Apergy®

PRO-ROD COILED ROD SOLUTIONS

Coiled Sucker Rod Selection Guide

SPECIFICATIONS

Pro-Rod® manufactures the following types of coiled rod to meet any pumping condition.

Type 620C Grade D (Carbon) – AISI 1536M Carbon-Manganese Alloy Steel. Designed for medium to heavy loads at any depth in non-corrosive well fluids. This grade can be utilized in both reciprocating and Progressing Cavity Pump (PCP) applications.

Type 780M Grade D (Alloy) – AISI 4120M Chromium-Molybdenum Alloy Steel. Designed for heavy rod loads at any depth in mild to medium corrosive well fluids that are effectively inhibited against corrosion attack. This grade has been alloyed and effectively heat-treated to resist corrosion and fatigue. Type 780M rods are recommended for both reciprocating and Progressing Cavity Pump (PCP) applications.

Type 750N Grade D (Special Alloy) – AISI 4320M Nickel-Chromium-Molybdenum Alloy Steel. Designed for heavy loads at any depth in corrosive well fluids that are effectively inhibited against corrosion attack. This grade had been alloyed and then effectively heat-treated to maximize its corrosion and fatigue resistance. Type 750N rods are ideally suited for both reciprocating and Progressing Cavity Pump (PCP) applications.

Type 800C Special High Strength Carbon Grade – AISI 1536M Carbon Manganese Alloy Steel. Designed for heavy loads at any depth in non-corrosive well fluids. This grade can be utilized in both reciprocating and Progressing Cavity Pump (PCP) applications.

Type 960M Special High Strength Grade – AISI 4120M Chromium-Molybdenum Alloy Steel. Designed for extra heavy loads at any depth in corrosive well fluids that are effectively inhibited against corrosion attack. This grade has been alloyed and effectively heat-treated to resist corrosion and fatigue. Type 960M rods are designed for reciprocating operations but can be utilized in some Progressing Cavity Pump (PCP) applications.

Type 970N Special High Strength Grade – AISI 4330M Nickel-Chromium-Molybdenum Alloy Steel. Designed for extra heavy loads at any depth in corrosive well fluids that are effectively inhibited against corrosion attack. This grade has been alloyed and effectively heat treated to maximize its corrosion and fatigue resistance. Type 970N rods are designed for reciprocating operations but can be utilized in some Progressing Cavity Pump (PCP) applications.

Rod Ends – API and Drive Rod Ends manufactured to the same dimensions, tolerances and grades as our coiled rods.

Properties

Physical Properties - quenched & tempered

Pro-Rod Type	620C	780M	750N	800C	960M	970N
Tensile, ksi (MPa) min.	**120** (827)	**120** (827)	**125** (862)	**135** (931)	**140** (965)	**140** (965)
Yield, ksi (MPa) min.	**85** (586)	**100** (689)	**100** (689)	**115** (793)	**115** (793)	**115** (793)
Hardness, Rc	22 min	22 min	22 min	30 min	30 min	30 min

Dimensions & Weight

Size Nominal O.D. **in.** (mm)	lb/ft (kg/m)	O.D. Tolerance **± in.** (± mm)
13/16 (20.6)	**1.76** (2.63)	**0.02** (0.51)
7/8 (22.2)	**2.04** (3.05)	**0.02** (0.51)
1 (25.4)	**2.67** (3.97)	**0.02** (0.51)
1 1/8 (28.6)	**3.38** (5.05)	**0.02** (0.51)

CARE AND HANDLING

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)
Type 620C & 780M	**13/16** (20.6)	**44,330** (19,718)
	7/8 (22.2)	**51,410** (22,868)
	1 (25.4)	**67,150** (29,869)
	1 1/8 (28.6)	**84,990** (37,803)
Type 750N	**13/16** (20.6)	**46,665** (20,756)
	7/8 (22.2)	**54,120** (24,072)
	1 (25.4)	**70,685** (31,441)
	1 1/8 (28.6)	**89,460** (39,793)
Type 960M	**13/16** (20.6)	**53,660** (23,869)
	7/8 (22.2)	**62,240** (27,683)
	1 (25.4)	**81,290** (36,157)
	1 1/8 (28.6)	**102,880** (45,762)
Type 800C	**1** (25.4)	**77,715** (34,569)
	1 1/8 (28.6)	**98,406** (43,773)
Type 970N	**13/16** (20.6)	**56,000** (24,907)
	7/8 (22.2)	**64,940** (28,887)
	1 (25.4)	**84,820** (37,729)
	1 1/8 (28.6)	**107,355** (47,751)

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 (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)	**1,350** (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)	**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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