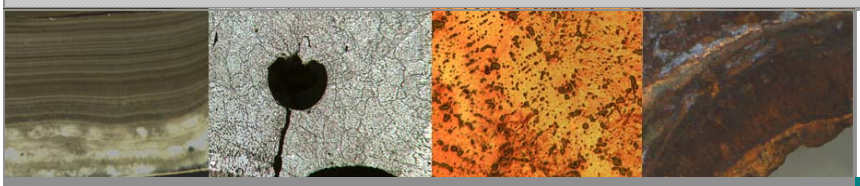
NUTS & BOLTS



New Hampshire MATERIALS LABORATORY, INC.
Your Problem Solving Partner

HYDROGEN EMBRITTLEMENT AND ASTM B633 ZINC PLATING

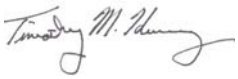
November 2009: ISSUE 3

Welcome to New Hampshire Materials Laboratory

Hydrogen Embrittlement...You may have read an article on this published back in Volume 18 in the Fall 2002 Nuts & Bolts. A link has been provided below.

http://www.nhml.com/newsletters/NHML-Materials-Testing-Newsletter-021001.pdf

The subject of hydrogen embrittlement recently became the topic of conversation here at NHML. Tony Tipton, our Chief Metallurgist, was recently presented with such a problem. Continue reading further to see if this could be effecting your company.



Tim Kenney
Laboratory Director

In This Issue

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Hydrogen Embrittlement and ASTM B633 Zinc Plating Requirements:

Written By: Tony Tipton, Chief Metallurgist

Are you familiar with the revisions done to ASTM B633 back in 2007? Could these revisions be the cause of re-occurring problems within your company? A case scenario showing how the revision affected one of our customers maybe affecting you.

Recently a customer submitted two fractured studs for failure analysis. The studs were zinc plated low alloy steel heat treated to a hardness of approximately 40 HRC. Investigation revealed the root cause of the fractures to be hydrogen embrittlement. The subject studs had been baked per drawing requirements for 3 hours at 190° C to remove hydrogen after zinc plating per the requirements of ASTM B633-98. However, in 2007 ASTM B633 was extensively revised and the hydrogen embrittlement relief baking parameters were eliminated from specification. The new 2007 edition of ASTM B633

Did You Know….

Our company with the help of CrystalVision, a innovated web company out Portsmouth, NH, launched a new and improved NHML Chemical Analysis website. This website will have chemistry specific case studies, and information on our Chemistry Department's capabilities. Take a peek and let us know what you think.

nhchemicalanalysis

NHML Staff Bio

Have you ever wondered who is behind the voice that answers your call?

specification requires that hydrogen embrittlement relief baking of zinc plated components be performed per requirements of ASTM B850. The hydrogen embrittlement relief baking parameters per ASTM B850 are dependent on component ultimate strength levels and for the subject studs would be 190-220° C for 14 hours. According to ASTM, the changes made to ASTM B633 in 2007 were the result of a history hydrogen embrittlement failures with the previous specification requirements and make the hydrogen embrittlement treatments in ASTM B633 consistent with ASTM B849 and ASTM B850. The present customer was unaware of these changes and if the plating suppliers were aware of the changes they did not bring it to their attention. It is likely that a number of users of ASTM B633 zinc plating are unaware of these major changes made in the past couple of years regarding the ASTM B633 specification.

Click here to go to ASTM International website for further information:

http://www.astm.org/Standards/B633.htm

One of the wonderful ladies is Connie Bartlett. As our Office Manager, she not only answers the phone but handles all the invoicing and billing. Connie has been with NHML for the past 15 years keeping Tim and other staff members on task.

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