SMI, Inc.
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Attn: Brian L. Wuertz
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4119 White Bear Parkway
St Paul, MN 55110

Product: VPCI-422 (VPCI-416 as the neutralizer)

Dilution: Ready to use

Date: 14-Nov-2005
SMI/REF: 05XCT991

ASTM F 519 - 05
Mechanical Hydrogen Embrittlement Evaluation of Plating/Coating Processes and Service Environments (Aggressive Chemicals)

Specimens: Type 1c, unplated AISI 4340 steel
Load (Table A5.1): 45 % of notched fracture strength
Exposure: Notched areas of stressed specimens were completely immersed in the test chemical for 15 minutes, neutralized per manufacturer's instructions, rinsed and dried with compressed air. The load of the test specimen was then increased to 75% NFS for 200 hours.
Temperature: Room temperature
Dilution: Ready to use

An aggressive chemical shall be considered non-embrittling if none of the exposed specimens fracture within 200 hours after being stressed to 75% NFS for Type I specimens.

Results:
Specimen #1: No failures occurred within 200 hours.
Specimen #2: No failures occurred within 200 hours.
Specimen #3: No failures occurred within 200 hours.
Specimen #4: No failures occurred within 200 hours.

Result Conforms

Respectfully submitted,

Patricia D. Viani, SMI Inc.