COROD® High-Strength (SE/SER) Continuous Rod

Weatherford's *COROD* high-strength (SE/SER) continuous rod is designed for heavy-load reciprocating and rotary pumping in deep, high-volume wells with mildly corrosive environments and more corrosive environments that are effectively inhibited. *COROD* SE/SER is made from a chrome-molybdenum special alloy, microalloyed with titanium to improve its mechanical and heat-treating properties. Its chromium content is increased to 2 percent to improve corrosion resistance in certain applications. This product is available in multiple round and semi-elliptical sizes to suit a wide range of applications.

COROD continuous rod provides a superior alternative to conventional sucker rods. Unlike conventional sucker rods, which are coupled every 25 or 30 ft (7.6 or 9.1 m), *COROD* continuous rod requires couplings only at the top and bottom of the rod string, regardless of well depth. This innovative solution reduces pin and coupling failures by decreasing the number of threaded connections, thereby minimizing the potential for rod string failures and costly well interventions. With more uniform contact loads and a lighter weight that reduces torque and power requirements for rotary-based applications, *COROD* continuous rod also extends the lifespan of tubing. Installation is quick, and Weatherford offers a full array of field servicing options.

Applications

- Rotary (progressing cavity pumping) systems
- Reciprocating-rod-lift systems

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Features, Advantages and Benefits

- Fewer threaded connections on the rod string reduce the potential for pin and coupling failures as well as the need for costly well interventions.
- The uniform body design evenly distributes contact loads over the entire rod, reducing the severity of tubing and rod wear.
- The large annular space minimizes pressure losses.
- The rod strings are lighter than conventional sucker-rod strings, reducing the amount of weight on the service unit.
- The finished product undergoes a cold-working process (known as *shot peening*) to produce a residual stress on the outside layer of the material, which in turn increases resistance to fatigue and corrosion failure.

Specifications

Minimum tensile strength (psi/*MPa*)	140,000 *965*
Minimum yield strength (psi/*MPa*)	115,000 *790*
Maximum average hardness	Rockwell: 36 Brinell: 336
Heat treatment	Quenched and tempered

Chemical Composition

Note: all elements in % by weight

Material	Carbon	Manganese	Phosphorus Maximum	Sulphur Maximum	Silicon	Nickel Maximum	Chromium	Molybdenum	Aluminum	Titanium	Copper
4120M	0.18 to 0.23	0.40 to 0.60	0.015	0.010	0.15 to 0.30	0.25	1.80 to 2.00	0.15 to 0.20	0.020 to 0.050	0.005 to 0.020	0.20 to 0.30

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Product Type

Round

(Rotary and reciprocating applications)

COROD Number	COROD Size (in./*mm*)	Minimum Weight (lb/ft, *kg/m*)	Minimum Area (in.^{2}/*mm*^{2})	Maximum Torque (ft lb/*N•m*)
SER 8.5	1-5/32 *29.4*	3.57 *5.32*	1.050 *678*	2,000 *2,712*
SER 6	1 *25.4*	2.67 *3.98*	0.785 *507*	1,300 *1,763*
SER 4	7/8 *22.2*	2.04 *3.05*	0.601 *388*	900 *1,220*
SER 3	13/16 *20.6*	1.76 *2.63*	0.518 *335*	700 *950*

Semi-Elliptical

(Reciprocating applications)

COROD Number	COROD Size (in./*mm*)	Minimum Weight (lb/ft, *kg/m*)	Minimum Area (in.^{2}/*mm*^{2})
SE 8	1-1/8 *28.6*	3.38 *5.03*	0.994 *642*
SE 7	17/16 *27.0*	3.01 *4.49*	0.886 *572*
SE 6	1 *25.4*	2.67 *3.98*	0.785 *507*
SE 5	15/16 *23.8*	2.35 *3.50*	0.690 *445*
SE 4	7/8 *22.2*	2.04 *3.05*	0.601 *388*
SE 3	13/16 *20.6*	1.76 *2.63*	0.518 *335*

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