The Importance of Sanitary Welds in Food Contact Areas

Certainly, improper welds on processing equipment and parts are among the most common and problematic hurdles to good sanitation results.

**Stitch vs. Butt Welds**

The photo at right shows a lap joint with a stitch weld where we can see that crack or gap that can be a hotspot for Listeria or other microorganisms that we don’t want gaining a foothold in our plants. Spot welding should be avoided because of the large gap that occurs where two pieces of metal come together. And you can’t get the two pieces apart because they are welded, making it hard to clean. This type of seam either needs to be eliminated or redone using a continuous, smooth weld to prevent bacteria.

A butt weld, in which the flat stainless steel plates are joined butt to butt, is the preferred weld style since there is by definition no overlap, which can result in flexing. Flexing can cause cracking, allowing soils, microorganisms and unwanted residues to get underneath the overlap, which are difficult to remove through sanitation methods. The photos below illustrate examples of butt welds; both incorrect and correct.

In this photo, we see a flat plate welded on one side without backer rod—and the depression that is a hiding place for microbes and soils.

In this shot, the plate is welded with backer rod. Although this butt weld is nice and even, it can still collect microbes because it is not ground and polished to a smooth finish to which bacteria cannot strongly adhere.
Finally, we see the ground and polished sanitary weld. The criteria for a good butt weld is that the weld is ground and polished to the same texture as the adjoining pieces.

**Pipe Welds**

What should you look for in the sanitary design of pipe welding? When a stainless steel pipe is welded, an inert gas is introduced into the pipe’s interior and then welded on the outside to prevent oxidation inside the pipe. However, if the gas pressure inside is inadequate, the weld will penetrate and result in a lumpy surface, as shown to the right, where the application of ID Argon purge gas was insufficient. When this occurs, there will be niches where the microbes can hide and the clean-in-place (CIP) system won’t touch it, no matter which way the product is flowing. One way to check the integrity of the interior pipe weld is to insert a boroscope so you can view it upon completion of the weld. If it passes initial inspection, you can continue to spot check the various welds. But if it fails, you may want to require the contractor to boroscope every weld at his expense.

Other pipe weld problems occur when there is a pit at the end of the weld which is caused by too rapid termination of the weld. If the pit actually goes all the way through that stainless pipe, it will become a niche in which soils, microbes and other residues can collect and will be very difficult to remove.

This photo shows another example of a niche-friendly weld, a convex weld on ID whose uneven surface is caused by the application of too much heat on the outside of the pipe. In addition, make sure equipment is free of stitch or spot welds, which is probably one of the most common welds done in food processing plants—and one of the biggest sins.

The photo at right shows an acceptable hand weld of a pipe interior. The weld is even and smooth, which makes the pipe more cleanable and allows product to flow properly.

However, the best way to weld a pipeline is to use an automatic orbital welder since it controls the gas pressure inside the pipe, as well
as the heat and speed, and thus is very efficient. A weld obtained using an automatic orbital welder is shown at right.

A final note related to welding and plant sanitation. If you have ever seen an area or component of stainless steel equipment become rusty, it is likely due to cross-contamination caused by grinders and polishers. If maintenance has used these tools on mild steel elsewhere in the plant, as soon as they touch a stainless weld any contaminants thereon will impregnate that iron into the stainless weld and it will turn rusty. So, stainless welding equipment, including the stainless rods, the grinders and polishers, should be dedicated to the stainless steel surfaces only.