

## Acid cleaning at start up... The time to remove scale from Cooling Towers and Boilers

### COOLING TOWERS

Scale on condenser surfaces, piping, water-regulating valves, and tower fill reduces cooling water flow rate and also cuts down on heat transfer. Even when you can't see scale, it's probably present in the system if the head pressure is more than 10 lbs. Above normal at full load or if the liquid refrigerant line is hot.

### IT PAYS TO REMOVE SCALE AT START UP TIME BECAUSE...

- A. A thorough acid cleaning permits the system to operate at peak capacity.
- B. Clean equipment, plus adequate water treatment, keeps the system operating properly all season.

### CHECK THESE IMPORTANT STEPS...

1. Check spray nozzle and water distribution holes. If clogged, clean out manually.
2. Drain and flush out the sump; refill with fresh water and start pump; shut off the bleed if there is one.
3. Amount of acid needed varies with amount of scale present. It takes 2 lbs. of powdered acid or 1/3 gal. Of

liquid acid to react with 1 lb. of lime scale.

4. As a starting dosage, add 10 lbs. of powdered scale remover, or 2 to 3 gallons of liquid acid for every 50 gallons of water in system. If water capacity is not known, estimate dosage from the chart below.
5. Check acid content every 15 minutes. If neutralized, add more acid. Follow the products' color indicator.
6. The acid solution should be circulated for several hours depending upon the thickness of the scale. Several doses of acid may be necessary to remove heavy scale deposits.
7. To determine when the equipment is clean, check the acid solution returning from the condenser. When the solution does not contain any bubbles and has remained acid, the lime scale has been removed.
8. After the cleaning job is finished, acid solution should be flushed thoroughly from the system. Check bleed line and spray nozzles to make sure they are not blocked by dirt which may have been embedded in scale deposits.
9. Set bleed-off and install chemical treatment.

Capacity of System Tons or Horsepower	Initial Dosage	
	Liquid Scale Dissolver	Imperial Scale Remover (Season Start)
10	2 gal.	10 lbs.
30	5 gal.	30 lbs.
50	10 gal.	50 lbs.
90	15 gal.	75 lbs.

## MONTHLY MAINTENANCE KEEPS CUSTOMERS SATISFIED

## ACID CLEANING AT START UP...

### BOILERS

Acid cleaning of boiler systems is recommended for the removal of scale deposits, and Nu-Calgon suggests the "Imperial Grade" Season Start as the best and safest dry acid cleaner for the removal of scale in boiler systems. Season Start provides excellent protection to steel, copper, brass and aluminum surfaces.

**Dosage:** As a starting dosage, add 10 lbs. of Season Start for each 50 gallons of water in the system. This solution should be circulated until the acid solution maintains a strong acid condition for 20-30 minutes. The solutions acid condition can be determined one of two ways:

1. **Observe color of solution-** if greenish blue, solution is strong enough to dissolve additional scale. If it is purple, solution is neutralized and more Season Start should be added. Add an amount equal to initial dose of product. If three additions of product are required, system should be flushed, filled with fresh water and

the process continued.

2. If solution is cloudy and color cannot be determined, then use of pH paper may be required. A pH above 3.5 would indicate the need for an additional dose of Season Start.

System is clean when cleaning solution maintains a strong acid condition for 10-15 minutes. Flush system and return to service.

Higher temperatures and greater solution strength increase the speed of cleaning. The temperature of the acid solution should be kept high whenever possible but never allowed to go over 160°F.

Season Start may be left in a system where the parts are not corroded for up to 24 hours to be sure the system is completely cleaned. On older systems where piping is thin or suspect, solution should be continuously monitored and immediately removed when system is clean.

Product Part Numbers
Liquid Scale Dissolver 1-Gallon Bottle: 4330-08 5-Gallon Pail: 4330-05
Imperial Scale Remover / Season Start 10 lb. Season Start: 4360-88 50 lb. Imperial Scale Remover: 4360-82