

Abstract

This standard addresses factors that affect weld discoloration on the inside of austenitic stainless steel tube. The document contains a color illustration relating the discoloration to the oxygen content of the backing shielding gas.

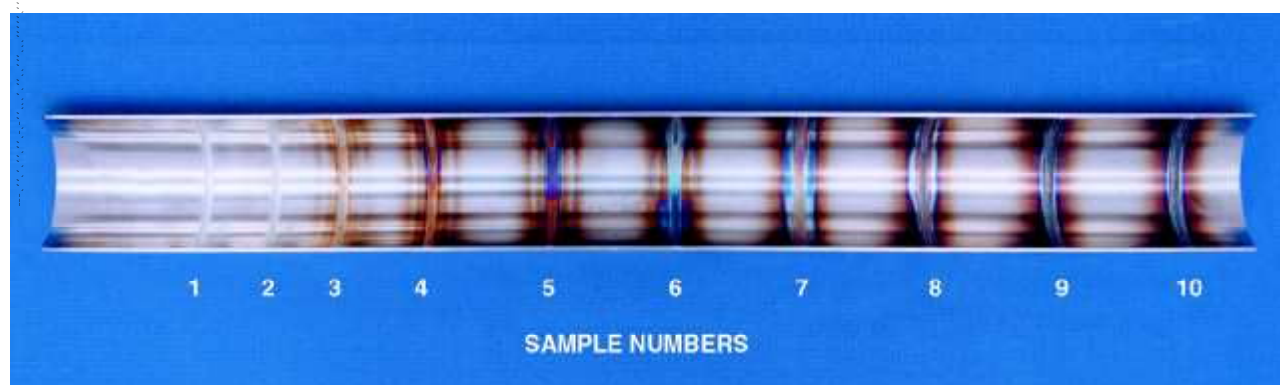
Guide to Weld Discoloration Levels on Inside of Austenitic Stainless Steel Tube

1. This standard provides a visual comparison guide that can be used to specify surface discoloration criteria for sanitary (hygienic) welds in austenitic stainless steel tube.

This figure has been extracted from AWS D18.1/D18.1M:2009.

2. **The Tube Sample.** The tube sample was prepared using an automatic orbital “bead-on-plate” weld on the outside diameter of a 2 in [50.8 mm] stainless steel tube. The weld penetrated through the tube wall. The concentration of oxygen in ppm added to the pure argon backing gas for each weld was as follows:

No. 1—10 ppm	No. 3—50 ppm	No. 5—200 ppm	No. 7—1000 ppm	No. 9—12 500 ppm
No. 2—25 ppm	No. 4—100 ppm	No. 6—500 ppm	No. 8—5000 ppm	No. 10—25 000 ppm



Weld Discoloration Levels on Inside of Austenitic Stainless Steel Tube

3. The illustration is most useful as a reference to identify the degree of discoloration rather than to specify oxygen limits in the backing gas. The amount of discoloration and its appearance can be influenced by factors other than oxygen such as:

- High levels of moisture in the backing gas will increase the degree of discoloration.
- Contaminants such as hydrocarbons, moisture, and some types of particulate on the surface prior to welding can influence discoloration levels.
- Hydrogen gas in the argon backing gas can significantly reduce the amount of discoloration.
- The metal's surface finish can affect the appearance of discoloration.

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