

Tubing Product Comparison Guide



Characteristic	Bare L80	Hard-Corr™	BOR-Carbon™	BOR-1Cr CY™
Base Material	Plain carbon steel	1Cr steel	Plain carbon steel	1Cr steel
Type of protection	None	Diffusion case hardening heat treatment	Diffusion case hardening heat treatment	Diffusion case hardening heat treatment
Location of protection	None	OD and ID	ID only	ID only
Surface Hardness	180 to 250 Vickers	600 to 800 Vickers	1200 to 1900 Vickers	1200 to 1900 Vickers
Protective Layer Thickness	none	>500 Vickers to 75 micron depth	125 to 375 microns	125 to 375 microns
Core Properties	L80 grade	L80 grade	50 to 60 ksi yield	60 to 80 ksi yield
Wear / Erosion resistance (relative to standard L80)	1x	2x	20x	20x
Corrosion resistance (relative to standard L80)	1x	2x	8x on ID bore	8x on ID bore 2x on OD surface
H2S protection	-	up to 1000 ppm	up to 30%	up to 30%
CO2 protection	-	no limitation	no limitation	no limitation
Temperature	-	up to 500°F	up to 1100°F	up to 1100°F
Pressures	to yield strength of tubing	to yield strength of tubing	to yield strength of tubing	to yield strength of tubing
Annular flow protection	None	Yes	None	None
Potential 13Cr replacement	No	Yes	No	No
Primary Applications	Areas with no wear, erosion, corrosion issues	Use in less severe locations with light wear, erosion, and corrosion. Able to be run as full string solution and at higher locations than boronized tubing	Use in harsh conditions where tubing failures are most likely to occur from severe wear, erosion, and corrosion	Use in harshest conditions where tubing failures are most likely to occur from severe wear, erosion, and corrosion. Recommended for wells with with external corrosion pitting
Optimized installation recommendation		Install combined string of Hard-Corr plus BOR-Carbon or BOR-1Cr CY tubing Install boronized tubing at most severe locations that need extreme protection where hole in tubing failures are most common Install additional Hard-Corr tubing in all other areas to prevent hole in tubing failures outside of the boronized tubing section		

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

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