

ELECTRIC MOTOR TIE BOLT HYDROGEN EMBRITTLEMENT RISK MITIGATION PROJECT

FIELD COATING SELECTION AND COMPREHENSIVE STUDY ELIMINATED RISK OF INTERNAL HYDROGEN EMBRITTLEMENT FROM HIGH STRENGTH BOLTS.

CHALLENGE

The Field team informed a customer of the high risk of internal hydrogen embrittlement on a series of grade 12.9 zinc plated socket head cap screws which they were using in electric motors. These parts had seen failures in the past, and going forward Field did not want such risky parts to be used anymore.

SOLUTION

Field researched various non-embrittling coatings (since the fasteners needed some corrosion resistance), and compiled a comprehensive study showing that the selected coating (ZnCoat) did not introduce a risk of HE, did not detract from the strength of the screws, and had superior corrosion resistance than the previous zinc coating. Field also performed torque-tension testing to evaluate the friction properties of the coating in this particular application so that when implementing the new coating, the customer could adjust their assembly torque to achieve the same clamping force they were getting with the old coating.

RESULTS

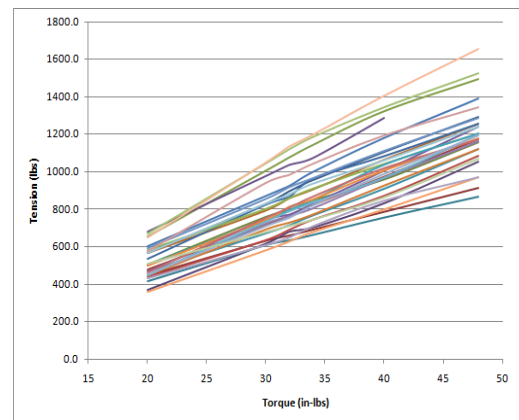
The Field Team did all of the legwork required to switch to a coating which eliminated the risk of internal hydrogen embrittlement. The customer will save money on failed parts and product rework. Field also helped modify the customer print to reflect ASTM Standards for high hardness parts and added a maximum hardness limit to the print to further improve the quality of the part and reduce embrittlement risk.

FIELD RESULTS

- Reduced warranty claims
- Elimination of delayed failure and required rework

FIELD SERVICE PROVIDED

- Product redesign
- Application problem solving
- Torque-tension testing
- Coordination with 3rd party testing labs



More than parts, Field is a full-service, data-driven, on-demand engineering partner with a unique technical approach to inventory management of, and supply chain solutions for, fasteners and other Class "C" items—contractually guaranteeing to lower your total cost of fastening.