Fusing Caustic Soda With Electric Heat

Manufacture of Oil and Soap Men's Basic Chemical by New Method Shows Important Economies.

By B. S. HAVENS

THE use of electric heat for fusing caustic soda on a commercial scale has been accomplished for the first time by the Riordon Pulp Corporation, of Temiskaming, Quebec.

Caustic Manufactured by Usual Electrolytic Process

Chlorine for use in making bleaching material is obtained by the electrolytic method, current being passed through a solution of sodium chloride. Chlorine is liberated at one electrode and, at the other, the liberated sodium combines with the water to form sodium hydroxide, which is then pumped to steam-heated evaporators. At this point, water is evaporated until the concentration is about 60% water and 40% caustic soda, by weight.

Electrically Heated Fusing Pots

The liquid is then pumped to the electrically heated pots in which it is fused. Each pot is approximately 10 feet in diameter inside and 6 feet deep and will hold approximately 2,600 imperial gallons. The pot is set in brick work consisting of 4½ inches of red brick outside, 9 inches of insulating brick and a 4½ inch fire brick wall inside, and is equipped with Canadian General Electric heating elements having a connected load of 500 kilowatts at 550 volts, 3 phase, there being two circuits of 250 kilowatts each. Automatic temperature control is provided by thermocouples, located in the chamber outside the pot, and there are four 250 kilowatts, 550 volts, 3 phase, Canadian General Electric control panels actuated by control pyrometers.

Concentration and Fusing Procedure

The caustic soda and water solution is pumped into the fusing pots continuously as fast as water is evaporated over a period of 50 hours, at which time the solution becomes sufficiently concentrated for fusing to take place. When the current is turned on at the cold fusing kettles, the temperature rises to 1200 degrees in from five to six hours. The temperature is maintained in the chamber outside the pot and, at 1200 degrees, the heat is conducted through the pot to the liquid as fast as it is generated. Thus the temperature outside the pot remains at about 1200 degrees during the first 40 hours of the operating cycle.

At the end of a 56-hour period from the start of the cycle, the 30,000 pounds of caustic in the pot reaches a temperature of approximately 800 degrees Fahrenheit and fuses into a water-free liquid state.

Savings Estimated

The Riordon Pulp Corporation, which operates the pots, has its own water power plant. Electricity is figured at 0.25 cents per kilowatt hour. Based on a production of 60 tons of caustic soda per week, requiring 1350 kilowatt hours per ton, the annual cost of electricity for the process is $10,400. For the same production using coal at $7.00 per ton and labor at $30 per week, the cost would be $21,200 per year.