

# Hydraulic Control Lines, Fittings, and Banding Kits

## HYDRAULIC CONTROL LINES

Schlumberger provides either welded or seamless hydraulic control line, supplied by leading manufacturers, for subsurface applications. Hydraulic control line is available in three materials, varying wall thicknesses, and a wide range of working pressure ratings. The line is supplied on spools to exact length requirements. Upon request, it is pressure tested hydraulically, purged with clean oil, and sealed on both ends prior to shipping.

Welded hydraulic control line is sunk-drawn to ASTM specification A-269 and is available in any length. Seamless hydraulic control line is available in lengths to 500 ft [152 m]. Lengths greater than 500 ft [152 m] are joined by orbital welding, which also meets ASTM specification A-269.

Material types for hydraulic control line include T316/T316L stainless steel, Incoloy<sup>®</sup> 825, and Incoloy 625. Control line made of T316/T316L stainless steel is suitable for sweet to moderately corrosive environments. Incoloy 825 and 625 are suitable for severely corrosive environments and high-working pressures and temperatures. Control system fluids must be compatible with the environments and operating temperatures of the control line.

Control line encapsulation also is available, where requested, to provide additional crush and abrasion resistance during installation. The encapsulation material should be matched for compatibility with well fluids and temperature requirements.

## HYDRAULIC FITTINGS

Schlumberger provides its proprietary inverted dual-ferrule connections as a standard across the entire safety valve range, except for special order or ultrahigh-pressure applications. The ¼-in [6.4-mm] fittings feature silver-coated threads to prevent galling. The nut is available in either Inconel<sup>®</sup> 925 or Inconel 718. The ferrules are available in 316 stainless steel or Incoloy 825, but should be matched to the control line material to ensure that the ferrule will bite into the control line and is suitable for the application. These fittings are rated to the working pressure of the control line. Pressure tests of these fittings to 40,000 psi [275,800 kPa] have been achieved, using suitable control line, with no failures.

## BANDING KITS

Banding kits, assembled from components supplied by leading manufacturers, contain the items and tools necessary to rigidly band hydraulic control line to the tubing string. Banding protects the line and helps support control line and tubing string weight to reduce tensile loading on the wellhead fitting of the line. Supplied in either ½- or ⅝-in [12.7- or 15.8-mm] widths, these banding kits are available in 316 stainless steel for sweet to moderately corrosive environments or 400 Monel<sup>®</sup> for more corrosive environments. In completions using multiple conduits, Schlumberger recommends the use of LaSalle cast clamp systems.

### Engineering Data for Hydraulic Control Line

#### Welded Line<sup>†</sup>

OD (in [mm])	Wall Thickness (in [mm])	Material	Recommended Working Pressure <sup>‡</sup> (psi [kPa])
0.250 [6.4]	0.049 [1.2]	316L Stainless Steel	7,500 [51,713]
		Incoloy 825	10,000 [68,950]
0.375 [9.5]	0.065 [1.7]	316L Stainless Steel	7,500 [51,713]
	0.049 [1.2]	Incoloy 825	
	0.065 [1.7]		10,000 [68,950]

#### Seamless Line<sup>§</sup>

0.250 [6.4]	0.049 [1.2]	316L Stainless Steel	10,000 [68,950]
	0.065 [1.7]		12,500 [86,188]
	0.049 [1.2]	Incoloy 825	13,500 [93,083]
	0.065 [1.7]		17,500 [120,663]
0.375 [9.5]	0.049 [1.2]	316L Stainless Steel	6,500 [44,818]
		Incoloy 825	9,000 [62,055]
		Incoloy 625	15,000 [103,425]

<sup>†</sup>Welded and sunk-drawn to ASTM specification A-269.

<sup>‡</sup>For subsurface applications.

<sup>§</sup>Weld-free coils are available in lengths to 500 ft [152 m]; greater lengths must be joined by orbital welding.