



# ENDLESS ROD<sup>®</sup>

## CONTINUOUS SUCKER ROD

Specifications & Comparison

**EXPERIENCE**  
**PERFORMANCE.**

# SPECIFICATION

## D GRADE

AISI 15 Modified Series Carbon Alloy Steel

Recommended for non-corrosive wellbore environments.

## DS GRADE HIGH STRENGTH

AISI 15 Modified Series Carbon Alloy Steel

Recommended for non-corrosive wellbore environments that require a high-strength product.

## CD GRADE

AISI 41 Modified Series Chrome-Moly Alloy Steel

Recommended for mildly corrosive wellbore environments that are effectively inhibited against corrosion.

## CM GRADE MID STRENGTH

AISI 41 Modified Series Chrome-Moly Alloy Steel

Recommended for mildly corrosive wellbore environments that are effectively inhibited against corrosion.

## CS GRADE HIGH STRENGTH

AISI 41 Modified Series Chrome-Moly Alloy Steel

Recommended for mildly corrosive wellbore environments that are effectively inhibited against corrosion and require a high-strength product.

## ND GRADE

AISI 43 Modified Series Nickel-Chrome-Moly Alloy Steel

Promotes improved durability related to fatigue resistance. Recommended for mildly corrosive wellbore environments that are effectively inhibited against corrosion.

## NS GRADE HIGH STRENGTH

AISI 43 Modified Series Nickel-Chrome-Moly Alloy Steel

Promotes improved durability related to fatigue resistance. Recommended for mildly corrosive wellbore environments that are effectively inhibited against corrosion and require a high-strength product.

## MATERIAL PROPERTIES

Grade	Material	Min. Tensile Strength (ksi)	Min. Yield Strength (ksi)	Max. Average Hardness (HRC)
D	C-Mn	115	85	28
DS	C-Mn	140	115	36
CD	Cr-Mo	115	90	28
CM	Cr-Mo	130	110	32
CS	Cr-Mo	140	115	36
ND	Ni-Cr-Mo	115	90	30
NS	Ni-Cr-Mo	140	115	36

## MAXIMUM SERVICE

Grade	3/4 in.		7/8 in.		1 in.		1-1/8 in.		1-3/16 in.	
	Torque (ft*lb)	Rig Pull (daN)	Torque (ft*lb)	Rig Pull (daN)	Torque (ft*lb)	Rig Pull (daN)	Torque (ft*lb)	Rig Pull (daN)	Torque (ft*lb)	Rig Pull (daN)
D	410	15,000	650	21,000	975	27,000	1,390	34,000	1,630	38,000
DS*	550	21,000	890	28,000	1,330	37,000	1,890	46,000	2,220	51,000
CD	430	16,000	690	22,000	1,030	29,000	1,470	36,000	1,730	40,000
CM	500	20,000	800	27,000	1,190	35,000	1,700	45,000	2,000	50,000
CS	550	21,000	890	28,000	1,330	37,000	1,890	46,000	2,220	51,000
ND	430	16,000	690	22,000	1,030	29,000	1,470	36,000	1,730	40,000
NS	550	21,000	890	28,000	1,330	37,000	1,890	46,000	2,220	51,000

\* Application specific. Please contact an LS representative for more information.

# COMPARISON

\*Information obtained from www.aperygals.com, www.weatherford.com and www.lpsus.net  
 \*Chemical properties available upon request

## GRADE CROSS REFERENCE

Grade	Lifting Solutions Endless Rod®		LightningRod™ Continuous Rod		ChampionX Pro-Rod®*		Weatherford COROD®*	
	Material (AISI)	Grade	Material (AISI)	Grade	Material (AISI)	Grade	Material (AISI)	
D	1537	D15C	1536	620C	1536M	D/DR	1536M	
DS	1537	-	-	-	-	-	-	
CD	4119	D41M	4119	780M	4120M	DE/DER	4120M	
CM	4119	-	-	-	-	ME/MER	4120M	
CS	4119	H41M	4119	960M	4120M	SE/SER	4120M	
ND	4318	D43N	4318	750N	4320M	DWR	4320M	
NS	4318	H43N	4318	970N	4330M	SWR	4320M	

## SIZE AND WEIGHT REFERENCE

Lifting Solutions Endless Rod®		LightningRod™ Continuous Rod		ChampionX Pro-Rod®*		Weatherford COROD®*	
Size in. (mm)	Weight lb/ft (kg/m)	Size in. (mm)	Weight lb/ft (kg/m)	Size in. (mm)	Weight lb/ft (kg/m)	Size in. (COROD #)	Weight lb/ft (kg/m)
3/4 (19.1)	1.50 (2.24)	3/4 (19.1)	1.49 (2.24)	13/16 (20.6)	1.76 (2.63)	13/16 (3R)	1.76 (2.63)
7/8 (22.2)	2.04 (3.05)	7/8 (22.2)	2.04 (3.05)	7/8 (22.2)	2.04 (3.05)	7/8 (4R)	2.04 (3.05)
1 (25.4)	2.67 (3.97)	1 (25.4)	2.67 (3.97)	1 (25.4)	2.67 (3.97)	1 (6R)	2.67 (3.98)
1-1/8 (28.6)	3.38 (5.05)	1-1/8 (28.6)	3.38 (5.05)	1-1/8 (28.6)	3.38 (5.05)	1-5/32 (8.5R)	3.57 (5.32)
1-3/16 (30.18)	3.78 (5.62)	-	-	-	-	-	-

## TORQUE AND TENSILE COMPARISON

Grade	Lifting Solutions Endless Rod®						Weatherford COROD®*					ChampionX Pro-Rod®*					LightningRod™ Continuous Rod					
	3/4 in.	7/8 in.	1 in.	1-1/8 in.	1-3/16 in.	Min. Tensile Strength (ksi)	13/16 in. (3R)	7/8 in. (4R)	1 in. (6R)	1-5/32 in. (8.5R)	Min. Tensile Strength (ksi)	13/16 in.	7/8 in.	1 in.	1-1/8 in.	Min. Tensile Strength (ksi)	3/4 in.	7/8 in.	1 in.	1-1/8 in.	1-3/16 in.	Min. Tensile Strength (ksi)
	Allowable Torque (ft*lb)						Allowable Torque (ft*lb)					Allowable Torque (ft*lb)					Allowable Torque (ft*lb)					
D	410	650	970	1,390	1,630	115	500	640	955	1,490	115	540	680	1,015	1,445	120	500	680	1,015	1,445	-	120
DS	550	890	1,330	1,890	2,220	140	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CD	430	690	1,030	1,470	1,720	115	-	640	955	1,490	115	565	735	1,110	1,535	120	525	735	1,100	1,535	-	120
CM	500	800	1,190	1,700	2,000	130	-	800	1,195	1,845	130	-	-	-	-	-	-	-	-	-	-	-
CS	550	890	1,330	1,890	2,220	140	700	900	1,300	2,000	140	725	900	1,350	1,900	140	670	900	1,350	1,900	-	125
ND	430	690	1,030	1,470	1,720	115	-	-	955	1,490	115	580	750	1,110	1,550	125	535	750	1,110	1,550	-	140
NS	550	890	1,330	1,890	2,220	140	700	900	1,300	2,000	145	725	900	1,350	1,900	140	670	900	1,350	1,900	-	145

# PIN ENDS

## PIN END CONFIGURATIONS (Body x Pin)

	3/4 in. x 3/4 in.	7/8 in. x 7/8 in.	1 in. x 1 in.	1 in. x 7/8 in.	1 in. x 7/8 in. Extended Thread <sup>1</sup>	1-1/8 in. x 1 in.	1-3/16 in x 1 in.	1-3/16 in. x 1-1/8 in.
	Allowable Torque (ft * lb)*							
<b>D</b>	410	650	970	750	970	1,350	1,350	1,638
<b>DS</b>	550	890	1,330	850	1,200	1,600	1,600	2,220
<b>CD</b>	430	690	1,030	750	1,030	1,350	1,350	1,730
<b>CM</b>	500	800	1,190	850	1,190	1,600	1,600	2,000
<b>CS</b>	550	890	1,330	850	1,200	1,600	1,600	2,220
<b>ND</b>	430	690	1,030	750	1,030	1,350	1,350	1,730
<b>NS</b>	550	890	1,330	850	1,200	1,600	1,600	2,220

<sup>1</sup>Non-API; requires high-strength coupling to achieve torque rating. \*Torque values based on rod body, pin size, coupling type, and proper welding procedures.

## COUPLING OUTSIDE DIAMETER

	3/4 in. (19.05 mm)	7/8 in. (22.23 mm)	1 in. (25.40 mm)	1-1/8 in. (28.58 mm)
<b>Slim Hole in. (mm)</b>	1.500 (38.1)	1.625 (41.3)	2.000 (50.8)	2.250 (57.2)
<b>Full Size in. (mm)</b>	1.625 (41.3)	1.812 (46.0)	2.187 (55.6)	2.375 (60.3)
<b>Oversize in. (mm)</b>	1.812 (46.0)	2.000 (50.8)	2.375 (60.3)	-

## TUBING DRIFT

	2-3/8 in. (60.33 mm)	2-7/8 in. (73.0 mm)	3-1/2 in. (88.9 mm)	4-1/2 in. (114.3 mm)
<b>Nominal Weight</b>	4.7 lb/ft	6.5 lb/ft	9.3 lb/ft	12.75 lb/ft
<b>API EUE Tubing in. (mm)</b>	1.901 (48.3)	2.347 (59.6)	2.867 (72.8)	3.833 (97.4)
<b>HDPE Lined in. (mm)</b>	1.600 (40.6)	2.000 (50.8)	2.500 (63.5)	3.400 (86.4)