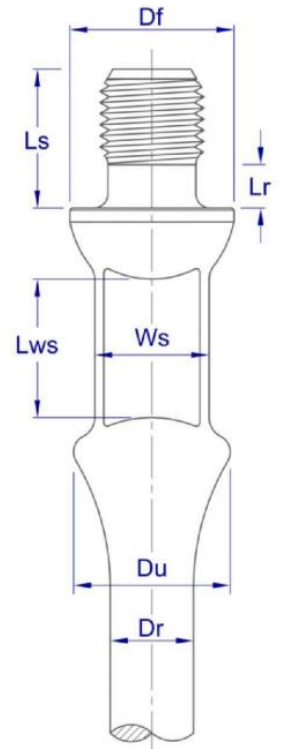


# Reinforced Pin API grade Sucker & Pony Rod

## Dimensions:

Nominal Size		Units	Dr	Df	Ws	Lws (min)	DU	Lr	Ls
Rod	Pin								
3/4"	7/8"	in	0.75	1.63	1.00	1.25	1.50	0.67	1.63
			+0.008 -0.016	+0.005 -0.01	± 0.031		+0.005 -0.119	+0.031 -0	+0.79 -0
		mm	19.05	41.28	25.40	31.75	38.03	17.07	41.28
			+0.2 -0.41	+0.12 -0.25	±0.79		+0.13 -3.03	+0.79 -0	+1.59 -0
7/8"	1"	in	0.88	2.00	1.11	1.25	1.55	0.80	1.88
			+0.008 -0.016	+0.005 -0.01	± 0.031		+0.005 -0.172	+0.031 -0	+0.79 -0
		mm	22.23	50.80	28.20	31.75	39.37	20.24	47.63
			+0.2 -0.41	+0.13 -0.25	±0.8		+0.13 -4.37	+0.79 -0	+1.59 -0



\*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 this materials comply with API 11B. Grades C, K and D 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
D 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	-
D 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
D Special KD	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
D Alloy	Min 95 kpsi (Min 655 Mpa)	120 to 140 kpsi (827 to 965 MPa)	10 % Min	45% Min	27 HRC
D Special	Min 100 kpsi (Min 689 Mpa)	125 to 140 kpsi (862 to 965 MPa)	10 % Min	45% Min	28 HRC
D Special KD	Min 85 kpsi (Min 586 Mpa)	115 to 140 kpsi (793 to 965 MPa)	10% Min	45% Min	25 HRC

## Performance Data:

### Maxium Pulling Force:

Grade	Rod Outer Diameter	
	3/4"	7/8"
D Alloy	33.5 klb (15.2 Ton)	45.6 klb (20.7 Ton)
D Special	35.3 klb (16 Ton)	48.1 klb (21.8 Ton)
D Special KD	30 klb (13.6 Ton)	40.8 klb (18.5 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:

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

Table 1: Goodman coefficients.

Grade	A	B
D Alloy	4	0.5625
D Special	4	0.5625
D Special KD	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:

$\sigma_e$  = 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:

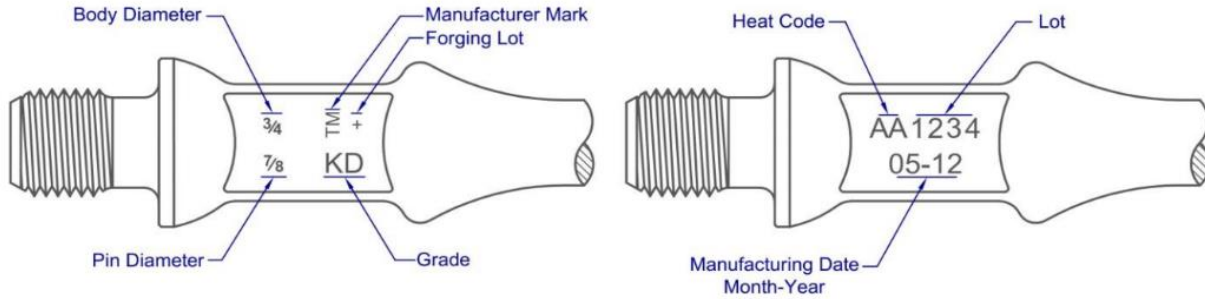
Grade	Color Code
D Alloy	Yellow
D Special	Orange
D Special KD	Orange

\*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:



## 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:** SRRPAPI  
**Product Family:** Sucker Rod (or Pony Rod)  
**Body Diameter:** 3/4"  
**Pin Diameter:** 7/8"  
**Grade:** D Special KD  
**Length:** 25 ft

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