

Drill Collars — Standard and Spiral

The most prevalent component within the bottomhole assembly (BHA)

The DRILCO drill collar stands out as not just the most prevalent component within the bottomhole assembly (BHA), but also as the most crucial for its overall efficiency. The meticulous attention given to material selection, heat treatment, machining, and inspection underscores why DRILCO drill collars consistently outperform others. By assisting operators in choosing optimal connections and appropriate optional features, DRILCO seamlessly blends top-quality products with expert advice, ensuring trouble-free BHA performance.

DRILL COLLAR SPECIFICATIONS

Drill collar connection size and type, in.	Minimum OD, in.	Bore, in.	Length, ft	Bending strength ratio [†]	Drill collar weight, lbm
NC 26 (2 ³ / ₈ IF)	3 ¹ / ₂	1 ¹ / ₂	30	2.42:1	801
NC 31 (2 ⁷ / ₈ IF)	4 ¹ / ₈	2	30	2.43:1	1,041
NC 38 (3 ¹ / ₂ IF)	4 ³ / ₄	2 ¹ / ₄	31	1.85:1	1,451
NC 38 (3 ¹ / ₂ IF)	5	2 ¹ / ₄	31	2.38:1	1,652
NC 44	6	2 ¹ / ₄	31	2.49:1	2,561
NC 44	6	2 ¹³ / ₁₆	31	2.84:1	2,353
NC 44	6 ¹ / ₄	2 ¹ / ₄	31	2.91:1	2,806
NC 46 (4 IF)	6 ¹ / ₄	2 ¹³ / ₁₆	31	2.63:1	2,598
NC 46 (4 IF)	6 ¹ / ₂	2 ¹ / ₄	31	2.76:1	3,085
NC 46 (4 IF)	6 ¹ / ₂	2 ¹³ / ₁₆	31	3.05:1	2,877
NC 46 (4 IF)	6 ³ / ₄	2 ¹ / ₄	31	3.18:1	3,364
NC 50 (4 ¹ / ₂ IF)	7	2 ¹ / ₄	31	2.54:1	3,643
NC 50 (4 ¹ / ₂ IF)	7	2 ¹³ / ₁₆	31	2.73:1	3,434
NC 50 (4 ¹ / ₂ IF)	7 ¹ / ₄	2 ¹³ / ₁₆	31	3.12:1	3,714
NC 56	8	2 ¹³ / ₁₆	31	3.02:1	4,675
6 ⁵ / ₈ Reg	8	2 ¹³ / ₁₆	31	2.60:1	4,675
6 ⁵ / ₈ Reg	8 ¹ / ₄	2 ¹³ / ₁₆	31	2.93:1	5,016
7 ⁵ / ₈ Reg	9 ¹ / ₂	3	31	2.81:1	6,727
7 ⁵ / ₈ Reg [‡]	9 ³ / ₄	3	31	3.09:1	7,130
8 ⁵ / ₈ Reg [‡]	11	3	30	2.78:1	8,970

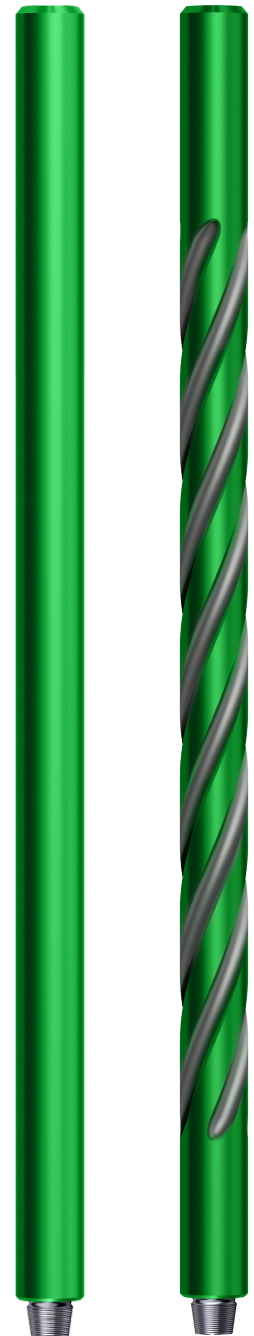
[†] Ratio of box-to-pin section modulus. See API RP7G for explanation.

[‡] Low torque face

Notes: Other sizes and connections are available. Optional features available upon request. The 4³/₄-in. OD drill collar is the smallest diameter that can be hardbanded. The weight of a round drill collar will be reduced by approximately four percent by spiral conversion.

Ordering instructions, please specify:

- Drill collar OD
- Drill collar bore ID
- Length of drill collar
- Size, type and location of connections (e.g. NC 50 box up × NC 50 pin down)
- Cast or pressed steel thread protectors
- Hardbanding — refer to the hardbanding section in this catalog for available options



Standard drill collar, left, and spiraled drill collar, right

Drill Collars — Standard and Spiral

Features

- Materials can be specified for conformance to standard industry requirements such as API Specification 7-1, as well as NS-1, and individual customer specifications.
- Rolled, milled or machined surface finishes are available.
- The critical threaded section has a hardness range of 285 to 341 BHN and a Charpy impact value of 40 ft.lbf at room temperature guaranteed 1-in. below the surface.
- New drill collar connections are manufactured to the specifications contained in the API Specification 7-1.
- Connections are phosphate-coated to protect them from the elements after machining and to help prevent galling upon initial makeup.
- Thread roots are cold rolled on API and H-90 connections; (excluding the 2 $\frac{3}{8}$ -, 2 $\frac{7}{8}$ -in. Reg and Slim-Line H-90.) Cold rolling compresses the fibers in the thread root making this area of the connection more fatigue-resistant.
- Pressed steel thread protectors are supplied for all drill collars that are equipped with standard connections.
- All drill collars undergo rigorous quality assurance checks during manufacturing, including ultrasonic testing of drill collar bars after heat-treating.

Optional Features

- Slip and elevator recesses reduce drill collar handling time by eliminating lift subs and safety clamps. Extreme care is taken to machine smooth radii free of tool marks. Cold rolling the radii at the upper shoulder of each recess extends the fatigue life of the drill collar. Slip and elevator recesses may be provided together or separately.
- An API stress-relief groove on the pin and an API bore back box are available on request, and are recommended for drill collars and all downhole tools where fatigue can occur as a result of bending. These features remove unengaged threads in the highly stressed areas of the drill collar connection so that bending occurs in the connection in areas with smooth surfaces free of stress concentrations. Consequently, the connection is less likely to crack because of fatigue.

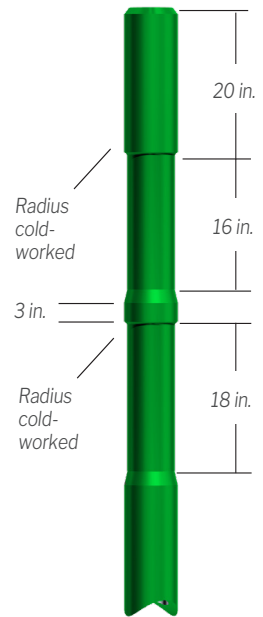
Note: Stress relief features are not commonly utilized for connections on sizes NC 38 and smaller.

- Spiral drill collars reduce the area of contact between the drill collar and the borehole wall. This feature is advantageous where differential sticking is a problem.
- Drill collar hardbanding is the most effective means of reducing the wear of the collar OD that occurs during normal openhole drilling. Standard hardbanding material consists of

granular tungsten carbide that is added to the molten weld puddle to obtain uniform distribution of the tungsten carbide particles. The resulting deposit is flush to $\frac{1}{32}$ in. beyond the collar OD. Hardbanding should not be applied to the box end unless the drill collar has been equipped with a slip recess because hardbanding will cover the normal slip area. **Note: The 4 $\frac{3}{4}$ -in. OD drill collar is the smallest diameter that can be hardbanded.**

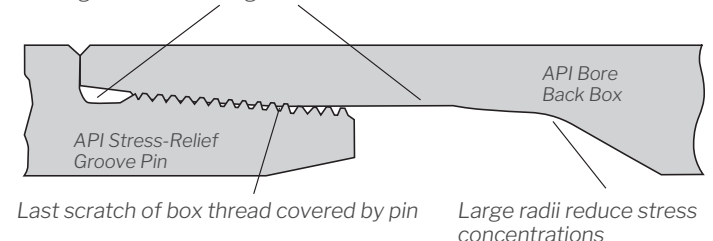
Applications

- Drilling weight is the primary application of drill collars. The buoyed weight of a typical drill collar string is approximately 15% more than the maximum WOB required for optimum bit performance, ensuring that enough drill collars are run in compression to maintain the neutral point within the drill collar string.
- Proper drill collar sizing results in improved borehole integrity, enabling the desired casing size to be run to bottom. The drill collar limits the lateral movement of the drill bit in the absence of larger diameter drilling tools.
- Drill collar stiffness is important for drilling and maintaining a straight wellbore. The first 90 ft of BHA above the bit have the greatest impact on hole straightness and drill collar stiffness should be optimized in this section. Please refer to the "DRILCO Drilling Assembly Handbook" for more information.



Slip and elevator recess option. **Note:** Slip and elevator recesses may be used together or separately.

Smooth surface free of tool marks increases flexibility and permits bending without cracking



Stress-relief option.