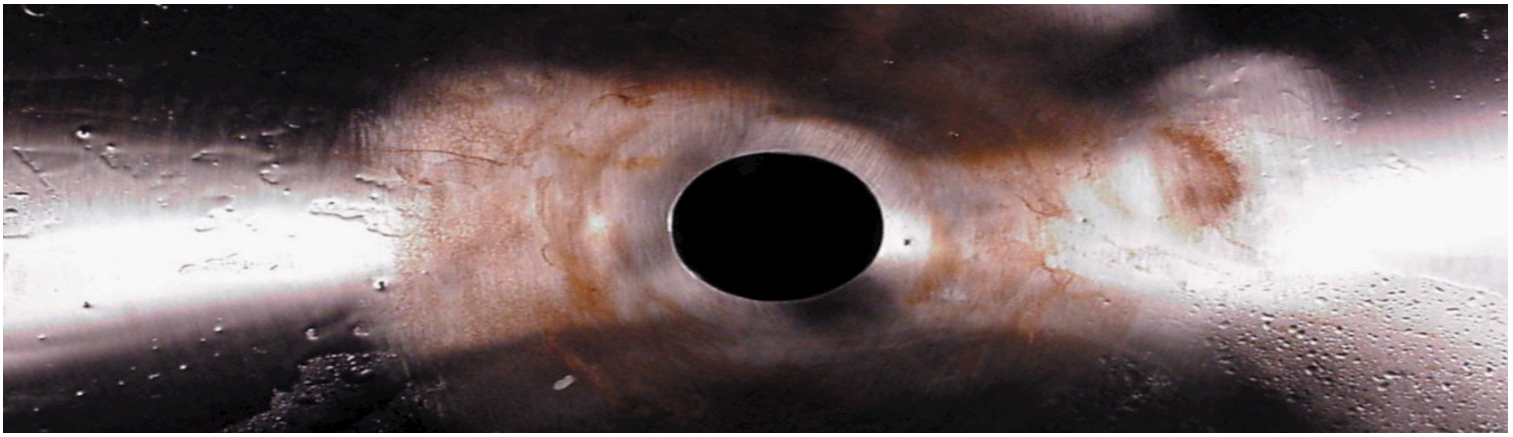


TECH TIPS

Issue #3 December 2005

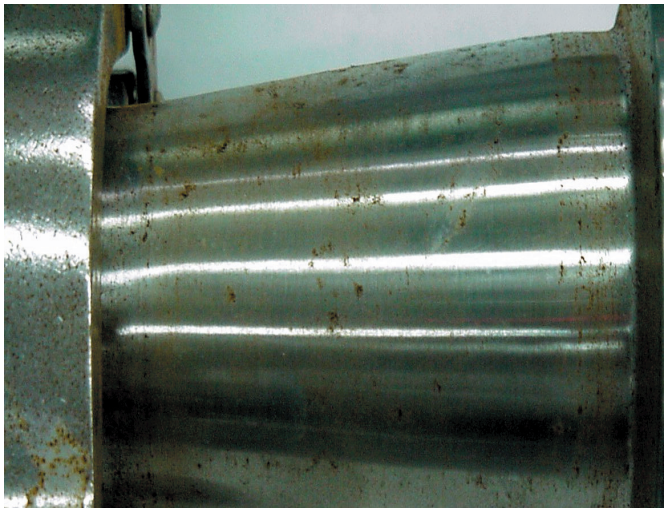
REMOVAL OF RUST AND SURFACE CORROSION FROM VESSELS

Many times stainless steel vessels can develop rust; sometimes referred to as 'rouge on the surface'. The red color comes from the presence of the various iron oxides and hydroxides that have formed. This can be due to tramp iron remaining on the surface after manufacturing or repairs performed after years of use. Another source for rust is corrosion of the stainless steel surface due to misuse of chemicals, especially chlorine and iodine sanitizers. The key is to inspect all stainless steel vessels, preferably on a production down day when completely dry, and look for signs of rust forming on the surface. Immediate corrective action is needed to halt the surface corrosion so it does not get worse. If left unchecked, surface rusting can continue to eat away at the stainless steel surface until pits or pinhole leaks develop.

Do not confuse rust and surface corrosion with iron staining of stainless steel. Iron staining is generally due to high iron content in the water supply and/or chemical used for washing. However, in the earlier days of food processing, iron plating could occur when dissimilar metals were used in the same circuit. This is less common now. If iron staining should occur, following JohnsonDiversey's de-staining procedure is recommended.

The chemical procedure provided in this issue of Tech Tips will not restore the original finish or luster of the vessel. It will inhibit any advancement of surface corrosion when proper cleaning and sanitizing procedures are carefully followed. If pitting corrosion exists, the only means to remove those surface defects is to re-polish the surface following proper procedures. However, if left unchecked these pits can become so deep that re-polishing the surface would weaken the surface and is not practical.

Besides performing the given chemical procedure to inhibit further corrosion, it is advisable to try to identify the source of the corrosion and/or rust. Sometimes it may be due to high chloride in the water. At times it can be due to the sanitation program being used to clean the vessel. Check for residual chlorine remaining in the final post-rinse step and in the sanitizing step, especially if an acid sanitizer is being used. Chlorine levels of >2 ppm can trigger surface etching/corrosion over time. If high levels of chlorine remain in the final post-rinse and/or sanitizing step, then investigate the CIP program for:

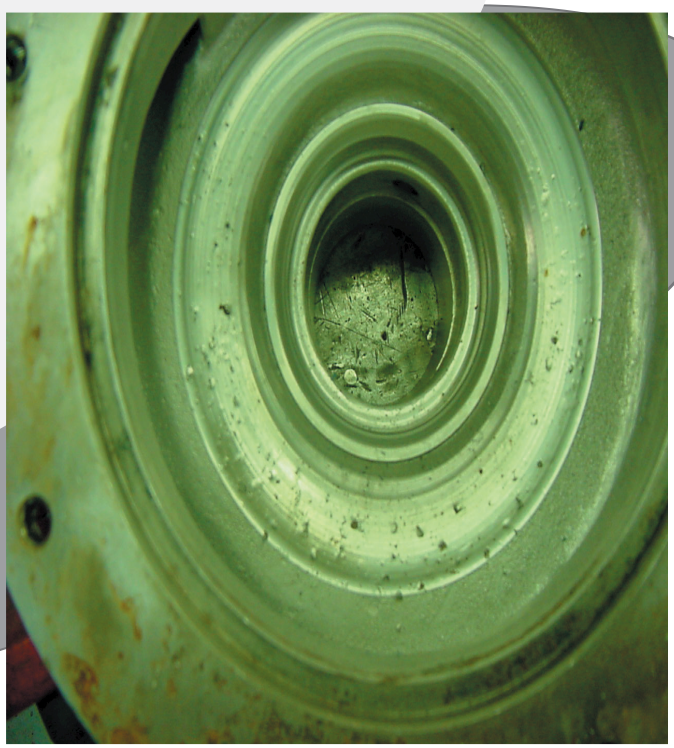


1. Excessive chlorine concentration in the CIP wash. A normal chlorine range in an alkaline CIP solution should be 50-150 ppm active chlorine (NaOCl).
2. Inadequate post-rinse following the wash step. Residual chlorine in the final rinse should be <2 ppm active chlorine.
3. Dispensing equipment is allowing chemicals to be siphoned into the CIP system. If injecting on the suction-side of the CIP supply pump, be sure to have an appropriately working check valve and anti-siphon valve present.
4. Excessive chlorine being used to treat the plant water supply. Check and verify that the plant's water supply is <2 ppm active chlorine.

JohnsonDiversey

REMOVAL OF RUST AND SURFACE CORROSION FROM VESSELS

PROCEDURE FOR REMOVAL OF RUST DEPOSITS AND DEACTIVING SURFACE CORROSION SITES FROM STAINLESS STEEL VESSELS



SPRAY METHOD
(NOTE: BE POSITIVE THAT ALL COMPONENTS OF THE SPRAY CLEANING SYSTEM ARE CONSTRUCTED OF TYPE 304 OR 316 STAINLESS STEEL. ALSO, THE VESSEL MUST BE CLEAN AND FREE OF NORMAL SOIL AND BE PROPERLY VENTED.)

1. With proper connection for spray circulation and all fittings properly gasketed and tight, add sufficient Acidplus (VA35), Super Dilac (VA19) or Nonstick (VA33L) to the system to result in a solution with pH of 1.5 or lower. Normally 1-1.5 ounces per gallon (8 ml-12 ml per Liter). To improve cleaning performance, add a defoaming wetting agent to the acid solution.

CAUTION:
DO NOT ADD A WETTING AGENT DIRECTLY TO THE ACID DETERGENT, BUT ADDING A WETTING AGENT TO THE ACID WASH SOLUTION, SUCH AS TENDEC (VC87) AT 1 OUNCE PER 10 GALLONS OF ACID SOLUTION, WILL HELP TO PENETRATE ANY DEFECTS IN THE STAINLESS STEEL SURFACE.

2. Spray this solution on the vessel surface for 45-60 minutes at 145-150ºF (60-65ºC).

3. Using Resource, Spectak G (VC1) or Liquid Bril Tak (VC85), add enough product to override the acid solution to a titration of 1% active caustic. Then add 0.5 gallon (2 Liters) of Kompleet (VB67L) or 1 gallon (4 Liters) of Everest Two to the wash solution.

4. Spray this solution on the vessel surface for 45-60 minutes at 145-150ºF (60-65ºC).

5. Drain solution and post-rinse vessel until surface is free of any caustic residue (neutral plant pH) and below 90ºF (32ºC).

SAFETY:
ALWAYS WEAR PROPER SAFETY EQUIPMENT WHEN WORKING WITH CAUSTIC AND ACID. ALSO, WHEN POSSIBLE USE A DISPENSER TO INJECT THE CHEMICALS INTO THE CIP SYSTEM. IF MANUAL ADDITIONS ARE NECESSARY, ALWAYS ADD SLOWLY THE CHEMICAL INTO THE DILUTENT.

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