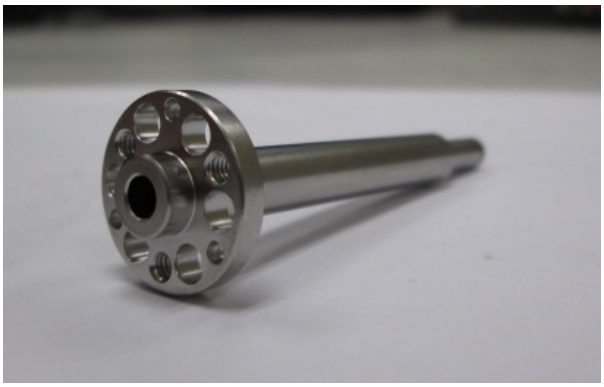
#1096 - Removing Heat Tint & Eliminating Heat Treat Side Effects

Industry:
Medical

MFG/Method:
Machining and heat treating

Alloy:
Titanium (6Al-4V)

As Heat Treated



Electropolished

Problem:
Heat treating is an integral step in the production of many metal parts, altering the grain structure and mechanical properties of an alloy to create more favorable properties and performance. While some forms of heat treating performed in atmospheric ovens do not alter the outer appearance of the part, others do, leaving behind discoloration and/or scale.

Heat treatment residue, discoloration and scale all leave parts with an "unfinished" appearance, making them unsalable. In addition to these aesthetic imperfections, a part's performance may be compromised, as well. Removing heat tint, discoloration or scale from parts is critical to ensuring both a desirable appearance and ideal performance.

The part pictured above was machined from 6Al-4V titanium, then heat-treated for over an hour at more than 900 degrees Fahrenheit. It finally underwent a period of age hardening at a lower temperature for 4-8 hours. Ultimately, the result was a thin film of gray, dusty scale all over the part. Able Electropolishing's client needed to achieve a uniform, clean finish before delivering the parts to

their customer, but the intricate machined features and small holes proved difficult to clean by other metal polishing techniques.

Solution:

By electropolishing the titanium part, Able removed a uniform amount of surface metal, including the small areas that mechanical polishing or hand polishing can't effectively reach. Able Electropolishing processed two rounds of samples to determine proper stock removal, electropolishing the titanium parts post heat treating to achieve a uniform finish free of scale while maintaining tolerance. Once the client approved .0003" total removal from the diameter of the part, Able Electropolishing salvaged all of the production parts by providing a bright, uniform and consistent finish removing heat tint, scale, and/or discoloration associated with the heat treat process.