

5 Ways to Produce Better Quality Bleach for Less Money

Chlorine and Caustic are Expensive - And the Price Will Continue to Increase

As a bleach producer, you know chlorine and caustic are expensive - and the price is going to continue to increase for the foreseeable future. Fortunately, cost escalations in raw materials need not negatively impact your profits. There are several ways Powell can help you potentially achieve very large savings of raw materials in any bleach operation.

Here are 5 ways you could save money in your process.

1. Reduction in Average Bleach Strength Saves Money!

Producers with good control of caustic dilution and good end point control of excess caustic can reduce average strength of the bleach produced when desired. For example, let's assume 10,000,000 gallons of bleach is produced per year. The prices of chlorine and caustic are \$150 and \$350 per ton respectively. The average bleach strength produced is 165 gpl available chlorine, well above typical minimum bleach strength of 155 gpl available chlorine. Through improved process control and/or better operator management, it is possible to achieve an average reduction in strength of 8 gpl available chlorine, resulting in average bleach strength of 157 gpl available chlorine. Significant cost savings could result over a one-year period, as illustrated below.

Chlorine: $10,000,000 \times 0.067 \text{ lbs/gal} = 670,000 \text{ lbs}$

Caustic: $670,000 \times 1.128 = 755,760 \text{ lbs}$.

ECU Savings: $335 \times \$500 \text{ per ton} = \$167,500 \text{ per year savings}$.

2. Excess Caustic is Expensive!

High excess caustic does not add stability to sodium hypochlorite, but it does waste a lot of money. For example, assume 10,000,000 gallons of sodium hypochlorite is produced at 165 gpl available chlorine and 10 gpl excess caustic. The prices of chlorine and caustic are \$150 and \$350 per ton respectively. If the same 10,000,000 gallons of sodium hypochlorite were produced at 165 gpl available chlorine but with 3 gpl excess caustic, the raw material savings would be as follows:

165 gpl @ 10 gpl excess will use 1.654 lbs NaOH/gal

165 gpl @ 3 gpl excess will use 1.596 lbs NaOH/gal

Total NaOH saved by using 3 gpl = $10,000,000 \times 0.058$

= 580,000 lbs NaOH per year

= 290 tons of caustic \times \$350 per ton = \$101,500 per year savings.

3. Sodium Chlorate Formation is Expensive!

During production of sodium hypochlorite, sodium chlorate (NaClO_3) is formed. Recent studies have shown some production plants have chlorate levels as high as 8-10 gpl. For every gram of chlorate, approximately 2.1 grams of sodium hypochlorite are lost, ie, $3\text{NaOCl} = \text{NaClO}_3 + 2\text{NaCl}$. Assume prices of chlorine and caustic are \$150 and \$350 per ton respectively. Assume also the average production of sodium hypochlorite is 165 gpl available chlorine, and there are 3.5 gpl of sodium chlorate in the solution. If the level of sodium chlorate is reduced to 1 gpl, the amount of raw material required to make the same amount of bleach equivalent to 5.25 gpl available chlorine. As a result, the raw material savings could be as follows:

Chlorine saved: $0.042 \text{ per gallon} \times 10,000,000 \text{ gallons} = 420,000 \text{ lbs/year}$

Caustic save: $420,000 \times 1.128 = 473,760 \text{ lbs/year}$

Total ECU Saved: $210 \text{ ECU} \times \$500 \text{ per ton} = \$105,000 \text{ per year savings}$.



4. Save on Electrical and Labor Costs!

The cost of electricity is increasing rapidly and is expected to continue to rise. Bleach plants are currently designed to operate at full capacity during the warmest times of the year. This means these systems may be using more electricity than required to operate during the off-peak times. Depending on local ambient conditions and bleach production, it may be possible to reduce an average of 25 kW per hour on your continuous systems during the year. For example, if electrical costs are \$0.15 per kW hour and the system is operated 2,000 hours per year, cost savings could be \$7,500 per year. However, since most systems can be modified to operate at double current flow rates for an approximate 25% increase in power, operating time could be reduced from 2,000 hours to 1,000 hours. Assuming a fixed power cost during the 24-hour day, electrical costs could go from \$22,500 to \$14,000. Many parts of the country are allowing off-peak power rates that are much lower than normal rates. If the system is designed to operate at high flow rates, production can occur at off-peak times and even further rate reductions can be realized. In addition to the electrical savings, labor savings would also accrue. For example, the elimination of personnel costs of \$20 per hour with benefits would save another \$20,000 per year.

5. Save Even More by Using Lower Grade Caustic!

During production, 10,000,000 gallons bleach would use approximately 8,000 tons of caustic. If bleach of the same or better quality than you're making now could be made without using the more expensive rayon grade caustic, significant savings could be realized. For example, if the 8,000 tons of caustic could be of lower quality, it might be purchased at \$15 dollars per ton less than rayon grade caustic. The savings from this could be as much as \$120,000 per year.

Powell Can Help You Find the Cost Savings in Your Bleach Process!

At Powell, we are making major strides in improving the efficiency, reliability and safety of bleach plant systems. Many of the improvements can pay for themselves with cost savings realized through increased production efficiency. If you want to achieve the level of efficiency at which costs savings similar to those outlined can be realized, contact us today. We would be pleased to discuss your present operation and suggest efficiencies that will save significantly on the cost of your raw materials.

Contact Powell Today!

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