SANITARY WELD REVIEW
AND ACCEPTABILITY

“Views of Regulatory Authorities on the Criteria for Acceptance of Welds”
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General requirements for welds and for limitations for welded surface roughness can be found in all 3-A sanitary standards where welding might be used.
The details of 3-A requirements for the acceptance of sanitary welds were described in Mr. Avery’s presentation.

These included such things as:
Tint -- (oxygen in inert gas purge)

AWS D18.1/D18.2 Specification for welding of austenitic stainless steel tube and pipe systems in sanitary (hygienic) applications. This standard was written by the AWS in cooperation with 3-A to replace the previous 3-A standard for welding of tubing and pipe in dairy and food product processing plants.
For equipment for which a 3-A certificate of compliance has been issued.

Conformance to all applicable 3-A welding and 3-A welded surface texture requirements are verified under the 3-A third party certification program.
For Equipment that has a 3-A certificate of compliance, FDA will accept that certification; or
If there appears to be a significant problem

Use the 3-A Report of Alleged Noncompliance (RAN) process
HOWEVER... Some equipment is fabricated in the field such as welded pipelines fabricated from sanitary tubing, etc.

and is not the subject of a 3-A certificate of compliance...
FOR EQUIPMENT FABRICATED IN THE FIELD SUCH AS PIPELINES, ETC.

• Representative welds -- inspected upon installation (in an unpolished state)

• This may be accomplished by:
  – Use of a borescope or video borescope, or;
FOR EQUIPMENT FABRICATED IN THE FIELD SUCH AS PIPELINES, ETC.

- Representative welds -- inspected upon installation (in an unpolished state)

- This may be accomplished by:
  - By physically removing representative welds from the pipeline for close visual inspection
FOR EQUIPMENT FABRICATED IN THE FIELD SUCH AS PIPELINES, ETC.
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• The acceptance criteria for field fabricated welds is based on whether:
  – the weld will be sound, (No leaks, cracks, crevices, pits, or protruding metal)
  – smooth/easily cleanable and
  – the welded joint and associated piping are drainable
FOR EQUIPMENT FABRICATED IN THE FIELD SUCH AS PIPELINES, ETC.

• Unacceptable welding flaws include:
  – Problems related to in appropriate inert gas purge
  – Pits and “skips” in welded joints
  – Piping misalignments and slope
FOR EQUIPMENT FABRICATED IN THE FIELD SUCH AS PIPELINES, ETC.

• Obvious objectionable conditions include:
  – Problems related to inappropriate inert gas purge
Judging Unpolished Welds

Unacceptable

Weld badly sunken from the outside – heavy oxidation crusted in weld area.

Reason: Inadequate gas (inert gas) purge.
The term used in the welding industry is "sugared" weld because it looks like burned sugar.
Judging Unpolished Welds

Unacceptable

Weld pushed outward.
Reason: Too much purge (inert gas) pressure.
Interior diameter if the weld is pushed outward
FOR EQUIPMENT FABRICATED IN THE FIELD SUCH AS PIPELINES, ETC.

- Obvious objectionable conditions include:
  - Pits and “skips” in welded joints
Judging Unpolished Welds

Unacceptable

Heat penetration too light -- Incomplete in some spots -- causing misses or skips. Reason: Weld speed irregular, too fast or low amps.
Incomplete heat penetration
FOR EQUIPMENT FABRICATED IN THE FIELD SUCH AS PIPELINES, ETC.

• Obvious objectionable conditions include:
  – Piping misalignments and slope
Judging Unpolished Welds

Unacceptable

(inside)

Reason: Piping misalignment
—(Incomplete heat penetration also present)
Piping misalignments are normally obvious from the outside but shall be confirmed by internal inspection.
Slope – use a level to verify
Judging Unpolished Welds

Acceptable

(inside)  (outside)