High-Torque Progressing Cavity Pumping Sucker Rods and Couplings

Accommodate high levels of torque

EL rod (left) and Hi-T coupling (right)

Applications

- The T-Rod™ line of sucker rods is suited for high-torque applications that do not require centralizing.
- The ultrahigh-strength EL® sucker rod, used with the Hi-T™ coupling, is appropriate for high-torque applications that require centralizing.

Features and Benefits

- Rods and couplings are manufactured to API 11B specifications and are ISO 9001/API Q1 certified to provide optimal quality and reliability.
- Full API grade range plus high strength and ultrahigh strength enable the rods and couplings to meet the specific requirements of any well.
- Fully rolled, cold-formed threads provide a precise, smooth, reinforced thread structure that ensures longer life, stronger connections, and greater reliability.
- Rods are shot-blasted to remove any scale or oxidation, and then liberally coated with rust inhibitors to protect against corrosion.
- The rods and couplings are palletized in bundles for safe handling and transport.

Tool Description

Weatherford high-torque progressing cavity pumping (PCP) sucker rods and couplings are designed to accommodate the high levels of torque that today's PCPs and surface units generate.

Fully rolled, cold-formed threads provide a precise, smooth, reinforced thread structure not attainable by normal machine-cut threads. Metal is displaced rather than removed, and the cold-working strengthens the thread root. This process provides longer life, stronger connections, and greater reliability.

Weatherford®

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Specifications

Chemical Analysis

Grade	D	KD	T66/XD	HD	EL Rod
AISI	4142SR	4720SR	4138M	4332SRX	Special
Carbon	0.40 to 0.45%	0.19 to 0.23%	0.38 to 0.42%	0.30 to 0.35%	0.38 to 0.42%
Manganese	0.75 to 1.00%	0.85 to 1.05%	1.00 to 1.30%	0.90 to 1.10%	1.00 to 1.30%
Silicon	0.15 to 0.30%	0.15 to 0.35%	0.20 to 0.35%	0.15 to 0.35%	0.20 to 0.35%
Maximum phosphorus	0.035%	0.035%	0.035%	0.035%	0.035%
Maximum sulfur	0.040%	0.040%	0.040%	0.040%	0.040%
Nickel	0.25%*	0.90 to 1.20%	0.30%*	1.65 to 2.00%	0.30%*
Chromium	0.80 to 1.10%	0.80 to 1.05%	0.55 to 0.85%	0.65 to 0.85%	0.55 to 0.85%
Molybdenum	0.15 to 0.25%	0.22 to 0.30%	0.24 to 0.32%	0.13 to 0.25%	0.24 to 0.32%

*Maximum

Physical Analysis

Grade	D	KD	T66/XD	HD	EL Rod[a]
Minimum elongation	10%	14%	10%	10%[b]	–
Minimum reduction of area	45%	45%	40%	40%	–
Brinell hardness	240 to 294	240 to 294	286 to 319	286 to 319	–
Minimum yield strength	100 ksi (689 Mpa)	95 ksi (655 Mpa)	115 ksi (793 Mpa)	115 ksi (793 Mpa)	–
Ultimate strength	115 to 140 ksi (793 to 965 MPa)	115 to 140 ksi (793 to 965 MPa)	140 to 150 ksi (965 to 1,034 MPa)	140 to 150 ksi (965 to 1,034 MPa)	–

[a]Contact your Weatherford representative for more information.
[b]Percent in 8 in.
Weatherford recommends changing sucker-rod couplings after three makeups, provided the connection threads have been inspected between makeups and deemed acceptable for reuse.

PCP Torque Limits for Torque Rods[a]

Grade	Rod Size[b]	Yield Strength	Specified Torque Limit[c]
D	1 × 7/8 in.	100 psi (689 kPa)	1,100 ft-lb (1,491 N·m)
KD	1 × 7/8 in.	95 psi (655 kPa)	1,110 ft-lb (1,505 N·m)
KD	1-1/4 × 1 in.	95 psi (655 kPa)	1,680 ft-lb (2,278 N·m)
HD	1 × 7/8 in.	115 psi (793 kPa)	1,200 ft-lb (1,627 N·m)
HD	1-1/4 × 1 in.	115 psi (793 kPa)	2,000 ft-lb (2,712 N·m)
HD	1-1/4 × 1-1/8 in.[d]	115 psi (793 kPa)	3,125 ft-lb (4,237 N·m)
HD	1-1/2 × 1-1/8 in.[d]	115 psi (793 kPa)	3,750 ft-lb (5,084 N·m)
Special Alloy T66/XD	1 × 7/8 in.	115 psi (793 kPa)	1,200 ft-lb (1,627 N·m)
Special Alloy T66/XD	1-1/4 × 1 in.	115 psi (793 kPa)	2,000 ft-lb (2,712 N·m)
Special Alloy T66/XD	1-1/4 × 1-1/8 in.[d]	115 psi (793 kPa)	3,125 ft-lb (4,596 N·m)
Special Alloy T66/XD	1-1/2 × 1-1/8 in.[d]	115 psi (793 kPa)	3,750 ft-lb (5,084 N·m)
EL Rod	7/8 in.	–	1,250 ft-lb (1,695 N·m)
EL Rod	1 in.	–	2,000 ft-lb (2,712 N·m)
EL Rod	1-1/8 in.	–	3,125 ft-lb (4,596 N·m)

[a]Hi-T coupling and special makeup procedures required for all torque rods.
[b]Not all sucker rod sizes are listed in this table. For information about additional sizes, contact your authorized Weatherford representative.
[c]Weatherford requires that a 0.8 service factor be applied to all torque limits.
[d]Hi-T 5-in. couplings are required for all 1-1/4 × 1-1/8 in. and 1-1/2 × 1-1/8 in. torque rods.