

SERVICE BULLETIN

Date: OCTOBER 2009 Log Number: 120

Subject: "APPEARANCE OF RUST ON STAINLESS STEEL"

"Common Causes Relating to Stainless Pitting and Corrosion"

1. All CMA dishmachines are constructed from #304 Stainless Steel. We have had machines returned in the past for pitting, and our investigations have shown excessive iron in the water (iron filters can be purchased to prevent iron reaction to stainless); iron, along with chlorine, will begin to pit the metal. In addition, one should check for poor grounding of the machine. Any combination of these three factors can and will lead to wash tank pitting. Rust issues are not warranted due to the technical factors that can constitute different reactions from the quality of water within the facility, plumbing issues in installation and chemical reaction from improper usage.
2. Can stainless steel rust? Why? (I thought stainless did not rust!) Answer: Stainless does not "rust" as you think of regular steel rusting, with a red oxide on the surface that flakes off. If you see red rust, it is probably due to some iron particles that have contaminated the surface of the stainless steel, and it is those iron particles that are rusting. Look at the source of the rusting, and see if you can remove it from the surface. If the iron is embedded in the surface, you can try a solution of 10% nitric and 2% hydrofluoric acid at room temperature or slightly heated. Wash area well with lots and lots of water after use.
3. Most dishmachine installations will have a water supply that runs through mild steel pipe / fittings, somewhere between the water meter and the dishmachine. When the water passes through the mild steel pipe / fittings, the water can be contaminated with small to large quantities of microscopic particles of carbon. If this carbon is mixed with chlorine and allowed to dry, it will turn into rust. The amount of rust is dependent upon the strength of the chlorine and the time it is allowed to dry. These particles are drawn to cracks and crevices where two pieces of S.S. are welded together; it could look as if the S.S. or the weld was manufactured from inferior materials. If the carbon problem is severe, the S.S. could also pick-up a "rust coating" or "spotting" in the middle of the pan, et al. If the carbon particles are not addressed, they can and will eventually eat a hole through welds and cause pitting in the pan, and other areas. In the early stages of rusting, most of the time, by using a rag with mineral oil to remove the carbon particles, machine damage can be prevented. Generally at first, the pitting from carbon particles is round like a needle's point; however, as the rust is allowed to grow it will become larger, and eventually eat a hole through the stainless / welds.⁽¹⁾
4. Pitting caused by electrolysis is an entirely different occurrence, with a different appearance. Electrolysis pitting is not round, but more irregular in shape. This pitting is generally not found at a "weld", but more commonly found in the middle of sheet metal parts. A common cause for electrolysis is poor "grounding" of the dishmachine. As the pitting gets deeper, and if you also have carbon particles present, the carbon particles can rust within the electrolysis pit, causing rusting. A simple way to determine the main problem is by finding the location and shape of the pitting. Electrolysis is usually located in the middle of the sheet metal, with irregular shaped pitting. Carbon particles are more likely to be located at welds or in cracks and crevices. Properly "grounded" dishmachines will prevent electrolysis from occurring. Ensure that the "grounding" source from the facility is secured.⁽¹⁾

In conclusion, it is in your best interest to familiarize yourself with how RUST can develop and its' appearance on stainless steel surfaces, and to explore the causes and helpful solutions in preventative action that can be applied in rectifying further damage and occurrences.

⁽¹⁾ Sources of technical information provided by engineers and experienced stainless steel manufacturers and suppliers, with over 35 years experience in the stainless business.