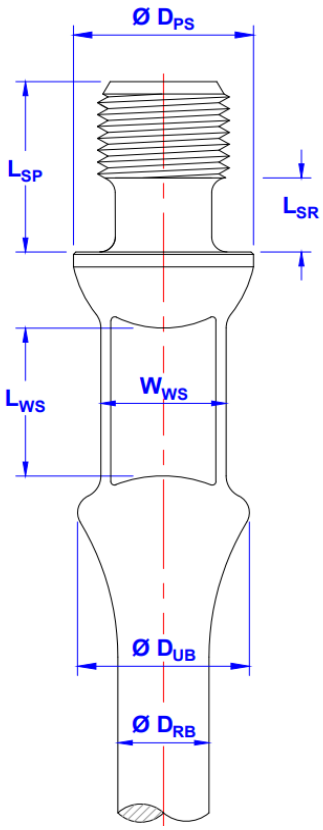
Tenaris

Sucker Rod String: Sucker & Pony Rod
PDS: SRRPAPI
Short Name: R07
Effective Date: 14/03/2025
Previous Revision: 23/12/2024

Reinforced Pin API grade Sucker & Pony Rod

Dimensions:

Nominal Size		Units	DRB	DPS	WWS	LWS	DUB	LSR	LSP
Rod	Pin								
3/4''	7/8''	max. in (mm)	0.758 (19.25)	1.630 (41.41)	1.031 (26.19)	-	1.502 (38.16)	0.703 (17.86)	2.415 (61.35)
		min. in (mm)	0.734 (18.64)	1.615 (41.03)	0.969 (24.61)	1.250 (31.75)	1.378 (35.01)	0.672 (17.07)	1.625 (41.28)
7/8''	1''	max. in (mm)	0.883 (22.43)	2.005 (50.93)	1.141 (28.99)	-	1.555 (39.50)	0.828 (21.03)	2.665 (67.70)
		min. in (mm)	0.859 (21.82)	1.990 (50.55)	1.079 (27.41)	1.250 (31.75)	1.378 (35.00)	0.797 (20.24)	1.875 (47.63)



*Dimensions according to API 11B.

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:

Different steel grades are available, depending on the type of load and the corrosion level in the wells. All these materials comply with API 11B. Grades C, K and DC carbon are only available under special request.

Chemical Composition:

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

Grade	C	Mn	Si	S	P	Cr	Ni	Mo	Others
DA Alloy	0.40-0.45	0.75-1.00	0.15-0.35	0.025 max	0.025 max	0.80-1.10	0.25 max	0.15-0.25	-
DS Special	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
KDS Special	0.20-0.25	0.80-1.00	0.15-0.35	0.025 max	0.025 max	0.70-0.90	1.15-1.50	0.25-0.30	V: 0.03-0.07

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
DA Alloy	min 95 kpsi (min 655 MPa)	120 to 140 kpsi (827 to 965 MPa)	10 % min	45% min	27 HRC
DS Special	min 100 kpsi (min 689 MPa)	125 to 140 kpsi (862 to 965 MPa)	10 % min	45% min	28 HRC
KDS Special	min 85 kpsi (min 586 MPa)	115 to 140 kpsi (793 to 965 MPa)	10% min	45% min	25 HRC

Performance Data:
Maximum Pulling Force:

Grade	Rod Outer Diameter	
	3/4"	7/8"
DA Alloy	36.1 klb (16.4 t)	49.5 klb (22.5 t)
DS Special	38 klb (17.3 t)	52.1 klb (23.7 t)
KDS Special	32.3 klb (14.7 t)	44.3 klb (20.1 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:

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

Table 1: Goodman coefficients.

Grade	A	B
DA Alloy	4	0.5625
DS Special	4	0.5625
KDS Special	4	0.5625

Where:

S_a = 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:

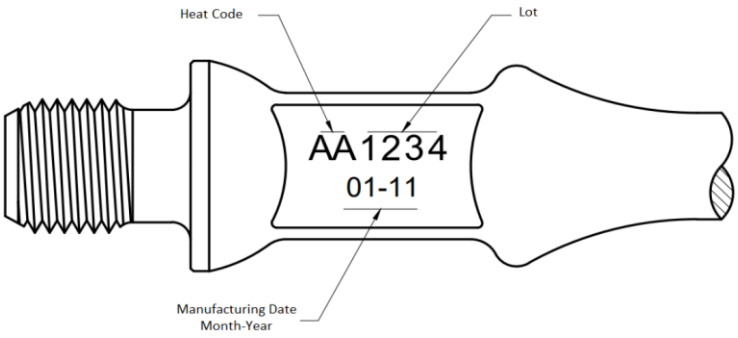
Grade	Color Code
DA Alloy	Yellow
DS Special	Orange
KDS Special	Orange

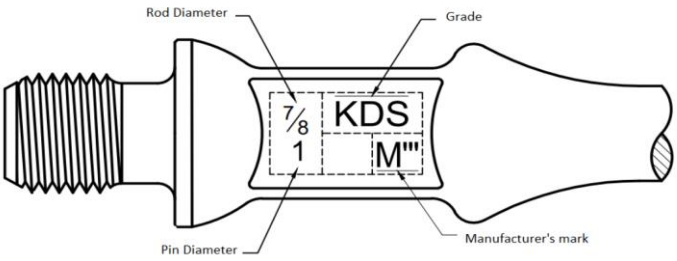
*Displayed colors are for guidance only.

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
DA Alloy	DA	D
DS Special	DS	DS
KDS Special	KDS	KD

Labeling:*

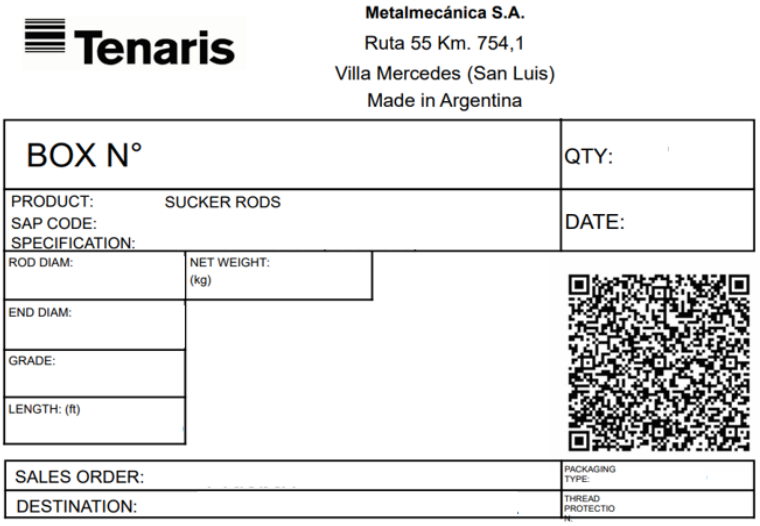


*Image for reference only.

Ordering Information:

When placing an order please attach the following information

PDS:	SRRPAPI
Product Family:	Sucker Rod (or Pony Rod)
Body Diameter:	3/4''
Pin Diameter:	7/8''
Grade:	KDS Special
Length:	25 ft