Bicarbonate (bicarb, or baking soda)

- Add the baking soda (technical grade sodium bicarbonate is fine) to the pool with the circulation system turned on.

Step 4 – Making Adjustments

- As soon as the bicarb is added and blended in, using an acid demand test for the dosage, add acid to lower the pH to around 7.8 - 8.0. Pre-dilute the acid and add around the perimeter of the pool with the circulation running.
- Double check the Alkalinity, which should be anywhere from 100 to 350 ppm.
- If the Hardness level is below 150 ppm, add calcium chloride as needed, using the Simplified Dosage Formula for adding Hardness (see below). Be sure the pH is below 8.2 before adding calcium chloride.
- Add chelating agents as needed.

Step 5 – Monitoring the Progress

- Brush and filter the pool daily for the first two weeks, and chemically maintain per APSP standards. Although some plaster dust may have formed already, little or no more plaster dust should form after this treatment.
- Add cyanuric acid, borax, chlorine, etc. according to your normal practice to reach to target maintenance levels. Always predissolve powders before adding.
- For the first month after fill, allow the Alkalinity to remain as high as it was after the bicarb addition, and ensure that the pH remains at 8.2 or lower.
- For the first month use an acidic sanitizer so the pH remains below 8.3.

Step 6 – Final Balancing

- After a month, begin adding additional acid until the Alkalinity reaches the target range.
- There is no great hurry to finish that – as long as the pH remains below 8.3, there will be no plaster dust or scale formation.

Footnote 1 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: $500 - (90 + 200) = 210$

Footnote 2 For example, if the pool will hold 20,000 gallons, and it needs 210 ppm of bicarbonate alkalinity: $(20,000 \div 71,400) \times 210 = 58.8$, or about 60 pounds to add

Simplified Formulas

Raising Alkalinity with Sodium Bicarbonate: $(\text{Volume} \div 71,400) \times \text{ppm desired increase} = \text{pounds}$
Raising Hardness with Calcium Chloride (77%): $(\text{Volume} \div 83,300) \times \text{ppm desired increase} = \text{pounds}$
Raising Hardness with Calcium Chloride (94%): $(\text{Volume} \div 101,700) \times \text{ppm desired increase} = \text{pounds}$
Lowering Alkalinity with Muriatic Acid (31.45%): $(\text{Volume} \div 125,000) \times \text{ppm desired decrease} = \text{quarts}$

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Illustrations for bicarb barrel described on reverse side:

