

Electropolishing and Resizing Automotive Gears

INDUSTRY:

High Performance Automotive Market

MFG/METHOD:

Machining and heat treating

ALLOY:

Steel

PROBLEM:

This part was manufactured to size, but subsequent heat treating cause the internal gear teeth to grow. The customer needed a way to size these internal teeth back down while retaining their uniformity and smoothness. After trying several traditional methods, none yielded the uniform finish they needed for the part to be viable—some parts simply do not fit into traditional sizing operations, because of either special tooling, potential for damage, introduction of surface stresses or contamination risks. Remaking the parts would have resulted in extra costs and increased lead times—all this, and the parts also needed a cosmetic finish.

Before:



After:



SOLUTION:

Able Electropolishing experimented with several sample parts, electropolishing the steel to remove varying amounts of surface material until achieving the ideal size. Because electropolishing submerges the part in an electrochemical bath that gently removes surface metal, it resized the internal gear teeth uniformly, ensuring that the part fit its mate exactly as the manufacturer intended.

An added benefit to the electropolishing this part received was a brilliant surface finish—unlike traditional or mechanical steel polishing, electropolishing can reduce microfinish values by 50% with a removal of only .0005" from each surface. This uniform removal of surface imperfections gives the piece shine while also reducing friction, ultimately improving the part's performance.