DRILL-GUARD: the ultimate protection for your drill string and casing

Each of the DRILL-GUARD premium hardbanding wires are designed and manufactured in-house utilizing our own technology from extensive Oil & Gas industry knowledge. We are confident in the superiority of our hardbanding wires because we have control of the entire process as outlined below.

- Formulation / Chemistry of each wire which is specifically designed for the Oil & Gas Industry
  - Crack-Free
  - Non-Spalling
  - Casing Friendly
  - Wear-Resistance
  - Re-Applicable
  - Compatibility
- Sourcing of the high grade raw materials with QC verification
- Optimal mixing times for the alloyed metallic powder cores
- In-house manufacturing with our proprietary mills
- Heat treatment
- Exceptional quality control
- Precision spooling and packaging
- Warehousing and inventory control prior to shipment
- Training and support to the drill pipe and BHA manufacturers as well as hardband service applicators
- Education and support to drilling contractors, Oil & Gas operators, and rental fleet companies

Fearnley Procter NS-1™ Level 3: Welding Alloys is the only company to have all drill pipe hardbanding wires certified to the highest level.

DRILL-GUARD Ti | DRILL-GUARD Nb | DRILL-GUARD CC

**DRILL-GUARD Ti**

**Best in class: tool joint protection**

- Superior wear performance
- Hardness: 55 to 58 Rockwell “C” Scale
- Titanium, vanadium, and niobium carbides

**API ® Standard 7CW Casing Wear Tests**
- Casing Wear Factor: 0.63 x 10-10 psi-1
- Frictional Factor: 0.26 dimensionless
- Hardband OD Loss: 0.001 in
- Tool Joint Weight Loss: 0.000 lbs

**DRILL-GUARD Nb**

**Best in class: welding operator appeal**

- Excellent wear performance
- Hardness: 58 to 61 Rockwell “C” Scale
- Niobium, vanadium, and titanium carbides

**API ® Standard 7CW Casing Wear Tests**
- Casing Wear Factor: 0.91 x 10-10 psi-1
- Frictional Factor: 0.33 dimensionless
- Hardband OD Loss: 0.002 in
- Tool Joint Weight Loss: 0.010 lbs

**DRILL-GUARD CC**

**Best in class: compatibility**

- Very Good wear performance
- Hardness: 55 to 57 Rockwell “C” Scale
- Multi-carbides

**API ® Standard 7CW Casing Wear Tests**
- Casing Wear Factor: 0.94 x 10-10 psi-1
- Frictional Factor: 0.36 dimensionless
- Hardband OD Loss: 0.009 in
- Tool Joint Weight Loss: 0.070 lbs

**DRILL-GUARD Non Mag**

**Best in class: crack resistant and welding operator appeal**

- Non Magnetic Austenitic Deposit
- Corrosion Resistant
- Metal Cored = Increased Productivity
- Buildup and / or Hardbanding
- Permeability ≤ 1.005 (less than half of the allowable by API)
- No post heat treatment or shot peening

**API ® Standard 7CW Casing Wear Tests**
- T-95 casing
- 3000 lb / ft side load
- 155 rpm
- 74,400 revolutions

Highest grade metallic powders and strip.

In-house proprietary mills manufacturing hardbanding wire.

Every DRILL-GUARD batch has a six layer welded test and a spectrometer verifies that chemistry meets the stringent specifications.

Microstructure of DRILL-GUARD Ti magnification x200.

Wet mag particle testing performed on DRILL-GUARD Nb at Accu-Test labs in Houston, TX.

DRILL-GUARD Ti sustained 26,647 lbs (12,086 kg) of force on a 1” (2.5 cm) Ring Test prior to yielding without any spalling, flaking, or delamination. The testing was performed at Accu-Test labs in Houston, TX.

DRILL-GUARD Nb-API Standard 7CW Casing (T-95) Wear Testing after successfully completing the Open Hole Testing. The testing was performed at Stress Engineering in Houston, TX.

CRACK-FREE → NON-SPALLING → CASING FRIENDLY → WEAR-RESISTANCE → RE-APPLICABLE → COMPATIBILITY
Our Technical ‘Spark’ Solves Your Industrial Challenges

Founded in 1966, Welding Alloys Group is the global specialist in alloyed cored welding wires. Each of our DRILL-GUARD hardbanding wires is specifically formulated and manufactured in-house to provide superior protection to the drill string while preserving the integrity of the casing.

A worldwide presence

For technical expertise, please contact: sales@drill-guard.com
www.drill-guard.com

www.welding-alloys.com