

S-Phase Nitriding: Retaining Corrosion Resistance in Stainless Steels



Advanced Heat Treat Corp. has been providing solutions for customers that need to retain the corrosion resistance in their stainless steels by using UltraGlow® technology for numerous years. This is now a very well-developed process that can be carried out by either carburizing or nitriding; such processes produce a so-called “S-phase.”

Austenitic Stainless Steels

For instance, a stainless steel component made of austenitic stainless steel such as 304 or 316, UltraGlow® Nitriding will saturate the surface of the component of the steel with nitrogen or both carbon and nitrogen and then form an expanded (S-phase) layer.

When austenite is saturated with a significant amount of nitrogen or carbon, which expand its lattice, the S-layer forms. The layer of this type can be formed in stainless steels such as 304, 316, 2205 and others. The S-phase layer has enhanced corrosion resistance. It is approximately 10-15 micrometers thick (or 0.0004-.0.0006 inches) and is extremely hard (more than 1000 Vickers).

This layer is resistant to corrosion in many environments. It is also resistant to cavitation and erosion, as well as to the tribological or corrosive interactions. Oil, gas and/or marine industries find this surface treatment extremely beneficial as it assists in the prevention of corrosion.

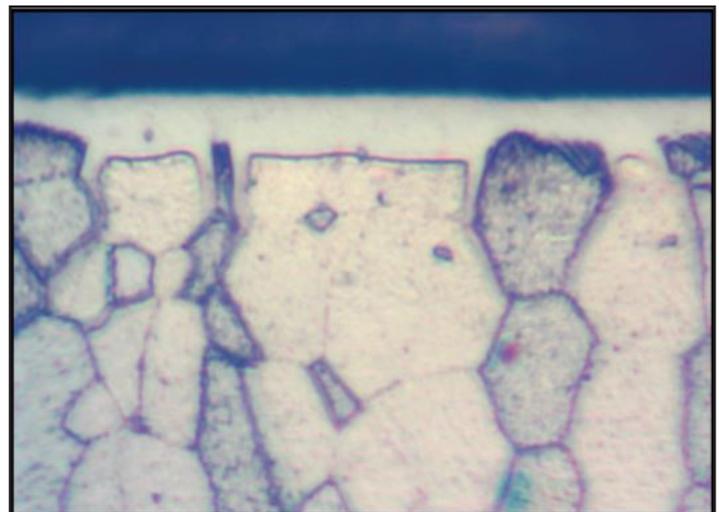


Photo micrograph of 2205 duplex stainless steel showing the S-phase formed during combined carburizing/nitriding cycle.

**S-Phase Nitriding is offered in Iowa, Alabama and Michigan.
Visit www.ahtcorp.com or contact your AHT
representative to learn more.**