

# TCS™ Hardbanding

Industry Leading Tool Joint  
and Casing Protection

**Tuboscope | NOV**

## The World Leader in Hardbanding

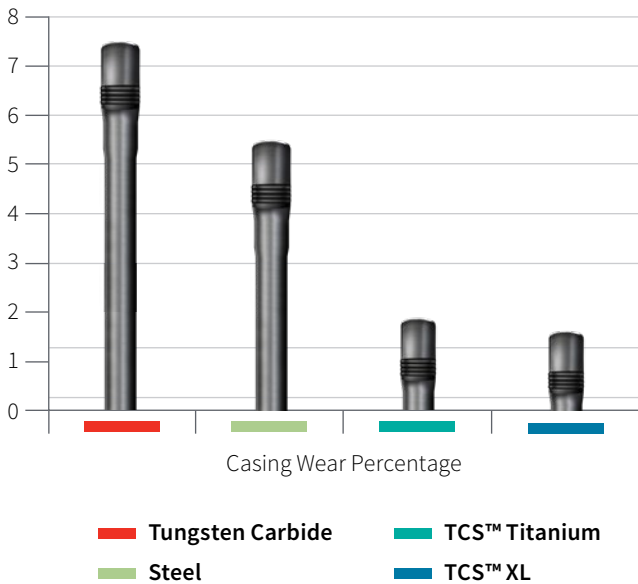
### Single Source

Tuboscope™ is the only oilfield hardbanding service company that offers a single source for wire manufacture, new pipe application, and reapplications worldwide. Additionally, we provide wire sales and applicator certification.

### Global Reach

With over 80 mobile units strategically located in 25 countries, Tuboscope's TCS™ Hardbanding service is available in major oilfield markets around the world.

Casing Wear Factor %

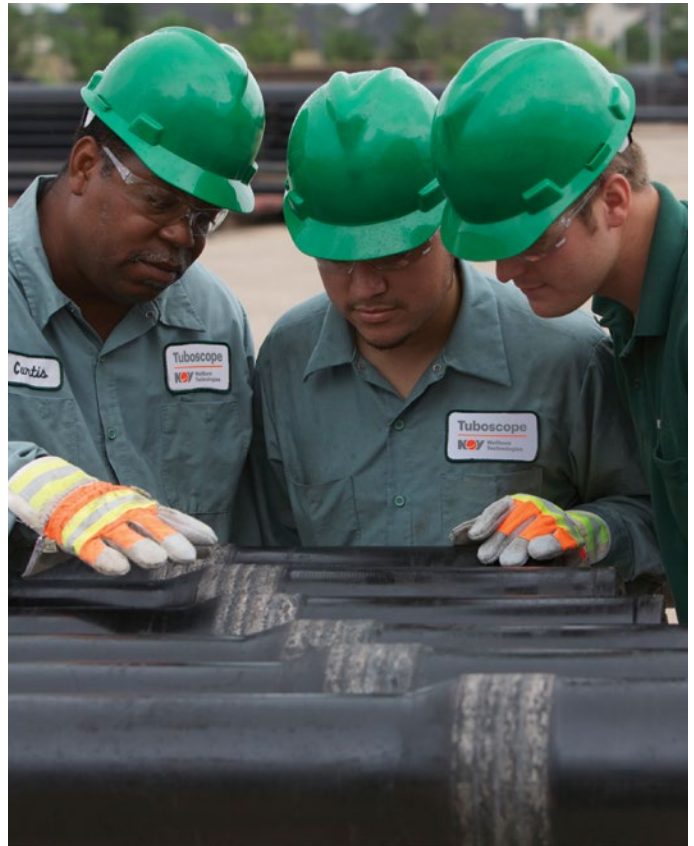


TCS Hardband products are tested to new API CW7 test standards.

## Full Field Application Capability

### When and Where You Need It

Combining qualified personnel with our mobile equipment turns your drill site into our work site. We get you back up and running quickly, by providing hardbanding services on new & used drill pipe, heavy weight, and drill collars, when and where you need it. In addition to the application of our proprietary hardbanding, we have the capability to apply most other hardband products.



## Field-Proven Hardbanding Alloys

### TCS™ Titanium (Premium Casing Friendly)

TCS Titanium is formulated for excellent casing wear protection and provides high stress abrasion resistance with unmatched resistance to cracking and spalling. Titanium carbides on their own are approximately 40% harder than tungsten carbide. The TCS Titanium microstructure exhibits smooth round particles, which help prevent galling problems on metal-to-metal contact. This combination gives a superb balance between abrasion and crack sensitivity that results in both reduced tool joint wear and casing wear.

#### Benefits

- Superior casing wear protection
- Crack-free
- Extremely low coefficient of friction
- Extended tool joint life
- High stress abrasion resistance
- Unlimited reapplication in the field of all TCS products
- Field reapplication over select competitive products\*
- Superior adhesion properties mean non-spalling

\*Reapplication over existing hardbanding that exhibits stress cracks or visible porosity is not recommended

### TCS™-XL (Casing Friendly)

Drilling costs are on the rise, making the need to protect your drill pipe and casing investment more important than ever. With our cost-effective TCS-XL hardband material, we are committed to providing the best combination of tool joint wear and casing protection. With ease of application via spray metal transfer, this niobium-based product can reduce application cost on used pipe for excellent tool joint and casing protection.

### Tungsten Carbide (Non-Casing Friendly)

Tungsten carbide is the original drill pipe hardfacing protection. Tuboscope applies various mesh sizes of crushed and spherical tungsten that is extremely effective on bottom hole assemblies which normally operate in open hole environments.

For extreme drilling environments, TCS-XL can be applied utilizing spherical tungsten to maximize tooljoint wear on BHA's in abrasive environments. TCS-XL applied with tungsten is not a casing friendly application.

### Completion Tubing Hardbanding

For ultimate upset protection of new and used completion tubing, no other casing friendly hardband offers more durability for work strings. A maximum of one (1) band is applied to both box and pin upset near the taper. This application allows future re-cuts, therefore extending the life of the string.



TCS-XL used pipe application



NOV Inc. has produced this brochure for general information only, and it is not intended for design purposes. Although every effort has been made to maintain the accuracy and reliability of its contents, NOV Inc. in no way assumes responsibility for liability for any loss, damage or injury resulting from the use of information and data herein. All applications for the material described are at the user's risk and are the user's responsibility.

© 2022 NOV Inc. All rights reserved.  
JIRA 17977

**Corporate Headquarters**  
7909 Parkwood Circle Drive  
Houston, Texas 77036  
USA

**Solutions Headquarters**  
2835 Holmes Road  
Houston, Texas 77051  
USA  
**Phone:** 713 799 5100