

Alcan Engineered Products

Alumold 500 Repair Update

October 7, 2009

Technical Issues

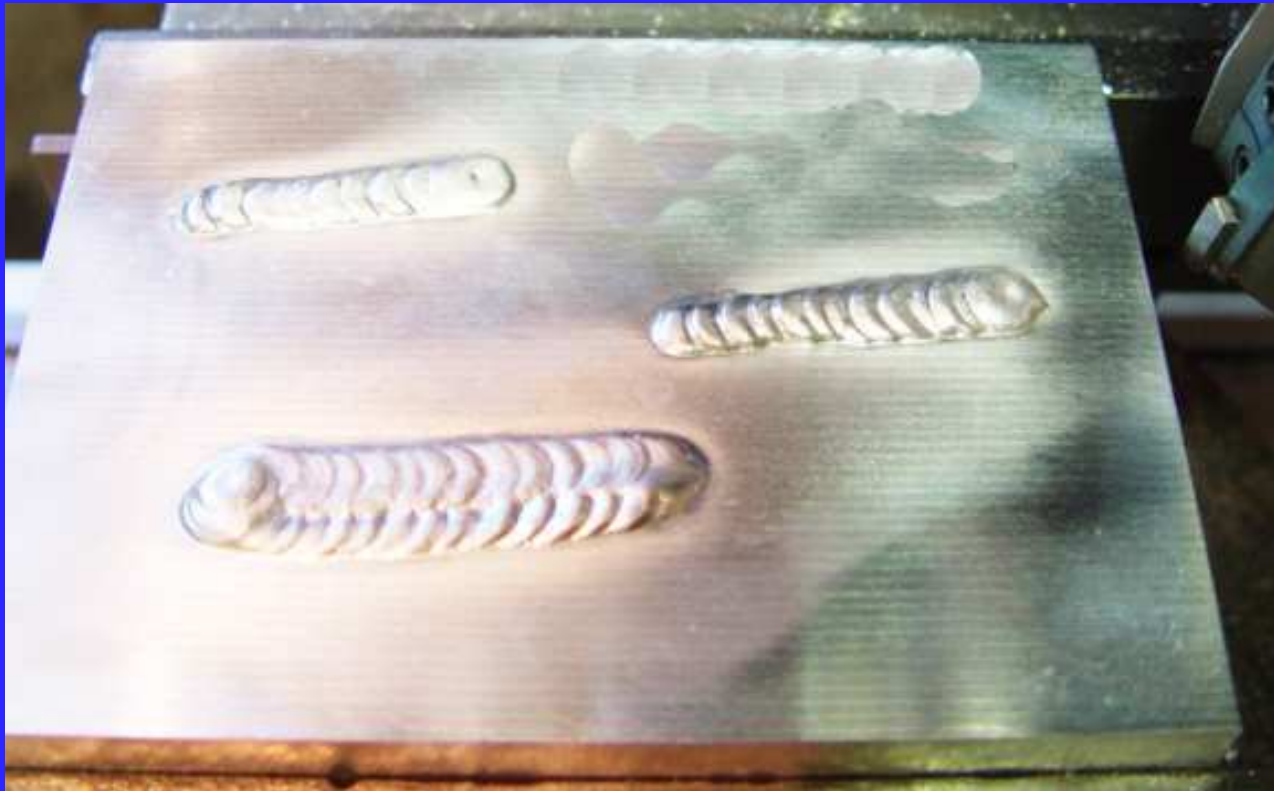
- High strength & hardness 7XXX alloys
 - generally not considered weldable
 - propensity for underbead cracking
- **Current practice using 4XXX & 5XXX fillers:**
 - satisfactory results achieved in most applications
 - etching response differences
- **Challenges:**
 - develop compatible filler alloy
 - develop weld practices to minimize cracking

Alcan Program Focus

- Develop:
 - compatible filler composition
 - welding practices to minimize cracking

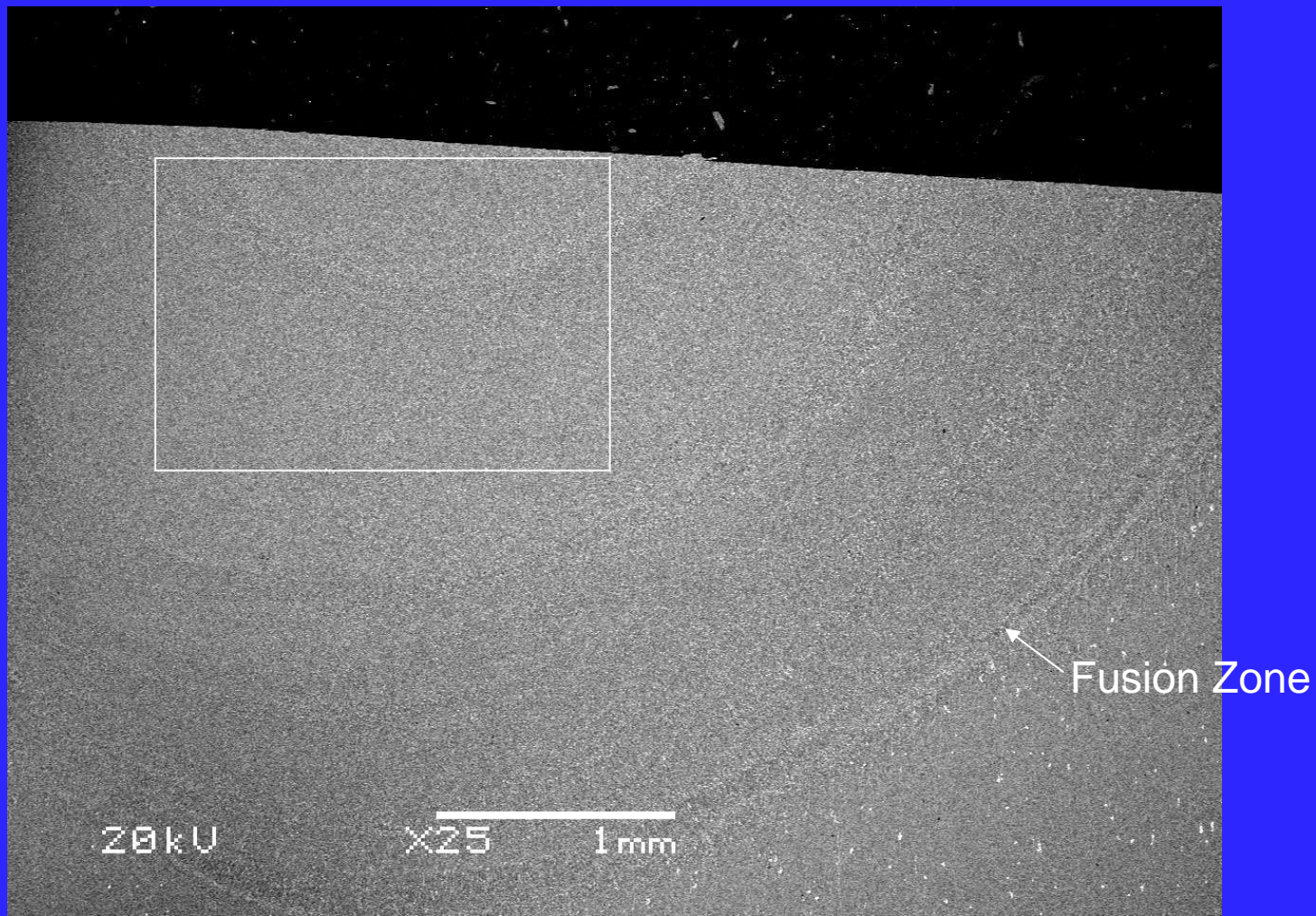
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GTAW Weld Samples



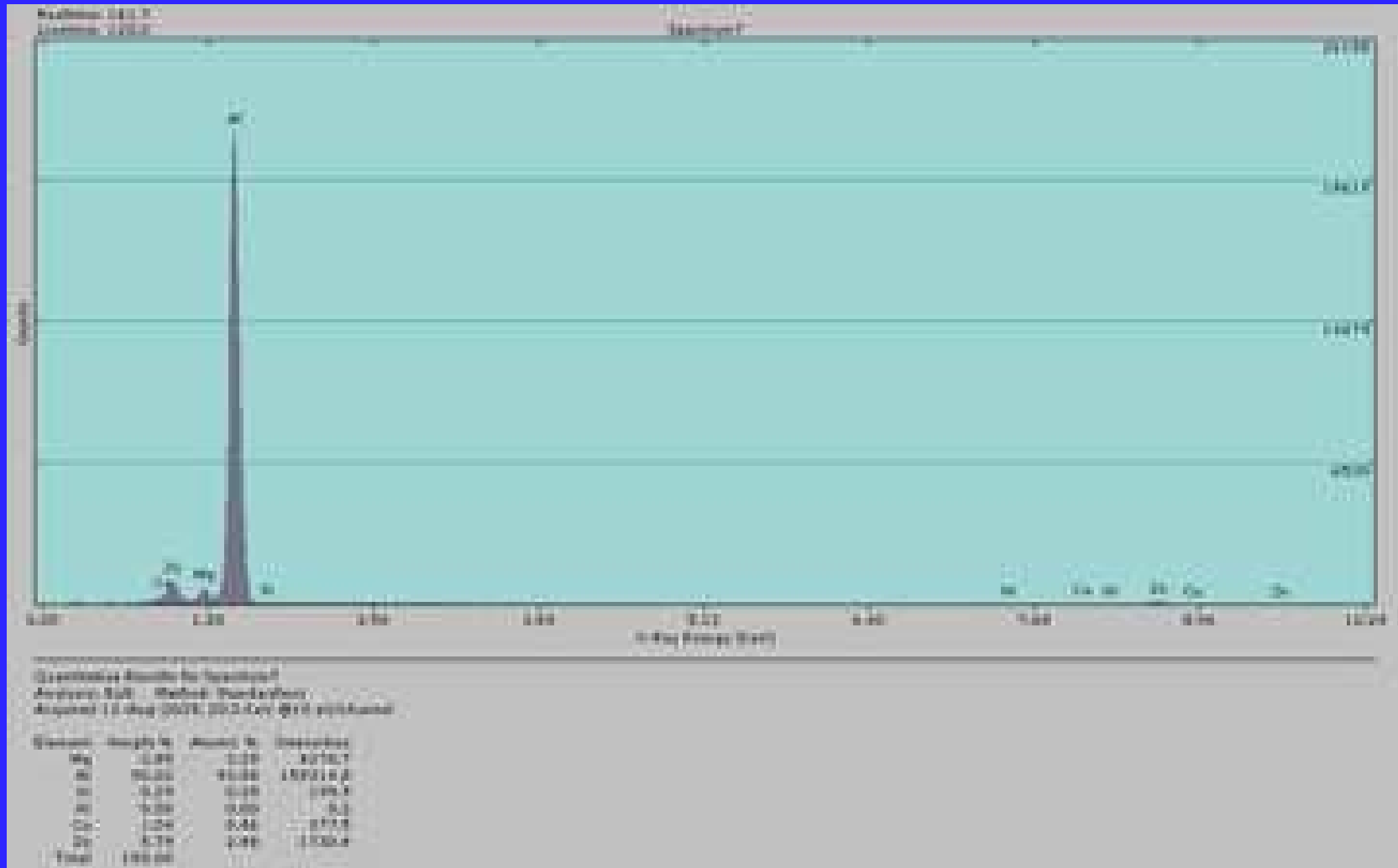
Single & Multipass Welds

Weld with 7XXX Filler



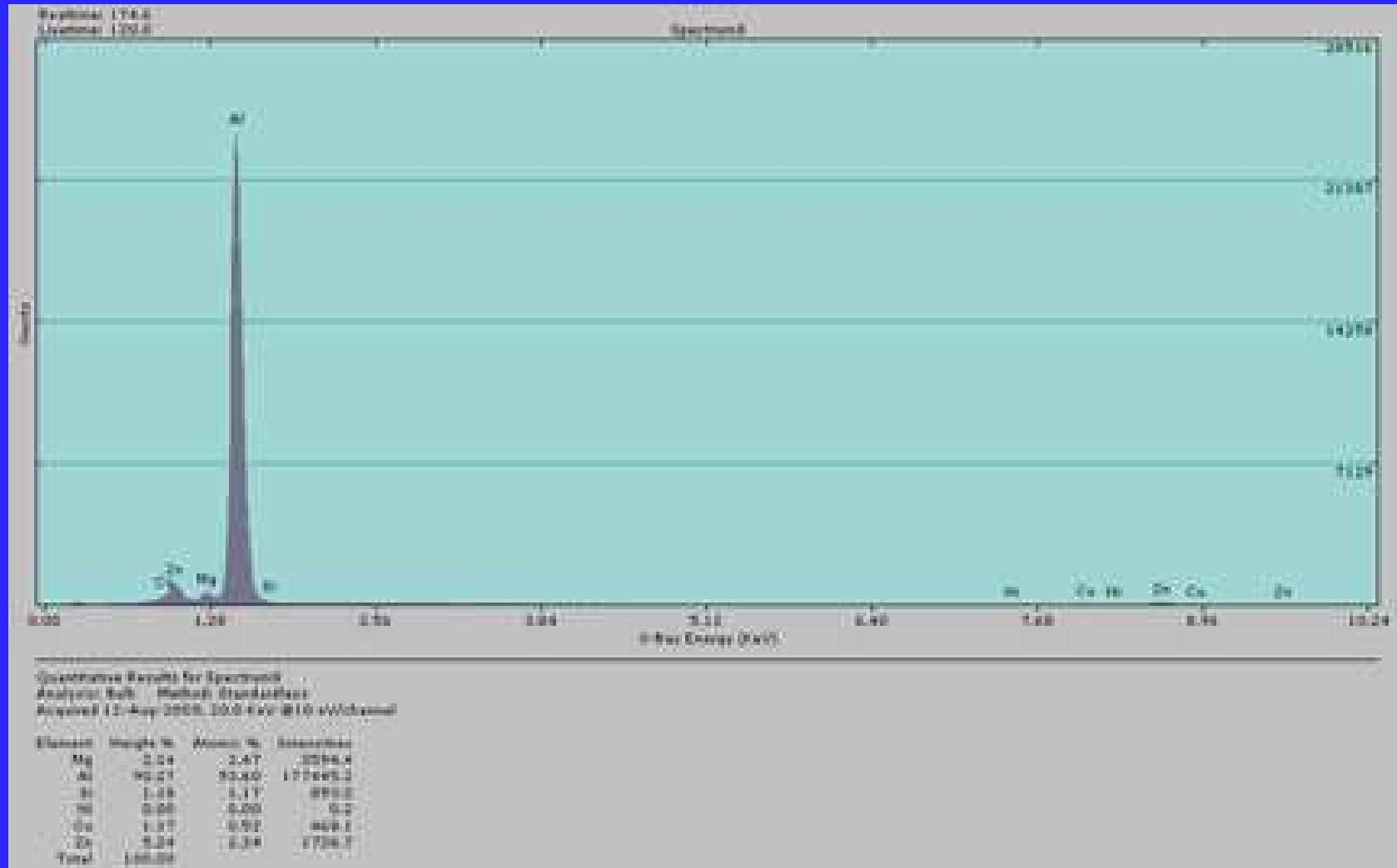
SEM Micrograph

Weld with 7XXX Filler



SEM Parent Metal Composition Scan

Weld with 7XXX Filler



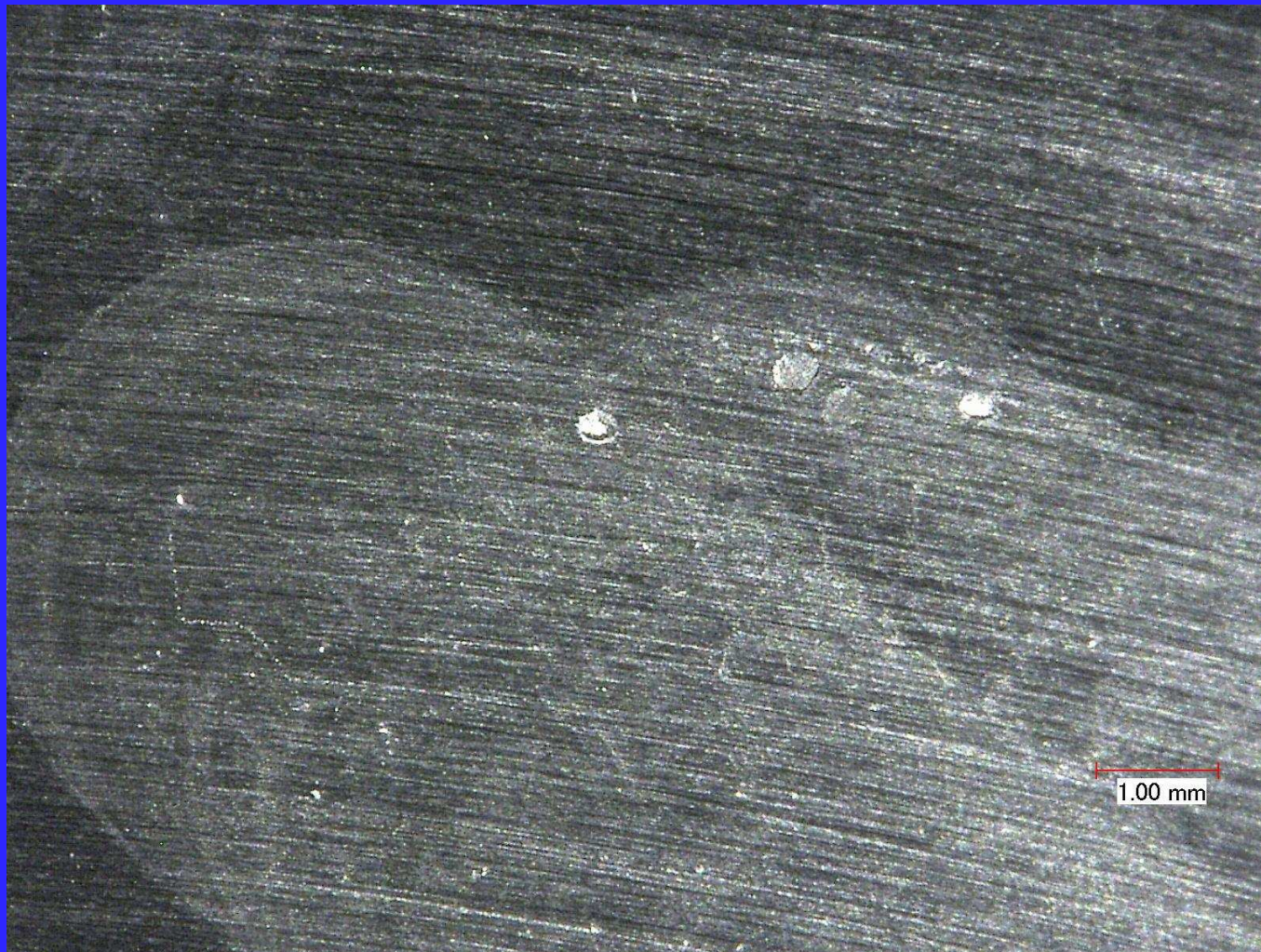
SEM Weld Composition Scan

Weld with 7XXX Filler

Welding parameters and technique important to avoid:

- Porosity at weld start
- Solidification cracking at termination
- HAZ microcracking

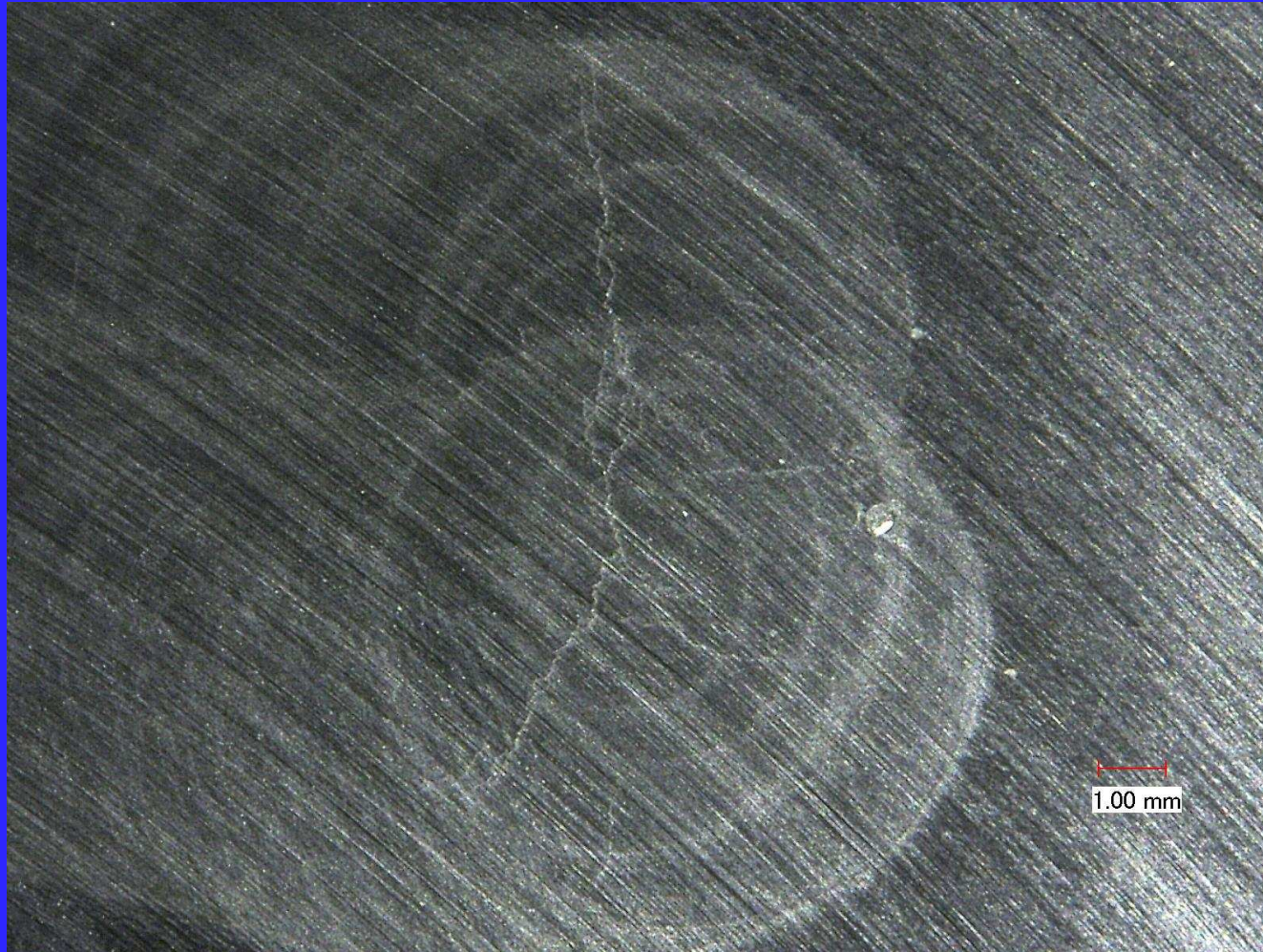
Weld with 7XXX Filler: typical defect



Porosity at Start

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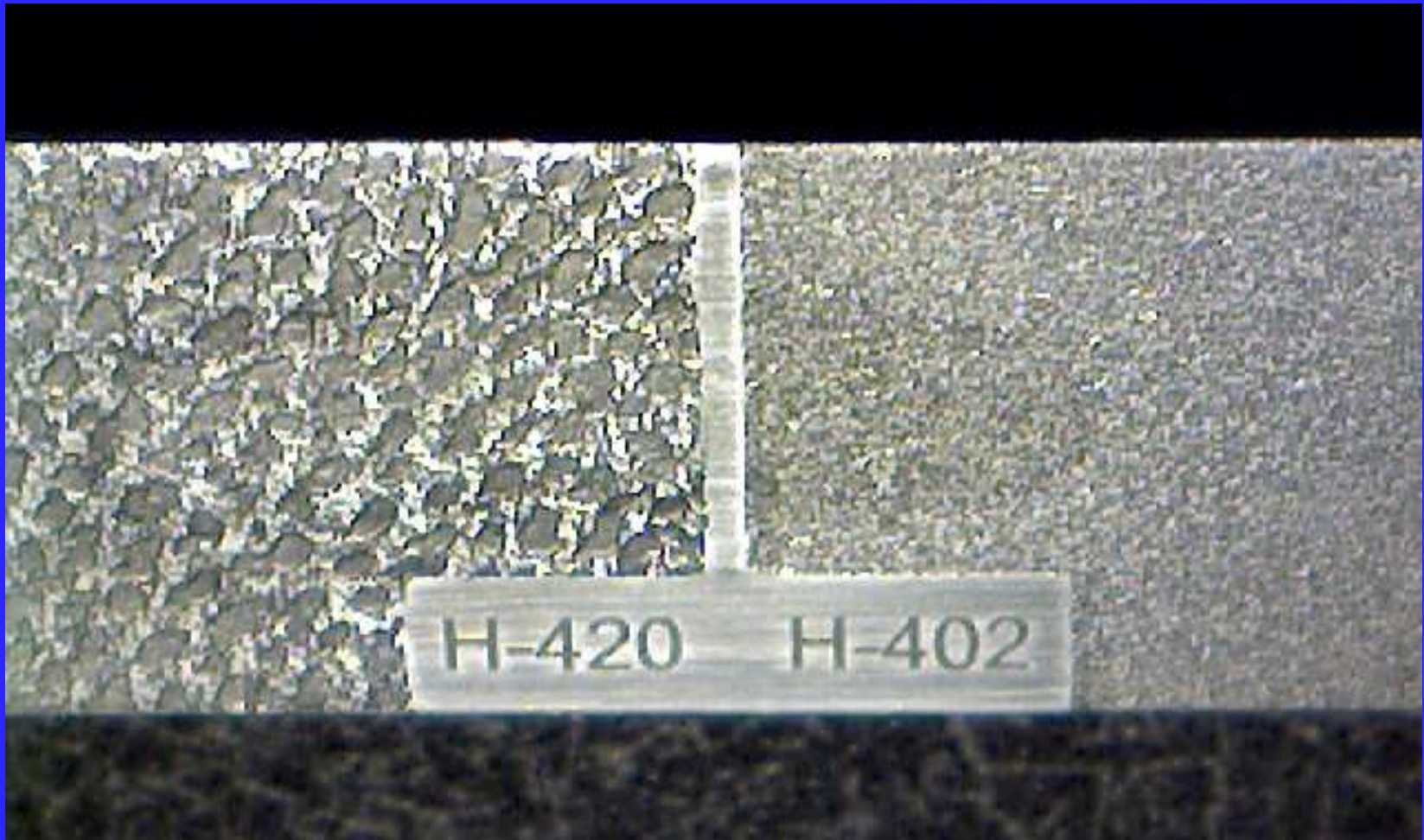
Weld with 7XXX Filler: typical defect



Weld Termination Cracks

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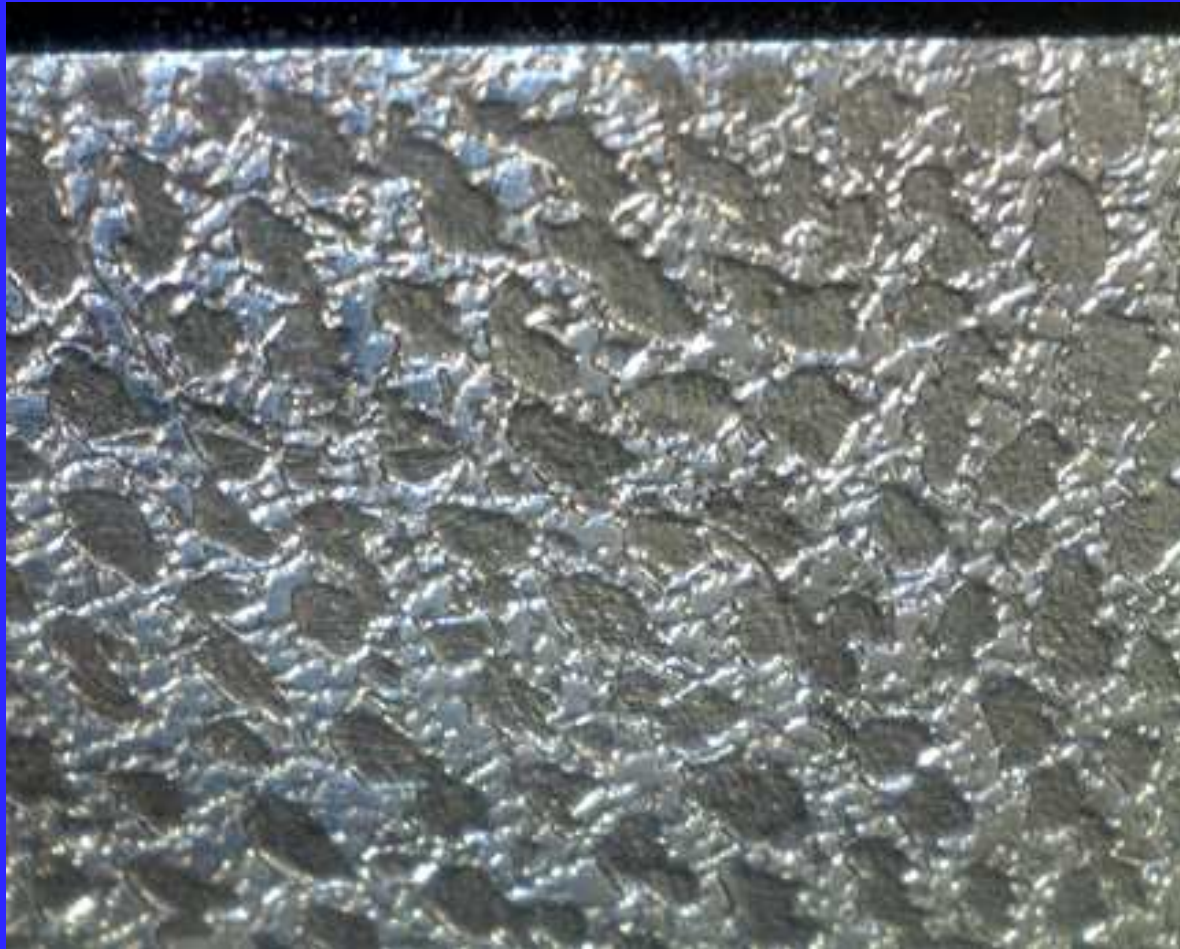
Weld with 7XXX Filler



Successful Repair - Course & Smooth Textures

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Weld with 7XXX Filler



Course (H420) Texture Macro

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Weld with 7XXX Filler



Smooth (H402) Texture Macro

Conclusions

- Alumold 500 can be successfully weld repaired with 7XXX filler
- Welding parameters and technique are important
- Texturing response is more uniform than 4XXX or 5XXX welds
- Work continues to refine the repair process