

Solid-Concentrates are water treatment chemicals reduced to a solid form and packaged in convenient to use sizes. KML's solid-concentrate system is a relatively new development in the water treatment industry, utilizing existing technology but providing it in a form that is safer to handle and use. KML Water Treatment has developed solid-concentrate products along with a dispensing system to replace liquids along with their drums while still maintaining the integrity of existing water treatment programs.

A complete line of products has been developed in solid-concentrate form. The chemistry of these products has been designed to correct most types of water problems, at varying ranges of hardness, pH, alkalinity, etc. The plant's existing pumps and feed equipment can still be used. Read on for more detail on the use of solid-concentrates.



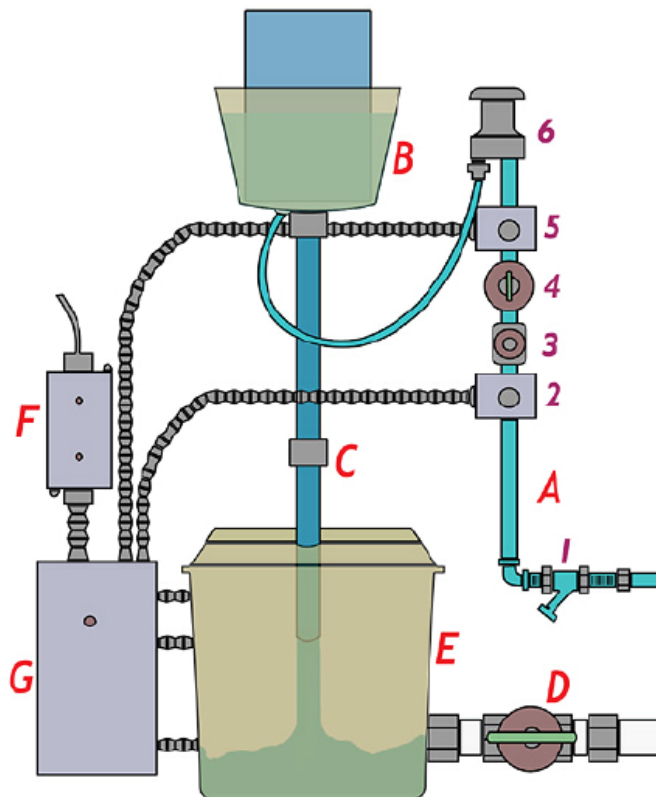
Soild Concentrate System Benefits:

- ✓ NO DRUMS
 - No spills
 - No containment dikes
 - No freezing
- ✓ LOWER FREIGHT COSTS
 - Can be sent by common carrier or by UPS
 - Freight savings can pay for the drum replacement system in one year or less
- ✓ NO HEAVY LIFTING
 - No lift gate or loading dock required
 - No potential injury to personnel
- ✓ LOWER SPACE REQUIREMENTS
 - Less than drums
 - Far less than portable feed or bulk tank systems
- ✓ NO CHEMICAL CONTACT
 - No dust as with other solid chemicals
 - No liquid on face, hands or clothing
 - No Personal Protective Equipment to wear

The Solid-Concentrates are provided in 4x1 gallon plastic containers (44-55 pounds/case). Through the use of the new solid chemical technology, 4 bottles of solid product can provide as much chemical treatment as 45 to 55 gallons of older technology liquid chemicals with far less mess and hassle. Remember that existing feed and control equipment can still be used; only the chemical drum is replaced. The picture above shows an example of a typical chemical dispensing system utilizing solid-concentrate technology.

HOW DOES THIS SYSTEM WORK?

The Dissolving Unit is 24 in x 24 in and weighs 23 lbs; it is attached to a wall, connected to (A) An incoming water line and (D) an outgoing line connected to the existing feed equipment, and plugged into a 110 V outlet (for safety, all voltage is reduced to 24 volts). The plastic gallon container is then positioned into the Dissolving Unit (B). As the system calls for treatment, the reservoir in the Dissolving Unit empties. A lower level switch activates/opens a solenoid valve and incoming water dissolves a portion of the solid concentrate and begins to refill the reservoir until an upper level sensor deactivates/closes the solenoid valve. This action continues intermittently (whenever the system calls for treatment) until the one-gallon container is completely empty. The operator then replaces the empty container with a full unit and the empty container can simply be disposed. System monitoring, by means of testing, continues as it always has.



CASE STUDY:

Prior to the construction of a new utility plant in 2000, the Operation had been utilizing liquid chemical treatment of their water systems. This involved handling 30, 55, and 250-gallon containers. Product was transferred (mixed) into day tanks and pumped into the water system that was being treated.

Operating Parameters:

- 2 Nebraska water tube boilers
- Steam produced/hour: 50,000 lbs
- Operating Pressure: 160 psi
- % Condensate returned: 50%
- Boiler Water Cycles: 15 – 20
- Water Source: softened make-up,

Proposal:

Solid-Concentrates were introduced to the plant almost three years ago, in order to replace liquids without sacrificing the level of control that the plant was experiencing by using liquid chemicals. The new program was focused on establishing the following goals:

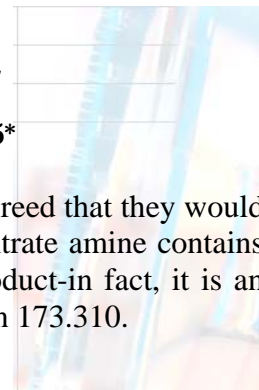
- Maintain the same or better level of system cleanliness
- Eliminate chemical drum handling/disposal
- Space saving
- Reduced inventory
- Reduce costs and environmental concerns of containment areas
- Accomplishment of all of the above without incurring increased costs

The Program:

The system was put into operation during the summer of 2000. Solid-Concentrate feed was set up separately, in order to control the following:

- Oxygen Scavenger.... boiler water treatment **BWT-833**
- Sludge/Scale/Corrosion Inhibitor...boiler water treatment **BWT-807**
- Condensate Corrosion Inhibitor...condensate treatment **Volamene-5***

*Since the plant feeds amine directly into the steam header, it was agreed that they would continue with the FDA approved liquid product. The Solid-Concentrate amine contains an inert substance, which, although it is a food grade approved product-in fact, it is an ingredient in some soft drinks, is not approved under Title 21, Section 173.310.



Results:

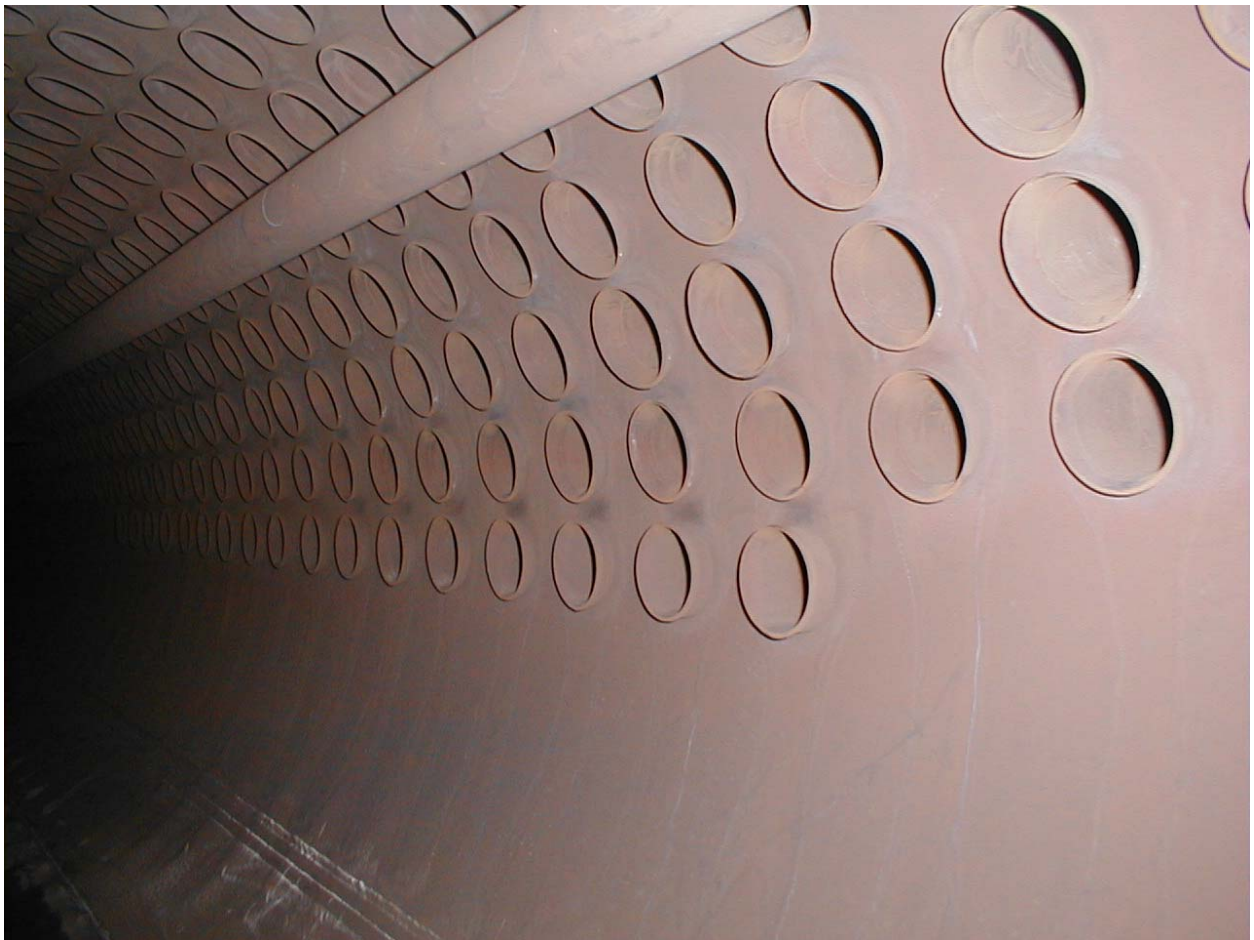
The system was recently opened for inspection and the results were spectacular. Both boilers were absolutely free of any scale/sludge and the passivated metal had no evidence of any oxygen pitting.

The heaviest container that an operator must handle is a 50 lb case.

We were able to effectively eliminate all liquids, except for the amine, and reduced the space for drum storage by at least 75%.

There is no container disposal necessary, except for the 5-gallon pails of liquid amine.

2001 cost for boiler treatment was \$13,200. Liquids prior to this time were averaging about \$15,000 per year. This results in a net savings of 12 %. The dissolving equipment cost about \$1,200 so there is less than a year's payback on the equipment.



KML PRODUCTS PROVIDED IN SOLID CONCENTRATES:**Cooling Water Treatment:**

- Corrosion & Scale / Deposit Control Treatments
 - CWT-919
 - CWT-921
 - CWT-947
 - CWT-960
- Closed System Treatments
 - BWT-820
 - BWT-822

Boiler Water Treatment:

- Scale and Deposit Control Treatments
 - BWT-807
 - BWT-858
- Oxygen Scavengers
 - BWT-833
- Hot Water Closed System Treatments
 - BWT-822
- All-In-One Boiler Treatments
 - BWT-807S
 - BWT-821P
 - BWT-859

For more information please contact KML Water Treatment at 800-423-1879.

