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transfer

CONVEYING NEWS BUILDING RELATIONSHIPS DEFINING 

REDUCE COSTS & INCREASE PRODUCTION BY OPTIMIZING CIP

Operators of processing plants all face pressure from owners and management to find ways to operate more efficiently. One way to reduce operating costs and increase production is through optimizing clean-in-place (CIP) procedures.

The Fundamentals of CIP

There are five fundamental steps to a cleaning process: solids recovery, pre-rinse, wash, post-rinse, and sanitize. First, using **CSI's Product Recovery System**, a flexible projectile called a pig pushes the solid product out of the lines. Ideally the recovered product can be packaged or saved for future batches. The lines are then rinsed with water, followed by the wash step(s) that use detergent solutions to remove all remaining soil. The post-rinse then pushes the detergent out of the lines; and finally, a sanitizer is used to kill any remaining microorganisms.

The Five T's of CIP Efficiency

When looking for ways to optimize CIP efficiency, five factors should be examined: time, temperature, titration, turbulence, and technology.

Time

If you are already maxed out on production capacity, saving CIP time can give you more packaged product in a week.

Time can also condense cleaning, reducing manpower and changeover time between products.

For example, if the pre-rinse is set for five minutes, but the water is visibly soil-free after three minutes, the cycle can be reduced by two minutes. On a circuit that is cleaned 350 times a year, this reduction would save eleven hours over the course of one year.

**Saving CIP time can give
you more packaged product
in a week.**

Temperature

The proper temperature for the cleaning cycle is attained by heat exchange, using steam to heat water. Re-evaluating your heat exchanger can optimize your system by saving time.

For example, during caustic wash, the timer is not started until the return temperature reaches the set point. If the hold time is shortened five minutes for a circuit that is run 350 times a year, you save an additional twenty-nine hours of production time. More efficient heat



exchange, larger heat exchangers or parallel heat exchangers can all be used to shorten heat times.

Titration

Titration is a method of verifying how much chemical is in your CIP solution. When optimizing the chemical portion of

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the CIP recipe, make sure the chemicals are being used effectively by checking results at key points in the system. Chemical concentrations tend to creep up over time; so, the mechanical and automation review of the system should focus on chemical control and reduction.

Meet John Kehrberg



Understanding customers' systems and solving difficult processing issues is **John Kehrberg's** specialty.

John has many years of experience in the processing industry, and CSI is proud to welcome him as a sales representative to California.

Prior to joining CSI, John worked as a filtration specialist. His extensive knowledge of pumps, valves and heat exchangers makes him a great asset to CSI's customers.

"I believe in personalized service," John said. "I like to be hands on and help customers with their most difficult challenges."

At CSI John's focus is serving the processors of California, Nevada and Arizona, and since he is conveniently located in California, he can easily visit and serve customers in the surrounding area.

Specializing in pumps, valves, filtration, fittings, skidded systems, hoses, product recovery, and more, John is ready to find the perfect solution to meet your need.

Outside of the processing industry, John enjoys riding motocross, wake boarding and snow boarding with his family.

If you have a need or problem you can't solve, call John today at **417.861.2638**. He's ready to put his experience to work for you.

Another way to optimize your system is by reusing chemical solutions. Many plants have a solution reuse tank as well as a recovery tank to save rinse water after the caustic wash. This water can be used to pre-rinse the next circuit, conserving valuable chemicals, heat and time.

Turbulence

If you viewed turbulent flow through a glass tube, you would see swirls, eddies and continual change. This is the mechanical action required for cleaning.

Velocity is directly proportional to the flow rate in the tube being cleaned. Various line circuits and tanks require different flow rates to clean properly. A reliable sanitary pump such as **Alfa Laval's SolidC Series** should be used for supply and return, and a variable frequency drive (VFD) should be used to control the speed of the pump motor and the resulting flow rate. A flow meter installed on the supply line sends a signal through a programmable logic controller to the VFD, which controls the speed and flow rate of the pump.

Ensuring that each circuit has the proper flow rate to clean effectively will make your CIP cycle more efficient.

Technology

Technology is at the heart of CIP. When optimizing a CIP system, it is beneficial to include a review of new, available technology.

One fairly new technology for CIP is the transition sensor. The device detects solids in the return line and provides a signal to the controller. This can shorten pre-rinse time, because the wash cycle can be started as soon as little or no solids are detected in the rinse water.

Another form of CIP technology is software that allows data acquisition and can chart historical information. Flow rate, return temperature and chemical conductivity can all be plotted on a time chart as well, showing on/off outputs to steam valves, supply pumps or chemical pumps. This information shows technicians, engineers and sanitarians what actually happened, eliminating guess work from trouble shooting and optimizing the CIP system.

To summarize, it takes the right amount of chemicals at a specific temperature with a certain amount of turbulence for the proper amount of time to clean the interior of a tube or vessel. Using modern technology, you can control these parameters accurately and automatically and collect data to record your results. Each variable works in unison, and every variable must be carefully assessed to determine the best ways to optimize your CIP system.

To learn how to make your system more efficient and save money, call Food Engineering Manager **Steve Cook** at **800.654.5635 extension 112**.

About the Author: Steve Cook



Steve Cook joined CSI in 1990 as a sales engineer and currently holds the position of Food Engineering Manager.

Steve has a Bachelor's of Science in mechanical engineering from the University of Missouri-Rolla. He specializes in designing solutions for food, dairy and beverage processing as well as CIP cleaning. With over 16 years of experience in the industry, Steve is able to provide practical solutions to solve even the most difficult processing challenges.

In his free time Steve enjoys camping, boating and spending time with his wife and children.

If you have a food, dairy or beverage challenge, give Steve a call at **800.654.5635, extension 112**. He would love the opportunity to solve your processing problems.

Meet Curt Harper



For nearly 17 years, CSI's customers have counted on **Curt Harper**. As an inside sales representative Curt takes care of customers' requests quickly and accurately.

His years at CSI provide valuable knowledge in his current position. When a customer calls, Curt is ready to provide a quote, enter an order or expedite an order. In addition to talking with customers, Curt also puts his experience to work by advising cus-

tomers service representatives on part descriptions, vendors and procedures, as well as assisting with purchasing and invoicing.

Prior to joining CSI, Curt graduated from Missouri State University with a Bachelor's of Science degree. He then worked for Paul Mueller Company as a Production Planner/Expediter for manufacturing and purchased items.

Curt's solid background and experience in the stainless steel manufacturing industry give him an advantage when it comes to understanding the needs of his customers.

When you call, Curt can help with pumps, mixing, blending, valve matrices, mix-proof valves, filtration, heating and cooling, CIP & COP, instrumentation, jacketed tubing, AL-6XN® and Hastelloy® C-22® tubing, fittings, and fabricated items.

In his free time, Curt enjoys golf, yard work and home repair.

If you have a need or a question, call Curt between 9 AM and 6 PM Central Time at **800.654.5634, extension 101**. He will use his knowledge and experience to find the best solution to meet your need.

PRODUCT SPOTLIGHT: CORROSION RESISTANT ALLOYS FROM CSI

In the early 90's CSI recognized a need for alloy components that could provide superior corrosion resistance where traditional 316L stainless steel components were inadequate. It was at that time that CSI first began providing AL-6XN® alloy fittings and tubing to the sanitary market. Since then, the need for corrosion resistant alloys has grown, and so has CSI's commitment to meeting that need.

CSI's "full service" approach is second to none. With an extensive on-hand stock of Hastelloy® C-22® and AL-6XN alloy fittings, tubing and bar stock, CSI has become the source for corrosion resistant materials to meet the challenges of today's marketplace.

However, CSI's service doesn't stop there. We also have a staff of dedicated product experts that are available for consultation. The CSI team can design and fabricate any special fitting or assembly that you need. CSI's in-house capabilities include: an exceptional design staff, CNC turning and milling, a complete state-of-the-art fabrication facility, expert craftsmen, mechanical and electropolishing, and an experienced field installation crew.

CSI's dedication to special alloys even goes a step further. CSI has taken the leading role in providing informational and technical support by developing training seminars that provide valuable information

*CSI items shown:
ferrule, butt-weld instrument tee, butt-weld 90 degree elbow*



on topics such as: the causes of corrosion, welding tips, machining characteristics, electropolishing, and passivation. These seminars, conducted throughout the year at various sites around the country, provide valuable information about the application of corrosion resistant alloys to all industries. To learn more about

our seminars, visit our website at www.csidesigns.com.

In addition to the seminars, CSI is also a key member of a number of standards groups and information exchange networks—such as ASME-BPE, ISPE and NACE—that develop product specifications and write acceptance standards for bioprocessing equipment.

Because CSI strives to maintain their proactive edge, there are plenty of exciting developments planned for the future. Keep watching for advancements such as new product introductions and a new estimating program for faster response on quotations.

No matter what your application may be, when it comes to corrosion resistant alloys, CSI is the source for products, information and support. For more information on these alloys, visit www.csialloys.com, or con-

act your customer service representative at **800.654.5635**.

AL-6XN is a registered trademarks of Allegheny Ludlum Corporation.

Hastelloy and C-22 are registered trademarks of Haynes International.



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Visit us on the web at www.csidesigns.com

We're Growing

On June 2, 2006 CSI broke ground for a building expansion project that will add 8,000 square feet to our existing facility. The new space will be used to store inventory, freeing up floor space in the existing fabrication shop for larger projects.

Over the past few years, the size and number of jobs in CSI's shop has grown. More skidded systems have been added to the growing throughput of transfer panels, utility stations, valve manifolds, and other projects.

We are excited for this project to reach its completion, scheduled for September 1. If you have never seen our facility, this would be a great time to pay us a visit. To schedule a tour, give us a call at [800.654.5635](tel:800.654.5635).

CSI SEMINAR HEADS TO COLORADO

On Thursday, September 28, CSI will present **Material Selection for Hygienic Processes** at the Boulder Marriott in Boulder, Colorado.

This one-day seminar will provide attendees with basic knowledge of corrosion and the criteria that should be used when selecting material for use in high purity applications. **There will also be an in depth look at problems plaguing end users such as: rouging, pitting, crevice corrosion, and other issues.** Then participants will follow with discussions on **alternative materials and designs.**

Expert panelists will also address topics including: welding appearance and integrity, fabrication of super-alloy materials, the effects of passivation on AL-6XN[®] alloy compared to the traditional 304L and 316L stainless steel alloys, and surface finish—why electropolish 316L stainless steels/why not electropolish AL-6XN.

The open forum presentations are specifically designed to directly answer questions and address problems faced by end users. Here's what past attendees have said:

"This was an absolutely first class seminar and presentation. I will recommend this to others."

"One of the best seminars I have attended!"

Proven to be effective and beneficial, this is one day you won't want to miss. For more information about CSI's seminars, or to register for this event, visit our website at csidesigns.com or call **Heather Mustain** at **800.654.5635**.