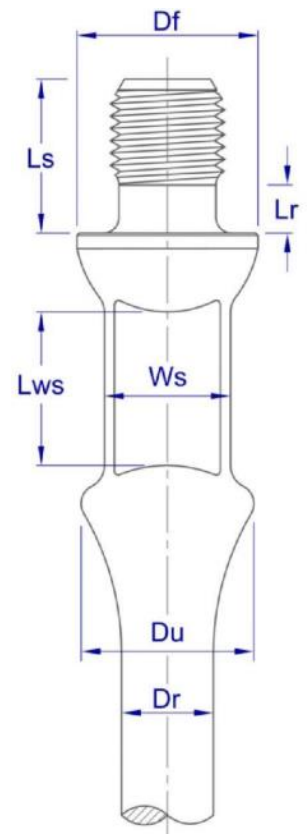


## High Strength Sucker & Pony Rod

### 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	Units	Dr	Df	Ws	Lws (min)	DU	Lr	Ls
Rod								
5/8"	in	0.63	1.25	0.88	1.25	1.22	0.52	1.25
		+0.007 -0.014	+0.005 -0.01	± 0.031		+0.005 -0.125	+0.031 -0	+0.63 -0
	mm	15.88	31.75	22.23	31.75	30.96	13.11	31.75
		+0.18 -0.36	+0.13 -0.25	±0.79		+0.13 -3.18	+0.79 -0	+1.59 -0
3/4"	in	0.75	1.50	1.00	1.25	1.41	0.59	1.44
		+0.008 -0.016	+0.005 -0.01	± 0.031		+0.005 -0.125	+0.031 -0	+0.63 -0
	mm	19.05	38.10	25.40	31.75	35.72	15.09	36.51
		+0.2 -0.41	+0.13 -0.25	±0.79		+0.13 -3.18	+0.79 -0	+1.59 -0
7/8"	in	0.88	1.63	1.00	1.25	1.50	0.67	1.63
		+0.008 -0.016	+0.005 -0.01	± 0.031		+0.005 -0.125	+0.031 -0	+0.63 -0
	mm	22.23	41.28	25.40	31.75	38.10	17.07	41.28
		+0.2 -0.41	+0.13 -0.25	±0.79		+0.13 -3.18	+0.79 -0	+1.59 -0
1"	in	1.00	2.00	1.31	1.50	1.91	0.80	1.88
		+0.009 -0.018	+0.005 -0.01	± 0.031		+0.005 -0.187	+0.031 -0	+0.63 -0
	mm	25.40	50.80	33.34	38.10	48.42	20.24	47.63
		+0.23 -0.46	+0.13 -0.25	±0.79		+0.13 -4.76	+0.79 -0	+1.59 -0
1 1/8"	in	1.13	2.25	1.50	1.63	2.19	0.88	2.13
		+0.01 -0.02	+0.015 -0.015	± 0.031		+0.005 -0.187	+0.031 -0	+0.63 -0
	mm	28.58	57.15	38.10	41.28	55.56	22.23	53.98
		+0.25 -0.51	+0.38 -0.38	±0.79		+0.13 -4.76	+0.79 -0	+1.59 -0



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
MMS	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
MMS	Min 115 kpsi (Min 793 Mpa)	138 to 155 kpsi (951 to 1069 MPa)	8% Min	30% Min	32 HRC
UHS	Min 115 kpsi (Min 793 Mpa)	140 to 160 kpsi (965 to 1103 MPa)	10% Min	40% Min	34 HRC

## Performance Data:

### Maxium Pulling Force:

Grade	Rod Outer Diameter				
	5/8"	3/4"	7/8"	1"	1 1/8"
MMS	28.2 klb (12.8 Ton)	40.6 klb (18.4 Ton)	55.3 klb (25.1 Ton)	72.3 klb (32.8 Ton)	91.4 klb (41.4 Ton)
UHS	28.2 klb (12.8 Ton)	40.6 klb (18.4 Ton)	55.3 klb (25.1 Ton)	72.3 klb (32.8 Ton)	91.4 klb (41.4 Ton)

## Beam Pumping: Maxium 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:

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

Where:

S<sub>a</sub> = Maximum allowable stress (psi or Mpa)

S<sub>min</sub> = Minimum calculated or measured stress (psi or Mpa)

S<sub>max</sub> = 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.

Grade	A	B
MMS	2.8	0.375
UHS	2.8	0.375

Table 1: Goodman coefficients

## 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:

$\sigma_e$  = 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=  $1.6 \times 10^{-5}$  For international system= 16)

$C_2$  = Constant (For imperial system= 0.1106. For international system=  $7.68 \times 10^8$ )

## Color Code:

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

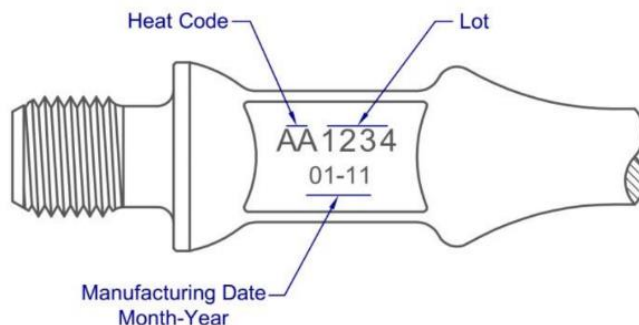
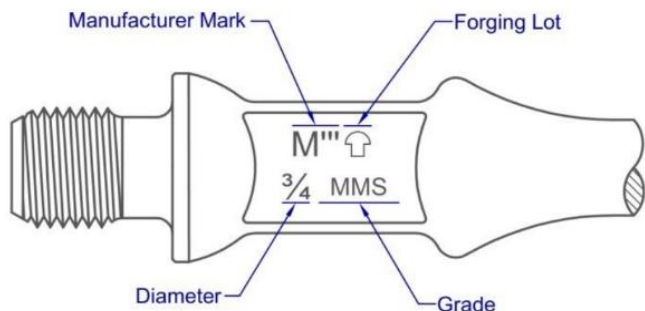
Grade	Color Code
MMS	Green
UHS	Purple

\*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:



## Labeling:\*



**Metalmecánica S.A.**  
Ruta 55 Km. 754,1  
Villa Mercedes (San Luis)  
Made in Argentina

BOX N°		QTY:
PRODUCT: SUCKER RODS		DATE:
SAP CODE:		
SPECIFICATION:		
ROD DIAM.	NET WEIGHT: (kg)	
END DIAM.		
GRADE:		
LENGTH: (ft)		
SALES ORDER:		PACKAGING TYPE:
DESTINATION:		THREAD PROTECTIO

\*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

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