

DRILCO



Defender

Premium hardbanding wires

60
YEARS



Premium abrasion and wear protection for tubulars

For more than 60 years, DRILCO has provided the highest quality hardbanding materials to extend tubular life on drilling operations around the world. DRILCO premium hardbanding wires are designed for both openhole and casing-friendly applications, which increases tubular durability and maximizes wear resistance on drill collars, drillpipe, heavy wall drillpipe, casing, and other tools used in drilling applications.



Defender premium hardbanding

Hardbanding is the most effective way to reduce wear rates on tubulars and casing strings. When placed on the tool joints and center wear pads, hardbanding increases abrasion resistance and extends service life.

DRILCO Defender* premium hardbanding wires provide hardbanding solutions for both openhole and cased hole drilling. Defender premium hardbanding wires—designed and manufactured using the highest grade of raw materials—can be applied over previous DRILCO applications as well as other hardbands.

Proper inspection and evaluation of previous hardbands and surrounding base materials are inherent in all DRILCO hardbanding procedures.

Advantages

- Field hardbanding personnel undergo an extensive training and qualification program covering all aspects of oilfield hardband applications.
- Highly trained personnel use state-of-the-art calibrated equipment to ensure reliable performance for every application.
- Premium hardbanding materials are specifically formulated using high-grade raw materials for greater durability.



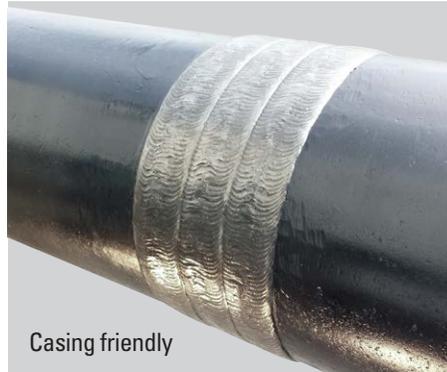
Defender MAX

Defender MAX* metal-cored hardbanding wire is designed to operate in openhole or cased hole environments. In openhole applications, tungsten carbide is dropped into the molten hardband. The matrix is designed and formulated to hold the carbide throughout the life cycle of the handband.

Defender MAX hardbanding wire is designed with a low coefficient of friction for casing-friendly applications. It is a combination of crack-free, nonporous, deposited, work-hardening hardband.

Advantages

- Noncracking
- Nonspalling
- Reapplicability
- Tough hard matrix
- Hardness values between 53 and 56 on the Rockwell C scale (HRC)
- Single- or double-layer applications
- Openhole durability with tungsten drop
- Casing friendly without tungsten drop
- Cored wire formulation to optimize performance



Specifications

Wire diameter, in [mm]	1/16 [1.6]
Polarity, current	Reverse, DC electrode positive
Shielding gas	98% Ar, 2% O ₂ @ 35 CFH [16 L/m]
Voltage	27–33 (typical 29)
Amperage	280–360 (typical 320)
Wire feed speed, in/min [mm/s]	260–330 [110–140] (typical 300 [125])
Electrode stickout, in [mm]	3/4–1 1/4 [19–32] (typical 1/2 [22])
Preheat temperature for 5 1/2- to 6 1/4-in OD, degF [degC] [†]	450 [230]
Max. interpass temperature, degF [degC]	725 [385]
Cooling rate control, degF [degC]	Slow cool until below 150 [65]

[†]Dependent on drill collar tool joint, material, and diameter

Defender ULTRA

Defender ULTRA* flux-cored hardbanding wire is designed and formulated to provide a combination of crack-free and nonporous deposited hardband. It provides optimal protection to the tool joint while minimizing wear to the casing.

In harsh, remote environments with strong winds, Defender ULTRA hardbanding wire operates with or without shielding gas to provide a premium hardband not otherwise available.

Advantages

- Noncracking
- Nonspalling
- Reapplicability
- Casing friendly
- Openhole durability
- Hardness values between 53 and 56 HRC
- Single- and double-layer applications
- Self-shielded gasless or gas-shielded hardbanding
- Cored wire formulation to optimize performance



Specifications

Wire diameter, in [mm]	1/16 [1.6]
Polarity, current	Reverse, DC electrode positive
Shielding gas	None required if self-shielded (if used: 98% Ar, 2% O ₂ @ 35 CFH [16 L/m])
Voltage	27–33 (typical 28)
Amperage	280–320 (typical 290)
Wire feed speed, in/min [mm/s]	320–400 [135–170] (typical 350 [150])
Electrode stickout, in [mm]	3/4–1 1/4 [19–32] (typical 3/4 [19])
Preheat temperature for 5 1/2-in to 6 1/4-in OD, degF [degC] ¹	450 [230]
Max. interpass temperature, degF/h [degC/h]	725 [385]
Cooling rate control, degF [degC]	Slow cool until below 150 [65]

¹Dependent on drill collar tool joint, material, and diameter

Defender NON-MAG ELITE

Designed to protect nonmagnetic drill collars and flex pipe, Defender NON-MAG ELITE* metal-cored hardbanding wire is applied to standard austenitic stainless steels, chromium-manganese, and nitrogen-bearing austenitic stainless steels. This metal-cored hardband is a tough corrosion-resistant, highly alloyed austenitic deposit with a typical permeability value of 1.005, which is half the maximum API permeability value of 1.010. Permeability is the measurement of a material's susceptibility to become magnetic by external magnetic fields such as the Earth's magnetic field.

Defender NON-MAG ELITE hardbanding wire is enhanced with a tungsten drop that disperses evenly throughout. The formulation of the wire provides consistent and uniform arc transfer with low fumes to optimize performance.

Heat control is critical on nonmagnetic tools during hardbanding applications. DRILCO carefully controls application temperatures with typical heat signatures of approximately 275 degF [135 degC] after five 1-in bands on a 6½-in by 3¼-in drill collar.

Advantages

- Noncracking
- Nonspalling
- Reapplicability
- Enhanced productivity
- Low fumes during hardbanding
- Highly alloyed austenitic deposit
- Tough and corrosion resistant
- Cored wire formulation to optimize performance
- Tungsten carbide to enhance wear resistance
- Low-heat signature during application



Specifications

Wire diameter, in [mm]	1/16 [1.6]
Polarity, current	Reverse, DC electrode positive
Shielding gas	98% Ar, 2% CO ₂ or 100% Ar @ 35 CFH [16 L/m]
Voltage	26–30 (typical 29)
Amperage	280–320 (typical 300)
Wire feed speed, in/min [mm/s]	260–330 [110–140] (typical 300 [125])
Electrode stickout, in [mm]	3/4–1 1/4 [19–32] (typical 3/4 [19])
Preheat temperature, degF [degC]	100 [40]
Max. interpass temperature, degF [degC]	400 [205] (typical 275 [135])

Defender



Find out more about DRILCO premium hardbanding and tubular product maintenance at DRILCO.com/Defender

DRILCO Inspection Services

Qualified DRILCO personnel offer a full range of inspection services, which include third-party and customer-defined standards.

DRILCO Machine Shop Services

For common tubular connections or proprietary connections requiring licensing, DRILCO machine shop facilities are strategically located around the globe for fast response, 24/7.

DRILCO Tubular Management Services

Tubular management services provide tubular inventory visibility, storage location management, and centralized maintenance to reduce repair time.

DRILCO.com/Defender

DRILCO