High Strength Bolts

In a maintenance type application, and sometimes even in an OEM design situation, a bolt failure often leads people to opt for a stronger bolt class or grade to prevent future failures. On the surface, this makes sense. Compared to a Grade 5 bolt, a Grade 8, Socket Head Cap Screw or Grade 9 bolt would increase the bolt strength roughly 25-50%. However, as highlighted below, there are a few issues that must be considered when using higher strength bolting products:

- The ductility of a bolt decreases as the hardness and strength increases.
- High strength bolts are more susceptible to fatigue failures.
- If electroplated, high strength bolts are prone to hydrogen embrittlement issues.
- A stronger bolt has a lower temperature range in which the bolt can be used.
- Higher strength bolts also cost significantly more due to the higher alloys and heat treatment they require.

It is always wise to look at the root cause of any failure before moving to a higher strength bolt. In design work, it is wise to consider a larger size bolt or a higher number of bolts in the joint before simply moving to a higher strength product.