Structure diagram for stainless steel weld metal

Ferrite determination

- Optical scanning: Accuracy depends on etching and equipment. Related standard: ASTM E 563 - 99
- Magnet tearing-off force: Standards for Ferrite Number (FN) determination. ISO 2449 and AWS A4.2 - 97. Cover range of FN 0-85. Torsion balance (e.g. Magne Gage) calibrated with coating thickness standards (NIST).
- Magnetic Induction: Devices as Fisher Ferritoscope, Other devices, to be calibrated on secondary standards.

- DeLong Diagram /2/ - WRC 1992 Diagram /4/
- Schaeffler Diagram /1/ - WRC 1988 Diagram /3/
- Chemical composition, position in structure diagrams
- Final Report of IIW Round Robin /7/

Linear Electric Europe combined the latest and most accurate WRC 1992 diagram with the basis, the Schaeffler Diagram for optimal estimation of structure and ferrite content.

Correlation % Ferrite & Ferrite Number

Volumetric % Ferrite (estimated NFN) correlates with Ferrite Number: NFN = FN

Solidification mode

A: Fully austenitic (+) at room temperature
FA: Peritectic solidification (+-), transformation on cooling to austenite; remaining ferrite in network.
F: Primary ferrite (-), formation of austenite (+) in ferrite (-) matrix

Constitution Diagrams

Solidification structure schematic in binary constitution diagrams /6/

Ferrite in the weld metal structure