

PVP2017

Pressure Vessels & Piping Conference 2017

July 16-20, 2017 Waikoloa Village, Hawaii

THE EFFECTS OF LOW TEMPERATURE CARBON DIFFUSION TREATED FASTENERS ON THREAD GALLING RESISTANCE

Karson P. Clark

VSP Technologies
Prince George, VA

ABSTRACT

Kolsterising® is a low temperature carbon diffusion treatment, referred to as carburization, in which carbon is forced into the surface of metal. This results in a significant increase of surface hardness without the formation of crystalline solids or chemical elements.¹ Carburization is not a coating process therefore the possibility of delamination is eliminated with the process. ² Low temperature carbon diffusion treatment is being considered by a chemical company to possibly aid in the disassembly of higher alloy fasteners in attempts to reduce maintenance and equipment overhaul time during plant outages. This paper will explore the effects surface carburization, or carbon diffused surface hardening, has on the resistance of thread galling for B8M Class 1, B8M Class 2, and Hastelloy® C-276 fasteners.³ With the data provided from this initial study, a better understanding of the benefits low temperature carbon diffusion treated fasteners provides will be obtained. This paper has a limited scope that will utilize hand torqueing at various percentages of bolt yield to analyze the resultant clamping force of carburized fasteners in comparison to that of standard fasteners. This study is a milestone to further clarify the thread galling resistance that carburized fasteners provides.

