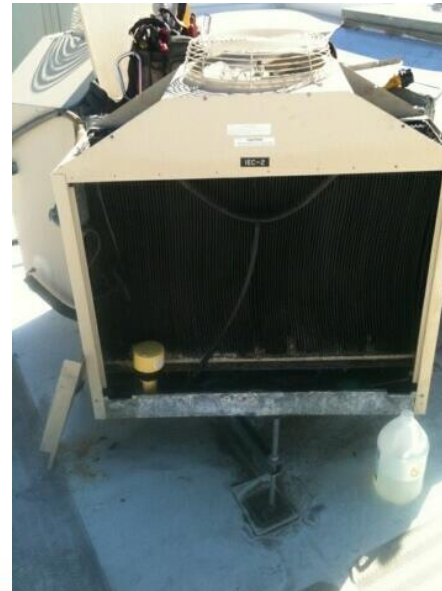
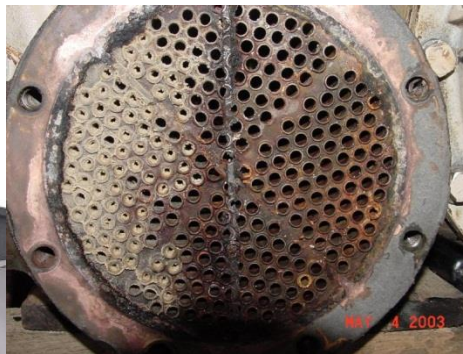


Acid Descaling Products by Nu-Calgon



Acid Descaling Products

Cooling Towers, Evaporative Coolers, etc.

- Liquid Scale Dissolver
- Season Start
- Eco-Lyme Descaler

Tankless Water Heater Descaling

- Vital-Flo Descaler Kit and Solution

Pipe Descaling

- Calci-Solve

Ice Machine Descaling

- Ice Machine Cleaner
- Nickel-Safe Ice Machine Cleaner

Cooling Towers and Evaporative Coolers

- Ideally cooling towers are set-up with a water treatment program.
- Program is dependent on incoming water supply, but can include the following steps:
 - Chemical treatment
 - Chemical feed mechanism (i.e., drip feeder or control)
 - Establishing make-up water feed
 - Establish bleed rate of water from sump

Cooling Towers and Evaporative Coolers (cont.)

Unfortunately, proper water treatment is frequently not established. Reasons include:

- Contractor/customer unaccustomed to chemical treatment options in the market
- Chemical maintenance not maintained
- Treatment avoided due to cost

Scale is the result in areas where hard water exists!



Scale Deposit in Sump



Cooling Tower Circuits



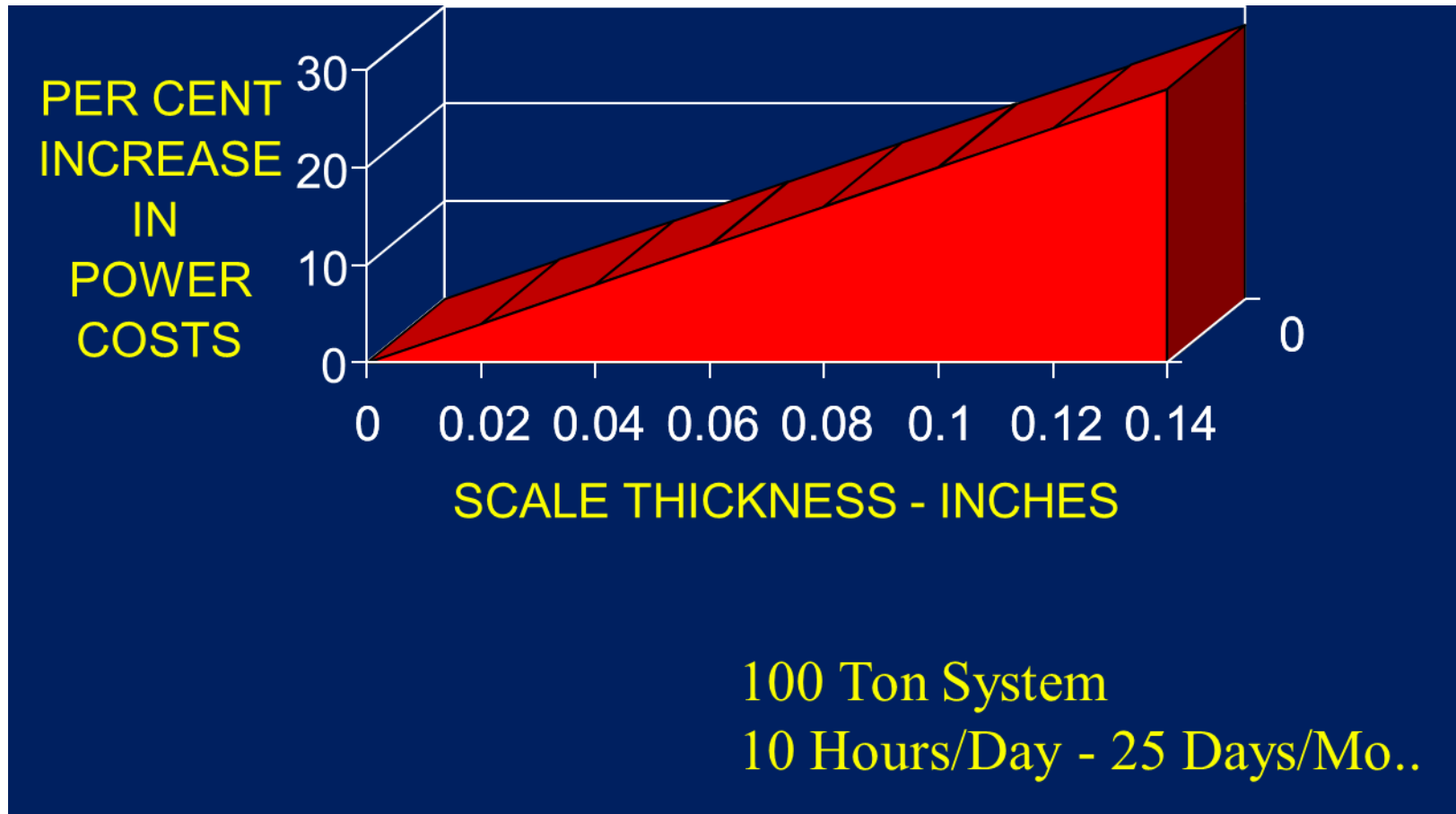
Cooling Tower Circuits (cont.)



Cooling Tower Circuits (cont.)



Cost of Scale



Acid Descaling

Acid descalers exists in two forms:

- Liquid
- Powdered



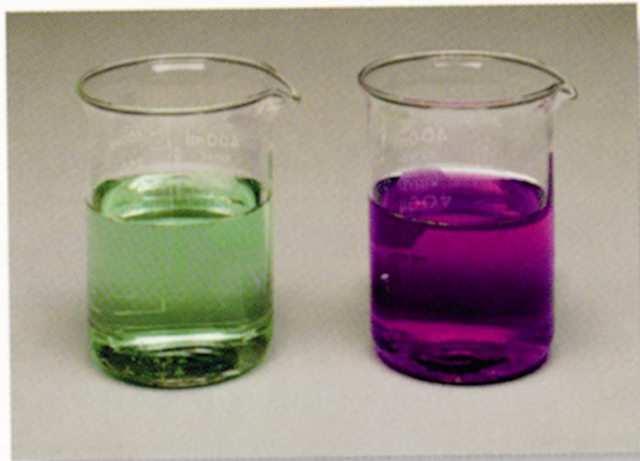
Liquid Scale Dissolver

Liquid Scale Dissolver

- Inhibited hydrochloric acid
- Unique pH system
- Fast acting on scale and iron oxide
- Requires no premixing
- Low foaming formulation (safety)
- Economical
- Not recommended for aluminum or stainless steel surfaces
- Supplied in one, five and 55 gallon sizes



Scale Dissolver pH System



strong acid **neutralized**

- When the product is first mixed, the solution will be greenish-blue, indicating strong acid
- When it has dissolved all the scale it can, it will turn purple, indicating it is spent or neutralized . . . a fresh dose needs to be added
- Flush after every 3rd dose
- System is clean when the strong acid color can be maintained for 30-40 minutes

pH colorant also
used on
Season Start

Low Foaming Chemistry

- Liquid HCl acids need to be inhibited.
- Inhibitors are notorious foamers
- Need to formulate low-foaming corrosion inhibitors
- The product on the right is from our leading competitor while the low-foaming product on the left is our Liquid Scale Dissolver



**Liquid Scale
Dissolver**

Brand X

Acid Cleaning

Season Start

- Dry sulfamic acid
- Impregnated with pH colorant
- Weaker acid provides added safety
- Gentler on the system (metals)
- Ideal for older systems
- No corrosive fumes
- Nu-Calgon offers Season Start (10 lb. container), also known as Imperial Scale Remover (50 lb. container)



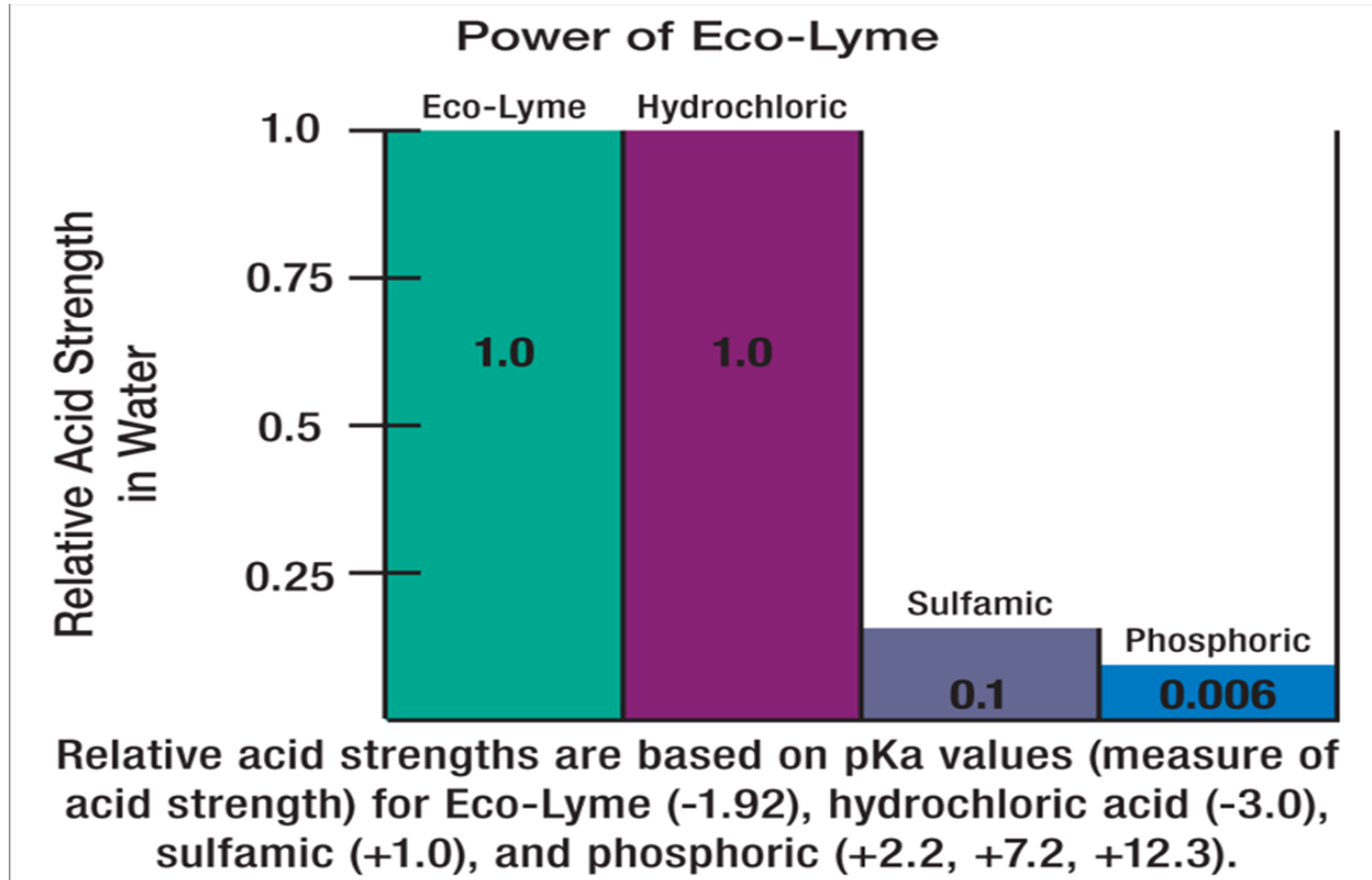
Eco-Lyme Descaler

Eco-Lyme Descaler

- New, unique descaler launched in 2012
- Similar performance to hydrochloric acid
- Low metal corrosion rates (easier on system)
- Odorless chemistry (safer to use)
- High salt solubility (scale stays dissolved)
- Low foaming chemistry (safer to use)
- No dye (pH colorant)
- **Only** strong descaler on market that is readily biodegradable!
- Supplied in one, five and 55 gallon sizes

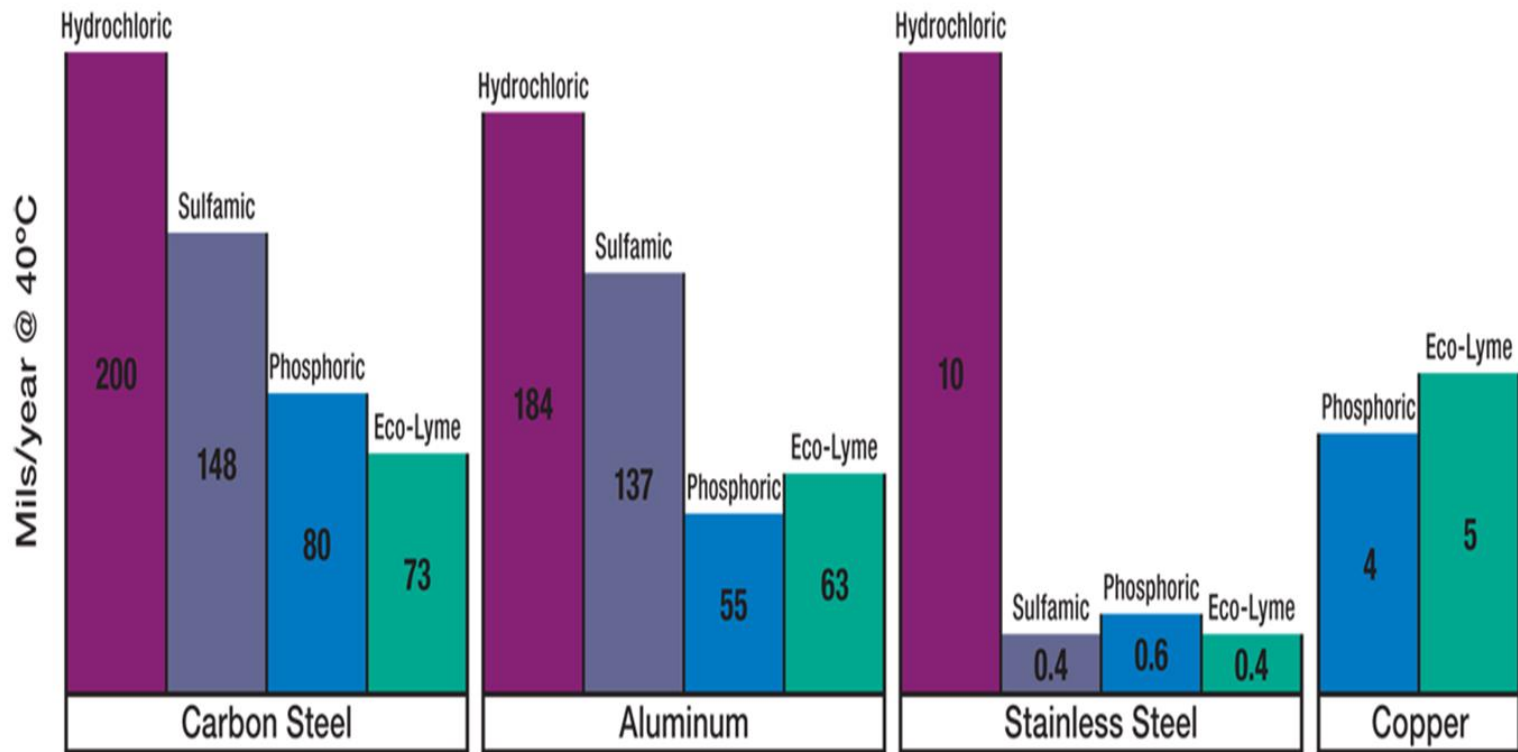


Eco-Lyme Performance



Metal Corrosion Rates

Comparative Corrosion Rates of Common Descaler Chemistries



Test Conditions: Coupons immersed for seven days, static conditions, 100 mL closed vessel per ASTM methods.

Eco-Lyme Descaler

Major attributes....

Select customers want:

- Safer chemistry to use
 - Virtually odorless chemistry
 - Added flexibility for indoor applications
- Performance that approaches HCl acid
 - Safer to use, but still is very effective!
- Gentler on equipment
 - Most potent chemistry for stainless steel substrates on the market
- Biodegradable profile
 - Fortune 500 companies with industrial hygienists that review what is brought on campus



Eco-Lyme Applications

- Cooling tower descaling
- Water cool condensers
- Geothermal heat exchangers (especially open loop)
- Closed water loop clean-up
- Food Service
 - Steam tables
 - Steam ovens
- Evaporative Coolers
 - Eco-Lyme is gaining traction in descaling evaporative cooler market since the rigid media does not have to be removed. Using Eco-Lyme is an easy service call and extends the life of the equipment and media.



When to Use Which Descaler

- **Liquid Scale Dissolver**
 - Most economical approach
 - Most potent chemistry for quick work
 - Exclusive pH colorant system takes guesswork out if solution is 'active'
 - For many materials, but not stainless steel or galvanized materials
- **Eco-Lyme**
 - Low odor chemistry, biodegradable
 - Excellent eco-profile
 - Descaling rate is between Liquid Scale Dissolver and Season Start
 - More versatile for other substrates, **including stainless steel**. We do not recommend for galvanized materials – still a strong chemistry.
- **Season Start**
 - Milder descaling chemistry
 - Easier for older, suspect systems that require descaling
 - Uses pH colorant system, but it is a powder that requires dissolving before use
 - Most versatile chemistry to use on most substrates, including stainless steel and galvanized materials.



Vital-Flo Tankless Water Heater Descaler Kit

**Complete Service Kit for Cleaning
Tankless Water Heaters**

Tankless Water Heaters

Notables

- Supplies endless hot water continuously
- Supplies 'hot' on demand, saves energy
- Compact design, wall mount
- Globally popular . . . 8+ providers
- Electric and gas designs
- Designs vary among manufacturers

TWH Design



Gas Tankless Water Heater

Compact design
mounts to wall.

Solid copper
heat exchanger
rapidly transfers
the heat to the
water



Powerful burners
generate endless
hot water instantly.

Flow through
design uses energy
only when you
use hot water.

Vital-Flo Value Proposition

If the investment in a tankless water heater is made, it is vital to keep it clean to assure performance

- The Vital-Flo kit reinstates performance by the removal of scale.
- Maximizes energy savings with device performing at design conditions.



Vital-Flo Design

Vital-Flo Solution

- Food grade phosphoric acid
- For this application, it's a perfect chemistry
 - More aggressive than OEM suggested vinegar/CLR
 - Not as aggressive as competing hydrochloric acid options in market.
 - Appropriate for stainless steel heat exchanger construction
- Phosphoric acid used in food industry as preservative



Vital-Flo Design

Vital-Flo Solution (cont.)

- NSF Listed
- Bottle supplied in Vital-Flo Kit (4387-01)
- Vital-Flo solution available separately (4387-02)



Vital Flo Design

- **Four gallon container**

- Handles two gallon fluid recommendation with pump volume displacement
- Chemical resistant

- **Container Lid**

- Contains optional port

- **Pump**

- Resilient 1/6 hp motor
- Direct 3/4" MHT inlet/outlet connections
- High flow better 'wets' larger diameter line in non-bottom feed applications
- Available separately

