



Series	Description
NI-WP <i>metric and imperial sizes</i>	Deep case hardened and ground shafts for ball screws steel grade: Cf53, C55E, 42CrMo4, 50CrMo4 / Ø20 - 100 mm / Ø3/4" - 4"

Steel grades correspondents

EN	Werkstoff	DIN	B.S.	UNI	JIS	GOST	AISI SAE ASTM
C53	1.1213	Cf53 (C53G)	070M55	C53	S50C	50	1050
C55E	1.1203	Ck55	060A57, 070M55	C55	S55C, S55CM	55	1055
42CrMo4	1.7725	42CrMo4	708M40	42CrMo4	SCM440(H)	35KHM	4140
50CrMo4	1.7228	50CrMo4	708M50	-	SCM445(H)	-	4150, 4147

Chemical composition - % by weight

Steel grade	Norm	C	Si	Mn	P	S	Cr	Ni.	Mo	V
Cf53	DIN 17212	0.50 ÷ 0.57	0.15 ÷ 0.35	0.40 ÷ 0.70	max. 0.025	max. 0.035	-	-	-	-
C55E	EN 10083-2	0.52 ÷ 0.60	max. 0.4	0.60 ÷ 0.90	max. 0.030	max. 0.035	max. 0.4	max. 0.4	max. 0.1	-
42CrMo4	EN 10083-3	0.38 ÷ 0.45	max. 0.4	0.60 ÷ 0.90	max. 0.025	max. 0.035	0.90 ÷ 1.20	-	0.15 ÷ 0.30	-
50CrMo4	EN 10083-3	0.46 ÷ 0.54	max. 0.4	0.50 ÷ 0.80	max. 0.025	max. 0.035	0.90 ÷ 1.20	-	0.15 ÷ 0.30	-

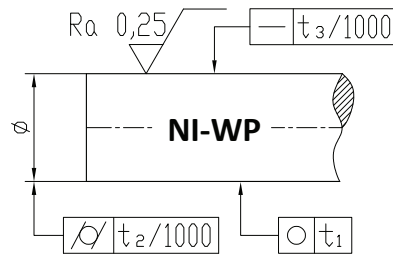
Mechanical properties for steel bars

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
Cf53+N	Ø ≤ 16	610 - 760	min. 340	min. 16	min. 183
	16 < Ø ≤ 100	610 - 760	min. 340	min. 16	-
C55E+N	Ø ≤ 16	min. 680	min. 370	min. 11	min. 208
	16 < Ø ≤ 100	min. 640	min. 330	min. 12	min. 198
42CrMo4+QT	Ø ≤ 16	1100 - 1300	min. 900	min. 10	330 - 380
	16 < Ø ≤ 40	1000 - 1200	min. 750	min. 11	325 - 360
	40 < Ø ≤ 100	900 - 1100	min. 650	min. 12	265 - 330
50CrMo4+QT	Ø ≤ 16	1100 - 1300	min. 900	min. 9	330 - 380
	16 < Ø ≤ 40	1000 - 1200	min. 780	min. 10	325 - 360
	40 < Ø ≤ 100	900 - 1100	min. 700	min. 12	265 - 330

N=normalized, QT=quenched and tempered

Deep Case Hardened and Ground Shafts for Ball Screw

steel grade: Cf53, C55E, 42CrMo4, 50CrMo4



Shaft Diameter \varnothing	Weight	Series	Standard length	Surface hardening depth	Roundness (circularity)	Parallelism (cylindricity)	Straightness	Standard tolerance
				SHD min.	t1 max.	t2 max.	t3 max.	
mm	kg/m		mm	mm	μm	μm	mm/m	ISO h6 μm
20	2.46	NI-WP 20	6000	4.0	6	9	0.3	0 / -13
25	3.85	NI-WP 25	6000	4.0	6	9	0.3	0 / -13
30	5.55	NI-WP 30	6000	5.0	6	9	0.3	0 / -13
35	7.55	NI-WP 35	6000	6.0	7	11	0.3	0 / -16
40	9.86	NI-WP 40	6000	6.0	7	11	0.3	0 / -16
45	12.48	NI-WP 45	6000	6.0	7	11	0.3	0 / -16
50	15.41	NI-WP 50	6000	6.0	7	11	0.3	0 / -16
60	22.20	NI-WP 60	6000	6.5	8	13	0.3	0 / -19
70	30.20	NI-WP 70	6000	6.5	8	13	0.3	0 / -19
80	39.44	NI-WP 80	6000	6.5	8	13	0.3	0 / -19
90	49.92	NI-WP 90	6000	6.5	10	15	0.4	0 / -22
100	61.62	NI-WP 100	6000	6.5	10	15	0.4	0 / -22

Shaft Diameter \varnothing		Weight	Series	Standard length	Surface hardening depth	Roundness (circularity)	Parallelism (cylindricity)	Straightness	Standard tolerance
mm	inch				SHD min.	t1 max.	t2 max.	t3 max.	Class "L"
mm	inch	kg/m	inch	inch	inch	inch	in/ft	inch	
19.05	3/4	2.24	NI-WP 19.05	236.22	0.157	0.00024	0.00035	0.00360	-0.0005 / -0.001
25.4	1	3.98	NI-WP 25.4	236.22	0.157	0.00024	0.00035	0.00360	-0.0005 / -0.001
31.75	1¼	6.21	NI-WP 31.75	236.22	0.197	0.00024	0.00035	0.00360	-0.0005 / -0.001
34.925	1¾	7.52	NI-WP 34.925	236.22	0.236	0.00028	0.00043	0.00360	-0.0005 / -0.001
38.1	1½	8.94	NI-WP 38.1	236.22	0.236	0.00028	0.00043	0.00360	-0.0006 / -0.0011
44.45	1¾	12.17	NI-WP 44.45	236.22	0.236	0.00028	0.00043	0.00360	-0.0006 / -0.0011
50.8	2	15.90	NI-WP 50.8	236.22	0.236	0.00028	0.00043	0.00360	-0.0006 / -0.0013
57.15	2¼	20.13	NI-WP 57.15	236.22	0.256	0.00031	0.00051	0.00360	-0.0007 / -0.0015
63.5	2½	24.85	NI-WP 63.5	236.22	0.256	0.00031	0.00051	0.00360	-0.0007 / -0.0015
76.2	3	35.78	NI-WP 76.2	236.22	0.256	0.00031	0.00051	0.00360	-0.0008 / -0.0017
88.9	3½	48.70	NI-WP 88.9	236.22	0.256	0.00039	0.00059	0.00480	-0.0010 / -0.0020
101.6	4	63.61	NI-WP 101.6	236.22	0.256	0.00039	0.00059	0.00480	-0.0012 / -0.0024

- ✓ Surface hardness: min. 60 HRC
- ✓ Surface roughness: Ra: max. 0.25 μm
- ✓ Length tolerance: ± 200 mm
- ✓ Steel grades condition: Cf53, C55E, 42CrMo4+QT, 50CrMo4+QT
- ✓ Surface hardening depth, SHD: according to EN ISO 15787
- ✓ On request: special lengths, tolerances and dimensions

✓ The hardening depth (SHD according to EN ISO 15787 or Rht 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.