

Water Purification



Over the past two decades, NASA and its contractors have conducted extensive research on how to assure pure water for manned spacecraft crews and how to recycle wastewater for reuse on future long duration spacecraft. This work has given rise to a large number of spinoff products and products for cleansing and

detoxifying water (see also pages 55 and 110-113) and in some cases inspired the formation of new companies to commercialize the technology.

Among the latter is Sensible Technologies, Inc. (STI), Irmo, South Carolina, a company formed in 1989 to exploit a particular NASA-developed water purification technology known as silver ionization. In this method, developed in the mid-1960s by Johnson Space Center, a small lightweight generator dispensed silver ions in the potable water supply of the Apollo spacecraft to kill bacteria in the water.

STI originally focused on using the

technology for cleansing swimming pools, but its effectiveness in purifying water and eliminating corrosive chemicals led company president Tommy Wood to seek other applications, such as industrial cooling towers and industrial process coolers.

Wood recognized that, although copper/silver ionization could successfully eliminate algae and bacteria, something more was needed to fulfill all the water man-

agement needs of recirculating and evaporative cooling water systems; the purification system must also be capable of eliminating corrosion, debris and scale, the plaque-like mineral precipitate that builds up in a water system's plumbing, reduces the system's efficiency and elevates maintenance costs.

STI therefore developed a system that employs three distinct technologies. The NASA copper/silver ionization process is the core technology, to which STI added capabilities for centrifugal separation of solids from liquids and magnetic field water modification. Says STI's Tommy Wood:

"Our systems do an excellent job of eliminating scale, corrosion, algae, bacteria and debris from process water, but there is an additional benefit; because of the NASA technology we employ, our systems destroy waterborne bacteria and viruses, including *Legionella pneumophila*, the bacterium responsible for Legionnaire's Disease."

The STI Cooling Water Management System integrates a pump, the centrifugal solids separator, the copper/silver biocide generator and magnetic field generators into a simply installed, easily operable equipment package that takes up only six square feet of space in most applications and totally eliminates the need for water treatment chemicals and water bleeding.

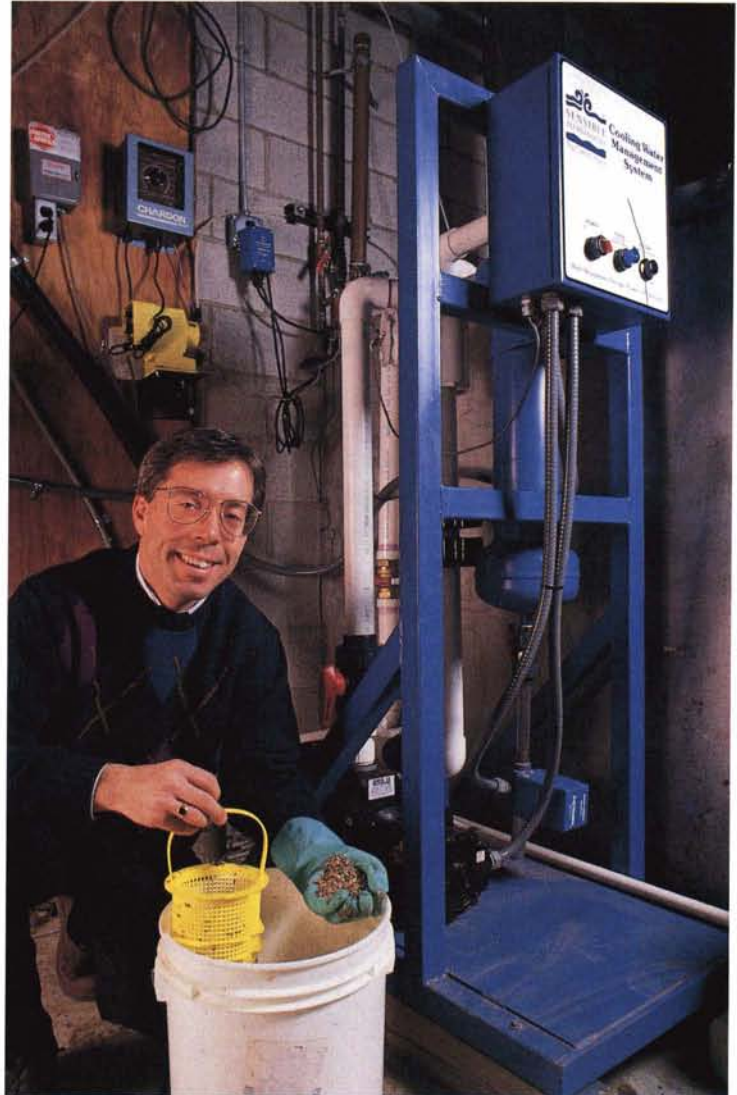
STI manufactures the system in three capacities: the STI-400, STI-1100 and STI-2200 for evaporative cooling systems of



up to 400, 1,100 and 2,200 tons respectively. Larger systems are custom built on request.

At far left is the STI-1100 unit and in the top left photo a closeup of the biocide generator (the STI-400 has two pairs of electrodes, the STI-1100 three pairs and the STI-2200 four pairs). The copper and silver ions produced by the generator kill the algae, bacteria and viruses in the water. The centrifugal separator removes all waterborne debris. The magnetic field generators remove existing scale, bar further scale buildup and prevent corrosion. At bottom left is a control panel with a gloved hand displaying a sample of scale removed from an industrial cooling water system.

STI systems have found a wide range of applications. For example, a system is operating on a cooling tower at General Motors Truck and Bus Engineering Center, Troy, Michigan; above right, STI's Jeff Jones is cleaning the pump strainer basket of a unit installed at the center. The GM cooling system was completely descaled within the first month, corrosion was eliminated and the water, once rust colored and opaque, is now clear. Other examples of industrial cooling water installations are a system in a process cooling tower at AVX Corporation, Myrtle Beach, South Carolina, and another in a closed-loop



process cooling system at Canbraco Industries, also at Myrtle Beach.

Other systems are operating in amusement parks, to prevent corrosion and cleanse the water of such facilities as bumper boat pools and miniature golf ponds; in ice manufacture, protecting pure water in atmospheric tanks from bacterial infestation; and in commercial/residential pools and spas, where the systems offer chemical savings and labor savings in addition to sanitary water. ●

