

Arnco WearSleeve Could Revolutionize Hardbanding Industry

Companies are beginning to look at alternatives to traditional hardbanding in order to reduce costs, and gain a competitive edge. The Arnco WearSleeve could step out as an innovative option outside the norm.

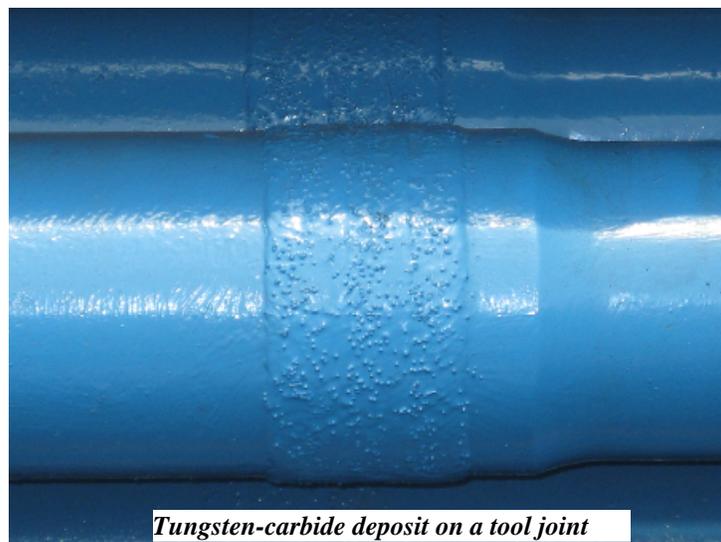
A Brief History

Hardbanding, a form of hardfacing, is a recognized necessity for most drilling practices today, protecting drill pipe tool-joint and casing assets from downhole wear. Hardbanding experienced its first major evolution when the use of “casing-friendly” alloys was introduced in the early 1990’s. Before the emergence of “casing-friendly” hardfacing, tungsten carbide deposits were used for tool-joint protection. Though, as drilling operations and casing programs grew in complexity it was recognized that while tungsten-carbide provided excellent wear protection for the tool-joint, the material produced excessive, sometimes catastrophic casing wear.

Since that time, a number of “casing-friendly” hardbanding alloys have entered the market, with varying levels of performance downhole. The main objective for a tool-joint applied hard metal is to produce the lowest achievable casing wear, while also exhibiting high durability, or wear resistance (i.e. how long the hard metal lasts during operations, protecting the tool-joint). Standardized tests, such as the “Mohr Wear Test” and “G65 Dry-Sand Abrasion Test”, are established in the industry to measure performance indicators. Currently, operators and drilling contractors are presented with a number of viable options when choosing a hardbanding product, and can assess their performance characteristics by analyzing these test results.

Current Application

Almost all competitive products in the industry are applied using a MIG welding process, typically at an inspection facility. Mobile units may also be used that can travel to, or near a drilling site. An “Applicator”, as they are called in the industry, is required to have a hardbanding unit which is simply a modified MIG welding apparatus configured to position and weld hardbanding onto a



Tungsten-carbide deposit on a tool joint

tool-joint. This is an established process that has worked well for many years. However, with cost increases related to transporting pipe to and from a facility, the cost to transport a unit to, or near a drilling site, potential downtime and the remote nature of many drilling operations, a cost effective alternative is being sought by many end-users.

The Arnco WearSleeve

In response to increasing cost burdens experienced by operators related to traditional hardbanding application, Arnco Technology has developed an innovative new product that could drastically change the drill-pipe hardfacing industry. It uses patented technology allowing for by-hand installation and removal of a hardfaced sleeve, while on the rig floor.

The WearSleeve is designed to be a re-usable unit, mirroring parent metal composition, onto which Arnco hardbanding is applied. The tool-joint pin end is machined to accept the WearSleeve using small, standard-dimension left hand threads. The WearSleeve is then installed directly onto the tool-joint between the pin and box connections during make-up. When trip-out occurs, the WearSleeves are visually inspected for wear experienced during operations. If the hard metal is worn on the WearSleeve beyond Arnco specifications, the



The Arnco WearSleeve

connection is broken out and a new or re-furbished WearSleeve is inserted. This is done directly on the rig floor, by hand, with no tools required.

Why it Makes Sense

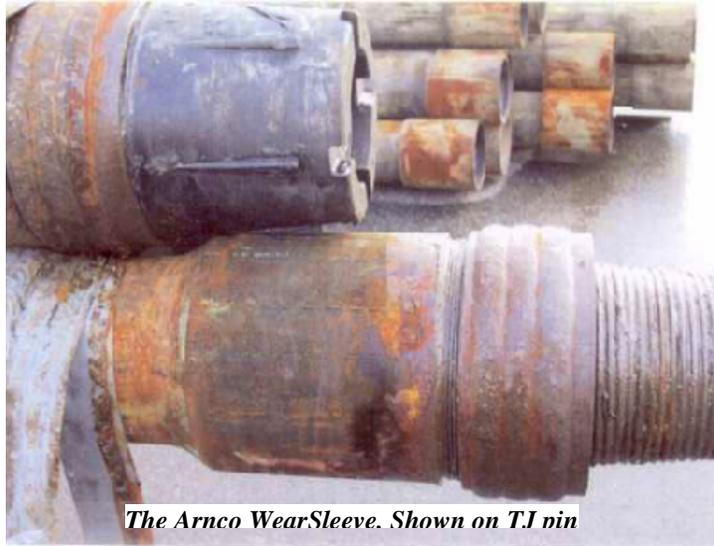
The design of the Arnco WearSleeve presents a strong value proposition to operators and contractors. In most cases the highest cost component associated with hardband application is handling and transportation logistics which are eliminated with

use of the WearSleeve. When comparing costs incurred by an operator for logistics and hardband application offsite versus use of the WearSleeve, savings using the sleeve were significant. Additional benefits include use by operations in remote locations, preventing burn-out of the internal plastic coating and full protection to the pin and box bevel diameters from wear throughout the life of the tool joint.

These are very attractive benefits, both economically and practically speaking. Creating the ability for operators and contractors to install, by hand, hardbanding on location helps reduce operating expenses and provides a number of supplementary benefits.

Further, The WearSleeve has been successfully used in harsh drilling environments, proving it's viability in the field, and it continues to undergo testing as it is considered and approved by international oil companies.

Since introducing “casing-friendly” hardbanding to the industry in the early 1990’s, Arnco has been a leader in the field of drill pipe hardfacing. Continuing to develop and market high-performance hardbanding products has kept the company on the leading edge. The development of the WearSleeve is another innovative step towards helping end-users protect their drill pipe and casing assets in the most cost effective and practical manner possible. Increasing interest towards the WearSleeve is sparking conversation in the industry and end-users are beginning to take a serious look at what could be an attractive alternative to traditional hardbanding application.



The Arnco WearSleeve. Shown on T/I pin