

# Sucker Rods Mechanical Properties and Chemical Composition

Tenaris offers sucker rods with different steel grades, depending on the type of load and the corrosion level in the wells. A range of products to suit all needs.

## MECHANICAL PROPERTIES AND CHEMICAL COMPOSITION

	API GRADES						HIGH STRENGTH RODS		
	GRADE C	GRADE K	GRADE D				PLUS	UHS-NR	MMS-NR
			D CARBON	D ALLOY	KD SPECIAL	D SPECIAL			
<b>Steel</b>	1530 M	4621 M	1530 M	4142 M	4320 M	4330 M	1530 M	4330 M	4138 M
<b>C</b>	0.31-0.36	0.18-0.25	0.31-0.36	0.40-0.45	0.18-0.25	0.30-0.37	0.31-0.36	0.30-0.37	0.38-0.43
<b>Mn</b>	1.40-1.60	0.70-1.00	1.40-1.60	0.75-1.00	0.80-1.00	0.70-0.95	1.40-1.60	0.70-0.95	1.10-1.40
<b>S</b>	0.025 Mx.	0.025 Mx.	0.025 Mx.	0.025 Mx.	0.025 Mx.	0.025 Mx.	0.025 Mx.	0.025 Mx.	0.025 Mx.
<b>P</b>	0.025 Mx.	0.025 Mx.	0.025 Mx.	0.025 Mx.	0.025 Mx.	0.025 Mx.	0.025 Mx.	0.025 Mx.	0.025 Mx.
<b>Si</b>	0.25-0.40	0.15-0.30	0.25-0.40	0.15-0.35	0.15-0.35	0.15-0.35	0.25-0.40	0.15-0.35	0.20-0.40
<b>Ni</b>	0.15 Mx.	1.65-2.00	0.15 Mx.	0.25 Mx.	1.15-1.50	1.65-2.00	0.15 Mx.	1.65-2.00	0.30 Mx.
<b>Cr</b>	0.2 Mx.	0.3 Mx.	0.2 Mx.	0.80-1.10	0.70-0.90	0.80-1.10	0.2 Mx.	0.80-1.10	0.50-0.90
<b>Mo</b>	0.05 Mx.	0.20-0.30	0.05 Mx.	0.15-0.25	0.20-0.30	0.20-0.30	0.05 Mx.	0.20-0.30	0.25-0.50
<b>V</b>	0.10-0.15	—	0.10-0.15	—	0.03-0.07	0.035-0.100	0.10-0.15	0.035-0.100	0.04-0.07
<b>Nb</b>	—	—	—	—	—	—	—	—	0.025-0.045
<b>Al</b>	0.01-0.04	0.01-0.04	0.01-0.04	0.01-0.04	0.01-0.05	0.01-0.06	0.01-0.04	0.01-0.06	0.01-0.07
<b>Cu</b>	0.25 Mx.	0.25 Mx.	0.25 Mx.	0.25 Mx.	0.25 Mx.	0.25 Mx.	0.25 Mx.	0.25 Mx.	0.25 Mx.
<b>Mechanical Properties</b>									
<b>YS [ksi]</b>	60 Min.	60 Min.	85 Min.	100*	85 Min.	100*	115 Min.	115 Min.	115 Min.
<b>UTS [ksi]</b>	90-115	90-115	115-140	120-140	115-140	125-140	140-160	140-160	138-155
<b>Heat Treatment</b>									
	Normalized	Normalized	Normalized	Normalized	Normalized	Normalized	Normalized	Normalized	Normalized
	Tempered		Forced cooling	Tempered	Tempered	Tempered	Induction Case Hardened	Tempered	Tempered

The values that appear in this brochure are reference values, and Tenaris reserves the right to modify them according to the internal specifications, without prior notice.

(\*) Typical value. Tenaris guarantees an 85 ksi Minimum Yield Strength as specified in API 11B Specs.