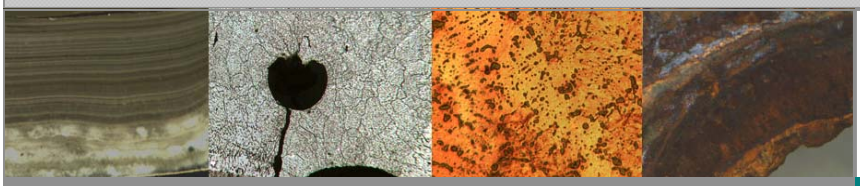
NUTS & BOLTS



New Hampshire MATERIALS LABORATORY, INC.
Your Problem Solving Partner

Anodizing Process and Defects

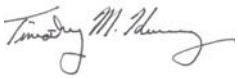
SEPTEMBER 2010 / ISSUE 5

Welcome to New Hampshire Materials Laboratory

Back in August, we published the Nuts & Bolts supplement “Inquiring Minds”. It discussed the qualities of 4140 steel, the importance of heat treating and chromium plating.

Today, we are looking at another interesting subject Aluminum Anodizing Defects. Did you know an anodized surface can be produced in a wide range of decorative colors? Read on for more information on the anodizing process and concerns we’ve recently seen here at NHML.

Be on the look out for more articles featuring steel in future Nuts & Bolts and other interesting facts in our supplements.



Tim Kenney
Laboratory Director

In This Issue

Join Our Mailing List

Aluminum Anodizing Defects

Anodizing converts the surface of an aluminum alloy into aluminum oxide. An anodized surface offers a number of special benefits:

- Increased corrosion resistance
- Improved paint and adhesive bonding
- Increased electrical resistance
- Increased abrasion resistance

An anodized surface can also be produced in a wide range of decorative colors. Color anodizing can be accomplished by several methods.

Dying: The pores in the anodized surface can absorb organic dyes. The depth of dye absorption depends upon the thickness of the anodized layer

NHML Staff Bio

Kandyleigh Provencher

Kandyleigh a.k.a. Kandy has been with NHML since 2002.

Her main duties as lab technician is to prepare metallographic samples, perform EDS and SEM testing and other various duties to keep the metallurgist on task. She is also known to offer a helping hand wherever help is needed in the lab.

and the number of pores in that layer. Color matching is easiest when one dye is used, and more difficult when two or more dyes are used.

Mineral Pigmentation: Mineral pigments can be precipitated within pores of the anodized layer. As an example, iron oxide precipitated from a ferric ammonium oxalate solution produces gold colored surfaces.

Integral Color Anodizing: The pigmentation process is accomplished by the inclusion of very small particles in the coating in an anodic reaction between the aluminum and the electrolyte. Composition and temper have a significant effect on the color produced. Alloys containing manganese and silicon tend to color black or grey. Alloys containing copper and chromium tend to color yellow or green.

Electrolytic Color Anodizing: In electrolytic color anodizing process is followed by electro deposition of metallic pigments from a dissolved metal salt in the pores of the anodized layer in a second operation. The resulting colors are very stable.

To read the entire article including recent anodizing problems we've recently seen, click on the link...**Aluminum Anodizing Defects**

Kandy is also an active member of the community and can be found teaching American Sign Language and volunteering her time helping non-profit organizations.

New Hampshire Materials Lab
www.nhml.com • lab@nhml.com • info@nhml.com
Tel: 800-334-5432 or 603-692-4110 • Fax: 603-692-4008