

Special Approaches to Metallography for Zirconium & Other Reactive Metals

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ATI Wah Chang has performed many metallurgical evaluations and failure analyses on reactive metals over the last 40+ years. These materials include zirconium, titanium, niobium, and tantalum products. Although some of the metallographic techniques used on reactive metals will be similar to those used in other more common metals, such as carbon or stainless steels, the unique nature of the protective oxide film on reactive metals necessitates that special techniques be used.

This presentation provides an overview of the aspects of metallography that are unique to reactive metals. Areas to be covered include: sample acquisition and handling; optical microscopy; surface analysis; and colorization techniques, such as anodization and heat tinting.

A case study of a metallurgical evaluation of stress-corrosion cracking (SCC) in Zircadyne® zirconium will also be presented as a practical application of the specialized techniques described earlier in the presentation.