Tenaris

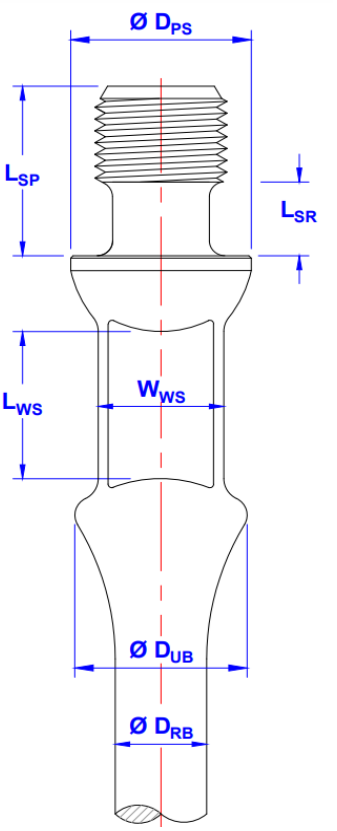
Sucker Rod String: Sucker & Pony Rod
PDS: SRHS
Short Name: R02
Effective Date: 14/03/2025
Previous Revision: 23/12/2024

High Strength Sucker & Pony Rod

Dimensions:

Available for both beam and progressive cavity pumping, Tenaris delivers sucker rods manufactured according to a rigorous quality assurance system that complies with ISO 9001 and API Q1 standards.

Nominal Size / Rod	Units	DRB	DPS	WWS	LWS	DUB	LSR	LSP
5/8"	max. in (mm)	0.632 (16.05)	1.255 (31.88)	0.906 (23.01)	-	1.224 (31.08)	0.547 (13.90)	1.313 (33.34)
	min. in (mm)	0.611 (15.52)	1.240 (31.62)	0.844 (21.44)	1.250 (31.75)	1.094 (27.78)	0.516 (13.11)	1.250 (31.75)
3/4"	max. in (mm)	0.758 (19.25)	1.505 (38.23)	1.031 (26.19)	-	1.411 (35.85)	0.625 (15.88)	1.500 (38.10)
	min. in (mm)	0.734 (18.64)	1.490 (37.85)	0.969 (24.61)	1.250 (31.75)	1.281 (32.54)	0.594 (15.09)	1.438 (36.51)
7/8"	max. in (mm)	0.883 (22.43)	1.630 (41.40)	1.031 (26.19)	-	1.505 (38.23)	0.703 (17.86)	1.688 (42.86)
	min. in (mm)	0.859 (21.82)	1.615 (41.02)	0.969 (24.61)	1.250 (31.75)	1.375 (34.93)	0.672 (17.07)	1.625 (41.28)
1"	max. in (mm)	0.883 (25.63)	2.005 (50.93)	1.344 (34.14)	-	1.911 (48.55)	0.828 (21.04)	1.938 (49.21)
	min. in (mm)	0.982 (24.94)	1.990 (50.55)	1.282 (32.56)	1.500 (38.10)	1.719 (43.66)	0.797 (20.24)	1.875 (47.63)
1 1/8"	max. in (mm)	1.135 (28.83)	2.265 (57.53)	1.531 (38.89)	-	2.193 (55.69)	0.906 (23.02)	2.188 (55.56)
	min. in (mm)	1.105 (28.07)	2.235 (56.77)	1.469 (37.31)	1.625 (41.28)	2.000 (50.50)	0.875 (22.23)	2.215 (53.98)



Sucker Rods Nominal Lengths: 25, 30 ft (7.62, 9.14 m)

Pony Rods Nominal Lengths:* 2, 4, 6, 8, 10, 12 ft (0.61, 1.22, 1.83, 2.44, 3.05, 3.66 m)

*Other lengths might be available upon request.

Steel Grades:

Tenaris manufactures high-strength sucker rods from quality steel bars to be used in high-flow wells. Products meet the most stringent requirements for greater mechanical strength, thus ensuring quality performance in deep wells with very high loads.

Chemical Composition:

Typical chemical compositions (wt%) listed in the following table.

Grade	C	Mn	Si	S	P	Cr	Ni	Mo	Others
HA	0.36-0.43	1.00-1.40	0.20-0.40	0.025 max	0.025 max	0.50-1.00	0.30 max	0.25-0.50	V: 0.04-0.08, Nb: 0.05 max
UHS	0.29-0.37	0.70-0.95	0.15-0.35	0.025 max	0.025 max	0.80-1.10	1.65-2.00	0.20-0.30	V: 0.04-0.08

Mechanical Properties:

Mechanical properties are listed in the following table.

Grade	Yield Strength (0.2% offset)	Ultimate Tensile Stress	Elongation (8")	Reduction of area	Hardness
HA	min 115 kpsi (min 793 MPa)	140 to 155 kpsi (965 to 1069 MPa)	8% min	30% min	32 HRC
UHS	min 115 kpsi (min 793 MPa)	140 to 155 kpsi (965 to 1069 MPa)	10% min	40% min	34 HRC

Performance Data:

Maximum Pulling Force:

	Rod Outer Diameter				
Grade	5/8"	3/4"	7/8"	1"	1 1/8"
HA	30.3 klb (13.8 t)	43.7 klb (19.9 t)	59.9 klb (27.2 t)	78.3 klb (35.6 t)	99.1 klb (45.1 t)
UHS	30.3 klb (13.8 t)	43.7 klb (19.9 t)	59.9 klb (27.2 t)	78.3 klb (35.6 t)	99.1 klb (45.1 t)

To prevent tensile failures, the weight indicator pull on a "like new" condition rod string should not exceed 90% of the yield strength of the smallest diameter sucker rod, based on its known size and grade. Maximum pulling force values herein informed were calculated based on the 90% of the specified minimum yield strength at the smallest section of a given rod.

Beam Pumping: Maximum allowable tensile stress

It is recommended that the modified Goodman stress diagram or the simplified formula listed bellow are used in the determination of the allowable range of stress applied to a sucker rod.

$$S_a = \frac{UTS}{A} + B * S_{min} * SF$$

Applied tensions can be compared to the maximum allowable using the Goodman formula:

$$Goodman\% = \frac{S_{max} - S_{min}}{S_a - S_{min}} * 100$$

Grade	A	B
HA	2.8	0.375
UHS	2.8	0.375

Table 1: Goodman coefficients.

Where:

Sa = Maximum allowable stress (psi or Mpa)

S_{min} = Minimum calculated or measured stress (psi or Mpa)

S_{max} = Maximum calculated or measured stress (psi or Mpa)

UTS = Minimum ultimate tensile strength (psi or Mpa)

SF = Service factor. For corrosive environments a value of 0.9 is recommended

Coefficients A and B are listed on Table 1.

Progressive Cavity Pumping: Effective Stress

The effective rod stress in PCP applications can be calculated using the von Mises equation:

$$\sigma_e = \sqrt{\frac{(C_1 * L^2)}{\pi^2 * D^4} + \frac{C_2 * T^2}{\pi^2 * D^6}}$$

Where:

σ_e = Effective stress (kpsi or Mpa)

L = Total axial load (lbf or N)

T = Total torque (lbf. ft or N. m)

D = Rod's body diameter (in or mm)

C_1 = Constant (For imperial system= $1.6x10^{-5.}$ For international system= 16)

C_2 = Constant (For imperial system= 0.1106. For international system= $7.68x10^{8}$)

Color Code:

Rod's ends are painted according to the following table:

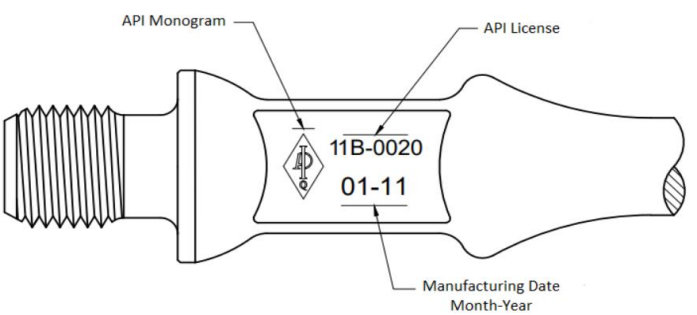
Grade	Color Code
HA	Green
UHS	Purple

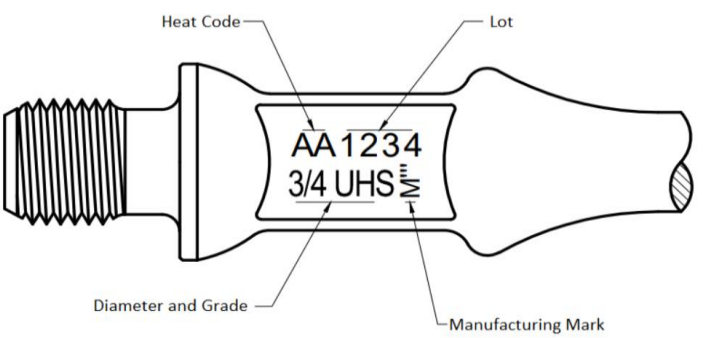
*Displayed colors are for guidance only.

Non Destructive Testing:

All raw material is carefully inspected using electromagnetic and/or ultrasonic methods to ensure the soundness of the final product.

Marking:





Grade	New Marking	Old Marking
HA	HA	MMS
UHS	UHS	UHS

Labeling:*

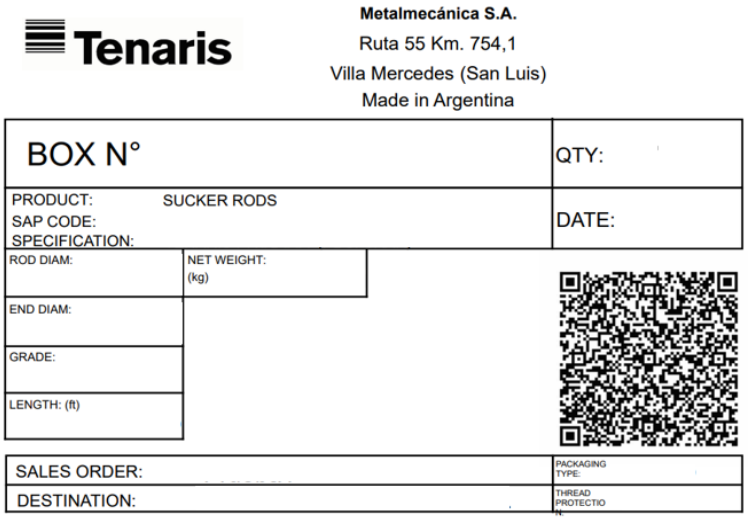


*Image for reference only.

Ordering Information:

When placing an order please attach the following information:

PDS:	SRHS
Product Family:	Sucker Rod (or Pony Rod)
Diameter:	1''
Grade:	UHS
Length:	25 ft