

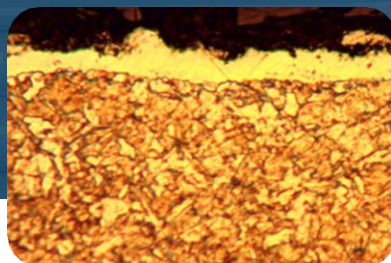
# Hard-Corr™



## Long Life Production Tubing for Extended Run Times

### Benefits

- ✓ Protection for OD, ID, and threads
- ✓ Extends tubing string life
- ✓ Reduces hole in tubing failures
- ✓ Increases mean time between failures (MTBF)
- ✓ Reduces frequency of costly workovers
- ✓ Reduces downtime on wells and lost oil production



Microstructure of  
Hard-Corr layer

### Performance

#### **2x increase in wear / erosion resistance of both OD and ID compared to standard tubing**

- ✓ Reduces rod on tubing wear and erosion failures
- ✓ 55 to 65 HRC (600 to 800 Vickers) surface hardness compared to 23 HRC maximum (250 Vickers) for standard tubing
- ✓ Hardness exceeds 50 HRC (513 Vickers) to .003" inch depth below surface

#### **2x increase in corrosion resistance of both OD and ID surfaces compared to standard tubing**

- ✓ Reduces hole in tubing failures from both internal and external corrosion pitting
- ✓ Resistant to H<sub>2</sub>S and CO<sub>2</sub>, chlorides, and produced water
- ✓ Recommended for use in wells with up to 1000 ppm H<sub>2</sub>S and unlimited amounts of CO<sub>2</sub>

#### **Case hardened heat treatment performed on ID and OD surfaces**

- ✓ Diffusion process with no change to ID and OD dimensions
- ✓ No risk of delamination or peeling

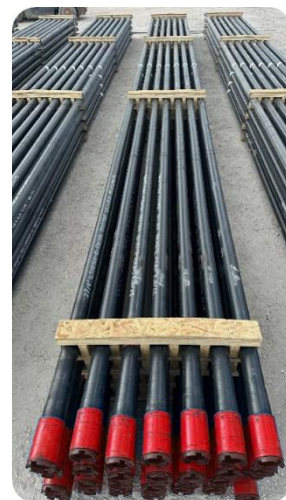
**Economical solution for full string**

### Typical Installation

- ✓ Recommended practice is to install boronized tubing (BOR-1Cr) at locations with severe wear, erosion and corrosion while running Hard-Corr tubing in the balance of the full tubing string
- ✓ Annular flow wells will benefit from OD protection that only Hard-Corr tubing can provide
- ✓ Hard-Corr is often chosen as an economical replacement for 13Cr

### Features

- ✓ 1Cr steel base material
- ✓ Provides protection to OD, ID, and threads for tubing and couplings
- ✓ 2-3/8", 2-7/8", and 3-1/2" available
- ✓ Able to withstand elevated temperatures up to 500°F
- ✓ Reduced coefficient of friction on OD and ID surfaces
- ✓ L80 grade core properties



**Please contact our experts with any questions or to discuss the best solution for your unique application**

#### **Bluewater Thermal Solutions**

1733 Lauder Road  
Houston TX 77039  
+1-877-990-0050  
[www.bluewaterthermal.com](http://www.bluewaterthermal.com)  
[sales@bluewaterthermal.com](mailto:sales@bluewaterthermal.com)