

## COILED ROD SOLUTIONS

### The Pro-Rod™ Advantage

Pro-Rod™ has earned the reputation as the industry-leader in the coiled rod market with our commitment to solving client challenges.



### The Benefits of Coiled Rod



Conventional coupled rod



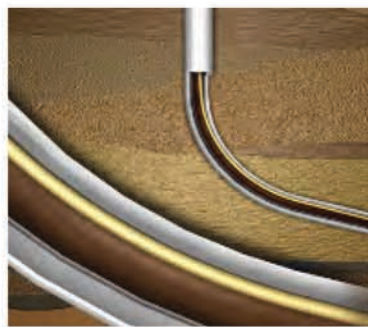
Coiled rod

#### INCREASED PRODUCTION

- Unrestricted flow and decreased pressure drops across couplings creates more production.
- Removal of rod coupling-piston effect facilitates laminar flow.



Conventional coupled rod



Coiled rod

#### REDUCE WELL DOWNTIMES AND MAINTENANCE

- Eliminating couplings prevents an estimated 75% of rod string failures.
- Coiled rod distributes side loadings and reduces tubing wear.

November 19, 2019

## Maximum Recommended Weight Indicator Pull on a Coiled Sucker Rod String

The following calculates the maximum rig weight indicator pull on a stuck rod string. The calculations are based on 90% of the minimum yield strength, for a rod string in "like new" condition. The maximum load should be reached by a straight, steady pull and not a shock load.

For a tapered string, calculate the total weight in pounds of all rods above the bottom section. Add to this weight the values in the table below for the rod type and size of the bottom section. This is the maximum load that should be pulled on a rod string. For a straight rod string, the table values are the maximum pull.

### Maximum Recommended Weight Indicator Pull

Rod Type	Size - in. (mm)	Load in Pounds (daN)	Rod Type	Size - in. (mm)	Load in Pounds (daN)
Type 620C & 780M	13/16 (20.6)	44,330 (19,718)	Type 960M	13/16 (20.6)	53,660 (23,869)
	7/8 (22.2)	51,410 (22,868)		7/8 (22.2)	62,240 (27,683)
	1 (25.4)	67,150 (29,869)		1 (25.4)	81,290 (36,157)
	1 1/8 (28.6)	84,990 (37,803)		1 1/8 (28.6)	102,880 (45,762)
Type 750N	13/16 (20.6)	46,665 (20,756)	Type 800C	1 (25.4)	77,715 (34,569)
	7/8 (22.2)	54,120 (24,072)		1 1/8 (28.6)	98,406 (43,773)
	1 (25.4)	70,685 (31,441)	Type 880H & 970N	13/16 (20.6)	56,000 (24,907)
	1 1/8 (28.6)	89,460 (39,793)		7/8 (22.2)	64,940 (28,887)
			1 (25.4)	84,820 (37,729)	

### Maximum Allowable Torque

Maximum Service		All Torque Values are ft-lbs (N-m)					
Rod Size in. (mm)	Grade D Carbon (620C) AISI 1536M	Grade D Alloy (780M) AISI 4120M	Grade D Special Alloy (750N) AISI 4320M	Special Service (800C) AISI 1536M	Special Service (880H) Proprietary	Special Service (960M) AISI 4120M	Special Service (970N) AISI 4330M
13/16 (20.6)	540 (732)	565 (766)	580 (786)	-	-	725 (983)	725 (983)
7/8 (22.2)	680 (922)	735 (997)	750 (1,017)	-	-	900 (1,220)	900 (1,220)
1 (25.4)	1,015 (1,376)	1,100 (1,491)	1,110 (1,505)	1,242 (1,684)	1,565 (2,122)	1,350 (1,830)	1,350 (1,830)
1 1/8 (28.6)	1,445 (1,959)	1,535 (2,081)	1,550 (2,101)	1,768 (2,397)	2,230 (3,023)	1,900 (2,576)	1,900 (2,576)

\* All values based on rod in like new condition.

\* To maximize rod fatigue life, Pro-Rod recommends using a 0.8 safety factor.

\* Correct rod end makeup connection is critical to the operation of a Progressing Cavity Pump installation.

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