Grade D™ Sucker Rod

Proven technology for greater fatigue tolerance

Applications

- Reciprocating rod lift systems
- PCP lift systems
- Medium-load applications in noncorrosive or inhibited wells[1]

Features and Benefits

- AISI 4142 chromium-molybdenum alloy steel
- API DA alloy standards
- Normalized-and-tempered steel improves mechanical properties for overall toughness and reduced brittleness
- Shot-peened process creates compressive stress that strengthens surface-tension properties for enhanced fatigue life

Tool Description

Weatherford Grade D sucker rods are designed for medium-load applications within inhibited, mildly corrosive wells. Grade D sucker rods conform to API 11B DA specifications and follow strict, Weatherford sucker rod standards for high quality. Like other Weatherford sucker rods, Grade D sucker rods pass through a proprietary shot-peen process, proven to improve fatigue life by up to 10 times. Grade D sucker rods feature fully rolled; cold-formed threads designed to provide a precise and smooth, reinforced-thread structure. Grade D sucker rods are liberally coated with atmospheric inhibitors and carefully palletized in bundles for safe transport and handling.

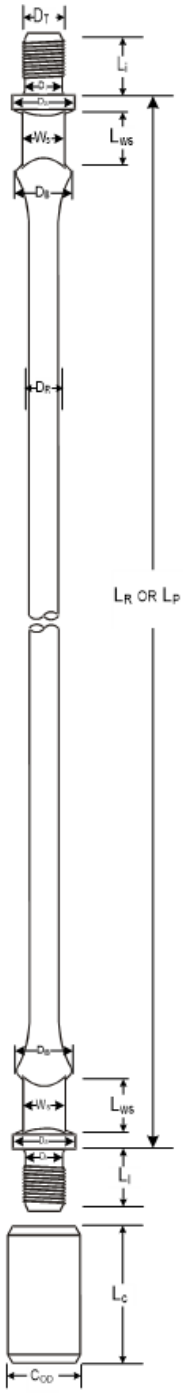
Weatherford Grade D sucker rods provide enhanced fatigue resistance for long-lasting performance in medium-to-heavy-load wells.

Weatherford®

Grade D™ Sucker Rod

Specifications

	Description	in. (mm)			
ID	Nominal size	0.750 (19.05)	0.875 (22.23)	1.000 (25.40)	1.125 (28.58)
D_R	Rod body diameter				
$0D_S$	Pin shoulder OD	1.500 (38.10)	1.625 (41.28)	2.000 (50.80)	2.250 (57.15)
D_T	Nominal thread diameter	1.063 (26.99)	1.187 (30.16)	1.375 (34.93)	1.562 (39.69)
L_I	Pin length	1.430 (36.51)	1.620 (41.28)	1.870 (47.63)	2.125 (53.98)
W_S	Wrench square width	1.000 (25.40)		1.313 (33.34)	1.500 (38.10)
L_{WS}	Wrench square length	1.250 (31.75)			1.630 (41.28)
D_B	Bead diameter	1.400 (35.72)	1.500 (38.1)	1.900 (48.42)	2.187 (55.63)
D_I	Stress relief diameter	0.915 (23.24)	1.040 (26.42)	1.220 (31.17)	1.414 (35.92)
L_R	Sucker rod length	25 and 30 ft (7.62 and 9.144 m)			
L_P	Pony rod length	2, 4, 6, 8, 10 ft (0.6, 1.2 ,1.8, 2.4, 3 m)			
L_C	Coupling OD, SH	4.00 ft (101.6 m)			
C_{OD}	Coupling OD, SH	1.500 (38.10)	1.625 (41.30)	2.000 (80.80)	2.250 (53.0)
C_{OD}	Coupling OD, FH	1.625 (41.30)	1.812 (46.00)	2.187 (55.60)	2.375 (60.30)
~ 25-ft rod weight w/o coupling		38.5 lbs (17.5 kg)	52.0 lbs (23.6 kg)	69.9 lbs (31.7 kg)	88.7 lbs (40.2 kg)
~ 25-ft rod weight w/FH coupling		40.0 lbs (18.1 kg)	53.8 lbs (24.4 kg)	72.5 lbs (32.9 kg)	91.8 lbs (41.6 kg)
~ 25-ft rod weight w/SH coupling		39.8 lbs (18.1 kg)	53.5 lbs (24.3 kg)	71.9 lbs (32.6 kg)	91.17 lbs (41.35 kg)



Chemical Composition

Material	C %	Mn %	P %	S %	Si %	Ni %	Cr %	Mo %	Cu/Va %
4142SR	0.40 to 0.45	0.75 to 1.00	0.035 Max	0.040 Max	0.15 to 0.30	0.25 Max	0.80 to 1.10	0.15 to 0.25	0.45 Max/ 0.055 to 0.075

Mechanical Properties

API Grade	Yield Strength ksi (MPa)	Tensile Strength ksi (MPa)	Elongation % (8 in.) 8 in.	Reduction %	Heat Treatment
DA Alloy	100 (689)	115 to 140 (792 to 965)	10 Min	45 Min	Normalized and Tempered

Specified Torque Limit[2]

Rod Size in. (mm)	0.750 (19.05)	0.875 (22.23)	1.000 (25.40)	1.125 (28.58)
ft-lbs (Nm)	480 (650)	765 (1,037)	1,140 (1,546)	1,620 (2,196)

Maximum Allowed Stress Calculation

$(T/4 + 0.5625\ S_{MIN}) * SF$

[1] Provided satisfactory corrosion-inhibiting practices are followed.
[2] Weatherford recommends applying a service factor to the specified-torque limit based on operating conditions. Please refer to Weatherford engineering bulletin TB-135 for further guidance on torque limits.

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