



Series	Description
NI-WRB <i>metric and imperial sizes</i>	Induction hardened and ground stainless steel linear shafts steel grade: X46Cr13 (W1.4034) / Ø5 - 50 mm / Ø1/4" - 2"

Steel grades correspondents

EN	Werkstoff	DIN	B.S.	UNI	JIS	GOST	AISI SAE ASTM
X46Cr13	1.4034	X46Cr13	(420S45)	X40Cr14	-	40Ch13	420C

Chemical composition - % by weight

Steel grade	Norm	C	Si	Mn	P	S	Cr	Ni.	Mo	V
X46Cr13	EN 10088-3	0.43 ÷ 0.50	max. 1.0	max. 1.0	max. 0.040	max. 0.030	12.5 ÷ 14.5	-	-	-

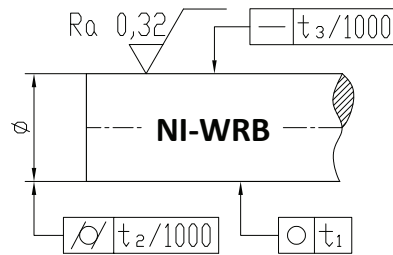
Mechanical properties for steel bars

Steel grade	Diameter Ø mm	Tensile strength R _m N/mm ²	Yield strength R _{p0.2} N/mm ²	Elongation A ₅ %	Hardness Brinell HB
X46Cr13+A	5 < Ø ≤ 50	max. 800	-	-	max. 245

A=annealed

Induction Hardened and Ground Stainless Steel Linear Shafts

steel grade: X46Cr13 (W1.4034)



Shaft Diameter \varnothing	Weight	Series	Standard length	Surface hardening depth SHD	Roundness (circularity)	Parallelism (cylindricity)	Straightness	Standard tolerance ISO h6
					t1 max. μm	t2 max. μm	t3 max. mm/m	
5	0.15	NI-WRB 5	3000	min. 0.4	4	6	0.25	0 / -8
6	0.22	NI-WRB 6	3000	0.4 + 0.9	4	6	0.25	0 / -8
8	0.39	NI-WRB 8	6000	0.4 + 0.9	4	6	0.20	0 / -9
10	0.62	NI-WRB 10	6000	0.4 + 0.9	4	6	0.20	0 / -9
12	0.89	NI-WRB 12	6000	0.6 + 0.9	5	8	0.20	0 / -11
14	1.21	NI-WRB 14	6000	0.6 + 0.9	5	8	0.20	0 / -11
15	1.39	NI-WRB 15	6000	0.6 + 0.9	5	8	0.20	0 / -11
16	1.58	NI-WRB 16	6000	0.6 + 0.9	5	8	0.20	0 / -11
20	2.46	NI-WRB 20	6000	0.8 + 0.8	6	9	0.20	0 / -13
25	3.85	NI-WRB 25	6000	0.9 + 0.8	6	9	0.15	0 / -13
30	5.55	NI-WRB 30	6000	0.9 + 0.8	6	9	0.15	0 / -13
40	9.86	NI-WRB 40	6000	1.5 + 1.3	7	11	0.15	0 / -16
50	15.41	NI-WRB 50	6000	1.5 + 1.3	7	11	0.15	0 / -16

Shaft Diameter \varnothing		Weight	Series	Standard length	Surface hardening depth SHD	Roundness (circularity)	Parallelism (cylindricity)	Straightness	Standard tolerance Class "L"
mm	inch					t1 max. inch	t2 max. inch	t3 max. in/ft	
6.35	1/4	0.25	NI-WRB 6.35	118.11	0.016 + 0.035	0.00016	0.00024	0.00308	-0.0005 / -0.001
9.525	3/8	0.56	NI-WRB 9.525	236.22	0.016 + 0.035	0.00016	0.00024	0.00246	-0.0005 / -0.001
12.7	1/2	0.99	NI-WRB 12.7	236.22	0.024 + 0.035	0.00020	0.00031	0.00246	-0.0005 / -0.001
15.875	5/8	1.55	NI-WRB 15.875	236.22	0.024 + 0.035	0.00020	0.00031	0.00246	-0.0005 / -0.001
19.05	3/4	2.24	NI-WRB 19.05	236.22	0.032 + 0.032	0.00024	0.00035	0.00246	-0.0005 / -0.001
25.4	1	3.98	NI-WRB 25.4	236.22	0.032 + 0.032	0.00024	0.00035	0.00185	-0.0005 / -0.001
31.75	1 1/4	6.21	NI-WRB 31.75	236.22	0.059 + 0.051	0.00028	0.00043	0.00185	-0.0005 / -0.001
38.1	1 1/2	8.94	NI-WRB 38.1	236.22	0.059 + 0.051	0.00028	0.00043	0.00185	-0.0006 / -0.0011
50.8	2	15.90	NI-WRB 50.8	236.22	0.087 + 0.063	0.00028	0.00043	0.00185	-0.0006 / -0.0013

- ✓ Surface hardness: 55±2 HRC
- ✓ Surface roughness: R_a : max. 0.32 μm
- ✓ Length tolerance: ±200 mm
- ✓ Surface hardening depth, SHD: according to EN ISO 15787
- ✓ On request: special lengths, tolerances and dimensions
- ✓ Additional chrome plating on request
- ✓ The hardening depth (SHD according to EN ISO 15787 or R_{ht} according to DIN 6773) is defined as the distance from the steel surface up to the point where the hardness value is 80% of the minimum guaranteed value of the surface hardness and it is established in accordance with ISO 13012, depending on the shaft's size.
- ✓ The minimum guaranteed value of the surface hardness varies between the steel grade.