

YALE PUMPER



YALE & TOWNE

THE YALE & TOWNE MANUFACTURING CO., STAMFORD, CONN.

PIPE LINES

A PAT ON THE BACK

The Mathieson Chemical Corporation, Baltimore, Md., is one of the nation's largest producers of caustic soda.

Mathieson maintains a technical service department to help solve any technical problems arising in connection with the use of their products. The Mathieson company recently issued a new technical service bulletin, No. 19, on *Caustic Soda Dilution*. For pumping equipment, they recommended, just as we recommend, two Model 80BV Tri-Rotor pumps, geared to a single 5 hp motor.

Figure 9 illustrates a completely automatic system based on temperature and differential temperature control. The rate of flow of the 73% caustic is controlled by the temperature of the diluted caustic leaving the heat exchanger. The temperature increases when 73% caustic is diluted. If thermal elements are placed in the 73% caustic line and in the diluted caustic line ahead of the heat exchanger, the temperature differential may be measured by a differential temperature controller. This may be set to maintain any predetermined temperature rise (see Figure 3). A check on the concentration of the dilute caustic is maintained by the continuous specific gravity-temperature indicator mentioned on page 9. A low temperature alarm may be operated from the differential temperature controller. This system may be made semi-automatic by eliminating the temperature controller and the automatic control valve on the 73% caustic line.

In another type of automatic system, the flow of 73% caustic is controlled by the temperature and the flow of water by the specific gravity of the diluted caustic leaving the cooler.

EQUIPMENT

The major items of equipment required for caustic dilution and approximate prices are indicated below. Manufacturers should be consulted for specific prices for instruments and other equipment. No attempt is made to estimate installation costs, since these may vary greatly from site to site.

Manual System	
Centrifugal caustic pump, Warshaw or eq., with 3 H.P. motor for 50 gpm.	\$600
Heat exchanger, all iron, approx. 300-350 sq. ft., equivalent to one used 5 cubic ft. 10" multitube exchanger, size 8-9-2-215, Type 1-1-1, Yule Machine Co., Louisville, Ky.	\$1200
For hot cooling water temperatures, or short relieving lines, 2 stands of the above exchanger, connected in series, may be required.	\$1200
TOTAL	\$1800
Semi-Automatic System	
Proportioning pumps, equivalent to Yale and Towne Co. No. 80BV Mounted Dual Unit, for 73% caustic dilution, complete with 5 H.P. motor.	\$1200
Heat exchanger indicator, equivalent to Yule Machine Co. No. 1-1-1, Yule Machine Co., Louisville, Ky.	\$1200
Continuous specific gravity-temperature indicator, equivalent to Fisher and Porter Co. Catalogue Bulletin No. 1-1-1, Fisher and Porter Co., New York, N.Y.	\$200
TOTAL	\$2600

Reproduction of section of page four from new Mathieson technical service bulletin No. 19 listing equipment needed for semi-automatic dilution system.

A recommendation of this kind is the best testimonial the Tri-Rotor pump can receive.

WHICH DILUTION?

Whether or not your customer needs dilution equipment depends on a number of factors.

The most important of these in the case of the user of caustic soda is the cost of transportation.

(Please turn to back page)

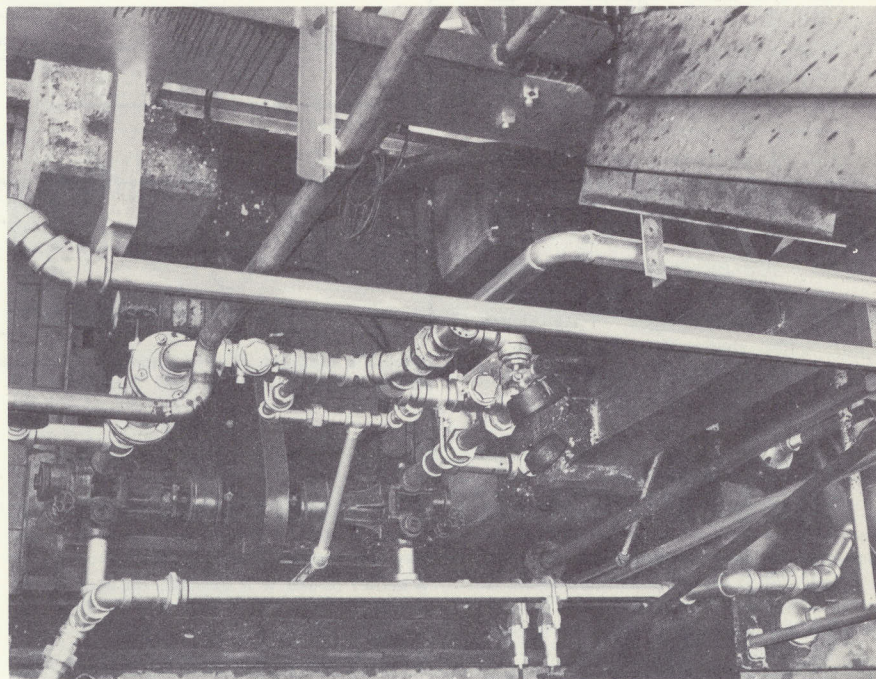
YALE PUMPS PROPORTION CAUSTIC SODA SOLUTIONS

VARIABLE VOLUME CONTROL MAKES DILUTION EXACT AND DEPENDABLE

Industrial users of liquid caustic soda face the problem of simultaneously unloading and diluting shipments received. The most economical way of shipping liquid caustic soda is in 73% solution. But the most convenient form in which to store and use it is in 50% solution. Therefore, the user must water it down.

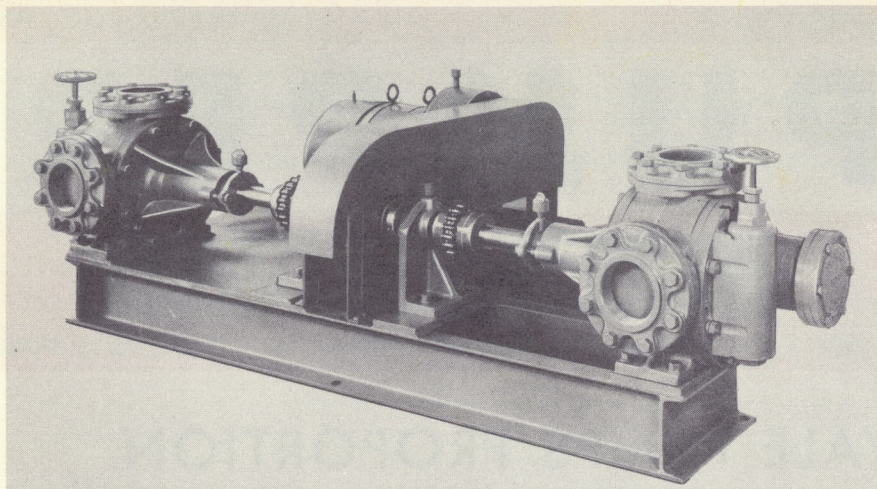
For the solution to be useful, the user must mix the water and caustic soda in accurately measured proportions.

But mixing water with caustic soda releases heat. Before pumping the solution into the storage tanks the industrial user must cool it to 140° F or less. At higher temperatures the storage tanks' weldments might be weakened by iron pick-up. Cooling minimizes corrosive effect of caustic on both storage tanks and pipes. You can help him solve this problem and do a better, easier job at less cost by



Merck & Co. uses two Model 80BV Tri-Rotor Proportioning pumps for diluting caustic soda in its Cherokee Plant at Danville, Pa. Tri-Rotors pull high vacuum, lift solution from bottom of tank car without any difficulty.

YALE TRI-ROTOR PUMPER



Sylvania Industrial Corp., Fredricksburg, Va., dilutes caustic soda with dual Model 200AV Yale pumps.

YALE PUMPS PROPORTION (Continued)

suggesting the installation of Tri-Rotor proportioning pumps and a heat exchanger.

One of the units in the Yale dual installation pumps caustic soda and the other pumps water. The water and caustic soda flow together at a dilution T, and from there the solution goes through the heat exchanger into the storage tanks.

The manual flow control adjunct on the Tri-Rotor pump regulates, quite exactly, the amount of fluid taken in and discharged. Both pumps run at the same speed and so if they were set for equal displacement they would discharge water and caustic soda solution in a one-to-one proportion. However, the user can easily regulate this displacement by hand. It is simple for him to set the pumps to deliver water and caustic soda in the right proportions for a 50% solution.

In making the setting, he reads the strength of solution from a specific-gravity temperature gage installed between the heat exchanger and storage tanks.

You may also recommend a low-temperature alarm between the dilution T and the heat exchanger. This alarm signals when the tank car is empty. You can also use the impulse from this

alarm signal to shut off the pumps and to close a valve between the heat exchanger and the storage tanks to prevent undiluted water from entering the tanks.

An installation of this type was sold by Louis M. Barish & Co., New York Tri-Rotor pump distributor, to Merck & Co., Inc., for use in its Cherokee Plant at Danville, Pa. Two Yale Model 80BV Tri-Rotor pumps are used in this

installation. A 5 hp motor runs both pumps.

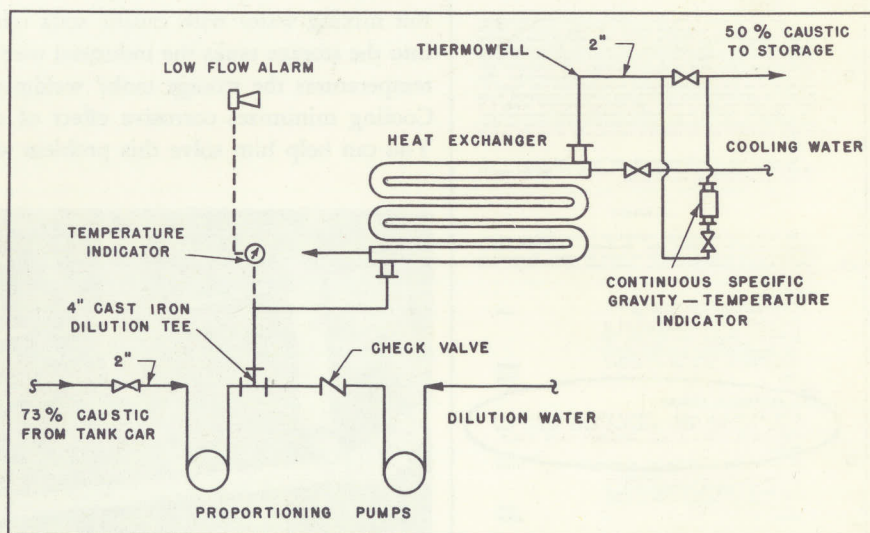
One pump is all-iron construction for handling caustic soda, and the other is bronze fitted for handling water. Pump speed is 300 rpm, providing a maximum capacity of 40 gpm.

Another such installation was sold by the Barish Company to the Sylvania Industrial Corp., Fredricksburg, Va. The pumps used in this instance are Yale Model 200AV, giving the system a capacity of 80 gpm. This installation normally operates at 50 rpm.

Both of these installations are running to the complete satisfaction of the customers and have paid for themselves many times.

A dual installation of Yale Tri-Rotor pumps is undoubtedly the industrial user's best answer to the problem of simultaneously unloading, diluting, and storing 73% solutions of caustic soda. The installation is less expensive and more efficient than complicated metering systems. It has proved its superiority in many instances. It combines both pumping and metering.

Anyone using much caustic soda industrially needs Tri-Rotor proportioning pumps.



Schematic diagram of semi-automatic dilution system. Adapted from Mathieson's new technical service bulletin No. 19, *Caustic Soda Dilution*.

PIPE LINES (Continued)

Mathieson and other suppliers make a strong effort to sell caustic soda in the form most economical to their customers; for the most part, either 73% or 50% concentration in a water solution. On a basis of dry NaOH, the more concentrated form costs slightly more to produce. The customer, on the other hand, usually stores and uses the caustic in a concentration of 50% or less.

If a customer buys caustic soda in 50% dilution he may not need to dilute it further.

He can dispense with approximately three thousand dollars worth of equipment. It may look to him like a big saving. Whether or not it is depends on how much caustic he uses, and how far it must be shipped.

Let us suppose, for example, that he uses seven hundred tons of caustic soda a year, and that his freight rate is 55¢ per hundred pounds. Mathieson points out that he will pay roughly thirty-four hundred dollars

a year just for hauling the extra water. That is more than the cost of the dilution equipment.

A customer's choice of 50% or 73% solution depends on the combined expense of caustic and freight. If he has much caustic soda shipped any distance, dilution equipment is likely to save him money.

And his best buy in dilution equipment is the semi-automatic system described in this PUMPER.

THE EDITOR

YALE & TOWNE