“Challenges Obtaining and Implementing Welding Alloys for High Temperature Stainless and Super Nickel Steel Weldments”

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Disclaimer…

The opinions expressed in this presentation are the opinions of the author, not the official opinion of the responsible API, ASME, AWS or ISO Committees.

Special Welding Alloy Inventories

- Inventories small vs. low carbon & 3XX stainless steels
- Low commercial demand
- Expensive to manufacture
- Many discontinued due to mergers, sagging sales, loss of inventory funding
- Long lead times: up to 24 weeks

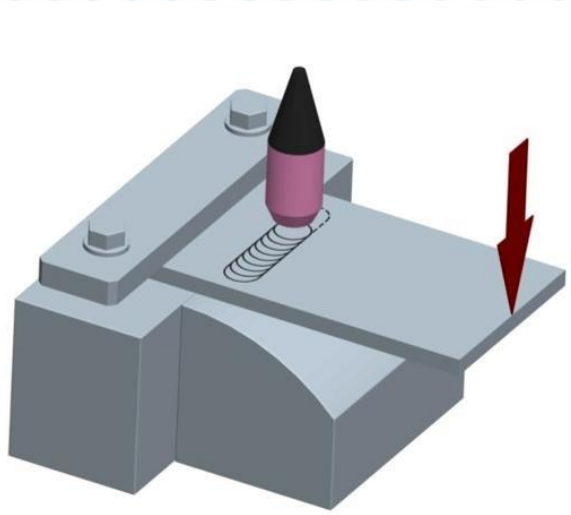
308H 347H 16-8-2 25-35 35-45 21-33 617 230W 740

Welding Technique Issues

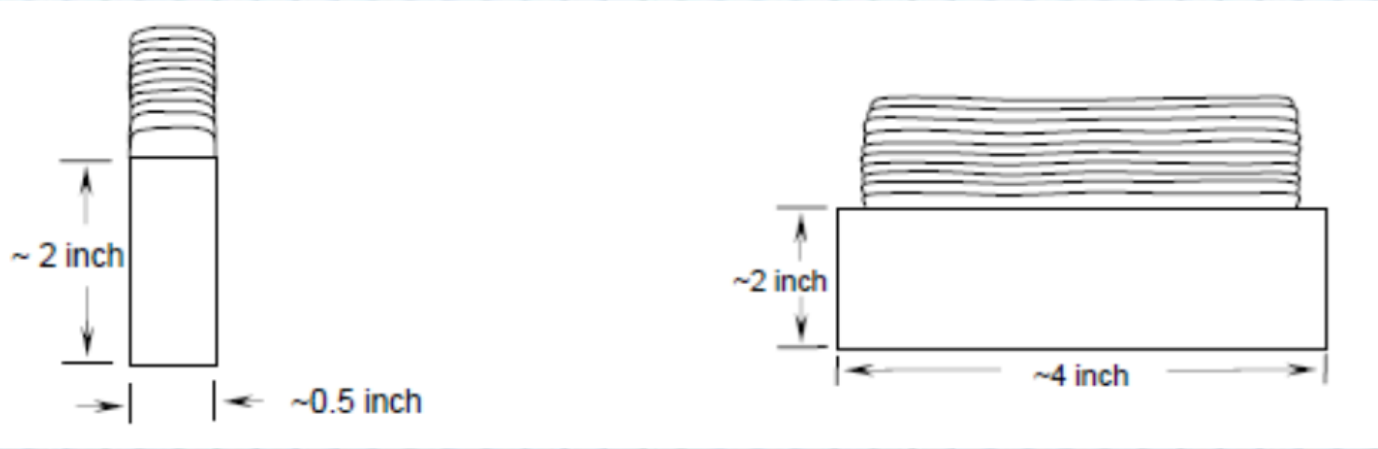
- Alloy vs. Technique Issue
- High Carbon SS vs. Nickel & Nickel Super Alloys : similar issues
- Dilution
- Groove Geometry
- Weld Bead/Layer Geometry
- All must be considered and controlled to avoid cracking and microfissuring
- Assure melting weld metal, NOT remelting (EPRI's Power Ratio)
- Dissimilar Weldments Introduce Additional Challenges

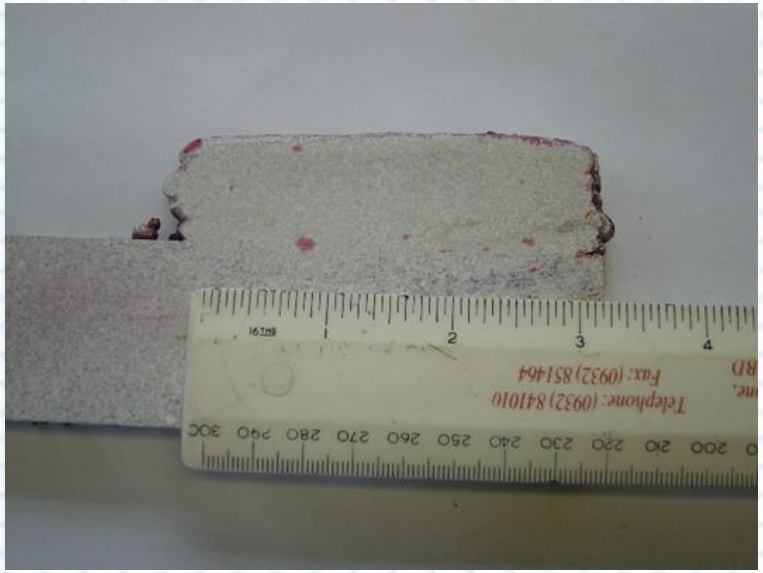
Weld Metal Evaluation & Testing

- Traditional Test Coupons & Specimens May be Inadequate
- Creative Test Assemblies
  - Induce Fabrication/Installation/Repair Stresses
  - Create Residual Stresses
  - Evaluate Cracking and Microfissures



EPRI P87 Test Specimen





QUESTIONS ?

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Thank You!